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# PROCEEDINGS



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IN PHYSICAL EDUCATION AND SPORTS SCIENCE 2020

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# Decomposition of High-level Sportive Performance Using Neuromechanical Methods

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## ABSTRACT

Muscular activation strategies or recruitment patterns are one of the hot topics in sport sciences. Researches try to define a specific muscular involvement pattern in a given sport branch and during the execution of specific movement pattern. As chosen one of the examples, archery release is very critical to reach high scores in sport archery. Especially, recurve archers use a device called clicker and as soon as its' snap against the bow handle archer needs to release the string. Three finger hooks opened by active contraction of extensor muscles or just relaxation of forearm flexors. Active contraction of forearm extensor muscles thought to create a lateral deflection of bowstring, which may decrease the score on the target. As like archery, soccer kick is also one of the specific movement patterns that have been observed for muscular activation strategies. Lower extremity muscles play an important role in kick movement to stationary ball. Activation of biceps femoris and gastrocnemius muscles found to be different than that of high-level soccer players. Hence, reaching to high-level sport performance needs to develop certain muscular activation or recruitment patterns. This review focuses on the specific muscular involvement strategies in given sports.

**Keywords:** Kinesiologic electromyography, Muscular recruitment, Sport performance.

## 1. INTRODUCTION

High-level sportive performance assessment may need numerous laboratory tests. One of the methods evaluates the neural procedures that affect the human movement [1]. In other words, muscular involvement or recruitment patterns are used as one of the most efficient approaches to distinguish high-level athlete from the middle class or beginners. As long as there are many other aspects of performance testing, evaluating the motor performance from neural and biomechanical aspects may supply important clues on the performance subdomains such as strength, speed, and endurance. Combining the sportive performance evaluation using neural aspect with biomechanical applications may be named as neuromechanical evaluation of human performance. Neuromechanical evaluation of motor abilities needs the synchronous usage of kinetic and kinematic aspects. Synchronization of these two methods forces the researchers to use superficial electromyography (EMG) instead of needle electrodes.

Kinesiologic EMG, in very general saying, may supply information on neural drive. More specifically, one may

evaluate the contraction/relaxation strategies used by agonist and antagonist muscles. Besides, cocontraction of agonist and synergist muscles may also be evaluated. When we combine the data from EMG with some kinematic (velocity, angular velocity, etc.) and kinetic (e.g., force output) data, the value of performance evaluation increases. As the EMG signal incorporates central control strategies, signal transmission along nerve fibers, and across neuromuscular junctions, electrical activation of the muscle fibers organized in elementary motors and through a chain of complex biochemical events, the production of forces acting on the tendons of the agonist and/or antagonist muscles and moving the bones [2]. Hence, the purpose of the current review manuscript is to share the latest findings on muscular recruitment patterns and their relations to high-level sportive performance.

## 2. MATERIALS AND METHODS

The literature on kinesiologic EMG applications, sport biomechanics, and high-level sport performance has

been reviewed. Besides, the findings from Anadolu University, Movement and Motor Control Laboratory combined with the literature. The findings from different sport branches have been chosen as good examples to be used as indicators of the relationship between high-level sport performance and muscular recruitment patterns. Archery example has been chosen as the first application of muscular recruitment and its relation with both hits on the target and performance level. Soccer kick to the stationary ball was the second application of contraction/relaxation strategies. Especially, swing leg was analyzed before and after the ball contact.

### 3. RESULTS

Muscular recruitment patterns or contraction/relaxation strategies have been reviewed and its relation with performance in a given sport has been discussed. The following subsections include the examples from different sport branches.

#### 3.1. Archery

Some studies have been conducted to evaluate the muscular recruitment patterns during archery shooting before and after the fall of the clicker. The manuscripts included in this review have used EMG as the main tool in data collection and analyzation. Muscles and the joints have been divided into parts as follows: (1) Forearm and pull finger muscles, (2) the arm muscles, (3) the shoulder girdle muscles, and (4) the back muscles. The recruitment patterns in forearm muscles during the bowstring release critical for accurate and reproducible performance execution in archery. Ertan *et al.* (2003) [3] conducted a research analyzing the activation patterns in forearm muscles during archery shooting. They included elite ( $n = 10$ ), beginner ( $n = 10$ ) archers, and non-archers ( $n = 10$ ). M. flexor digitorum superficialis and M. extensor digitorum activations were quantified using EMG.

Some skill indexes have been created by Ertan *et al.* (2005) to analyze the correlation between FITA scores and archery skill indexes. They defined negative significant correlation between FITA scores and log of skill indexes showing that increase in archery experience causes a decrease in area under the processed EMG data. The amplitudes have been found to be lower in highly experienced archers [4]. Besides, Nishizono *et al.* (1987) have proved that world-class archers have stronger activities of M. deltoideus than that of national-level or middle-class archers. Moreover, the muscular

contraction level was higher in back muscles than that of the arm muscles in world-class archers compared with middle-class and beginner archers. It can be concluded that elite archers use their back and shoulder girdle muscles more than arm and forearm muscles in drawing the string. The advantages of that strategy may be two-fold: (1) Delayed exhaustion as bigger muscle(s) used [5] and (2) having lower contraction levels of forearm muscles may not cause lateral deflection of the bowstring [6]. Both advantages of the mentioned strategy help increasing the scores on the target.

#### 3.2. Soccer

Cerrah *et al.* (2014) worked on a project to define recruitment patterns of knee joint muscles of the swinging leg during the in-step kick. They have related the ball velocity with EMG activity of lower extremity muscles in kicking leg. They included in professional ( $n = 14$ ) and amateur ( $n = 17$ ) soccer players. The rectus femoris (RF), vastus lateralis (VL), vastus medialis (VM), long head of biceps femoris (BF), and medial gastrocnemius muscular activities have been recorded and analyzed using EMG. Three successful maximal in-step kicks using a  $0^\circ$  approach angle with two steps to a stationary ball toward a target have been analyzed. They have found that significantly earlier contraction of BF muscle and reduced activation of RF muscle and an earlier and greater muscle activity occurred in VL and VM in professionals compared to amateur players [7]. The results of their study can be concluded as the higher performance of professional players compared to amateurs appears not to be due to muscle strength, it is thought to be due to the recruitment or contraction/relaxation strategies of agonist and antagonist muscles and cocontraction of synergist muscles during swinging, ball contact, and follow-through phases.

### 4. DISCUSSION AND CONCLUSIONS

The literature proved that high-level sportsmen have different muscular recruitment pattern than that of middle class and beginner ones. Each sport branch has different execution of the given movement pattern that is very important to achieve high performance level. Hence, each sport branch needs to be evaluated separately and made deep analyses of muscular involvement strategies.

### REFERENCES

1. Ballanger, B., and Boulinguez, P. EMG as a key tool to assess motor lateralization and hand reaction time

- asymmetries. *J Neurosci Methods*, 2009, 179(1), 85-89.
2. Cerrah, A.O., Ertan, H., and Soylu, A.R. Evaluating force with electromyography. *Turk Clin J Neurol*, 2010, 5(3), 160-6.
  3. Ertan, H., Kentel, B., Tümer, S.T., and Korkusuz, F. Activation patterns in forearm muscles during archery shooting. *Hum Mov Sci*, 2003, 22(1), 37-45.
  4. Ertan, H., Soylu A.R., and Korkusuz, F. Quantification the relationship between FITA scores and EMG skill indexes in archery. *J Electro Kin*, 2005, 15(2), 222-227.
  5. Acikada, C., Ertan, H., Tınazcı, C. Shooting dynamics in archery. In: Ergen, E., Hibner, K., (eds). *Sports Medicine and Science in Archery*. 2<sup>nd</sup> ed. Lausanne, Switzerland: International Archery Federation, Medical Committee; 2004.
  6. McKinney, W., and McKinney, M. *Archery*. 8<sup>th</sup> ed. Madison, WI, USA: Brown and Benchmark; 1997.
  7. Cerrah, A.O., Gungor, E.O., Soylu, A.R., Ertan, H., Lees, A., and Bayrak, C. Muscular activation patterns during the soccer in-step kick. *Isokinet Exerc Sci*, 2011, 19(3), 181-190.



# Assessment of Exercise-induced Changes in Sensorimotor Skills: A Critical Appraisal

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## ABSTRACT

This work provides an overview of our findings on acute and long-term changes in sensorimotor skills following different forms of exercise and training programs. Sensorimotor functions, together with neuromuscular and cardiorespiratory parameters, were monitored using the tests of static and dynamic balance, agility, reaction time, movement speed, as well as strength and power of limb and core muscles. Findings revealed that repeated task-oriented sensorimotor exercises acutely improve the accuracy of visual feedback control of body position. The learning effect is greater when visually guided center of mass tracking task is performed under dynamic than under static conditions. Furthermore, sway velocity declines when responses to visual stimuli are performed during standing on an unstable support surface. A similar effect was observed after serial mechanical proprioceptive stimulation applied to lower limbs. On the other hand, fatigue induced by sport-specific exercise increases sway velocity, whereas its values decrease during standing on an unstable surface when responding to visual stimuli. Furthermore, sensorimotor time increases after exercise of high intensity and reaction time when concurrently balancing on an unstable surface. Concerning the adaptive changes, serial mechanical proprioceptive stimulation, combined agility-balance training in the form of balance exercises performed simultaneously with a reaction task, and instability resistance exercises differently enhance variables of sensorimotor and/or neuromuscular functions in various populations. While performing secondary reaction tasks during standing on an unstable surface improve reaction time and dynamic balance, task-oriented sensorimotor exercises performed on an unstable spring-supported platform enhance also the accuracy of visual feedback control of body position. In addition, instability resistance exercises increase the speed of step initiation and muscle strength and power. Similar effects on these abilities can be achieved by serial mechanical proprioceptive stimulation. Agility training is necessary to increase reaction and movement speed. However, further studies are needed to investigate the effects of these exercises on sport-specific performance.

**Keywords:** Acute response, Adaptive changes, Sensory and motor functions, Testing, Training.

## 1. INTRODUCTION

This study presents our experience and knowledge obtained from studies evaluating the acute and long-term changes in sensorimotor skills following different forms of exercise and training programs. Laboratory and field tests of sensorimotor functions completed with the assessment of neuromuscular and cardiorespiratory parameters were used for this purpose. This included tests of static and dynamic balance, agility, reaction time, movement speed, as well as strength and power of limb and core muscles.

Investigations evaluating acute responses to different forms of exercise showed the following results:

- a) Visual reaction time over repeated trials increases while balancing on an unstable surface, whereas sway velocity declines when concurrently performing reaction tasks.
- b) Practice of task-oriented sensorimotor exercise acutely enhances the accuracy of visual feedback control of body position but not static and dynamic balance. Subjects are able to respond to visual stimuli faster and more precisely by horizontal shifting center of mass (CoM) in one of the four



directions according to the position of the stimulus on the screen during standing on an unstable spring-supported platform equipped with PC system for feedback monitoring of CoM movement. Such an exercise also temporarily improves the accuracy of visual feedback control of CoM movement in both anteroposterior and mediolateral direction over repeated trials. The learning effect is greater when visually guided CoM tracking task is performed under dynamic than under static conditions.

- c) Prolonged proprioceptive stimulation applied to lower limbs transiently impairs static balance but facilitates dynamic balance adjustments leading to its temporary improvement. In both cases, such effects become more pronounced as the duration of stimulation increases. An additional proprioceptive stimulation also enhances the acute effect of lower limbs resistance exercise on parameters of balance.
- d) Post-exercise agility performance depends on the type of fatigue. Sensorimotor time decreases after exercise of moderate intensity but is negatively affected by highly intensive exercise.
- e) The soccer match-induced fatigue impairs neuromuscular performance. Both center of pressure velocities while standing on an unstable platform with eyes closed and ground contact time significantly increase after the first half of a game. A further increase is observed after the second half of a game. Along with, dynamic balance with eyes open and agility performance while moving shorter distances are also affected. On the other hand, there are no significant post-match changes in static balance with eyes open and eyes closed, agility performance while moving longer distances, speed of the step initiation and the soccer kick, height of the squat, and countermovement jumps.
- f) Using retention tests revealed that squats performed on a wobble board with an additional load of 25% of body weight for 1 min with 1.5 min rest in-between (i.e., 12 min practicing/18 min rest in 30 min session) are effective schedule for improvement of balance. The previous experience also showed that adaptive changes in body balance of elite athletes may be induced if such a schedule is provided 4–5 days/week for >25 training days.

Findings on chronic balance adaptations after varied training programs were as follows:

- a) The 3-week task-oriented sensorimotor exercise performed on an unstable spring-supported platform equipped with PC system for feedback monitoring of CoM movement improves the accuracy of

visual feedback control of body position and dynamic balance observed as more rapid postural sway adjustments in altered surface conditions in untrained subjects. However, such training is insufficient to improve static balance and jumping performance.

- b) The 12-week conventional training program consisting of balance exercises does not improve the accuracy of visual feedback control of body position in individuals with functional imbalances. Providing visual feedback of CoM movement on a computer screen during training contributes to more precise perception of CoM position and regulation its movement during task-oriented sensorimotor exercises.
- c) The 3-month serial mechanical proprioceptive stimulation applied to lower limbs significantly improves agility performance, static balance, and explosive power of lower limbs in older women.
- d) The 8-week instability agility training in the form of balance exercises performed simultaneously with reaction tasks improves dynamic balance, namely, when responding to visual stimuli, and reduces multi-choice reaction time in untrained young adults.
- e) The 6-week combined agility-balance training in the form of balance exercises performed simultaneously with reaction tasks improves dynamic balance not only under visual control but also with eyes closed, increases speed of the step initiation that most likely contributes to the enhancement of agility performance, reduces drop jump ground contact time, and improves the ability to differentiate the force of muscle contraction during repeated jumps in basketball players. On the other hand, such training fails to improve static balance, simple and multi-choice reaction time, and explosive power of lower limbs.
- f) The 6-week agility training improves agility performance in volleyball players, whereas there are no significant changes in sensorimotor time after the same period of volleyball training. Repeated measurements of sensorimotor time during 1 year of training reflect their actual ranking.
- g) The 4-week resistance exercises on an unstable board in an altered-G environment improves muscle power and upright balance while revealing less reliance on visual stimuli and/or increase the use of somatosensory cues after training.
- h) The 12-week instability resistance training improves dynamic balance on injured leg and during bipedal stance on a mediolaterally tilted platform, as well as

speed of the step initiation in athletes with previous anterior cruciate ligament (ACL) injury. However, such training is insufficient to enhance kicking performance and static balance.

These findings were published in particular articles and summarized in the form of reviews, book chapters, and books (e.g., Zemková, 2010; Zemková and Hamar, 2015; Zemková, 2018a; Zemková, 2019). As shown, specifically tailored testing procedures were designed to evaluate the acute responses to exercise and adaptive changes after training programs. This includes balance (Zemková, 2014; Zemková and Hamar, 2014), agility (Zemková and Hamar, 2010; Zemková and Hamar, 2015), instability resistance (Oddsson *et al.*, 2007; Zemková, 2016; Zemková and Oddsson, 2016), and core stabilization and core strengthening exercises (Zemková, 2017; Zemková *et al.*, 2017; Zemková, 2018b) in various populations, such as young athletes (Zemková and Hamar, 2018), elite athletes of specific sports specializations (Poór and Zemková, 2018), physically active individuals, overweight and obese people with predominantly sedentary lifestyle (Zemková *et al.*, 2016b), and the elderly and those suffering from particular diseases or after injuries (Zemková *et al.*, 2016a).

Other studies were conducted under my supervision by students within their dissertation and rigorous theses (www.uniba.sk), for instance, those evaluating the effects of 6 weeks of high-intensity agility training on simple and multi-choice reaction times in karate competitors (Miklovič, 2010), 12 weeks of training consisting of exercises eliciting instability of either upper or lower body on balance in karate competitors (Macko, 2010), 12 weeks of instability training on balance and strength in athletes (mainly soccer players) after ACL injury (Vlašič, 2011), 8 weeks of agility training under simulated competitive and non-competitive conditions on agility, reaction time, speed, and power in physically active individuals (Kováčiková, 2012), 12 weeks of either stable-unstable resistance training or unstable-stable resistance training on neuromuscular performance in handball players (Bauer, 2013), 16 weeks of resistance training on unstable and stable surfaces on strength and balance in tennis players (Ferková, 2013), three different 10-week training programs focused on improvement of coordination abilities in early school-age children (Štefániková, 2013), 8 months of resistance training on muscle strength and power in the adolescent with anorexia nervosa as a part of cognitive behavioral

therapy (Poór, 2019), and 3 months of balance training on postural stability and strength of core muscles in women after oncological treatment (Šuchter, 2019). Although these balance, agility, and resistance exercises have been demonstrated to improve sensorimotor and/or neuromuscular functions, their effects on sport-specific performance are less known and are open for further investigation.

## 2. ACKNOWLEDGMENTS

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## REFERENCES

- Oddsson, L.I.E., Karlsson, R., Konrad, J., Ince, S., Williams, S.R., and Zemková, E. A rehabilitation tool for functional balance using altered gravity and virtual reality. *J Neuroeng Rehabil*, 2007, 4(25), 2-7.
- Poór, O., and Zemková, E. The effect of training in the preparatory and competitive periods on trunk rotational power in canoeists, ice-hockey players, and tennis players. *Sports (Basel)*, 2018, 6(4), E113.
- Zemková, E. Sensorimotor exercises in sports training and rehabilitation. In: Duncan, M.J. and Lyons, M., (eds). *Trends in Human Performance Research*. New York: Nova Science Publishers, Inc.; 2010, pp. 79-117.
- Zemková, E. and Hamar, D. The effect of 6-week combined agility-balance training on neuromuscular performance in basketball players. *J Sports Med Phys Fit*, 2010, 50(3), 262-267.
- Zemková, E. Sport-specific balance. *Sports Med*, 2014, 44(5), 579-590.
- Zemková, E. and Hamar, D. Physiological mechanisms of post-exercise balance impairment. *Sports Med*, 2014, 44(4), 437-448.
- Zemková, E. and Hamar, D. *Toward an Understanding of Agility Performance*. 2<sup>nd</sup> ed. Boskovice: František Šalé Albert; 2015.
- Zemková, E. Instability resistance training for health and performance. *J Tradit Complement Med*, 2016, 7(2), 245-250.
- Zemková, E., Hamar, D., Kienbacher, T., and Ebenbichler, G. Clinical applications of posturography: From research to practice. *Slovak J Health Sci*, 2016a, 7(2), 59-77.
- Zemková, E., Kyselovičová, O., Ukropec, J., and Ukropcová, B. Unique functional performance testing for the overweight and obese. *Med Sportiva Pract*, 2016b, 17(1), 1-8.
- Zemková, E., and Oddsson, L.I.E. Effects of stable and unstable resistance training in an altered-G environment

- on muscle power. *Int J Sports Med*, 2016, 37(4), 288-294.
- Zemková, E. Assessment of power and strength of trunk muscles: From the lab to the field. *Sci Rev Phys Cult*, 2017, 7(4), 103-117.
- Zemková, E., Hamar, D., Kienbacher, T., and Ebenbichler, G. Assessment of core stability and strength: From theory to practical applications. *Slovak J Health Sci*, 2017, 8(2), 64-81.
- Zemková, E. Assessment of sensorimotor functions: From the lab to the field. *Slovak J Health Sci*, 2018a, 9(2), 61-74.
- Zemková, E. Science and practice of core stability and strength testing. *Phys Act Rev*, 2018b, 6, 181-193.
- Zemková, E., and Hamar, D. Sport-specific assessment of the effectiveness of neuromuscular training in young athletes. *Front Physiol*, 2018, 9, 264.
- Zemková, E. *Postural Sway Response to Exercise*. 2<sup>nd</sup> ed. Boskovice: František Šalé-Albert; 2019.

# The 360° TitaniUM Core Strength Exercise® Improve Balance in Teenager

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## ABSTRACT

The core is described as an anatomical box consisting of 29 pairs of muscles forming a front (abdominals), back (paraspinal and glutes), and top and bottom (pelvic floor and hip girdle). It represents the connection between lower and upper limbs and should be considered as a functional unit, in which different muscles interact, even if not located in the thoracolumbar region (such as shoulders and pelvic muscles). Exercises involving the full body linkage such as core strength training have been advocated to enhance the capacity of transmitting force through the body linkage. Balance is the ability to maintain a stable posture with body mass center in the domain of base of support while counteracting external or internal conflicts. Several potential mechanisms exist to explain the ability to improve balance, most of which involve the improved functioning of the nervous system or strengthening of the core. The 360° TitaniUM Core Strength Exercise® is a new sequence of exercise to strengthen the core region muscles, it consisted of 12 isometric exercises and the participants carried out the exercises in sequence with each exercise session consisted of 10–20 s/exercise progressively, three sets every session with the rest period of 1 min between sets. The primary aim of this study was to explore whether 12 weeks of 360° TitaniUM Core Strength Exercise® could elicit significant improvement of balance stability in teenager. Forty teenagers, 20 males and 20 females age 14–16 years old, were recruited for this study. Results revealed that 12 weeks 360° TitaniUM Core Strength Exercise® induced significant improvements of balance stability in teenager between pre-test and post-test ( $t [39] = -8.29, P < 0.001$ ). From the results of this study, we can conclude that the 360° TitaniUM Core Strength Exercise® is suitable and effective training method to improve the balance stability in teenager.

**Keywords:** 360° TitaniUM Core Strength Exercise®, Balance in teenager.

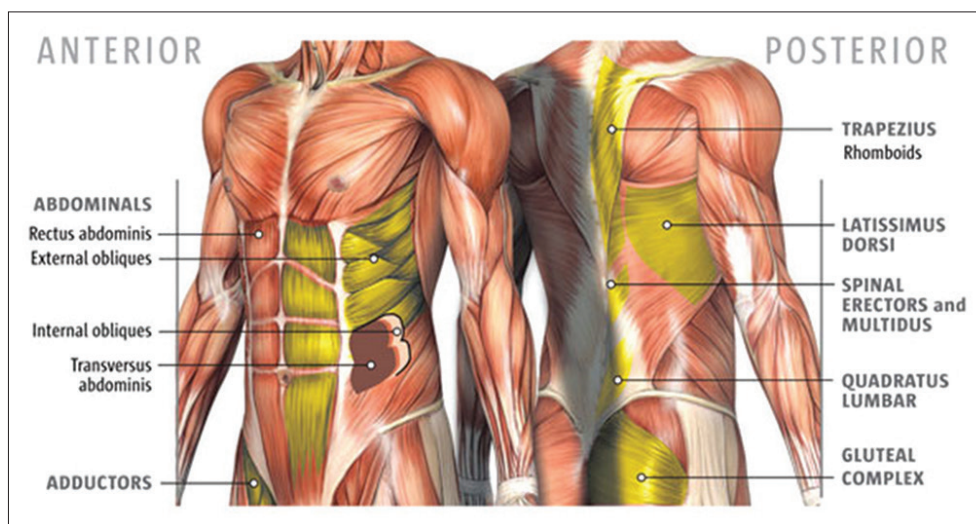
## 1. INTRODUCTION

The core was described as an anatomical box consisting of 29 pairs of muscles [Diagram 1] forming anterior muscles (abdominals and adductors) and posterior muscles (paraspinal and glutes) (Richardson *et al.*, 1999). Exercises involving the full body linkage such as core strength training have been advocated to enhance the capacity of transmitting force through the body linkage (Schoenfeld *et al.*, 2014). An efficient core allows for optimal acceleration, deceleration, and stabilization of the entire kinetic chain during functional exercise. The core needs to be trained appropriately to efficiently distribute weight, absorb force, and transfer ground reaction forces during functional movements. The core muscles also stabilize the spine and trunk during

movements of lower and upper extremities such as jumping, running, and throwing.

Core strength training differs from many traditional weight training routines by working both the lower back and abdominals in unison. The 360° TitaniUM Core Strength Exercise® is a new sequence of exercises to strengthen the core region muscles. It is easy to remember with no specific equipment needed to carry out this exercise. It is suitable for all athletes and non-athletes. The structured sequence of exercises would enable the practitioners to experience greater efficiency of movement; improved body control and balance; increased power output from both the core musculature and peripheral muscles such as the shoulders, arms, and legs; reduced risk of injury. At such, well-developed core strength may contribute to stabilizing the core by





**Diagram 1:** Core muscles (anterior and posterior)

stiffening the torso and transferring the energy of the legs to the upper extremities (Roth *et al.*, 2017).

Maintaining upright body posture is fundamental for humans. Therefore, research concerning balance control and postural stability is very diverse. Several clinical and laboratory methods have been developed which enable researchers to assess different dimensions of the postural control system (Mikołajec and Rzepka, 2007). Experimental protocols are usually designed to assess postural steadiness or postural balance. Postural balance refers to the ability to stay upright within the base of support or to recover equilibrium after external dynamic perturbation.

Balance is the ability to maintain a stable posture with body mass center in the domain of base of support while counteracting external or internal conflicts (Abbasi, 2012). Instability of balance can demonstrate main health problems in human beings; therefore, knowledge of center of gravity within the human body and support base is crucial for constant adjustments to the muscular activity and joint positioning, which simulate a motor function that ensures a connection among sight, deep sensory organs that support antigravity muscles to maintain the standing posture. Balance depends on coordinated integration of somatosensory, vestibular, and visual input (Kisner and Colby, 2007).

Core strength training targets the muscles deep within the abdomen which connect to the spine, pelvis, and shoulders, to assist in the maintenance of good posture and provide the foundation for all arm and leg movements (Akuthota *et al.*, 2008).

Centre of pressure (CoP) emerges as the most common variable among others registered with the use of force plates. It is defined as the point of application of ground reaction forces under the feet. CoP is the outcome of the inertial forces of the body and equilibrium restoring forces of the postural control system. CoP displacement is used to investigate neurological and biomechanical mechanisms of postural control.

### 1.1. Objectives of the Study

The objectives of the study were as follows:

1. To determine the balance stability of the teenager
2. To find out the effectiveness of 360° TitaniUM Core Strength Exercise® on balance stability between pre- and post-intervention.

## 2. METHODS

### 2.1. Participants

Participants of this study were recruited from the Sultan Abdul Samad Secondary School under the adopted school's schemes with UMCares. A total of 20 male and 20 female students aged 14 to 16-year-old were recruited, written consent forms were obtained from their parents and the school authority to conduct this study.

### 2.2. Instrumentations

All participants were tested on pre- and post-intervention with Lafayette Stability Platform with Digital Control. The intervention was carried out for 12 weeks, all

data collected were analyzed using SPSS version 22. The results of this study provided information on the effectiveness of 360° TitaniUM Core Strength Exercise® on balance stability among teenager.

The Lafayette Stability Platform with Digital Control Model 16030SR [Figure 1] is designed to measure balancing ability, which is essential to successfully performing many activities. The Stability Platform features fully integrated timing functions for test control and electronic angle measurement for unsurpassed accuracy.

The platform's control allows a wide range of user customization including variable test times, selectable angle limits, and digital tilt angle readout. The stability platform's rugged design and electronic capabilities mean that it will be able to provide many years of reliable operation.

### 2.3. Procedures

The pre-test data were collected at the Motor Behavior Lab, Centre for Sports and Exercise Sciences, University of Malaya. Trained project staff administered the testing following a standardized protocol that emphasized the confidentiality.

After completed the pre-test, the participants were briefed and guided to perform the 360° TitaniUM Core Strength Exercise® [Figure 2]. All subjects were given a book of 360° TitaniUM Core Strength Exercise® as a reference.

The post-test data collected in the same Motor Behavior Lab, Centre for Sports and Exercise Sciences, University of Malaya, when the participants completed their 12-week intervention program. The same procedures in the pre-test were applied in the post-test. During the intervention period, the subjects began the training 3 times/week for 12 weeks. The 360° TitaniUM Core Strength Exercise® consisted of 12 isometric exercises: (1) Double elbow prone bridge; (2) right elbow lateral bridge; (3) both legs supine bridge; (4) left elbow lateral bridge; (5) both hand prone bridge; (6) right-hand lateral bridge; (7) left leg up supine bridge; (8) right leg up supine bridge; (9) left-hand lateral bridge; (10) alternate left-hand right leg; (11) alternate right hand left leg; and (12) superman. All these exercises should have performed in sequence, as shown in Figure 3.

Each exercise has to be maintained for 10 s in the 1<sup>st</sup> month and increases progressively in duration to

perform these exercises from 10 s to 20 s, as shown in Table 1. The researcher monitored during the participants performing these exercises to ensure that the technique is correct and timing each exercise during the intervention period.



**Figure 1:** Lafayette Stability Platform with Digital Control Model 16030SR



**Figure 2:** 360° TitaniUM Core Strength Exercise®

**Table 1:** Schedule of performing the new IET program

Month	Frequency	Duration	Set
1 <sup>st</sup> month	3 sessions/week (guided by researcher)	10 s/exercise	3
2 <sup>nd</sup> month	3 sessions/week (guided by researcher)	15 s/exercise	3
3 <sup>rd</sup> month	3 sessions/week (guided by researcher)	20 s/exercise	3

**Table 2:** Mean, standard deviation, and *t*-test results

Test	Mean	Standard deviation	<i>t</i>	df	Sig. (two tailed)
Pre-test	1.01	0.96	-8.29	39	0.001
Post-test	3.25	1.79			

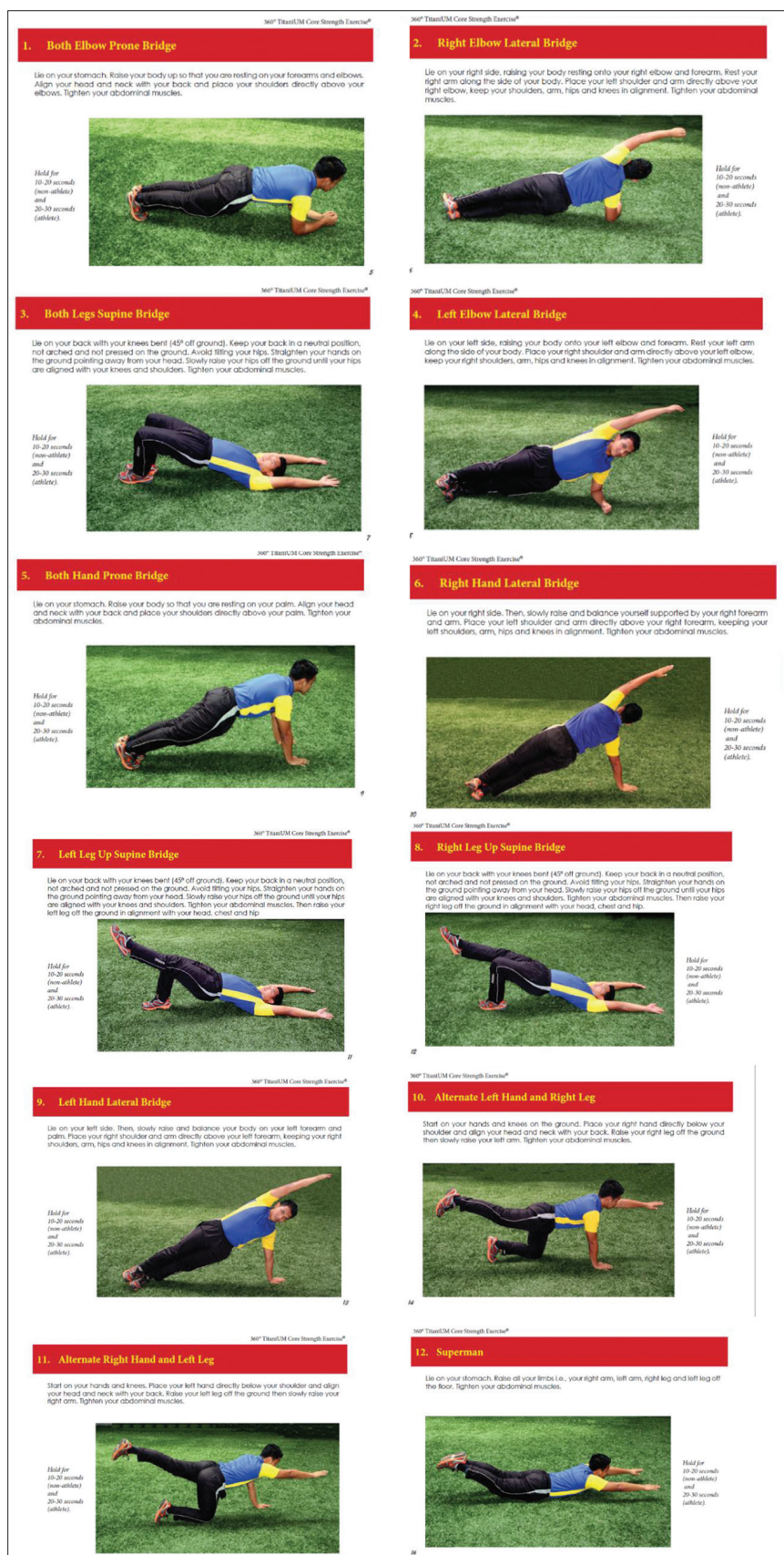


Figure 3: Sequence of Performing the 360° TitaniUM Core Strength Exercise®



## 2.4. Statistical Analysis

All data are expressed in mean and standard deviations (Mean  $\pm$  SD). All statistical analyses were performed using IBM SPSS Statistics for Windows, version 23, Armonk, NY: IBM Corporation and the significance level was set at  $P < 0.05$ .

## 3. RESULTS

All participants ( $n = 40$ ) adhered and completed the required 36 sessions of the 360° TitaniUM Core Strength Exercise® over 12 weeks training period.

Results indicate a significant improvements of balance ability between pre-test (M = 1.01, SD = 0.96) and post-test (M = 3.25, SD = 1.79),  $t(39) = -8.29$ ,  $P < 0.001$ .

## 4. DISCUSSION

The main objective of this study was to find out the effectiveness of the 360° TitaniUM Core Strength Exercise® on balance stability between pre- and post-intervention. Results indicated that 12 weeks of the 360° TitaniUM Core Strength Exercise®, 3 sessions/week, with 10 s–20 s/exercise progressively is able to induce significant improvements of the balance stability in teenager. Therefore, the novel of this new core strength protocol utilized within this study appears to provide a viable alternative method for strengthen the core strength muscles and directly improved the balance in teenagers.

The 360° TitaniUM Core Strength Exercise® consisted of 12 isometric exercises, performing in sequence and targeting on 29 pairs of core strength muscles. At such, theoretically, it could be argued that this new core strength exercise might result in both a greater magnitude (and possibly a greater rate) of with other core exercises. It has been hypothesized that isometric contractions of a greater muscle mass require an increased central and peripheral drive (Mitchell, 1991; Soares *et al.*, 2019).

Results of this study indicated that the balance ability of the participants improved significantly between pre-test and post-test ( $t(39) = -8.29$ ,  $P < 0.001$ ) after intervention. The results obtained are supported a few previous studies from the literature sources, balance stability is determined by the ability of the human body to keep the vertical position at rest, while walking, running, or during other physical activities. The balance stability is the ability to maintain static or dynamic

position of the body. Ricotti (2011) determines the sensitive period of the balance stability between 11 and 14 years of age for girls and 1 year later for boys. Several authors (Balter *et al.*, 2004) suggest that the high level of balance stability development is a direct result of the numerous repetitions which affects the motor response. Furthermore, the age of participants for this study is between the ranges of sensitive period for balance stability. Furthermore, the current results supported previous studies which repetitions will affect the motor response, whereby the intervention was carried out with repetitions throughout 12 weeks.

Researchers proposed that improved balance could decrease the amount of musculature involved in stabilization, allowing more muscles to contribute to force production in a given movement (Kean *et al.*, 2006). The process of balancing is complex and requires specific coordination of the core and limbs. Balance is defined as an ability to maintain the center of gravity within the base of support (Yaggie and McGregor, 2002). To maintain balance, the brain receives feedback from various systems including visual, vestibular, and somatosensory (Hrysomallis, 2011). Furthermore, balance training may lead to neural adaptations at the spinal and supraspinal levels that suppress reflex activity. This suppression may improve muscle contraction properties and result in more stable joints, allowing for better balance (Taube *et al.*, 2008).

Static stabilometry is a set of balance tests carried out after standing on the platform using resources for reducing the stability, tests performed with extended arms and closed eyes. Results of this study are similar to the previous study which used an untrained female population to compare curl up and back extensor exercises performed on a physioball to the same done on the floor (Cosio-Lima *et al.*, 2003). The physioball trained group showed significant improvements in abdominal electromyography activity and balance times compared to the floor exercise group. The current results also supported the previous study which showed that core strength and endurance training program 2 times week for 6 weeks led to significant enhancements in three different core endurance tests (back extensor endurance, flexor endurance, and lateral musculature endurance) in 10 untrained college students (Schilling *et al.*, 2012).

The previous studies revealed that trunk muscle fatigue led to decreased dynamic stability of the trunk and loss of balance control (Davidson and Kabat-Zinn, 2004). At



such, strengthen the core muscles will reduce muscle fatigue and able to improved balance stability in longer duration.

## 5. CONCLUSION

The 360° TitaniUM Core Strength Exercise® is suitable and effective training method to improve balance stability in teenager after 12 weeks of intervention.

## 6. ACKNOWLEDGMENTS

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## 7. CONFLICTS OF INTEREST

The author declares no conflicts of interest.

## REFERENCES

- Abbasi, A., Tabrizi, H.B., Jahadian, H., and Rahmanpournmoghadam, J. Dynamic balance in inactive elder males changes after eight weeks functional and core stabilization training. *Middle-East J Sci Res*, 2012, 11(3), 304-310.
- Akuthota, V., Ferreiro, A., Moore, T., and Fredericson, M. Core stability exercise principles. *Curr Sports Med Rep*, 2008, 7(1), 39-44.
- Balter, S.G., Stokroos, R.J., Akkermans, E., and Kingma, H. Habituation to galvanic vestibular stimulation for analysis of postural control abilities in gymnasts. *Neurosci Lett*, 2004, 366(1), 71-75.
- Kean, C.O., Behm, D.G., and Young, W.B. Fixed foot balance training increases rectus femoris activation during landing and jump height in recreationally active women. *J Sports Sci Med*, 2006, 5(1), 138-148.
- Kisner, C., and Colby, L.A. *Stretching. Therapeutic Exercise: Foundations and Techniques*. Philadelphia, PA: F.A. Davis Company; 2012, pp. 121-153.
- Mikołajec, K., and Rzepka, R. Objective assessment and importance of stability and motor control in sports performance. *J Hum Kinet*, 2007, 18, 135-140.
- Cosio-Lima, L., Reynolds, K., Winter, C., Paolone, V., and Jones, M. Effects of physioball and conventional floor exercises on early phase adaptations in back and abdominal core stability and balance in women. *J Strength Cond Res Natl Strength Cond Assoc*, 2003, 17(4), 721-725.
- Davidson, R.J., and Kabat-Zinn, J. "Alterations in brain any immune function produced by mindfulness meditation: Three caveats": Comment response. *Psychosom Med*, 2004, 66(1), 149-152.
- Hrysomallis, C. Balance ability and athletic performance. *Sports Med (Auckland, N.Z.)*, 2011, 41(3), 221-232.
- Mitchell, J.H. Neural control of the circulation during exercise. In: *Cardiovascular and Respiratory Responses to Exercise in Health and Disease: Proceedings of the 8<sup>th</sup> Biennial Conference*, 1991, pp. 9-22.
- Richardson, C., Jull, G., Hodges, P., and Hides, J. *Therapeutic Exercise for Spinal Segmental Stabilization in Low Back Pain: Scientific basis and Clinical Approach*. Edinburgh: Churchill Livingstone, 1999.
- Roth, R., Donath, L., Kurz, E., Zahner, L., and Faude, O. Absolute and relative reliability of isokinetic and isometric trunk strength testing using the IsoMed-2000 dynamometer. *Phys Ther Sport*, 2017, 24, 26-31.
- Schilling, C., Gilles, M., Blum, W., Daseking, E., Colla, M., Weber-Hamann, B., and Deuschle, M. Leptin plasma concentrations increase during antidepressant treatment with amitriptyline and mirtazapine, but not paroxetine and venlafaxine. *J Clin Psychopharmacol*, 2012, 33(1), 99-103.
- Schoenfeld, B.J., Contreras, B., Tiryaki-Sonmez, G., Willardson, J.M., and Fontana, F. An electromyographic comparison of a modified version of the plank with a long lever and posterior tilt versus the traditional plank exercise. *Sports Biomech*, 2014, 13(3), 296-306.
- Soares, B.R., Neves, R.P., Olher, R.R., Souza, L.H., Santos, L.C., Condé, R.B., and Moraes, M.R. Cardiovascular responses to maximal voluntary isometric contraction in different muscle mass in young men. *J Exerc Physiol Online*, 2019, 22(1), 51-62. Available from: <http://www.search.ebscohost.com/login.aspx?direct=true&db=s3h&AN=134763378&site=ehost-live>.
- Taube, W., Gruber, M., and Gollhofer, A. Spinal and supraspinal adaptations associated with balance training and their functional relevance. *Acta Physiol (Oxf)*, 2008, 193(3), 101-116.
- Yaggie, J., and McGregor, S. Effects of isokinetic ankle fatigue on maintenance of balance and postural limits. *Arch Phys Med Rehabil*, 2002, 83(2), 224-228.

# A Study of Boldness Behavioral Attitude of Players of Various Combat Games

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## ABSTRACT

The purpose of the study was to compare the Boldness Behavioral Attitude of Players of Various Combat Games. For the present study, researcher has selected 30 players from Aurangabad, Maharashtra; within-group design was used for the present study. Ten players from each (boxing, wrestling, and taekwondo players) who were participated in Inter-University Tournament of Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, Maharashtra, were selected for the study by purposive non-probability random sampling method. The age range of respondents was 18–25 years. Multi-assessment personality series (MAPS) questionnaire was used for the collection of data. This scale was developed by Sanjay Vohra. The scale contains 147 complete sentences and each item is provided three alternatives; the players had to select one of the three alternative statements. And only, the score of boldness was taken for this study. To see the difference between boxing, wrestling, and taekwondo players in reference to boldness behavioral attitude, one-way analysis of variance was applied. Significant level was kept at 0.05 level. The result shows that by seeing the mean of boldness of players of different combat games, there are differences. To see, these differences were significant or not researcher has calculated one-way analysis of variances, it was found that there was a significant difference between players of different games in reference to boldness because the calculated “*f*” value, i.e., 7.58 which is much greater than tabulated “*f*” = 3.35. The above study revealed that difference was found between the means of boxing, wrestling, and taekwondo players. In conclusion, it can assumed that if players differ in the extent that they change their behavior based on their previous and current experiences, this may represent a potential mechanism through which social roles can be generated and reinforced to create even long-lasting differences between players. In other words, psychological factors may be maintained by participation in various games and sports activities because of their role in social coordination.

**Keywords:** Boldness behavioral attitude, Boxing, wrestling, and taekwondo players.

## 1. INTRODUCTION

Boldness implies daring, courage, and confidence. Rather than going with the flow boldness goes against the tide. It dares to disagree with popular opinion for the sake of affirming what is true, right, and just. When others do wrong, boldness stands for what is right. Every person searches for things, people, or ideas in which to find stability and security. Some choose to put their trust in popular opinion, the security of friends, or the prosperity of wealth. However, opinions change; friends can betray a trust and wealth can vanish overnight. Truth, right, and justice, on the other hand, provide a foundation which

has remained far more stable throughout history than has opinion, popularity, or abundance. Boldness is the gift of God to overcome this enemy. Boldness is confidence in the gospel, a message that defies fear to the uttermost. Boldness is necessary if we are going to be risk-takers and not self-preservers. Moreover, risk-taking is absolutely necessary for the progress of salvation. Finally, as I started into this issue, it became apparent to me that boldness is a highly neglected topic and one that it is vital to every believer. Hence, many people are controlled by fears of all kinds. The person who receives the gift of boldness is delivered from a multitude of transgressions and lives in peace. Boldness is totally opposite of fearfulness. To be bold

implies a willingness to get things done despite or taking risks. Boldness may be a behavioral attitude that only certain individuals are able to display. For example, in the context of sociability, a bold person may be willing to take the risk shame or rejection in social situations arising or to bend the rules of etiquette or politeness. An excessively bold player may be aggressively while performing his skill or taking a shot. Boldness may be contrasted with courageousness of an individual and latter implies having fear but confronting it. But perhaps, we could think about how evolutionary significance of boldness might play a part of debate. Players are a fiercely social and cooperative in nature and protecting members of our close social group has a sound evolutionary basis. By reducing the risks to those with whom we interact or share the same genes, moreover, our own genetic material is preserved. We are also having a strong social interaction with different groups increase the chances of humanity. At the same time, it is too simple to say that those players having higher boldness are associated with higher aggression. In this case, the researchers suggest that the players are more exposed to take risk cope with this by responding more aggressively and so more boldly to threat his attitude. Players today usually constrain their aggression within carefully outlined legal and social rules so that they can show their optimum level of performance. But perhaps, the aggressive nature of player in rugby still scratches an evolutionary itch inspired by an individual's impulse to be bold. Hence, researcher wants to know the boldness level of players of different games.

## 2. METHODS

For the present study, researcher has selected 30 players from Aurangabad, Maharashtra; within-group design was used for the present study. Ten players from each (boxing, wrestling, and taekwondo players) who were participated in Inter-University Tournament of Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, Maharashtra, were selected for the study by purposive non-probability random sampling method. The age range of respondents was 18–25 years.

### 2.1. Measures

MAPS questionnaire was used for the collection of data. This scale was developed by Sanjay Vohra. The scale contains 147 complete sentences and each item is

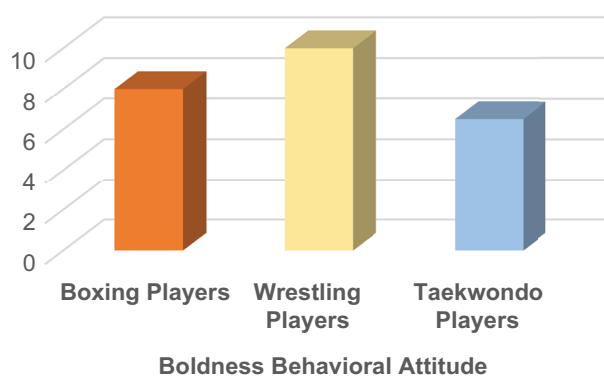
provided three alternatives; the players had to select one of the three alternative statements. And only, the score of boldness was taken for this study.

### 2.2. Statistical Analysis

To see, the difference between boxing, wrestling and taekwondo players in reference to boldness behavioral attitude one-way analysis of variance was applied. Significant level was kept at 0.05 level.

## 3. RESULTS

Tables 1 and 2 show that by seeing the mean of boldness of players of different combat games, there are differences. To see, these differences were significant or not researcher has calculate one-way analysis of variances, it was found that there was a significant difference between players of different games in reference to boldness because the calculated "F" value, i.e., 7.58 which is much greater than tabulated "F" = 3.35.



Graph

Table 1: Mean and SD of boldness

Game	Mean	SD
Boxing players	8.2	1.29
Wrestling players	9.8	0.89
Taekwondo players	7.4	0.92

SD: Standard deviation

Table 2: Comparison of boldness of players of different games

SV	SS	df	MS	F
Between	27.288	2	13.644	7.58*
Error	48.6	27	1.8	

\*Significant at 0.05 level, tabulated "F" at  $(2,27) = 3.35$

#### 4. CONCLUSION

Above study revealed that difference was found between the means of boxing, wrestling, and taekwondo players. To see, these differences were significant or not one-way analysis of variance was applied. It was found to be significant. It can assume that if players differ in the extent that they change their behavior based on their previous and current experiences, this may represent a potential mechanism through which social roles can be generated and reinforced to create even long-lasting differences between players. In other words, psychological factors may be maintained by participation in various games and sports activities because of their role in social coordination.

#### REFERENCES

- Dall, S.R., Bell, A.M., Bolnick, D.I., and Ratnieks, F.L. An evolutionary ecology of individual differences. *Ecol Lett*, 2012, 15, 1189-1198.
- King, A.J., Johnson, D.D., and Van Vugt, M. The origins and evolution of leadership, *Curr Biol*, 2009, 19, R911-916.
- “Wikipedia: Bebold”, Wikipedia, 2018-08-21. [Retrieved on 2018-08-25].
- Baucis and Philemon, Myth Encyclopedia-mythology, Greek, People. Available from: <http://www.Mythencyclopedia.com>. [Retrieved on 2013-08-25].
- A Vison for Prayer and Missions in Africa. Available from: <http://www.send56.org>.

# Analysis of Success Ratio of Attacking and Defensive Skills in Pro Kabaddi League

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## ABSTRACT

Game Kabaddi is played with seven players inside the court. Player, who is called as a raider is supposed to enter in opposite team's area to tag them and get the point, and at the same time, opposite team players try to stop or hold the player within their boundary to get the point. Changes in the rules of the kabaddi game in Pro Kabaddi League had increased the popularity of the game also; there are many more changes in the skill executed and strategies of the teams. Hence, the objective of this study was to find out the success ratio of Attacking and Defensive skills in Pro Kabaddi. Methodology: In Pro Kabaddi League (2016 season), in each team, there were 25 players; hence, 200 players of eight teams participating in this competition were the sample for this study. Results: Teams effectively and strategically used attacking and defensive skills in winning the matches. But teams with better defense have a better chance to win the match.

**Keywords:** Attack, Defense, Pro Kabaddi League, Raid.

## 1. INTRODUCTION

Kabaddi is one of the Indian games which are played all over the world and popular that first originated in Ancient India. There are many regional variations of the game of Kabaddi in India, including Sanjeevani, Gaminee, Punjabi, and Amar versions, all of which have slightly different interpretations of the game and its rules. The governing body for Kabaddi is the International Kabaddi Federation and consists of over 30 national associations and oversees the game and its rules across the world. Game Kabaddi is played with seven players inside the court. Player, who is called as a raider is supposed to enter in opposite team's area to tag them and get the point, and at the same time, opposite team players try to stop or hold the player within their boundary to get the point. Team with the highest points at the end of the game time is the winner in that game. Pro Kabaddi League is an initiative of Mashal Sports to take kabaddi on the next level by converting the game to be played as league sport where players nationally and internationally are brought together. It was inaugurated in 2014 and played between eight franchises, representing cities of India under the management of Mashal Sports.

After season 2, it became biannual. In Pro Kabaddi League, reforms of attacking and defensive skills are seen in various seasons. There are many more changes in the skill executed and the strategies of the teams. However, whether attacking or defensive skills are more important in winning the game? Hence, this study was undertaken to success ratio of Attacking and Defensive Skills in Pro Kabaddi

### 1.1. Objective

The objective of the study was to find out the success ratio of Attacking and Defensive Skills in Pro Kabaddi.

## 2. METHODOLOGY

This research was done with a descriptive survey research method.

### 2.1. Sampling

- Population: All the matches of the Pro Kabaddi League were recorded for this study. Hence, all eight teams participating in 60 matches during this season were the population for this study.

- Sample: In Pro Kabaddi League (2016 season), in each team, there were 25 players; hence, 200 players of eight teams participating in this competition were the sample for this study.

## 2.2. Statistics

**Table 1:** Statistics of skills used during raids in the competition

S. No.		Attempt	Success	Unsuccess	Nil
1	Total attacks	2432	1205	152	1075
			49%	6%	44%
2	Total defense	1627	952	675	
			59%	41%	

## 3. CONCLUSIONS

In this season of Pro Kabaddi League, 2432 total raids were attempted by the raiders of all the teams in all matches. Out of this, 1205 (49%) raids were successful in which the raider got the point for the team. One hundred and fifty-two (6%) raids were unsuccessful where raiders were caught by the opponent team and 1075 (44%) raids were nil raid means neither raider nor opponent team got the point.

In this season of Pro Kabaddi League, 1627 times players of the team tried to catch the player of the opponent team to get the point for their team, but only 952 times (59%) they were successful and 1075 times (44%) they were unsuccessful to get the point.

From the above analysis, it is concluded that teams effectively and strategically used attacking and defensive skills in winning the matches. But teams with better defense have a better chance to win the match.

## REFERENCES

- Best, J.W., and Khan, J.V. *Research in Education*. 7<sup>th</sup> ed. New Delhi: Prentice Hall; 1995.
- Gay, L.R. *Educational Research: Competencies for Analysis and Application*. 6<sup>th</sup> ed. New Delhi: Prentice Hall; 2000.
- Morrow, J.R. *Measurement and Evaluation in Human Performance*. 2<sup>nd</sup> ed. USA: Human Kinetics; 2000.
- Available from: [http://www.prokabaddileagues.in/p/blog-page\\_84.html](http://www.prokabaddileagues.in/p/blog-page_84.html).
- Available from: <http://www.rulesofsport.com/sports/kabaddi.html>.
- Available from: <http://www.sportycious.com/introduction-kabaddi-91452>.



# A Study of Physical Fitness and Mental Health among Sportsman and Non-sportsman

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## ABSTRACT

The present study was undertaken to investigate the relationship physical fitness and mental health among sportsman and non-sportsman. Sample of the study, 200 sportsmen and non-sportsmen were used. The purpose of the study was to examine the physical fitness and mental health among sportsman and non-sportsman. Hypothesis of the study is sportsmen who have significantly good physical fitness than non-sportsmen and another one is sportsmen who have significantly good mental health than non-sportsmen. C.G. Deshpande Mental Health test and for physical fitness measure through sit-ups. It was a conclusion that sportsman has significantly good physical fitness than non-sportsman and sportsman has significantly good mental health than non-sportsman.

## 1. INTRODUCTION

Physical fitness comprises two related concepts: General fitness (a state of health and wellbeing) and specific (a task-oriented definition based on the ability to perform specific aspects of sports or occupations). Physical fitness is generally achieved through exercise, correct nutrition, and enough rest. It is an important part of life. However, as automation increased leisure time, changes are lifestyles following the industrial revolution rendered this definition in sufficient days, physical fitness is considered a measure of the body's ability to function efficiently and effectively in work and leisure activities, to be healthy, to resist hypokinetic diseases, and to meet emergency situations.

### 1.2. Mental Well-being

Mental health can be seen as a continuum, where an individual's mental health may have many different possible values. Mental wellness is generally viewed as a positive attribute such that a person can reach enhanced levels of mental health, even if they do not have any diagnosable mental health condition. This definition of mental health highlights emotional well-being, the capacity to live a full and creative life, and the flexibility to deal with life's inevitable challenges. Positive psychology is increasingly prominent in

mental health. A holistic model of mental health generally includes concepts based on anthropological, educational, psychological, religious and sociological perspectives, as well as theoretical perspectives from personality, social, clinical, health, and developmental psychology. Sandoval and Davis (1981), a school-based mental health consultation curriculum many have been written about mental health consultation and school-based consultation, but little has been written about how consultants are to be prepared for their role.

## 2. METHODOLOGY

### 2.1. Aims and Objectives of the Study

This study aims to examine the mental health of sportsman and non-sportsman.

#### 2.1.1. Hypothesis

- Sportsman's has been significantly good physical fitness than non-sportsman
- Sportsman's has been significantly good mental health than non-sportsman.

#### 2.1.2. Sample

For the present study, 200 players were selected from Aurangabad. The effective sample consisted of 200 subjects, out of which 100 subjects were sportsman

and 100 subjects were non-sportsman. The age range of subjects was 18–25 years.

### 2.1.3. Tools

C.G. Deshpande Mental Health test: C.G. Deshpande Mental Health test was used for measuring frustration. All the 50 items of the scale are presented in simple and brisk style. Each of the 40 items has two answers (multiple choice) “YES” and “NO.” This is a well known test having high reliability and validity coefficients.

## 2.2. Physical Fitness Measure through Sit-ups

### 2.2.1. Procedures of data collection

Each of the two instruments could be administered individuals as well as a small group: First is physical fitness measures through sit-ups. While collecting the data for the study, the later approaches were adopted. The subjects were called in a small group of 20–25 subjects and their seating arrangements were made in a classroom. Before administration of test or scale, through informal talk appropriate rapport from following the instruction and procedure suggested by the author of the scale and tests. The test was administered and field copies of each test were collected.

### 2.2.2. Variables

- Independent variable: (1) Group, (a) sportsman and (b) non-sportsman
- Dependent variable: (1) Physical fitness and (2) mental health.

## 2.3. Statistical Treatment of Data

Sportsman and non-sportsman show the mean, S.D., and “*t*” value of factors “Physical Fitness (Sit-Ups)”

Group	Mean	SD	<i>n</i>	DF	“ <i>t</i> ”
Sportsman	43.49	18.89	100	198	6.12**
Non-sportsman	28.08	16.73	100		

The results related to the hypothesis have been recorded. The mean of physical fitness (sit-ups) score of the sportsman is 43.49 and that of the non-sportsman is 28.08. The difference between the two means is highly significant, “*t*” = 6.12, df = 198. Thus, the hypothesis is confirmed that sportsman has significantly good physical fitness than non-sportsman.

Sportsman and non-sportsman show the mean, S.D., and “*t*” value of factors “Mental Health.”

Group	Mean	SD	<i>n</i>	Df	“ <i>t</i> ”
Sportsman	40.29	10.08	100	198	6.44**
Non-sportsman	31.53	9.14	100		

The result related to the hypothesis has been recorded. The mean of mental health score of the sportsman is 40.29 and that of the non-sportsman is 31.53. The difference between the two means is highly significant, “*t*” = 6.44, df = 198. Thus, the hypothesis is confirmed that sportsman has significantly good mental health than non-sportsman.

## 3. RESULTS

- Sportsmen have significantly good physical fitness than non-sportsmen
- Sportsmen have significantly good mental health than non-sportsmen.

## REFERENCES

- Clifford Beers Clinic. About Clifford Beers Clinic; 2006. [Retrieved on 2007-06-01].
- Hattie, J.A., Myers, J.E., and Sweeney, T.J. “A factor structure of wellness: Theory, assessment, analysis and practice”. *J Couns Dev*, 2004, 82(3), 354-364.
- Johns Hopkins University. Origins of Mental Health; 2007. [Retrieved on 2007-06-01].
- Keyes, C. “The mental health continuum: From languishing to flourishing in life”. *J Health Soc Behav*, 2002, 43(2), 207-222.
- Office of the Deputy Prime Minister-Social Exclusion Unit: “Factsheet 1: Stigma and Discrimination on Mental Health Grounds”; 2004.
- Weare, K. *Promoting Mental, Emotional and Social Health: A Whole School Approach*. London: RoutledgeFalmer; 2002, pp. 12.
- Witmer, J.M., and Sweeney, T.J. “A holistic model for wellness and prevention over the lifespan”. *J Couns Dev*, 1992, 71(2), 140-148.
- World Health Organization. *Promoting Mental Health: Concepts, Emerging Evidence, Practice: A Report of the World Health Organization, Department of Mental Health and Substance Abuse in Collaboration with the Victorian Health Promotion Foundation and the University of Melbourne*. Geneva: World Health Organization; 2005.
- World Health Report 2001-Mental Health: New Understanding, New Hope, World Health Organization; 2001.



# A Comparative Study of Emotional Intelligence among Sportsmen and Non-sportsmen

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## ABSTRACT

The present study was undertaken to investigate the relationship between emotional intelligence among sportsmen and non-sportsmen. Sample of the study 200 sportsmen and non-sportsmen was used. The purpose of the study was to examine the emotional intelligence among sportsmen and non-sportsmen. The hypothesis of the study is sportsmen have significantly high emotional intelligence than the non-sportsmen. Pethe and Hyde's emotional intelligence tests were used in the study. Besides these, a public distribution system was used to get the other necessary information relating to the respondents. It was the conclusion that sportsmen have significantly high emotional intelligence than the non-sportsmen.

## 1. INTRODUCTION

There is a growing interest in emotional intelligence in sport (Meyer and Zizzi, 2007). Recent research found emotional intelligence to emotions experienced before the successful and unsuccessful performance (Lane *et al.*, 2009b). Lane *et al.* (2009b) found that emotions correlating with successful performance vigor, happiness, and calmness, whereas emotions associating with poor performance include confusion, depression, and fatigue. Emotional intelligence correlated positively with pleasant emotions and negatively with unpleasant emotions. Further, Lane *et al.* (2009c) found emotional intelligence scores correlated with frequent use of psychological skills. Athletes reporting frequent use of psychological skills (Thomas *et al.* 1999) also appear to report high scores on the self-report emotional intelligence scale (Schutte *et al.*, 1998).

According to the theoretical proposal by Salovey and Mayer (1990), emotional intelligence could explain the process through which people recognize which emotions appear to help performance and which emotions might hamper performance. Furthermore, emotional intelligence might also help explain why some people appear to initiate strategies to reduce the discrepancy between current emotions and ideal emotions. Recent research has argued that people learn from their emotional experiences (Baumeister *et al.*, 2007). Baumeister *et al.* propose previous emotional outcomes and current emotional

states contribute people selecting actions according to anticipated emotions. In sport psychology, the notion that emotions provide feedback and those individuals learn to associate certain emotions with success is consistent with suggestions made by Hanin (2003). Hanin argued that the development of emotional beliefs regarding which emotions associated with optional performance and emotions associated with dysfunctional performance.

### 1.1. Objective of the Study

The objective of the study was to find out the emotional intelligence among sportsmen and non-sportsmen.

### 1.2. Aim of the Study

The aim of the study was to examine the emotional intelligence among sportsmen and non-sportsmen.

#### 1.2.1. Hypothesis

Sportsmen have significantly high emotional intelligence than non-sportsmen.

#### 1.2.2. Sample

For the present study, 200 samples were selected from Aurangabad cities, Maharashtra state. The effective sample consisted of 200 subjects, 100 subjects were sportsmen and 100 subjects were non-sportsmen. The age range of subjects was 18–25 years.

### 1.2.3. Tools

#### 1.2.3.1. Emotional intelligence test

This test is developed and standardized by Pethe and Hyde. This is well known test having high reliability and validity coefficients.

### 1.3. Procedures of Data Collection

One instrument could be administered individuals as well as a small group. While collecting the data for the study, the later approaches were adopted. The subjects were called in a small group of 20–25 subjects and their seating arrangements were made in the classroom. Before administration of the test, through informal talk appropriate rapport form. Following instructions and producer suggested by the author of the test. The test was administered and a field copy of the test was collected. Following the same procedure, the whole data were collected.

### 1.4. Variable

- Independent variable – Players (a) sportsmen and (b) non-sportsmen
- Dependent variable – (1) Emotional intelligence.

## 2. STATISTICAL ANALYSIS AND DISCUSSION

Emotional intelligence among sportsmen and non-sportsmen students Mean S.D. and “*t*” value:

Group	Mean	S.D.	<i>n</i>	Df	“ <i>t</i> ”
Sportsmen	83.22	11.29	100	198	7.65**
Non-sportsmen	71.43	10.48	100		

The results related to the hypothesis have been recorded. The mean of emotional intelligence score of the

sportsmen mean is 83.22 and that of the non-sportsmen mean is 71.43. Difference between the two mean is highly significant (“*t*” = 7.65, df = 198, *P* < 0.01). It is clear that sportsmen and non-sportsmen differ significantly from each other from the mean scores and it was found that the sportsmen have significantly high emotional intelligence than the non-sportsmen. This result supports the hypothesis.

## 3. CONCLUSION

Sportsmen have significantly high emotional intelligence than non-sportsmen students.

## REFERENCES

- Austin, E.J., Saliofske, D.H., Huang, S.H., and McKenny, D. Measurement of trait emotional intelligence: Testing and cross validating a modified version of Schutte *et al.*'s (1998) measure. *Pers Individ Differ*, 2004, 36(3), 555-562.
- Beedie, C.J., Terry, P.C., and Lane, A.M. The profile of mood states and athletic performance: Two meta-analysis. *J Appl Sport Psychol*, 2000, 12(1), 49-68.
- Devonport, T.J., Lane, A.M., and Hanin, Y. Affective state profiles of athletes prior to best, worst and performance-induced injury outcomes. *J Sports Sci Med*, 2005, 4, 382-394.
- Ekman, P., and Davidson, R.J., (eds). Afterword what is the relation between emotion and memory? In: *The Nature of Emotion*. Oxford: Oxford University Press, 1994, pp. 316-318.
- Hagtvet, K.A., and Hannin, Y.L. Consistency of performance related emotions in elite athletes: Generalizability theory applied to the IZOF model. *Psychol Sports Exercise*, 2007, 8(1), 47-72.
- Hannin, Y.L., (ed). Individual zones of optimal functioning (IZOF) model: Emotion-performance relationships in sports. *Emotions in Sport*. Illinois: Human Kinetics, 2000, pp. 65-89.

# Psychological Factors Influencing Exercise Adherence among Young Adult Females in Pune City

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## ABSTRACT

We reside in a society physical inactivity remains a serious issue, particularly for women. Among individuals who do initiate exercise programs, approximately half dropout during the first 6 months has been stated in several researches. Presumably, when individuals feel pressured to exercise, they lack the enjoyment and inner motivation to continue, causing them to discontinue their behavior. In this study, 208 female participants completed the survey. Participants were ranged in age from 20 to 28 years. Adherence was determined based on a participant's attendance record with comparison to exercise, i.e., physical activity recommendations given by the WHO. The results from the current study supported the hypothesis. Compared to adherent women, non-adherent women were more likely to endorse body-related and health-related motives for exercising; however, the results also indicate that adherent women were more likely to express intrinsic motives for exercising. Overall, the results from this study state that the body-related and health-related pressures have the potential to detract from women's abilities to persist toward exercise adherence and that the psychological well-being improves with exercise adherence.

**Keywords:** Exercise adherence, Psychological factors, Young adult females.

## 1. INTRODUCTION

As we enter the 21<sup>st</sup> century, one of the greatest accomplishments to be celebrated is the continuous pursuit of fitness since the beginning of man's existence. Throughout prehistoric time, man's quest for fitness has been driven by a desire to survive through hunting and gathering. With the passage of time, though no longer driven by subsistence two requirements, fitness remains paramount to health and well-being. In the dark (476–1000) and middle ages (900–1400) also, physical activity and fitness were prerequisites for survival. The renewed appreciation for human life, which evolved during the renaissance, created an environment which was ready for the widespread development of physical education. It appears that as societies become too enamored with wealth, prosperity, and self-entertainment that fitness levels drop. In addition, as technology has advanced with man, the levels of physical fitness have decreased. History offers little insight how to prevent or turnaround these recourses. Among individuals who do initiate exercise programs, approximately 50% drop out during the first 6 months (Dishman, 1990) [1]. Physical

activity is very important from fitness and health point of view, which is equally important for males as well as females; nowadays, female mortality rate is increasing due to various diseases and women-specific health problems, so physical activities are vitally important for females and also we find females engaged in different health practices and fitness practices everywhere as prescribed by their physicians or mentors. Today, social pressures focusing on health and physical attractiveness have been used to promote exercise among women. However, research has shown that motives driven by external sources result in decreased exercise participation, i.e., it has shown a negative association with persistence. Physical inactivity remains a serious issue in our society, particularly for women. Among individuals who do initiate exercise programs, approximately half drop out during the first 6 months. Presumably, when individuals feel pressured to exercise, they lack the enjoyment and inner motivation to continue, causing them to discontinue their behavior. Women often report that their motivation to exercise is based on body-related concerns, which reflect an external or interjected pressure. For example, Berman

*et al.* (2005) [2] reported that women endorsed weight and body-related reasons for exercise, and though they did exercise, they continued to experience body dissatisfaction, pre-occupation with weight, and poor emotional wellbeing. Importantly, research suggests that women report weight management as a motivation for exercise more often than do men, which may make them particularly susceptible to exercise, non-adherence results from other research have indicated that body-related motives are not only associated with social physique anxiety, depression, 3 anxiety, reduced self-esteem, and body dissatisfaction but also with less exercise participation. Other research showed that individuals who are more adherent to regular exercise programs compared to those who are less adherent, experience greater improvements in fitness, physical function, quality of life, and disease-specific outcomes. However, studies suggest that about 50% of adults who start a physical activity program will drop out within a few months. In this study, the researcher will be attempting to find out the different psychological reasons for exercise adherence and non-adherence for a particular area (Pune city), as habitat, environment, and community also have greater impact on exercise adherence.

## 2. METHODOLOGY

### 2.1. Participants 208 Female Participants Completed the Surveys Detailed Below

Participants ranged in age from 20 to 28 years. All subjects were recruited from certified gyms in Pune city by random sampling method after their exercise session of gym is over. The researcher personally visited the gyms and took the survey face to face to decrease the errors in findings.

### 2.2. Instrumentation Participants Reported their Sex, Age, Ethnicity, and a Specific Exercise Goal, in Days per Week, Which They Aimed to Meet for Each of the 4 Weeks and in the Long Run

#### 2.2.1. The exercise motivation inventory-2 (EMI-2)

The EMI-2 is a 51-item scale administered to assess the degree to which participants endorse specific motivational factors. Participants answered each item on a Likert-type scale, ranging from 0 = not at all true for me to 5 = very true for me (Markland and Ingledew, 1997) [3]. The alpha coefficient of EMI-2 is 0.938; the mean values of the questionnaire element

are indicating the value more than 3 which explain the positive relationship among the variable. The standard deviations are also positive and do not show any negative relationship.

#### 2.2.2. The Physical self-efficacy scale (PSES)

The PSES is a 5-item scale used to assess participants' beliefs in their ability to overcome specific barriers to maintain their exercise intentions (Schwarzer and Renner, 2005) [4]. Participants answered each item on a Likert-type scale, ranging from 1 = very uncertain to 4 = very certain. The Cronbach's alpha, mean, and standard deviation for the current sample were as follows: The results indicate the reliability coefficient 0.754 high reliability which shows positive relationship.

#### 2.2.3. The positive and negative affect schedule (PANAS)

The PANAS is a 20-item scale that was used to assess participants' affective well-being (Watson *et al.*, 1988) [5]. Ten items comprise the positive affect subscale; the other 10 items comprise the negative affect subscale. Participants answered each item on a Likert-type scale, ranging from 1 = very slightly or not at all to 5 = extremely. The alpha coefficient of PANAS-SF is 0.722, which is preferably high and shows positive relationship.

#### 2.2.4. The satisfaction with life scale (SWLS)

The SWLS is a 5-item scale that was used to assess participants' global judgment of their satisfaction in various life domains (Diener *et al.*, 1985) [6]. Participants answered each item on a Likert-type scale, ranging from 1 = strongly disagree to 7 = strongly agree. The average of this scale was  $M = 24.22$ . Participants reported, how they feel about their life, how satisfied they are with their life ranging from extremely satisfied to extremely dissatisfied after calculating the sum of responses given, placing appropriate number against the statement of attitude toward life satisfaction ranging from 7 (Strongly agree) to 1 (strongly disagree).

## 3. RESULTS

The research students have focused on two types of respondents, namely, adherent and non-adherent. It is also about understanding their external purpose, positive affect, and satisfaction. Adherence was determined based on their survey and the attendance record kept by gym and her average weekly exercise as



per discussion and record in survey. Because reported average weekly exercise was compared to the standard exercise recommendation given by the WHO, the status of adherents and non-adherents was decided. Hence, likewise, 155 participants among the samples proved to exercise adherers, whereas rest 53 participants reported non-adherent's attitude toward exercise [5]. Cronbach's alpha reliability method was also applied to test the reliability of all items in the questionnaire which was prepared for adherent women and collected 53 samples. The reliability coefficient value was highly significant, in the questionnaire of "The EMI" is 0.938 (93.8%) and indicates high reliability of the questionnaire. The second questionnaire was on PANAS shows 0.722 (72.2%) and also indicates high reliability. The third questionnaire was on self-efficacy for exercise specifies 0.754 (75.4%) high reliability. The data analysis indicates that there is a positive relationship between exercise and positive results. The descriptive analysis of mean and median values indicates a positive result with a value  $>3.00$  which is considered positive. Standard deviations are also having positive values. For testing of the hypothesis research, student has used SPSS21 statistical tool and tested under ANOVA. Results of hypothesis testing are as follows: Tables of the first hypothesis state the correlation between designed variables which have been mentioned. All relationships between dependent and independent variables are positively and significantly correlated where  $P > 0.05$ .  $P = 0.004b$ ,  $P > 0.05$ .  $P = 0.001b$   $P > 0.005$   $P = 0.004b$   $P > 0.05$   $P = 0.000b$   $P > 0.05$   $P = 0.001b$ ; therefore, all of the related table design changes have a positive relationship between the regular exercises and its positive impact on health, activeness, strength alertness determination, etc. Tables of hypothesis testing signify that there is a correlation between designed variables which has been mentioned. All relationships between dependent and independent variables are significantly correlated where  $P > 0.05$ .  $P = 0.012b$ ,  $P > 0.05$ .  $P = 0.045b$   $P > 0.05$   $P = 0.007b$   $P > 0.05$   $P = 0.015b$ ; therefore, all of the table design changes have relationship between the irregular exercises and its impact on external motives.

#### 4. DISCUSSION

Regular exercise benefits health improves mood and cognitive function. Regular physical activity is essential for good physical and mental health. It improves your overall health and fitness, maintains a healthy weight, reduces the risk of many chronic illnesses, and promotes good mental health [6]. It is always a good

idea to include stretching, strength training, and aerobic or endurance exercises in your exercise. Women may find that when motivated by exercise, or as a result they are focused on physical appearance, they appear to be less inclined to continue. Regular exercise not only benefits physical health but also improves subjective well-being. Specifically, it was expected that adherent women would be more likely to express intrinsic motivation, while non-adherent women would be more likely to identify extrinsic motives for exercising. The results from the current study supported this hypothesis. Compared to adherent women, non-adherent women were more likely to endorse body-related and health-related motives for exercising; however, the results indicate that adherent women seem more likely to express intrinsic motives for exercising. Further confirming the difference found related to extrinsic motives, the data also showed that overall, body-related motives were negatively associated with exercise consistency. Thus, women who reported greater body-related motives for exercising were less consistent in their exercise behavior over the course of more than 4-week since they joined their exercise gym, and they were less likely to meet their own exercise goals during that time period. Consistent with the hypothesis, adherent women showed significant increases in reported feelings of psychological well-being overtime. Over the course of more than 4 weeks, there was a significant increase in physical self-efficacy, positive affect, and satisfaction with life among adherent women. Thus, as they continued to meet their goals, they felt an increased sense of psychological well-being. From the data, it can be determined if increased psychological well-being resulted in greater exercise adherence or vice versa. Furthermore, there is a possibility that these factors could share bidirectional relationships. Nevertheless, the significant and positive increase they reported in these factors is notable, particularly as they relate to the women's exercise adherence. Overall, the results from this study provide some messages: (1) That body-related and health-related pressures have the potential to detract from women's abilities to persist toward exercise adherence on large scale and lead to non-adherence and (2) the psychological well-being improves with exercise adherence and vice versa. It may be more helpful to women if societal messages aimed to promote physical fitness focusing 7 on factors that are more intrinsic, such as competence, autonomy, and relatedness by providing the platforms to perform physical skills on the basis of getting rewards and constant target-oriented physical activities to be organized or arranged or facilitated for females.

## REFERENCES

1. Dishman, R.K. Determinants of participation in physical activity. In: Bouchard, C., Shephard, R., Stephens, T., Sutton, J., McPherson, B., (eds). *Exercise, Fitness, and Health*. Champaign, IL: Human Kinetics; 1990, pp. 75-102.
2. Berman, E., Kerr, G., and De Souza, M.J. A qualitative examination of weight concerns, eating, and exercise behaviors in recreational exercisers. *Women Sport Phys Act J*, 2005, 14, 24-38.
3. Markland, D., and Ingledew, D.K. The measurement of exercise motives: Factorial validity and invariance across gender of a revised exercise motivations inventory. *Br J Health Psychol*, 1997, 2, 361-376.
4. Schwarzer, R., and Renner, B. Health-Specific Self-Efficacy scales; 2005, pp. 7-10. Available from: <http://www.userpage.fu-berlin.de/~health/healsself.pdf>.
5. Watson, D., Clark, L.A., and Tellegen, A. Development and validation of brief measures of positive and negative affect: The PANAS scales. *J Pers Soc Psychol*, 1988, 54(6), 1063-1070.
6. Diener, E., Emmons, R.A., Larsen, R.J., and Griffin, S. The satisfaction with life scale. *J Pers Assess*, 1985, 49, 71-75.

# A Study of Extraversion-introversion among Kho-Kho Players

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## ABSTRACT

A total of 300 national Kho-Kho players of India of both the sexes, male and female, and culture rural and urban ranging in the range of 19–22 years were administered Neymann-Kohlstedt diagnostic test for introversion-extraversion to study the relationship between extraversion dimension and Kho-Kho game. The results indicate that the sex and culture variable were found statistically significant.

## 1. INTRODUCTION

Sports performance has been found to be related to some personality variables, personality traits, for example, extraversion may influence the performance of sportsmen, extraversion has been found to be highly related or supportive to dominance and sociability in athletes and sports participants by Sperling (1942), Tillman (1964), Ruffer (1965), Whiting and Stenbridge (1965), Werner and Gottheli (1966), Bruner (1969), Kape (1970), and Ikegami (1970). Extraversion, according to Alderman (1974), is a construct evolving out of Jung's (1933) early designation of the two major attitudes of personality; the extraverted attitude, which orients the person to the external, objective world and the introverted attitude, which orients one toward the inner, subjective world. Eysenck (1947) development of the two broad personality dimensions of neuroticism stability and extraversion-introversion provides the major underlying theoretical structure of this trait. He describes extraverted individuals as:

“Outgoing, impulsive, uninhibited, involved in group activities, sociable, friendly, craving excitement, and having many social contacts. They stick their necks out and take chances, act on the spur of the moment, are optimistic, aggressive, lose their temper easily, laugh a great deal, and are unable to keep their feelings under control.”

According to Eysenck (1947), extraversion is at best a behavior description of personality, but it does possess

biological causal source implication. He believes that extraversion can be explained at the neural level in that his extraversion-introversion scale reflects the strength of the excitatory-inhibitory functions of the central (cortical) nervous system. He (1967) also proposed that the extraversion associated reticular-cortical loop systems of the brain stem. It means that this dimension involves the reticular activating system. His proposal was founded in the belief that cortical excitation in response to external stimulation (such as the effects of competition) is higher in introverts than in extraverts.

It is through the linking of the reticular formation and hypothalamus with personality dimensions that Eysenck believes that differing personality will reflect their positions on a level of arousal continuum. For example, cortical excitation in response to external stimulated (e.g., a tension situation in sports) is postulated as being higher in introverts than in extraverts. Conversely, he believed that inhibition will be higher in extraverts as they possess stronger inhibitory mechanism because of their stronger nervous system. The reason for this is that weaker nervous system is more sensitive and begins to respond at stimulus intensities which are ineffective for strong nervous system. This results in the weaker system's responses being closest to the maximum level of responding than those of a strong system through the stimulus intensity continuum. Eysenck feels that this represents the cortical supremacy of introverts as producing a constraint of their behavior in accordance

with conditional and learned patterns of response that leads to the emergence of those personality traits characterizing introverts, conversely, the absence of such constraints and to the emergence of extraversion traits.

According to Alderman (1974), “Eysenck’s view can be interpreted as indicating that extraverts are low on excitation and high on inhibition, which introverts being the opposite. Athletes, then, would react quite differently to a rise arousal level from competitive circumstances depending on whether or not they are mainly extraverts or introverts. For example, an athlete, high on extraversion, would have more trouble” getting up “for a game than one high on introversion. But would be better able to handle and channel arousal later in the game because of strong inhibitory mechanism.”

The dominance trait appears to be one of the important personality traits of sportsmen which has two interesting implications for sports performance, for example, (1) Eysenck expects extraverts to have low to learners for sensory deprivation on higher tolerance for physical pain because they have higher thresholds of arousal. It explains why athletes are, in fact, highly physically active and relatively tolerant of physical pain, which is required in many endurance events and in the hard physical training programmers required for skill perfection. (2) It is generally accepted that an optimal level of arousal, stimulation, or activation, exists in each person where his performance is maximal. It is usually represented by an inverted LJ-curve relationship which shows that a person’s level of arousal increases, performance increased up to an optimal increase, performance increased up to an optimal point, after which further increases in the level of arousal result in a deterioration of performance.

As reported by Alderman (1974), “Eysenck has taken this basic premise, related it to his personality variables, and stated that if extraverts have stronger nervous systems, which have higher thresholds to stimulus intensities (i.e., arousal), then they should be able to handle higher levels of arousal before their performance deteriorates. This is undoubtedly true in outstanding athletes. The ability to withstand the extremely high levels of arousal caused by intense competition and the usually higher vociferous spectator reactions, without a consequent drop in performance, is the hallmark of a successful athlete. A partial explanation for this ability to withstand pressure may lie in Eisenach’s neural

explanation of extraversion trait that continually crops up on athletes.”

It is evident from the review of researches that several psychosocial variables, for example, locus of control (Brone and Reznikoff, 1989), group cohesion and collective efficacy (Spink, 1990), self-esteem (Melnick and Mookherjee, 1991), and mood, physical estimation, and attraction (McDonald *et al.*, 1991). Goal commitment (Johnson and Perlow, 1992), anxiety (Greenless *et al.*, 1999), and intrinsic motivation (Amorose and Horn, 2000) in relation to sportsmanship were investigated. Moreover, it is found that psychological variables, especially personality of traits, have great influence on the sportsmen behavior. However, no investigator has tried to extend the problem by investigating the relationship between extraversion and Kho-Kho game. Consequently, the present study is designed to measure introversion and extroversion of Kho-Kho players and find out the extent to which male national Kho-Kho players and female national Kho-Kho players differ, significantly from each other on introversion and extraversion And also to search whether the players from urban area differ significantly from rural areas on introversion-extroversion dimension.

## 2. METHOD

### 2.1. Sample and Procedure

In the present study, at the initial, the total sample comprised 370 stage national-level Kho-Kho players. These respondents were categorized into four groups on the basis of their sex (male and female) and culture (rural and urban). However, at the final stage, only 300 Kho-Kho players ranging in the age range of 19–20 years were selected and were administered Neymann-Kohlsted diagnostic test for introversion and extraversion.

## 3. RESULTS

On extraversion-introversion measure, more scores indicate extraversion and less score shows introversion. The mean and standard deviation values of four classified groups of extraversion and introversion are presented in Table 1. On the basis of Table 1, the inferences cannot be drawn confidently; hence, the relating to extraversion-introversion dimensions of the four classified groups was treated to ANOVA. The results are presented in Table 2.



**Table 1: Mean and SD values**

Variables	Values	A1 B2	A1B2	A2B1	A2B2
Extraversion	M	18.00	20.80	14.76	17.08
Introversion	$\sigma$	2.67	1.98	2.48	2.44

A1: Male, A2: Female, B1: Rural, B2: Urban. SD: Standard deviation

**Table 2**

Source of variation	Sum of squares	df	Mean sum of squares	F-ratio	Level
A=Sex	1129.08	1	1129.08	199.82	01
B=Area of residence	349.92	1	349.02	61.93	01
A×B	1.92	1	1.92	0.33	NS
Error within	1675.20	296	5.62		
Total	3156.12	299			

Table 2 has yielded that obtained F-ratios for sex and culture (area of residence) were found significant at respectable level of significance, whereas the interaction effect was not found significant at any respectable level of significance.

The results clearly show [Table 1] that male extraverted Kho-Kho players have obtained higher mean scores on extraversion-introversion test irrespective of their area of residence because they differ significantly in terms of motivation, aggression, physical structure, confidence, dominance, extraverted, and psychological makeup.

Male extraverted players are more skilled, they are more physically strong, and they are self-concept. The data of the present investigation support the finding of Sperling (1942), Tillman (1964), Ruffer (1965), Whiting and Stembridge (1965), Werner and Goftheil (1969), Bruner (1965), Werner and Goftheli (1969), Bruner (1969), Kane (1970), and Ikegarni (1970).

## REFERENCES

- Brone, R.J., and Reznikoff, M. Strength gains, locus of control, and self-description of college football players. *Percept Mot Skills*, 1989, 69(2), 483-493.
- Greenlees, I.A., Nunn, R.L., Graydon, J.K., and Maynard, I.W. The relationship between collective efficacy and precompetitive affect in rugby players: Testing Bandura's model of collective efficacy. *Percept Mot Skills*, 1999, 89(2), 431-440.
- Johnson, D.S., and Perlow, R. The impact of need for achievement component on goal commitment and performance. *J Appl Soc Psychol*, 1992, 22(21), 1711-1720.
- McDonald, D.G., Beckett, M.B., and Hodgdon, J.A. Psychological predictors of physical performance and fitness in U.S. navy personnel. *Mil Psychol*, 1991, 3(2), 73-87.
- Melnick, M.J., and Mookerjee, S. Effects of advanced weight training on body-cathexis and self-esteem. *Percept Mot Skills*, 1991, 72(3, Pt 2), 1335-1345.
- Spink, K.S. Group cohesion and collective efficacy of volleyball teams. *J Sports Exercise Psychol*, 1990, 12(3), 301-311.

# Effect of Sex and Age on Self-concept of Inter-University Volleyball Players

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## ABSTRACT

The present study was undertaken to investigate the effect of sex and age on self-concept among interuniversity volleyball players. The purpose of the study was to examine the effect of sex and age on self-concept of interuniversity volleyball players. Hypothesis of the study is male interuniversity volleyball players who have significantly better self-concept than the female interuniversity volleyball players and another one is 22–25 years interuniversity volleyball players who have significantly better self-concept than the 18–21 years interuniversity volleyball players. C.G. Deshpande Self-concept Scales were used the study. It was a conclusion that male interuniversity volleyball players have significantly better self-concept than the female interuniversity volleyball players. Moreover, 22–25 years interuniversity volleyball players have significantly better self-concept than the 18–21 years interuniversity volleyball players.

## 1. INTRODUCTION

Self-concept (also called self-construction or self-perspective) is a multi-dimensional construct that refers to an individual's perception of "self" in relation to any number of characteristics, such as academics (and nonacademic), gender roles and sexuality, racial identity, and many others while closely related with self-concept clarity (which "refers to the extent to which self-knowledge is clearly and confidently defined, internally consistent, and temporally stable"). It presupposes but is distinguishable from self-awareness, which is simply an individual's awareness of their self. It is also more general than self-esteem, which is the purely evaluative element of the self-concept. The self-concept is composed of relatively permanent self-assessments, such as personality attributes, knowledge of one's physical attributes. The self-concept is not restricted to the present. It includes past selves and future selves. Future selves or "possible selves" represent individual ideas of what they might become, what they would like to become, and what they are afraid of becoming. Volleyball is an Olympic team sport in which two teams sport, in which two teams of six players are separated by a net. Each team tries to score points by grounding a ball on the other team's court under organized rules. The

complete rules are extensive. Carly B. Slutzky and Sandra D. Simpkins (May 2009), the link between children's sports participation and self-esteem: Exploring the mediating role of sports self-concept. Sports participation is positively associated with indices of adjustment, such as self-esteem, among adolescent participants.

## 2. METHODOLOGY

### 2.1. Aim and Objective of the Study

The aim of the study was as follows:

- To examine the self-concept of male and female interuniversity volleyball players
- To examine the self-concept of 18–21 years and 22–25 years interuniversity volleyball players.

### 2.2. Hypothesis

Male interuniversity volleyball players have significantly better self-concept than the female interuniversity volleyball players and 22–25 years interuniversity volleyball players have significantly better self-concept than the 18–21 years interuniversity volleyball players.

### 2.3. Sample

For the present study, 200 players were selected from Maharashtra. The effective sample consisted of 200 subjects, out of which 100 subjects were male and 100 subjects were female. The age ranges of subjects were 18–25 years.

### 2.4. Tools: Self-concept Scale

This test is developed and standardized by C.G. Deshpande. The reliability coefficient of the test was found 0.86 with Spearman–Brown formula. The validity coefficient was found to be 0.84.

### 2.5. Procedures of Data Collection

Each of the three instruments could be administered individuals as well as a small group. While collecting the data for the study, the later approaches were adopted. The subjects were called in a small group of 20–25 subjects and their seating arrangements were made in a classroom. Before administration of test, through informal talk appropriate rapport from following the instruction and procedure suggested by the author of the tests.

### 2.6. Variable: Independent Variable

- Gender
  - a. Male
  - b. Female.
- Age
  - a. 18–21 years
  - b. 22–25 years.

### 2.7. Dependent Variable

- Self-concept.

### 2.8. Statistical Treatment of Data

Male and female interuniversity volleyball players show the mean, standard deviation, and “*t*” value of factors “Self-concept.”

Factor	Group	A1B1	A2B1	A1B2	A2B2
Self-concept	Mean	42.27	39.45	43.34	38.76
	SD	2.51	2.86	2.06	2.19

A=Gender: A1=Male, A2=Female, B=Age: B1=22–25 years, B2=18–21 years

### 2.9. Summary of Two-way ANOVA

Source	Ss	df	MS	F	P
A	990.13	1	990.13	378.75	<0.01
B	465.13	1	465.13	177.93	<0.01
A×B	1.12	1	1.12	0.43	NS
Within	512.38	196	2.61		
Total	1968.76	199			

From the summary and graph, it is seen that main effect a highly significant main effect a refer to the factor gender. It was varied at two levels, i.e. male and female. It was assumed that male and female differ significantly with regard to self-concept. Since the main effect is highly significant ( $F = 378.75$ ,  $df = 1$  and  $192$ ,  $P < 0.01$ ), it is clear that male and female subjects differ significantly from each other from the mean scores found that the males had significantly better self-concept than the females this result supports the hypothesis.

The second independent variable the factor of age it was also varied at two levels. The effective sample was divided into two groups, 22–25 years and 18–21 years. The main effect has highly significant result and  $F$  values of 177.93 for 1 and 192  $df$  are significant beyond 0.01 level and support the hypothesis 22–25 years interuniversity volleyball players.

## 3. RESULTS

Male interuniversity volleyball players have significantly better self-concept than the female interuniversity volleyball players. Moreover, 22–25 years interuniversity volleyball players have significantly better self-concept than the 18–21 years interuniversity volleyball players.

## REFERENCES

- Aries, E., Olver, R.R., Blount, K., Christaldi, K., Fredman, S., and Lee, T. “Race and gender as components of the working self-concept.” *J Soc Psychol*, 1998, 138(3), 127.
- Ayduk, O., Gyurak, A., and Luerssen, A. “Rejection sensitivity moderates the impact of rejection on self-concept clarity.” *Pers Soc Psychol Bull*, 2009, 35(11), 1467-78.
- Bong, M., and Clerk, R.E. Comparison between self-concept and self-efficacy in academic motivation research. *Educ Psychol*, 1999, 34(3), 139-153.
- Byrne, B.M. The general/academic self-concept homological network: A review of construct validation research. *Rev Educ Res*, 1984, 54, 427-456.

# Sports Technology Development of Physically Challenged Students and Intellectually Disabled Students in the Field of Physical Education

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## ABSTRACT

The first ever World report on disability, produced jointly by the World Health Organization (WHO) and the World Bank (2011) on disability and rehabilitation, suggests that more than a billion people in the world today experience disability. This is largely due to the lack of services available to them and the many obstacles they face in their everyday lives. According to the WHO, a disability is: "Any restriction or lack (resulting from any impairment) of ability to perform an activity in the manner or within the range considered normal for a human being." The most commonly cited definition is that of the World Health Organization in 1976 which draws a three-fold distinction between impairment, disability, and handicap, defined as follows: An impairment is any loss or abnormality of psychological, physiological, or anatomical structure or function; a disability is any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being; a handicap is a disadvantage for a given individual, resulting from an impairment or a disability, that prevents the fulfillment of a role that is considered normal (depending on age, sex, and social and cultural factors) for that individual. The term "disability" summarizes a great number of different functional limitations occurring in any population in any country of the world. People may be disabled by physical, intellectual or sensory impairment, medical conditions, or mental illness.

**Keywords:** Anatomical Structure, Disability, Function, Physiological, Psychological.

## 1. INTRODUCTION

An Educator's Guide to Teaching Students with Physical Disabilities:(Adapted from Bright Hub Education: [www.brighthubeducation.com](http://www.brighthubeducation.com))

To maintain inclusive classrooms, teachers should have knowledge of physical impairments, assistive technology, teaching strategies, and necessary accommodations and modifications.

Children with physical disabilities, once taught in separate classes and even separate schools, now learn beside their peers in regular classrooms. Inclusion has changed how these students are educated, with the continuing development of the Disability Standards for Education (2005) working to ensure rights to quality education.

As types of physical disabilities vary in degree of impairment, teachers will find a general knowledge of various conditions and how they affect children helpful. Assistive technology can level the effects of these impairments by allowing students to participate in classroom activities more easily and independently. Specific classroom and instructional strategies, as well as accommodations and modifications, also assist students in achieving their best individual educational outcomes. Explore the following articles to learn how all of these factors come together for the inclusion of students with physical disabilities in today's classroom.

## 2. TYPES OF PHYSICAL DISABILITIES

The term "physical disabilities" encompasses a wide range of congenital and acquired conditions and



impairments. While students with varying diagnoses and severities benefit from physical, occupational, and speech therapies, each child has differing abilities and requires individualized supports. Some conditions, such as muscular dystrophy, are progressive, but those such as cerebral palsy and epilepsy can improve with treatment.

- Overview of physical disabilities and special education services
- Muscular dystrophy
- Cerebral palsy
- Fetal alcohol syndrome
- Epilepsy.

### 3. ASSISTIVE TECHNOLOGY

Any device or tool that enables a student to participate in learning activities can be called assistive technology. Simple pencil grips or ergonomically designed pens can make holding and manipulating writing instruments easier. Oversized art supplies and handmade adaptations can allow students with fine motor difficulties to create art. For those with more severe impairments, assistive technology lets that students have access to computers for learning and expressing themselves. Keyboard and mouse alternatives replace standard input devices. Voice recognition software allows users to speak what they want to input instead of typing it.

- Assistive writing tools
- Adaptive art tools for students with spasticity
- Computer devices for students with cerebral palsy
- Funding sources for assistive technology.

### 4. ACCOMMODATIONS AND MODIFICATIONS

Since each student differs in degrees of impairment and ability, accommodations and modifications must be individualized according to needs. Although some subjects are more difficult to accommodate and modify for certain disabilities, many options make learning more accessible. Accommodations can include notetakers, the use of scribes for written assignments, handouts in alternative formats, and separate rooms for testing. A teacher's creativity also opens new opportunities to learn.

- Science and math accommodations and modifications
- Accommodations for students with visual impairments
- Adaptations for orthopedic impairments.

### 5. ADAPTIVE PHYSICAL EDUCATION

Physical disabilities should not exclude students from participating in gym activities. Depending on a student's disability, a separate, adaptive class or modifications within a typical gym class both offer physical education. Basketball, golfing, and tennis can be adapted or participated in with the assistance of a physical education teacher or aide. Other physical activities, even swimming, can provide great therapeutic benefits to students.

- Options for adaptive physical education
- Modifying physical activities
- Sports activities
- Teaching the physically disabled to swim.

### 6. ASSISTIVE TECHNOLOGY – PHYSICAL DISABILITIES

Ergonomic pens and pencils make writing easier for children who have disabilities that make holding a standard pen or pencil difficult. Different styles of these writing devices are available to meet a child's individual needs. Some children with disabilities may not be able to hold a standard pen or pencil. Others may be able to hold a standard pen or pencil but may have a great deal of difficulty using the pen or pencil to write. Ergonomic pens and pencils are designed to be easier for the child to hold and utilize. They come in different weights and shapes. Heavy weighted pens can help children with coordination difficulties write. Fatter pens and pencils may be easier to grip. Writing utensils with rubber grips are easier to hold on to. Some children may find large pens and pencils easier to hold and grip. Other children may find small pens and pencils easier to hold and grip. Allow the child to experiment with various writing devices, so they can determine which one is most suitable for them. Also have the child experiment with holding the writing utensils in different ways. For example, some children may have more success when holding a pen between the middle and forefingers. There is a wide variety of assistive handwriting aids on the market. The following sections list some of the popular models.





## 7. ALSO RECOMMENDED

- Common factors of students with orthopedic impairment
- A teacher's guide to hearing disabilities and learning
- The benefits of assistive technology in schools
- Five barriers to inclusion in education
- Activities to improve pencil grasp
- Teaching kinesthetic learners
- I cannot read your writing!
- Helping children develop a tripod pencil grasp.

## REFERENCES

- Connor, F., Scandary, J., and Tulloch, D. Education of physically handicapped and health impaired individuals: A commitment to future. *DPH J*, 1988, 10, 5-24.
- Fraser, B.A., and Hensinger, R.N. *Managing Physical Handicaps. A Practical Guide for Parents, Care Providers, and Educators*. Baltimore: Paul H. Brookes; 1983.
- Reynolds, C.R., and Clark, J.H. *Assessment and Programming for Young Children with Low Incidence Handicaps*. New York: Plenum; 1983.
- Sirvis, B. Physical disabilities. In: Meyen, E., Skrtic, T., (eds). *Exceptional Children and Youth: An Introduction*. 3<sup>rd</sup> ed. Denver: Love Publishing; 1988.
- U. S. Department of Health and Human Services. *Tenth Annual Report to Congress on the Implementation of the Education of the Handicapped Act*. Washington, DC: U. S. Department of Health and Human Services, Office of Special Education and Rehabilitative Services; 1988.
- Eugene, W., Nixon., and Cozens, F.W. *An Introduction to Physical Education*. 4<sup>th</sup> ed. United States: W. B. Saunders Company; 1958.
- Janet, A.S., and Karen, P.D. *The New Adapted Physical Education: A Developmental Approach*. 2<sup>nd</sup> ed. Mayfield Publisher; 1989.
- Eugene, W.N., and Fredericj, W.C. *An Introduction to Physical Education*. 4<sup>th</sup> ed. United States; 1958.
- Available from: [http://www.ehow.com/info\\_8544105\\_types-sports-facilities-disabilities.html](http://www.ehow.com/info_8544105_types-sports-facilities-disabilities.html).
- Available from: <http://www.swimming-techniques-learn.com/swimming-for-disabled.html>.



# Enhancing Skills of Physically Challenged Students and Intellectually Disabled Students in the Field of Physical Education and Sports

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## ABSTRACT

The Paralympic Games are the pinnacle of sports for many athletes with a disability. The purpose of this paper is to briefly provide some background on the Summer Paralympic Games and their eligibility and classification rules. Results from selected studies examining the biomechanics of locomotion (amputee running, swimming, and wheelchair pushing) and projecting external objects (e.g., throwing and hitting) as well as the evolution of sports performance and training practices such as strength and conditioning will be described. Recommendations for how this evidence can be used to improve athletic performance in Paralympic sports and inform future research are also provided. Examiners must have a broad base of skills to measure adequately the functional and cognitive abilities of students who are physically disabled or health impaired. In addition to the areas traditionally evaluated in the assessment of children with mild handicaps, measures should be included in the areas of gross motor, fine motor, and daily living skills; perception; recreation and leisure skills; augmentative communication; and sensory input.

**Keywords:** Fine motor, Handicaps, Physically disabled or health impaired.

## 1. INTRODUCTION

### 1.1. Physical Disability

A physical disability is any impairment which limits the physical function of one or more limbs or fine or gross motor ability. Other physical disabilities include impairments which limit other facets of daily living (<http://en.wikipedia.org/>).

The term physical disability is broad and covers a range of disabilities and health issues, including both congenital and acquired disabilities. Within that ranges are physical disabilities or impairments that interfere with a child's ability to attain the same developmental milestones as his or her age-mates. The number of students with physical disabilities is expected to grow as medical advances continue to reduce mortality rates for infants and children. According to the Individuals with Disabilities Education Act (IDEA), a person with an orthopedic impairment, brain injury, or other health impairments that, by reason of that impairment, need

special education and related services is considered to have a physical disability. The condition must interfere with or substantially limit the child's ability to take part in routine school activities.

### 1.2. Types of Physical Disabilities

According to Wikipedia, the free encyclopedia cited in <http://en.wikipedia.org/wiki/> state types of physical disability as follows:

- **Mobility impairment:** It is a category of disability that includes people with varying types of physical disabilities. This type of disability includes upper limb disability, manual dexterity, and disability in coordination with different organs of the body.
- **Visual impairment:** It is another type of physical impairment. There are hundreds of thousands of people that greatly suffer from minor to various serious vision injuries or impairments.
- **Hearing impairment:** It is the category of physical impairment that includes people that are completely or partially deaf. People who are only partly deaf



can sometimes make use of hearing aids to improve their hearing ability.

### 1.3. Causes of Physical Disabilities

As cited in [http://en.wikipedia.org/wiki/Physical\\_disabilities](http://en.wikipedia.org/wiki/Physical_disabilities) causes

- Prenatal causes: Those disabilities that are acquired before birth. These may be due to diseases that have harmed the mother during pregnancy or genetic incompatibilities between the parents.
- Perinatal causes: Those disabilities that are acquired during birth. This could be due to prolonged lack of oxygen or the obstruction of the respiratory tract, damage to the brain during birth (due to the accidental misuse of forceps, for example) or the baby being born prematurely.
- Postnatal causes: Those disabilities gained after birth. They can be due to accidents, infection, or other illnesses.

Seaman and DePauw (1989) identified that physical impairments adversely affect the movement of the body, especially the skeletal system, including the spine, muscles, bones, and joints. Although many factors contribute to this impairment, the three main causes are as follows:

1. Neurological impairment.
  2. Musculoskeletal conditions.
  3. Trauma caused physical impairments.
1. Neurological impairment: It implies damage or deterioration to the central nervous system the brain and spinal cord. Be aware that whenever the central nervous system suffers damage, muscular wellness, or paralyses are almost always present.
  2. Musculoskeletal conditions: Some individuals are physically disabled because of defect or diseases of the muscles or bones. The condition of the musculature or skeletal system or both affects the ability to move problems arising from musculoskeletal conditions, without neurological impairment, may be congenital or acquires after birth.
  3. Trauma caused physical impairments: Trauma refers to those accidents or mishaps that occur after birth to an otherwise normal individual. Accident fractures, dislocation sprains, bruises, contusions, poisoning, and various wounds can result in temporary or permanent impairments.

### 1.4. Benefits of Physical Education for Students with Disabilities

The physical educator can make a major contribution to reduce the risk and facilitate independent living through physical activity in the following ways:

- Develop recreational motor skills for independent functions in the community.
- Develop physical and motor prerequisites to self-help skills required for independent living.
- Develop physical fitness for the maintenance of health.
- Develop prerequisites motor skills necessary for participation in self-fulfilling social activities.

### 1.5. The Role of the Physical Educator

Auxter *et al.* (1993) suggested whenever a child with a disability is placed in a regular educator for those children are the same as for any other child in the classroom. Because all children differ with respect to amount of learning, rate of learning, and learning style, modifications in methodology, curriculum, or environment are often necessary for both non-handicapped and handicapped children. Special education which involves significant modifications in methodology, curriculum, or environment may also be delivered to some handicapped children in regular classrooms.

Regular educators have any or all of the following duties with respect to children with disabilities;

1. Identification of possible disabling conditions.
2. Referral of children for education and placement.
3. Data gathering.
4. Assisting children with disabilities with special equipment.
5. Participation in developing Individualized Education Programs.
6. Sharing information with and without disabilities in the school environment.

### 1.6. Sports in Which Children with Disabilities Can Take Part

Today, the idea of people with a disability being able to participate in sports and physical activity is not so uncommon. In many countries, opportunities exist from the grassroots to elite levels for people with a disability to showcase their abilities in sports and physical activity. However, this is not the case in all parts of the world.

Wheelchair archery	Wheelchair tennis	Athletics: Track and field
Wheelchair basketball	Swimming for disabled	Wheelchair racing
Wheelchair table tennis	Wheelchair tennis	Wheelchair fencing



### 1.7. Pictures of Some Sports Disabled Persons



## 2. CONCLUSION

From the reviewed literature, one can conclude that physical education is the integral part of the total educational activities which is beneficial for mental, physical, social, and psychological aspects of an individual's life through planned and selected physical activities. Therefore, one has to understand that physical education plays a great role in the society, especially for short-wave diathermy if efficiently and effectively practiced. Hence, based on the findings of the study, it can be concluded as follows:



- In promoting inclusive education, awareness creation is crucial for all stakeholders. Especially, teachers and principals were found more concerned to the issue raised.
- The study concluded that most of the school administrations do not give special attention and have enough knowledge of the benefits of including children with disabilities in PE practical class.
- It is the fact that positive attitude of teachers can enhance the achievement of any new strategy in any educational system. However, positive outlook

without related knowledge, skill, and duty is not the end in the process.

## REFERENCES

- Connor, F., Scandary, J., and Tulloch, D. Education of physically handicapped and health impaired individuals: A commitment to future. *DPH J*, 1988, 10, 5-24.
- Fraser, B.A., and Hensinger, R.N. *Managing Physical Handicaps. A Practical Guide for Parents, Care Providers, and Educators*. Baltimore: Paul H. Brookes; 1983.
- Reynolds, C.R., and Clark, J.H. *Assessment and Programming for Young Children with Low Incidence Handicaps*. New York: Plenum; 1983.
- Sirvis, B. Physical disabilities. In: Meyen, E., Skrtic, T., (eds). *Exceptional Children and Youth: An Introduction*. 3<sup>rd</sup> ed. Denver: Love Publishing; 1988.
- U. S. Department of Health and Human Services. *Tenth Annual Report to Congress on the Implementation of the Education of the Handicapped Act*. Washington, DC: U. S. Department of Health and Human Services, Office of Special Education and Rehabilitative Services; 1988.
- Available from: [http://www.ehow.com/info\\_8544105\\_types-sports-facilities-disabilities.html](http://www.ehow.com/info_8544105_types-sports-facilities-disabilities.html).
- Available from: <http://www.swimming-techniques-learn.com/swimming-for-disabled.html>.

# Sports Psychology

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## ABSTRACT

The birth of sports psychology in Europe happened largely in Germany. The first sports psychology laboratory was founded by Dr. Carl Diem in Berlin in early 1920. The early years of sports psychology were also highlighted by the College of Physical Education in Berlin Germany by Robert Werner Schulte in 1920. The laboratory measured physical abilities and aptitude in sports, and in 1921, Schulte published *Body and Mind in Sport*. In Russia, sports psychology experiments began as early as 1925 at institutes of physical culture in Moscow and Leningrad, and formal sports psychology departments were formed around 1930. However, it was a bit later during the cold war period (1946–1989) that numerous sports science programs were formed, due to the military competitiveness between the Soviet Union and the United States, and as a result of attempts to increase the Olympic medal numbers, the Americans felt that their sports performances were inadequate and very disappointing compared to the ones of the Soviets, so this led them to invest more in the methods that could ameliorate their athletes performance and made them have a greater interest on the subject. The advancement of sports psychology was more deliberate in the Soviet Union and the Eastern countries, due to the creation of sports institutes where sports psychologists played an important role. Sports psychology is an interdisciplinary science that draws on knowledge from many related fields including biomechanics, physiology, kinesiology, and psychology; it involves the study of how psychological factors affect performance and how participation in sports and exercise affects psychological and physical factors. Sports psychologists teach cognitive and behavioral strategies to athletes to improve their experience and performance in sports. In addition to instruction and training of psychological skills for performance improvement, applied sports psychology may include work with athletes, coaches, and parents regarding injury, rehabilitation, communication, team building, and career transitions.

**Keywords:** Americans, Berlin, Biomechanics, Europe, Germany, Kinesiology, Leningrad, Physical education, Physiology, Psychological factors, Psychology, Rehabilitation, etc., Russia, Soviet Unions, Sports, United States.

## 1. INTRODUCTION

Sports psychology is a proficiency that uses psychological knowledge and skill to address the optimal performance and well-being of athletes' developmental and social aspects of sports participation, and systematic issues associated with sports settings and organizations. APA recognizes sports psychology as a proficiency acquired after a doctoral degree in one of the primary areas of psychology and licensure psychologists. This proficiency does not include that those who have earned doctoral degree in sports psychology are not licensed psychologists. Sports psychology interventions are designed to assist athletes and other sports participants from a wide array

of settings, level of competition and ages, and ranging from recreational youth participants to professionals and Olympic athletes to master's level performers.

This proficiency helps protect the public by ensuring that those who seek services receive them from qualified individuals. The proficiency provides a recognized set of standards to guide appropriate training of psychologists who wish to practice sports psychology.

### 1.1. Specialized Knowledge Includes

1. Theory and research in social, historical, cultural, and developmental foundation of sports psychology.

2. Issues and techniques of sport-specific psychological assessment and mental skill training for.
3. Performance enhancement and participation satisfaction.
4. Clinical and counseling issues with athletes.
5. Organizational and systematic aspects of sports consulting.
6. Developmental and social issues related to sports participation.
7. Biobehavioral bases of sports and exercise.
8. Specific knowledge of training science and technical requirements of sports and competition, International Olympic Committee, National Collegiate Athletic Association rules, etc.

Let's take a look at the field of sports psychology and discover how it can help as an athlete, parents as an athlete, or as a coach. There are 10 areas that sport psychology studies, and how it applies this knowledge to sports learning and performance. Sports psychology helps us understand self as an athlete. We need to have mental strategies for learning, practice, and performance factors. Sports psychology gives you the methods and approaches to become aware of what need and coach can craft custom interventions. The following points importance of sports psychology:

1. Enhancement of physical capacity: Sports psychology plays a very unique role in the enhancement of physiological capacities such as strength, speed, and flexibility.
2. Learning the motor skills: Sports psychology plays its major role in the learning of motor skills. It is also helpful in the cognitive stage, the social active stage of motor skill learning.
3. Understanding the behavior: Sports psychology helps in understanding the behavior of athletes or sportsperson engaged in competitive sports. Coaches also come to know the interest, attitude toward physical activity, instincts, drives, and personality of sportsperson.
4. Pre-performance routines: Pre-performance routines refer to the actions and behaviors athletes use to prepare for a game or performance. These routines help to develop consistency and predictability for the player. This allows the muscles and mind to develop the motor skills.
5. Self-talk: Self-talk refers to the thoughts and words, athletes and performers say to themselves usually in their minds.
6. Using extrinsic rewards: The key aspect in using extrinsic rewards effectively is that they reinforce an athlete sense of competence and self-worth.

7. Sports psychology helps increase motivation and drive: Successful athletes who have long careers fuel them with exciting goals a vision for the legacy they want to leave dreams of how they want to play.
8. Sports psychology helps handle stress and pressure: One of the major ways sports psychology helps you is through stress reduction in learning and performance.
9. Sports psychology helps handle the paradox of success: An issue that every athlete faces at some time is the paradox of success.

## 2. SIGNIFICANCE OF RESEARCH

In present research have studied that importance of sports psychology and areas of sports psychology.

## 3. OBJECTIVES OF RESEARCH

The objectives of the research are as follows:

1. To study the history of sports psychology.
2. To study the areas of sports psychology.
3. To study the importance of sports psychology.

## 4. HYPOTHESIS OF RESEARCH

1. Sports psychology plays a major role in the sports department.
2. Sports psychology is very helpful for players, coaches, and sports institutions.
3. Sports psychology is necessary for development in sports.

## 5. CONCLUSION

1. Sports psychology is very significant for physical education and sports department.
2. Many numbers of players, coaches, and sports institutions taking the help of sports psychology stream.
3. Sports psychology is helpful for search new area in sports and physical education.

## REFERENCES

1. Afremow, J. *The Champion's Mind: How Great Athletes Think, Train, and Thrive*. United States: Macmillan.
2. Mack, G. *Mind Gym: An Athlete's Guide to Inner Excellence*. New York: McGraw-Hill Education.



3. Gallwey, T. *The Inner Game of Tennis: The Classic Guide to the Mental Side of Peak Performance*. Random House Trade Paperbacks.
4. The Times of India, Daily Newspaper, 2019.
5. The Indian Express, Daily Newspaper, 2019.
6. The Hindu, Daily Newspaper, 2018.

# Effect of Hatha Yoga Training on Physiological Variables of School Students

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## ABSTRACT

This study was conducted to find out the effect of hatha yoga training on physiological variables of school level students. This was an experimental study. For conducted this study, 100 male students of 9<sup>th</sup>–12<sup>th</sup> classes were selected as the subjects. They were divided into four groups randomly; each group has 25 subjects. Group I assigned for yoga asana training, Group II for pranayama training, Group III for asana and pranayama mix training, and Group IV – as a control group. The control group was not participated any type of training. Systolic blood pressure, diastolic blood pressure, resting heart rate, and breath-holding capacity were selected as the variables of the physiological fitness for the study. The subjects were participated in 12 weeks hatha yoga training program. The data for the study were collected through the pre- and post-test of 12 weeks training program. For analyzing, the data of physiological fitness variables *t*-test were applied at 0.05 test level of significance. The result of the study showed that there was a significant improvement in breath-holding capacity and resting heart rate but not significant in systolic blood pressure and diastolic blood pressure due to hatha yoga training.

**Keywords:** Breath-holding capacity, Diastolic blood pressure, Hatha yoga, Physiological, Resting heart rate, Systolic blood pressure.

## 1. INTRODUCTION

The origins of hatha yoga have been come in the light to the 11<sup>th</sup> century A.D. The word “hatha” derived from Sanskrit two words- ha and tha, “ha” means sun and “tha” means moon. It is also called sun-moon yoga. It helps strives to balance opposite parts of the individual body such as front and back, left and right. Hatha Yoga uses physical resources to achieve proper self-development.

Some yoga experts or yogis claimed that hatha yoga developed by experts to help the people to remain healthy during the spiritual dark periods. Hatha yoga consists of eight limbs of practices but mainly concentrated on two limbs of the eight paths. These two paths were posture and breathing. Thus, breathing exercise is very important to health. Our prana or life force is directly related to our breath. We did not achieve optimal health and full potential of life if we are breathing incorrectly.

Pranayama is the science of correct breathing. It teaches us how to control of life force. In pranayama, we practice breathing correctly and deeply.

In the other hand, yoga asana (posture) is very helpful to improve flexibility, balance, and strength in our body. Each asana has a definite form and steps for improving the desired position of the body. Yoga asana and pranayama scientifically developed health and increase the strength of all body parts. These both types of exercise improve muscular tissue to glands and internal body organs. Hatha yoga helps us to make strong and physically fit as any other exercise program. We enjoy all the benefits of asana with safe and regular practice of them. They bring spiritual power in the body and mind. Asana is very helpful to control inner energy. Regular practice of yoga prevents us from various diseases, including cancer, diabetes, high or low blood pressure, kidney failure, and mental disorder.



Yoga is very helpful to make our lives better. It improves our both inner and outer strength. It helps in increase the immune power of our body. It is not only preventing us from diseases but also cures different diseases. If we practiced yoga regularly, it is become an alternative system of medicine. It also decreases the side effects of medicines.

Asana helped people to lose weight, overcome fears, and increase concentration. Yoga improved self-awareness, performance in daily tasks and sense of well-being, better self-acceptance, and feeling of being at peace.

### 1.1. Objectives of Study

The objectives of the study were to find out the effect of hatha yoga training on physiological variables.

## 2. RESEARCH METHODOLOGY

### 2.1. Selection of the Subject

For the present study, 100 male students of 9<sup>th</sup>–12<sup>th</sup> classes from Govt. Senior Secondary Schools were selected by purposive sampling as the subjects of the study and they were divided into four groups randomly. Each group has 25 subjects. Group I for Yoga Asana training group, Group II treated as pranayama training group, Group III for mix training of asana and pranayama, and Group IV treated as control group. Physiological fitness test was conducted for all groups before and after the training program. Groups I, II, and III were participated in their respective given 12 weeks, 5 days a week training program of Yoga, whereas the control group was not participated any type of specific training program, those given only general exercises. At the end of 12 weeks training program, physiological fitness test components were conducted on all the groups.

### 2.2. Selection of Test

The purpose of this study was to test the effect of hatha yoga on physiological fitness; the following test items were selected to measure the physiological fitness components.

1. Breath-holding time – Stopwatch
2. Resting heart rate – Stopwatch
3. Systolic blood pressure – Sphygmomanometer, Stethoscope
4. Diastolic blood pressure – Sphygmomanometer, Stethoscope.

### 2.3. Statistical Procedure

For analyzing the data of physiological fitness variables, t test was applied to assess the impact of hatha yoga training on physiological fitness.

## 3. RESULTS OF THE STUDY

Table 1 shows the mean and SD and *t*-value of physiological variables of yoga asana group and control group. The results of the data showed that pre- and post-value of experiment *t*-value of breath-holding capacity and resting heart rate is significant at 0.05 level of significance but not significant in systolic blood pressure and diastolic blood pressure in experimental group due to hatha yoga training, whereas *t*-value of pre- and post-value of control group of breath holding, resting heart rate, systolic blood pressure, and diastolic blood pressure is not significant at 0.05 level of significance which showed that there is a significant improvement in physiological variables such as resting heart rate and breath-holding capacity after 12 weeks yoga asana training and yoga asana recommended exercise for improvement of physiological components of school-going students.

Table 2 shows the mean and SD and *t*-value of physiological variables of pranayama group and control group. The results of the data showed that pre- and post-value of experiment *t*-value of breath-holding capacity and resting heart rate is significant at 0.05 level of significance but not significant in systolic blood pressure and diastolic blood pressure in experimental group due to hatha yoga training, whereas *t*-value of pre- and post-value of control group of breath holding, resting heart rate, systolic blood pressure, and diastolic blood pressure is not significant at 0.05 level of significance which showed that there is a significant improvement in physiological variables such as resting heart rate and breath-holding capacity after 12 weeks. Yoga pranayama training is recommended exercise for improvement of physiological components of school-going students.

Table 3 shows the mean and SD and *t*-value of physiological variables of yoga asana and pranayama mix group and control group. The results of the data showed that pre- and post-value of experiment *t*-value of breath-holding capacity and resting heart rate is significant at 0.05 level of significance but not significant in systolic blood pressure and diastolic blood pressure in experimental group due to hatha

**Table 1:** Comparison of pre- and post-experiment results of physiological variables of yoga asana group and control group

	Variable	Mean	Std. deviation	Std. error mean	<i>t</i>
Yoga asana group (n=25)	Breath-holding time	49.5708	9.26171	0.556	-5.628
		52.7008	9.55581		
Control group (n=25)	Breath-holding time	44.4020	8.46075	0.577	-0.056
		44.4344	8.18299		
Yoga asana group (n=25)	Resting heart rate	68.7200	4.79166	0.432	7.407
		65.5200	4.33128		
Control Group (n=25)	Resting heart rate	67.9200	5.67098	0.695	0.690
		68.4000	3.95811		
Yoga asana group (n=25)	Systolic blood pressure	117.6400	3.12090	0.487	0.492
		117.4000	2.21736		
Control group (n=25)	Systolic blood pressure	118.6400	2.94222	0.446	0.359
		118.4800	2.36502		
Yoga asana group (n=25)	Diastolic blood pressure	77.3600	3.55762	0.465	0.774
		77.0000	2.34521		
Control group (n=25)	Diastolic blood pressure	76.4800	3.02930	0.525	0.152
		76.4000	2.44949		

**Table 2:** Comparison of pre- and post-experiment results of physiological variables of pranayama group and control group

	Variable	Mean	Std. deviation	Std. error mean	<i>t</i>
Pranayama group (n=25)	Systolic blood pressure	118.6800	3.35062	0.561	2.065
		117.5200	1.68622		
Control group (n=25)	Systolic blood pressure	118.6400	2.94222	0.446	0.359
		118.4800	2.36502		
Pranayama group (n=25)	Diastolic blood pressure	77.1200	2.90574	0.509	2.119
		76.0400	2.22636		
Control group (n=25)	Diastolic blood pressure	76.4800	3.02930	0.525	0.152
		76.4000	2.44949		
Pranayama group (n=25)	Resting Heart Rate	67.8400	4.50629	0.494	7.608
		64.0800	3.85054		
Control group (n=25)	Resting Heart Rate	67.9200	5.67098	0.695	0.690
		68.4000	3.95811		
Pranayama group (n=25)	Breath-holding time	46.0576	8.75623	0.658	7.869
		51.2356	9.92456		
Control group (n=25)	Breath-holding time	44.4020	5.67098	0.577	0.056
		44.4344	3.95811		

yoga training, whereas *t*-value of pre and post value of control group of breath holding, resting heart rate, systolic blood pressure, and diastolic blood pressure is not significant at 0.05 level of significance which showed that there is a significant improvement in

physiological variables such as resting heart rate and breath-holding capacity after 12 weeks yoga asana and pranayama training and yoga pranayama recommended exercise for improvement of physiological components of school-going students.

**Table 3:** Comparison of pre- and post-experiment results of physiological variables of asana and pranayama mix group and control group

	Variable	Mean	Std. deviation	Std. error mean	t
Asana and pranayama group (n=25)	Systolic blood pressure	118.9600	2.79106	0.577	2.425
		117.5600	1.87261		
Control group (n=25)	Systolic blood pressure	118.6400	2.94222	0.446	0.359
		118.4800	2.36502		
Asana and pranayama group (n=25)	Diastolic blood pressure	77.6800	3.07842	0.741	2.049
		76.1600	2.47790		
Control group (n=25)	Diastolic blood pressure	76.4800	3.02930	0.525	0.152
		76.4000	2.44949		
Asana and pranayama group (n=25)	Resting heart rate	69.6000	5.35413	0.588	6.114
		66.0000	4.28174		
Control group (n=25)	Resting Heart Rate	67.9200	5.67098	0.695	0.690
		68.4000	3.95811		
Asana and pranayama group (n=25)	Breath-holding time	43.5184	6.94108	0.648	6.762
		47.9052	7.07608		
Control group (n=25)	Breath-holding time	44.4020	5.67098	0.577	0.056
		44.4344	3.95811		

#### 4. CONCLUSION

The results of the study clearly showed that the effects of hatha yoga training on school level students were positively significant on some physiological variables such as resting heart rate and breath-holding capacity. The results proved that hatha yoga is very helpful to improve physiological fitness of the students.

#### REFERENCES

- Acharya, B.K. Effect of pranayama (voluntary regulated breathing) and yogasana (yoga postures) on lipid profile in normal healthy junior footballers. *Int J Yoga*, 2010, 3(2), 70.
- Anand, B.K. Yoga and medical sciences. In: *Seminar on Yoga, Science and Man*. New Delhi: Central Council for Research in Indian Medicine and Homeopathy; 1976.
- Bhargava, R., Gogate, M.G., and Mascarenhas, J.F. Autonomic responses to breath holding and its variations following pranayama. *Indian J Physiol Pharmacol*, 1988, 32(4), 257-64.
- Chen, T.L., Mao, H.C., Lai, C.H., Li, C.Y., and Kuo, C.H. The effect of yoga exercise intervention on health related physical fitness. In school-age asthmatic children.
- Culos-Reed, S.N., Carlson, L.E., Daroux, L.M., and Hatley-Aldous, S. A pilot study of yoga for breast cancer survivors: Physical and physiological benefits. *Psychooncology*, 2009.
- Dutta, U. Effectiveness of general and specific stretching exercises on flexibility in gymnastics. In: *Abstract Cum Souvenir VI national conference and Seminar on Physical Education and Sports Science*. 1990.
- Kristine, M.F. *The Effect of Surya Namaskara Yog Practice on Resting Heart Rate and Blood Pressure, Flexibility, Upper Body Muscle Endurance and Perceived Well-being in Healthy Adults*. United States: Cleveland State University; 2008.
- Ganguly, S.K., and Gharote, M.L. Cardiovascular efficiency before and after yogic training. In: *Yoga Mimamsa*. 1984.
- Gedder, M.D. Effect of mobility patterning technique upon selected motor skill of primary school educate mentally retarded children. *Res Q*, 1968, 39, 953.

# Employability in Sports

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## ABSTRACT

There are considerable evidence of sport's role in delivering a wide variety of benefits to communities and individuals, including economic growth. Sport can help increase economic prosperity, provide employment opportunities, and contribute toward raising aspirations and increasing skill levels. Today, sports emerge as an important component of socioeconomic development of country. The active participation in sports improves community health and productivity, reduces medical expenses, imbibes discipline in character, generates great leaders, and enhances social cohesion. The execution of a mega sports event helps in developing infrastructure, generates employment, secures inflow of foreign capital, generates players and athletes, and thus contributes significantly to the economic development of country. Therefore, it can be said that the impact of sports on economy and society is multidimensional. Sports are helpful to build skills for employability. Some research suggest that being involved in sports can equip young people with specific "core" and "soft" skills that may raise their level of employability. "Core" skills include those that are directly associated with coaching and sports management.

**Keywords:** Aspirations, Athletes, Core skill, etc., Economic growth, Employment opportunities, Evidence, Expenses, Imbibes discipline, Individuals, Infrastructure, Productivity, Socioeconomic development.

## 1. INTRODUCTION

The international job market has become more competitive than ever before. As a result, we are witnessing an increased focus on the employability of candidates in the industry. A wide perception is despite the increase in individuals pursuing undergraduate and postgraduate qualifications, many are still lacking the basic but fundamental employability skills needed to succeed in the career world.

As the competition for jobs has grown, so has the concept of employability and the term is also widely drawn on in the bigger debate surrounding the education system. Although more candidates than ever before are achieving impressive results at school and pursuing further education, the concept of employability goes much further than simply gaining relevant qualifications.

So who has the ultimate responsibility over employability? What can be done to improve knowledge and understanding of the concept in the industry?

Stephen argues that it is down to the training providers, employers, and candidates; one of the key issues he highlights that everyone in the industry must be able to understand and trust the qualification. However, education and training providers can only shape their programs if they know what employers want in terms of the knowledge and skills of their students. Therefore, a level of action is needed from employers working together. Once this is achieved, development and change can begin to take place in the industry.

"Employability must be defined by employers, employers have both the opportunity and the responsibility to shape training and education by defining what they need, training providers need to meet these needs but to do this they must have a coherent message from employers. Skills active in the UK and EOSE in Europe have been working for a number of years with employers to set standards that define the competencies needed for every occupation in the sector. Training providers and even universities have increasingly responded to these standards by reshaping their courses.

The International Labor Organization (ILO) has highlighted the position of sports institutions as lying outside the tripartite structures of actors with whom the ILO usually works governments, employers, and workers and therefore calls for the creation and development of joint projects and partnerships. For skills building in sports for employment, the ILO has suggested that classifications of sports and sport-related economic activities opportunities be carried out in African countries, considering that so few of them have been documented in this region. This would allow for a better understanding of the present situation of the sports sector and uncover any potential employment opportunities and skills that young people may find useful in the sports sector in Africa. Sports are not new element in development cooperation. It has been used in an *ad hoc* way to reach development related objectives as far as back as from 1920. For example, within the United Nations, humanitarian aid workers have tapped the potential of sports as a mean to improve the condition of victims of conflict and natural disasters for many years. The ILO and the International Olympic Committee signed an agreement to collaborate as far back as 1922. However, sports are largely underestimated as a major tool in humanitarian programs and were rarely used in a systematic way. More recently, there has been a fundamental shift. Today, more and more national and international organizations are using sports to add their approaches in local, regional, and global development and peace promotion programs. This is done in close cooperation with sports organizations most of the time. Despite recent progress, the systematic use of sports and physical education for development is still in its early stages as many remain unconvinced of the impact sports can have on reaching development and humanitarian objectives. Sports and development has emerged and continues to evolve because of major international policy development. Here is a chronological list of some of the key milestones that have occurred over the past few decades, putting sports as a tool for development on an international agenda.

To young people encourage in employment, training, and education mode outside the classroom. Street League has the ambitious aim of moving 70% of “hard to reach” young people who joined their sports and employability academy into employment, training, or education. Our research with participants and employees helped to explain factors that contributed to the success of the program as well as areas for improvement. Street league commissioned Brunel University to conduct an external evaluation street league. The evaluation employed qualitative research methods to evaluate Street League’s product services with particular

attention to impact and to provide recommendation for future development and improvement to help their active their objectives. Key findings include that taking part in sport-based employability scheme overwhelmingly helped young people their teamwork, communication, and social skills. A key finding importance of young people develops their teamwork, communication, and social skills and young people attached to developing friendship with their peers and positive relationship with the adult staff. We also found that football and dance were perceived to be keyed to the programs successful outcomes. Sports provided a space for a building relationship and building skills related to employability. In addition, sports served as a hook and give Street League a distinctive brand in the youth employment sector.

Developing employable graduates is a major focus for universities today as they strive to prepare students for life after graduation. No more than ever, students are asking for Return of Investment on their degree programs so they can pay off their high student loans and gain employability as soon as possible. International students, in particular, are looking toward universities to provide them with the right tools to become employable graduates, whether that is in their host country or back home. The field of applied sports sciences allows working professionals to further their education and takes their careers new heights.

### 1.1. Significance of Research

In present research shows that the role of sports in employment and economy as well as new challenges in sports sector.

### 1.2. Objectives of Research

The objectives of the study were as follows:

- To study the role of sports sector in economy development
- To study how to sports helps to increase in employment
- To study the challenges in sports sector and employment possibility.

### 1.3. Hypothesis of Research

- Sports sector plays a very significant role in economic development
- Sports are very important for youth which gives healthy life for youth and career chances



- Sports sector development is very necessary for creating large number of jobs and employability.

## 2. CONCLUSIONS

- The present research shows that sports sector is very important for economic development and sustainable development
- Large number of youth and students are attracted at sports sector for career opportunities and healthy life
- The present research shows that sports sector can create a large number of jobs and employability.

### 2.1. Recommendation

- It is a very necessary sports institution take part to develop sports sector

- Government can also provide a good atmosphere for sports sector and take a favorable decision for sports sector
- It is very important youth also take part in to develop sports sector.

## REFERENCES

1. Mathew, E.T. *Employment and Unemployment in India*. New Delhi: Sage Publications Pvt. Ltd.
2. Goutam, D. *JobOonomics: India's Employment Crisis and What the Future Holds*. India: Hachette India.
3. Shakya, S. *Scientific Principles of Sports Training*. New Delhi: Khel Sahitya Kendra.
4. The Times of India, Daily Newspaper, 2019.
5. The Indian Express, Daily Newspaper, 2018.
6. The Hindu, Daily Newspaper, 2019.



# Influence of Yoga on Mental Health of Sports Students

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## ABSTRACT

In this study, influence of yoga was seen on mental health of sports students. For investigation, 40 sports students who practicing yoga were taken of both genders randomly and 40 players who not practicing yoga were taken of both genders randomly. Age group was 21–24 years. Mental health of students assessed by mental health scale of Kamlesh Sharma and the result was analyzed using ANOVA and it was seen that mental health level was better in yoga practicing group. It was also seen that performance of player was better in yoga practicing group. It indicates beneficial effect of yoga.

**Keywords:** Mental health, Players, Yoga.

## 1. INTRODUCTION

Nowadays, educational institute gives more important to sports as part of physical education program, offers student a powerful way to enhance mental and physical health, to develop positive trait of personality and over all well-being. Involvement of students in different sports activities will help students to develop self-discipline, health and fitness, commitments, leadership, and personal and social developments. Sports person also have stress and pressure, anxiety regarding performance in sports. For buffering from this negativity, yoga helps person to balance equilibrium.

### 1.1. Concept of Yoga

First systematic concept of yoga is formed by Maharshi Patanjali in his book Yoga Sutra and he defined yoga as “subjugation of thoughts wave of mind.” He assumed mind as lake which constantly agitated by distracting thoughts wave, hence, one could not see bottom of lake, i.e., self. The Raja yoga system is eight-fold system of practice (Ashtanga yoga) and consists of the following part or step:

1. Yama (restraint) calls for the cultivation of five virtue
  - Ahinsa (non-violence)
  - Satya (truthfulness)
  - Asteya (non-stealing)
  - Brahmacharya (continence)
  - Aparigraha (non-receiving gift).
2. Niyama (discipline): It consists of
  - Sucha (cleanliness)
  - Santosh (contentment)

- Tapah (austerity)
  - Swadhyay (study of holy book)
  - Isvara Pranidhana (self-surrender to god).
3. Asana (posture)  
Raja yoga stress on a steady and pleasant posture with limbs of the body remaining restful and conducive to concentration and meditation.
  4. Pranayama (control of breath)  
Pranayama is made from to words prana and ayama. Prana mean life force and ayama mean to control. Pranayama consists of breathing in (puraka), restraining breath (kumbhaka), and breathing out (rechaka) in proper proportion. The breath supplies power to whole body. Breathing regulates autonomic nervous system. Deep breathing enhances parasympathetic nervous system.
  5. Pratyahara (withdrawn of minds)  
It means that to train mind for detachment from signal of sense organs.
  6. Dharana (concentration)  
Mean gathering the mental energies which is scattered in all directions and focusing on particular object for certain time without disturbance.
  7. Dhyana (meditation)  
When concentration becomes effortless and continuous, then meditation begins. Maharshi Patanjali says “Meditation is the interrupted concentration of thoughts on its object.”
  8. Samadhi (absorption).  
When meditation becomes constant and continuous and mind merge in the object.

For this study, those players who are practicing asana, pranayam, om chanting, and meditation were taken in yoga practicing group. Those players who are not practicing yoga techniques were taken in yoga non-practicing group.

## 1.2. Purpose of Study

The purpose of the study was to understand the influence of yoga in mental health of player.

## 1.3. Objective of Study

The objective of the study was as follows:

- To study mental health of yoga practicing and non-practicing group
- To study mental health of player on basis of gender.

## 1.4. Hypothesis

- Mental health of yoga practicing group is better than yoga non-practicing group
- There would be no significant difference in mental health of male and female players.

# 2. METHODOLOGY

## 2.1. Sample

Sample consists of 40 players, 20 boys and 20 girls. Sample was taken from Aurangabad. Age group of sample was 21–24 years.

## 2.2. Design

Multiple randomized design was used in present investigation.  $2 \times 2$  design was used.

- Independent variable
  1. Yoga performing group – Boys
  2. Yoga non-performing group – Girls
- Dependent variable: Mental health
- Control variable: Place, age, and socioeconomic status.

## 2.3. Tool

Mental health scale developed by Kamlesh Sharma, was used to assess mental health among youth. Reliability coefficient by test-retest method is 0.86. Validity is concurrent validity with mental health checklist of Pramod Kumar and coefficient of concordance is 0.79.

## 2.4. Procedure

Data were collected individually. Proper instructions were given to them. They had been assured regarding

confidentiality of data. After instruction, stress scale was given to subjects and they were asked to fill up scale according to instruction. Subject took some time to complete scale. The scale was recollected and data were tabulated and analyzed with ANOVA.

# 3. RESULTS

Yoga practicing boys	Yoga non-practicing boys
X=933	X=541
M=93.3	M=54.1
Yoga practicing girl	Yoga non-practicing girl
X=914	X=526
M=91.4	M=52.6

## 3.1. From ANOVA

Source of variance	Sum of square	Df	Mean square variance
Between group	15239.3	3	5079
Within group	1243.8	36	34.55
Ss between level of yoga	15050	1	15050
Ss between level of gender	28.9	1	28.9
Interaction within yoga and gender	0.4	1	0.4

F test (group) = 147

F test for yoga factor = 435.60

F test for gender = 0.83

F test for interaction = 0.011.

The value of F test was significant at both levels. It indicated that groups had significant difference.

Second finding indicated that yoga practicing group having significant difference in mental health. As mean of yoga practicing group was more indicating, mental health was better in that group.

Third finding indicated no significant difference at both levels in gender.

Fourth finding indicated no interacted effects seen.

# 4. DISCUSSION

From the above finding, it indicated that mental health of yoga practicing group was better than non-practicing group. It indicates that yoga helps to balance mental condition during stressful condition and maintain

well-being. From the third finding, it was seen that there was no influence of gender on mental health of persons.

## 5. CONCLUSION

From the above study, yoga having beneficial effect on mental health of player and practicing yoga also help player for better performance in sports.

## REFERENCES

- Adiswarananda, S. *Meditation and its Practices*. Kolkata: Advaita Ashrama; 2004.
- Jain, M., and Sharma, S. Art of living: It significant in management of stress and general health. *Indian J Appl Psychol*, 2005, 42, 13-18.
- Kamlesh, M.L. *Psychology of Physical Education and Sport*. New Delhi: Metropolitan Book Co. Pvt. Ltd.; 1973.

# Basketball Players Common Injuries

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## ABSTRACT

Basketball was first introduced to the world in 1891 by Dr. James Naismith, using a soccer ball and two peach baskets. Today, high-speed, physical sports scarcely resemble the original game. With modern basketballs, fast-paced game comes many opportunities for injuries. It is estimated that more than 1.6 million injuries are associated with basketball each year. According to a study of basketball players by the National Athletic Trainers' Association: 22% of all male basketball players sustained at least 1 time – loss injury each year. About 42% of the injuries were to the Ankle/foot, 11% hip and thigh, and 9% knee. Sprains were the most common type of injury (43%). General trauma was the second most common type of injury (22%). About 60% of the injuries occurred during practice highlighting the need to warm up and strap for training. About 59% of game-related injuries occurred during the second half of the game, which identifies fatigue as a predisposing factor. Prevention is better than curative any injuries. Preventive means designed to keep something undesirable such as injury/illness/disease or harm from occurring. Curative meant able to cure or curing injury/illness/disease.

## 1. INTRODUCTION

### 1.1. Most Common Injuries in Basketball Players

#### 1.1.1. Foot and ankle sprains

Feet and ankles take a beating in basketball, one of the most common injuries is a Jones fractures, which is a fracture of the fifth metatarsal base. This can be due to the chronic impact of the ballistic activity, running and jumping, as well as the athlete's foot structure.

#### 1.1.2. Deep thigh bruising

Deep thigh bruising (contusion) is another common basketball injury, typically caused by an opponent's elbow or knee inadvertently striking a player's thigh muscles. Treatment of thigh bruising.

#### 1.1.3. Jammed fingers

Jammed fingers occur when the ball contacts the end of the finger and causes significant swelling of a single joint.

#### 1.1.4. Facial cuts

A face cut is when an offensive player makes a cut that puts the player between the basketball and their defender.

#### 1.1.5. Knee injuries

Basketball requires extensive stop and go and cutting maneuvers which can put the ligaments and menisci of the knee at risk. Injury to the medial collateral ligament is most common following a blow to the outside of the knee. An injury to the anterior cruciate ligament (ACL) is a more serious injury and can occur with an abrupt change in direction and landing for the jump.

#### 1.1.6. Stress fractures

Stress fractures can occur from a rapid increase in activity level or training or from overtraining. Stress fractures in basketball most commonly occur in the foot and lower leg (tibia).

## **1.2. Preventive Measures**

### **1.2.1. Scientific training**

Must be follow the principles of training methodologies warming up, limbering down, concentrate basic and skill-related training physical fitness components, periodization, and systematic planning of training schedule. Have a pre-season physical examination and follow your doctor's recommendations. Pay attention to environmental recommendations, especially in relation to excessively hot and humid weather, to help avoid heat illness. Avoid overuse injuries. More is not always better! Many sports medicine specialists believe it is beneficial to take off at least one season each year. Try to avoid the pressure that is exerted on young players to overtrain. Listen to your body and decrease training time and intensity if pain or discomfort develops. This will reduce the risk of injury and help avoid burnout. Talk with your coach and/or basketball trainer about an ACL injury prevention program and incorporating the training principles into team warm-ups and limbering down. The players should return to play only when clearance is granted by a health-care professional.

### **1.2.2. Playfields/court**

Clean of courts before play – check for slippery spots or debris. Play on a clean, dry, safe surface.

### **1.2.3. Shoes and dress and protective**

Wear supportive basketball dress and shoes with skid-resistant soles and have high tops. Use a mouth guard, ankle braces, and safety glasses. Do not wear jewelry.

### **1.2.4. Food and nutrition**

Maintain balance diet with carbohydrates, proteins, fats, vitamins, and minerals. Hydrate adequately. Waiting until you are thirsty is often too late to hydrate properly. If you are injured, take the time needed to heal before you return to sports.

### **1.2.5. Techniques and tactics**

Use good technique and use tactics at the time of neck-to-neck situation game playing and follow the rules and regulations of the game.

## **1.3. Curative Measures**

Minor injuries, such as mild tissue, sprain, and strains, can often be initially treated at home/sports academies/hostels using PRICE therapy for 3 or 4 days.

### **1.3.1. Price**

Stands for protection, rest, ice, compression, and elevation.

### **1.3.2. Protection**

Protect the affected area from further injury, for example, using a support.

### **1.3.3. Rest**

Avoid exercise and reduce your daily physical training. Using crutches or a walking stick may help if you cannot put weight on your ankle or knee. A sling may help if you had injured your shoulder.

### **1.3.4. Ice**

Apply an ice pack to the affected area for 15–20 min every 2–3 h. A bag of frozen peas, or similar, will work well. Wrap the ice pack in a towel so that it did not directly touch your skin and cause an ice burn.

### **1.3.5. Compression**

Use elastic compression bandages during the day to limit swelling.

### **1.3.6. Elevation**

Keep the injured body part raised above the level of your heart whenever possible. This may also help reduce swelling.

## **1.4. Use Pain Reliefs**

Painkillers, such as paracetamol, can be used to help ease the pain. Ibuprofen and other non-steroidal anti-inflammatory drugs tablets or creams can also be used to ease pain and reduce any swelling. Aspirin should not be given to children under 16 years old.

## **1.5. Immobilization**

Immobilization can sometimes help prevent further damage by reducing movement. It can also reduce pain, muscle swelling, and muscle spasm. For example, slings, splints, and casts may be used to immobilize injured arms, shoulders, wrists, and legs while you heal. If you have a sprain, prolonged immobilization is not usually necessary, and you should try gently moving the affected joint as soon as you are able to do so without experiencing significant pain.

## **1.6. Physiotherapy**

Some people recovering from a long-term injury may benefit from physiotherapy. It is a specialist treatment

where techniques such as massage, manipulation, and exercises are used to improve range of motion, strengthen the surrounding muscles, and return the normal function of the injured area. A physiotherapist can also develop an exercise program to help strengthen the affected body part and reduce the risk of the injury recurring.

### 1.7. Corticosteroid Injections

A corticosteroid injection may be recommended if you have severe or persistent inflammation. It can help relieve pain caused by your injury, although for some people, the pain relief is minimal or only lasts for a short period of time. If necessary, a corticosteroid injection can be repeated, but you will usually only be able to have two or three injections a year. Side effects can include thinning of the skin, loss of fat, and infection. The doctor treating you will be able to explain the possible side effects in more detail.

### 1.8. Surgical and Procedures

Most sports injuries do not require surgery, but very severe injuries such as badly broken bones may require corrective treatment. This may include a manipulation or surgery to fix the bones with wires, plates, screws, or rods. In some cases, it may be possible to realign displaced bones without needing an operation. Certain other injuries may also occasionally require surgery. For example, an operation may be needed to repair a torn knee ligament.

### 1.9. Recovery from an Injury

Depending on the type of injury you have, it can take a few weeks to a few months or more to make a full recovery. You should not return to your previous level of activity until you have fully recovered, but you should aim to gently start moving the injured body part as soon as possible. Gentle exercises should help to improve the area's range of movement. As movement becomes easier and the pain decreases, stretching and strengthening exercises can be introduced. Make sure you do not try to do too much too quickly because this can delay recovery. Start by doing frequent repetitions of a few simple exercises before gradually increasing the amount you do. In some cases, the help of a professional, such as a physiotherapist or sports injury specialist, may be beneficial. They can design a suitable recovery program and advise you about the exercises you should do and the number of repetitions.

## REFERENCES

1. James, N. Inventor of Basketball, History, Kansas Heritage Group.
2. Miyasaka, K.C., Daniel, D.M., and Stone, M.L. The incidence of knee ligament injuries in the general population. *Am J Knee Surg*, 1991, 4, 43-48.
3. Griffin, L.Y. Prevention of noncontact ACL injuries. *Am Acad Orthop Surg*.
4. Available from: <https://www.nhs.uk/conditions/sports-injuries/treatment>.
5. Available from: <https://www.seattlechildrens.org/health-safety/keeping-kids-healthy/prevention/basketball-injuries>.
6. Available from: <https://www.physioworks.com.au/injuries-conditions/activities/basketball-injuries>.



# Evaluation of the Nutritional Status among College of Horticulture Students in Bengaluru

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## ABSTRACT

A prospective observational survey was conducted randomly among college students in Bengaluru. A self-administered data collection form was designed to understand the nutritional behavior of the subjects. A total of 300 subjects were included in the study, among them, 75% were female and 25% were male. The survey revealed that most of them skipped their meals. A majority of 61.33% of students opted for high-fat diet and 89.33% opted for starch-rich foods. A total of 74% of students usually eat four different varieties of vegetables but only 23.66% of them eat fruits in each week. From this study, it was evident that majority of students have poor dietary habits. Lack of awareness on balanced diet and due to their busy schedules, teenagers were not maintaining a proper diet. This could be reduced by bringing minimum awareness of dietary habits to them. Taking proper diet is very essential to reduce the risk of diseases in future and to improve nourishment.

**Keywords:** Bengaluru, Evaluation, Horticulture students, Nutritional status.

## 1. INTRODUCTION

The present study was conducted to understand the nutritional behavior in the College of Horticulture students. A balanced diet is a way of eating all of the right nutrients that your body needs to be healthy. Healthy eating contributes to overall healthy growth and development, including healthy bones, skin, and energy levels and a lowered risk of dental caries, eating disorders, constipation, malnutrition, and iron deficiency anemia [1]. It is also important because your organs and tissues need proper nutrition to work effectively. Without good nutrition, the body is more prone to disease, infection, fatigue, and poor performance [2]. In recent decades, important socioeconomic changes in most developed countries have undeniably affected the eating habits and level of physical activity of citizens. This trend was clearly illustrated by the current increase in illnesses directly or indirectly related to the increase in overweight and obesity [3]. It has been established that poor nutrition and insufficient physical activity are the main risk factors for various diseases. Some research studies suggest that any type of physical activity reduces the risk of developing coronary heart disease, stroke, as well as various metabolic disorders

such as hypertension and diabetes and improves the patient quality of life [4].

Nutrition is an intake of food, considered in relation to the body's dietary needs. Good nutrition is an adequate, well-balanced diet combined with regular physical activity. It is a cornerstone of good health. Poor nutrition can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, and reduced productivity. Many of us are in the habit of eating too many carbohydrate-rich foods and not quite enough protein-rich foods, so our intake is out of balance. In addition to this, often, the high carbohydrate foods that we choose have been so processed that they contain very few vitamins and minerals. Eating too much carbohydrate leads to diabetes. The leading cause of bad nutrition in college students is eating fast food which affects them to become obese and malnourished. Consumption of junk food has increased manifold, which has led to a number of diseases related to nutritional deficiencies [5]. Another biggest mistake that students make in their dieting habit is to skip meals. Skipping meals on a regular basis, particularly breakfast, disturb body metabolism. According to the Food and Agriculture Organization of the United Nations, poverty and lack of resources are the two main causes that

contribute to the estimated 925 million people worldwide suffering the effects of malnutrition and its companion diseases [6]. Getting regular exercise, adequate sleep, and balancing the demands of work with relaxation help to provide a balanced, healthy lifestyle.

## 2. RESEARCH METHODOLOGY

The survey was conducted to evaluate the nutrition status in college students using a self-administered questionnaire. This was designed to allow the subjects to evaluate the nutritional value of their diet. The survey was carried among 300 subjects in College of Horticulture, Bengaluru, in the state of Karnataka. The survey was conducted among people aged between 17 and 23 years and estimated the results. The consent form was given to subjects. The survey to the maximum targeted the subjects in relation to their dieting habit like how often they skip meals, how often they include a portion of vegetables and fruits in their diet, how often, and how much of fats, sugars, starchy foods, salt, drinks, and alcohol they consume.

## 3. DATA ANALYSIS AND INTERPRETATION

A total number of subjects were 300, out of which female participants were dominated 225 (75%) and male participants were 75 (25%). This is depicted in Figure 1.

Figure 2 shows eating habits among the college students: How often they skip their breakfast, lunch, and dinner.

Figure 3 shows varieties of food items and their frequency of inclusion into their meals.

Figure 4 shows choice and frequency of inclusion of fat content into their food among the students.

Figure 5 shows choice and frequency of inclusion of starchy foods into their meal among the students.

Figure 6 shows habit of inclusion of sugar foods into their meal among the students.

Figure 7 shows habit of consuming salt and salt foods among the students as part of their meal.

Figure 8 shows drinking habits and variety of drinks consumed by the students.

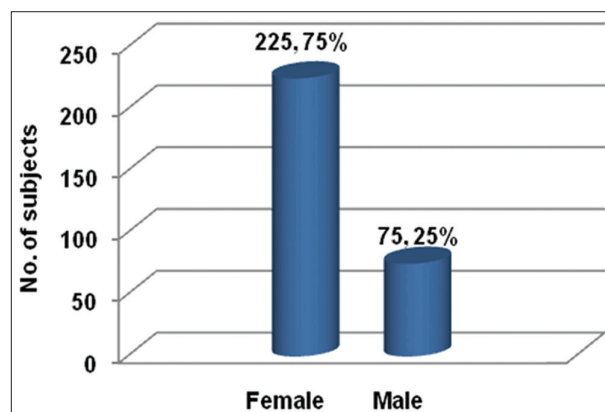


Figure 1: Subjects according to their gender

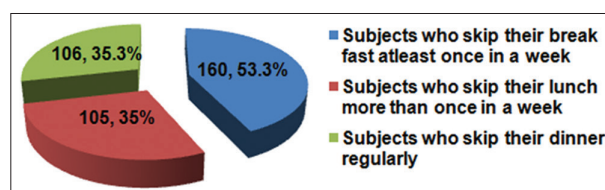


Figure 2: Subjects according to their eating habits

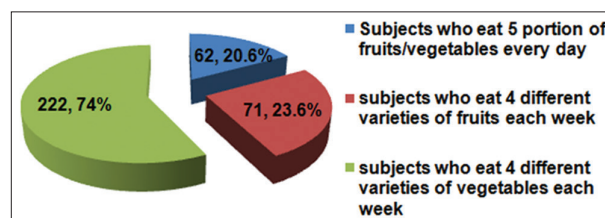


Figure 3: Subjects according to their habit of eating fruits and vegetables

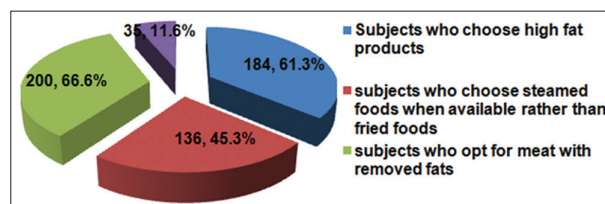


Figure 4: Subjects according to their habit of eating fats

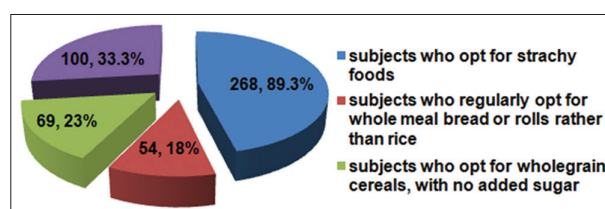
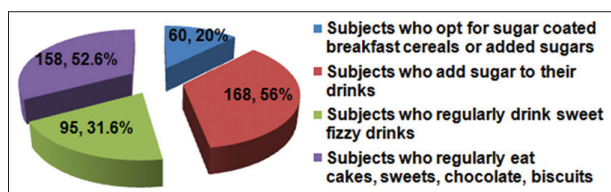
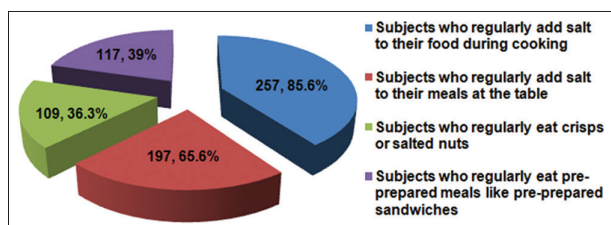


Figure 5: Subjects according to their habit of eating starchy foods

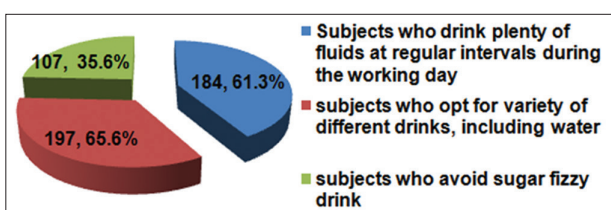
In the present study among students, it was evident that they usually skipped their meals on regular basis,



**Figure 6:** Subjects according to their habit of eating sugar foods



**Figure 7:** Subjects according to their habit of eating salt foods



**Figure 8:** Subjects according to their drinking habits

particularly breakfast 160 (53.33%) students, dinner 106 (35.33%), and then lunch 105 (35%) members. Skipping meals, especially breakfast, disturb the body's metabolism and lead to diabetes. According to O'Dea, in 2005, which was about the education strategies for the improvement of body image and prevention of eating problems, showed that 85% of men and 87% of women, who are overweight decide to go on a diet to lose weight. In addition, it also showed that 13% of men and 20% of women refuse to eat breakfast [9]. In 2001, it was also reported that the students do not have the necessary information and training about weight control, nutrition needs, and diet [10]. In this study, 136 (45.33%) students had chosen steamed food rather than fiber food. However, fiber helps the digestive system function properly and prevents bowel disorders like constipation. Early indicators of atherosclerosis, the most common cause of heart disease, begin as early as childhood and adolescence. Atherosclerosis is related to high blood cholesterol levels, which are associated with poor dietary habits [11].

By consuming the right proportions of these nutrients such as carbohydrates, proteins, fats, and fibers, we can help the damaged cells to rejuvenate and carry out their normal functions to lead a healthy life [7]. A total of 268 (89.33%)

students opted for starch-rich foods according to this survey. In addition, 158 (52.66%) of the total opted for sugar-containing foods including soft drinks, sweets, jams, cake, puddings, pastries, and ice cream; these foods contain high synthetic sweetening agent which increased the risk of diabetes. The study conducted by Prabha et al. reported that there was a decreased risk of diabetes by incorporating the natural sweetening agent "stevia" to some value-added foods such as jams, ice creams, and chocolates [12]. According to the report of the International Food Information Council Foundation (2015), almost 61% opted for added sugar [13]. Reducing the amount of salt in the diet can help keep blood pressure normal or down, which, in turn, reduces the risk of having a heart attack or stroke. Six grams for men and women are sufficient amount for salt intake. In this survey, 257 (85.66%) subjects add salt to the foods. According to health and diet survey by FDA, 2014, almost 89% opted for high salt diet [15]. Drinking plenty of fluids may reduce the risk of dehydration, especially water reduces weight. Almost 30–59% of the US adults who try to lose weight increase their water intake [16]. According to the WHO study, the reason behind poor nutrition is the development of psychosocial changes, such as increasing need for independence and a desire to make lifestyle choices that conform to peer ideals and differ from those of the family, teenagers. These persons are at risk of poor nutritional status [17]. Finally, by conducting the present survey, we noticed that due to lack of awareness, students were not taking proper diet so creating minimum awareness among people about nutrition is very essential to reduce the risk of diseases in future and improve their nourishment.

#### 4. FINDINGS

A balanced diet is one that gives the body the nutrients to need to function properly. To get the proper nutrition from the diet, we have to include large portions of our daily calories from fresh fruits, vegetables, whole grains, etc. From our study, it was evident that majority of students opted for junk food because of their busy schedule which leads to obesity and then increased risk of coronary heart diseases. Most of the students usually skip their meals on regular basis that may disturb the body metabolism and increase the future risk of diabetes. Females are mostly abstemious in their eating habits for maintaining physical beauty that is at a greater risk of poor nutrition.

#### 5. CONCLUSION

Due to lack of awareness on diet, students are not maintaining proper dietary habits. This can be reduced

by bringing minimum awareness among people. Taking a proper diet is very much essential to reduce the risk of health.

## REFERENCES

1. U. S. Department of Health and Human Services and U. S. Department of Agriculture: Dietary Guidelines for Americans; 2005, pp. 6.
2. Balanced Diet. Available from: <http://www.healthline.com/health/balanced-diet>. [Retrieved on 2017-08-05].
3. World Health Organization: Report on Nutrition; 2002. Available from: <http://www.who.int/topics/nutrition/en>. [Retrieved on 2017-08-05].
4. Priyank, T., Rajesh, V., Satish, K.B.P., and Kumaraswamy, M. Lifestyle factors: An alarm towards hypertension. *Asian J Pharm Clin Res*, 2013, 6 Suppl 4, 185-188.
5. Manisha, P., Rohit, K.V., and Shubhini, A.S. Nutraceuticals: A new era of medicine and health. *Asian J Pharm Clin Res*, 2010, 3, 11-15.
6. International Nutrition and World Food Problems in Perspective; 2017. Available from: <http://www.fao.org/docrep/w0073e/w0073e03.htm>. [Retrieved on 2017-08-05].
7. O'Dea, A.J. School-based health education strategies for the improvement of body image and prevention of eating problems: An overview of safe and successful interventions. *J Health Educ*, 2005, 105, 11-33.
8. O'Dea, A.J., and Abraham, S. Knowledge, beliefs, attitudes and behaviours related to weight control, eating disorders and body image in Australian trainee home economics and physical education teachers. *J Health Educ*, 2001, 33, 332-340.
9. Food and Health Survey. International Food Information Council Foundation; 2015.
10. Kavey, R.W., Daniels, S.R., Lauer, R.M., Atkins, D.L., Hayman, L.L., and Taubert, K. American heart association guidelines for primary prevention of atherosclerotic cardiovascular disease beginning in childhood. *J Pediatr*, 2003, 142, 368-372.
11. The Food and Health Survey: Consumer Attitudes toward Food Safety, Nutrition and Health; 2015. Available from: <http://www.foodinsight.org/2015-food-health-survey-consumerresearch>. [Retrieved on 2017-08-05].
12. Health and Diet Survey. Food and Drug Administration [FDA]; 2014.
13. Weiss, E.C., Galuska, D.A., Khan, L.K., and Serdula, M.K. Weight-control practices among U. S. Adults 2001-2002. *Am J Prev Med*, 2006, 31, 18-24.
14. World Health Organization. Diet Nutrition and the Prevention of Chronic Diseases: Report of World Health Organization Study Group, Technical Report Series No. 797. Geneva: World Health Organization; 2002.



# Impact of Plyometric Training on Selected Motor Abilities among Basketball Players of TSWRDC, Vikarabad, Telangana

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## ABSTRACT

The purpose of the study was to explore the impact of plyometric training on selected motor abilities among basketball players of Osmania University. To achieve this purpose of the study, 28 women basketball players of Telangana Social Welfare Residential Degree College, Vikarabad, Telangana, affiliated Osmania University. Their age group ranged between 18 and 20 years. The subject was divided into two groups, namely, experimental group and control group. The experimental group was subjected to plyometric training (3 days/week Monday, Wednesday, and Friday) at morning session for 6 weeks. Agility and flexibility and speed were selected as dependent variable. The appropriate data were statistically analyzed using independent “t” test. The level of significance was set at 0.05; the result of the present study showed that the plyometric training has significant improvement on agility, flexibility, and speed basketball players.

**Keywords:** Basketball players, Motor abilities, Plyometric training.

## 1. INTRODUCTION

Basketball is a very complex activity, where being successful depends on numerous anthropometric and motoric skills. The basic characteristics of basketball activities are quick direction change movement, as well as those of motoric structure movement intensity with and without a ball. Ability of quick activity beginning, movement stereotype reorganization, and precise movements in relatively small spaces with space and time limitation represent basketball player's activity characteristics and are directly connected to the ability of quality performance of speed-explosive capacities.

Plyometric (also known as “ploys”) is a type of exercise training designed to produce fast, powerful movements and improves the functions of the nervous system, generally for the purpose of improving performance in sports, plyometric movements, in which a muscle is loaded and then contracted in rapid sequence, use

the strength, elasticity, and innervations of muscle and surrounding tissues to jump higher, run faster, throw further, or hit harder, depending on the desired training goal. Plyometric is used to increase the speed or force of muscular contractions, providing explosiveness for a variety of sport-specific activities. Plyometric has been shown across the literature to be beneficial to a variety of athletes. Benefits range from injury prevention, power development, and sprint performance among others.

### 1.1. Purpose of the Study

The main purpose of this study was to impact of plyometric training on selected motor abilities among Telangana Social Welfare Residential Degree College (TSWRDC) women basketball players.

1. To find out the motor abilities components of basketball players.
2. To find out the plyometric training how impacts on selected motor abilities among basketball players.



## 2. METHODOLOGY

The purpose of this study was to explore the impact of plyometric training on selected motor abilities among basketball players. To achieve this purpose of the study, 28 TSWRDC women basketball players were selected from TSWRDC (for women), Vikarabad, Telangana, India, who were randomly selected as subjects. Their age ranged in between 18 and 20 years. The subject was divided into two groups, namely, experimental group (plyometric group) and control group (general training group). The plyometric group was subjected to plyometric training (for weekly 3 days Monday, Wednesday, and Friday) at evening session for 6 weeks. Flexibility, agility, and speed were selected dependent variable. After collection appropriate data, it was statistically analyzed using paired *t* test. The level of significance was set at 0.05.

### 2.1. Selection of Variables

**Table 1:** Following test was selected for the study

Variables	Test items	Unit of measurement
Flexibility	Sit and reach test	In inches
Agility	SEMO agility test	In seconds
Speed	AAPHERD youth fitness test (50 m dash)	In seconds

### 2.2. Training Procedure

For the experimental group underwent their training programmed as 3 days/week for 6 weeks. Training was given in the evening session. The training session includes warming up and cool down. Every day the workout lasted for 45–60 min approximately. The subjects underwent their training programs as per the schedules such as side-to-side ankle hops, double leg hops, split jumps, lateral cone hops, single leg bounding, and some simple exercises for developing and maintaining flexibility (i.e., head pull-down, shoulder blade reach, shoulder shrug, upper torso dangle exercise, toe touch exercise, knee hug, and modified

lotus side bending exercise under the strict supervision. During the experimental period, the control group did not participate in any of the special training.

## 3. RESULTS

Table 2 reveals that the obtained mean values of the experimental and control group innervations of plyometric training of agility, speed, and flexibility were 12.8993 and 14.6086; 7.43 and 8.71; and 7.36 and 3.93, respectively; the obtained “*t*” ratio was 7.7982\*, 4.9486\*, and 8.7190\*, respectively; the tabulated “*t*” value is 2.14 at 0.05 level of confidence for the degree of freedom 14. The calculated “*t*” ratio was greater than the table value. It is found to be a significant change in agility, speed, and flexibility of the basketball players.

## 4. DISCUSSION

The result of the study indicated that the selected motor abilities such as agility, speed, and flexibility were improved significantly after undergoing plyometric training. The changes in the selected parameters were attributed to the proper planning preparation and execution of the training given to players. The result of the present study indicates that the plyometric training methods are the appropriate protocol to improve agility, speed, and flexibility of TSWRDC women basketball players. From the result of the present study, it is very clear that the selected motor abilities such as agility, speed, and flexibility improvement significantly due to plyometric training.

## 5. CONCLUSION

Based on the findings and within the limitation of the study,

1. It was noticed that practice of plyometric training helped to improve selected motor abilities of university level women basketball players.

**Table 2:** Comparison of mean and independent “*t*” values of motor abilities between pre- and post-test among the experimental and control group

Variables	Group	N	M	SD	SEM	<i>t</i>	<i>P</i>
Agility	Experimental	14	12.8993	0.6175	0.1650	7.7982	0.0001
	Control	14	14.6086	0.5398	0.1443		
Speed	Experimental	14	7.43	0.65	0.17	4.9486	0.0001
	Control	14	8.71	0.73	0.19		
Flexibility	Experimental	14	7.36	1.15	0.31	8.7190	0.0001
	Control	14	3.93	0.92	0.25		

\*Significant at 0.05 level of confidence

2. It was also seen that there is a progressive improvement in the selected criterion variables of plyometric (experimental group) group of university level women basketball players after 6 weeks of plyometric training program.

## REFERENCES

1. Annadurai, R. Effect of Swiss ball and plyometric training programme on selected motor abilities and skill performance of inter collegiate men volleyball players. *Acad Sports Sch*, 2014, 3, 5.
2. Anspaugh, D.J., Hamrick, M.H., and Rosato, F.D. *Wellness: Concepts and Application*. New York, USA: McGraw-Hill; 2005.
3. Barrow, H.M. and McGee, R. *A Practical Approach to Measurement in Physical Education*. Philadelphia, PA, USA: Lea and Febiger; 1979.
4. Kansal, D.K. *A Textbook Sport Science: Test, Evaluation, Accreditation Measurements and Standards*. K.K. Publications; 1996.

# Impact of Multimedia on Teaching Basic Cricket Rules in India

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## ABSTRACT

Today, classroom practices are quite different from those of yesterday. Similarly, the classroom practices in the coming century may be quite different from those of today. The shape of future schools, colleges, and universities is bound to change radically due to technological impact in the years to come. Multimedia means making appeal to different senses instead of one as in the traditional method. Multimedia includes high technology instructional media. The present study was to investigate the role of multimedia on teaching basic cricket rules of Osmania University women cricket specialization students. Forty students studying bachelor's degree in the department of physical education and sports sciences, with the age from 18 to 20 years (mean age =  $19 \pm 0.5$  years) were selected for this study. They were divided into two groups of 20 subjects each, namely, the traditional practical method of teaching group and multimedia-based modular of teaching group (teaching cricket rules). A computer expert was consulted to develop the courseware program to teach the basic cricket rules and it was discussed with him how to develop software based on the modules. The achievement test consisted of 100 questions. Out of 100 questions, 60 objective type questions and 40 fill in the blanks type questions were present. The total score of the test was 100. For each correct answer, the score was 1 and for each wrong answer, the score was 0. The statistical tool used for this study was "*t*"-ratio. The results of the study show that the mean values of traditional lecture method of teaching group and multimedia-based modular method of teaching group were  $50.75 \pm 2.89$  and  $70.25 \pm 2.998$ , respectively. The obtained "*t*" ratio value 20.61 was greater than the required table value of 2.0246 for significance at 0.05 level of confidence with df 38. The results of the study showed that there was a significant difference between the traditional lecture method of teaching group and multimedia-based modular method of teaching group in teaching cricket rules in favor of the experimental group.

**Keywords:** Multimedia, Teaching basic cricket rules.

## 1. INTRODUCTION

Today, classroom practices are quite different from those of yesterday. Similarly, the classroom practices in the coming century may be quite different from those of today. The shape of future schools, colleges, and universities is bound to change radically due to technological impact in the years to come. Reader's Digest defines multimedia as a combination of modes of communication, such as video and audio text. According to Encyclopedia of Education, the term "multimedia instructional system" refers to the use of appropriate and carefully selected varieties of learning experiences which, when presented to the learner through selected teaching strategies, will reinforce and strengthen one

another so that the learner will achieve pre-determined and desired behavioral objectives.

Multimedia means making appeal to different senses instead of one as in the traditional method. Multimedia includes high technology instructional media (Pillai, 1988). In teaching-learning process in classroom situation, different media are used, namely, video, computer, and other projected and non-projected aids to make learning more effective. A teacher using multimedia can make even difficult concept clear to a below average student easily. Multimedia devices are more capable of penetrating deeply into human character with an immediate excitement than any other single medium.

Any discussion on multimedia without highlighting the current use of computers will be incomplete. The decreasing cost and increasing availability of microcomputers in schools have led researchers as well as teachers to become more interested in CAI (Pillai, 1988). According to a research, which was conducted by Annarino, the use of multimedia at elementary school enhanced teaching and stimulated pupils learning the somersault. In the above study, the components of the multimedia system included texts and printing materials, still images, sound, analog video cameras, video recorders, and presentation walls. The results indicated that schoolchildren, which had been taught using multimedia, performed better than children who had been taught by the traditional way did. Multimedia can be considered a special kind of software. The main scope of SE is ensured high quality of software with reduced costs and time that meets the requirements of the customer (e.g., portability, reliability, usability, reusability, and design) by structuring the developmental process into specific phases, cascades or cycles, for example, inception, elaboration, construction, and transition with several core workflows or problem analysis, definition of requirements, sketch, specifying the interface, implementation, integration and verification, installation, validation and documentation and modification, expansion and correction (Balzert, 2000).

## 2. METHODS

In this study, 40 students studying bachelor's degree in the Department of Physical Education and Sports Sciences, Osmania University, were randomly selected by lot method from the total of 405 students as subjects. The age of the subjects was ranged from 18 to 20 years (mean age = 19 = 0.5 years). They were divided into two groups of 20 subjects each, namely, the traditional practical method of teaching group and multimedia-based modular of teaching group (teaching cricket rules).

### 2.1. Development of Computer Software

Since a multimedia approach would be incomplete without application of computer software. A computer expert was consulted to develop the courseware program to teach the basic cricket rules and it was discussed with him how to develop software based on the modules. Although there are various programs such as "drill and practice program" and "tutorial program," this is the most widely used type of computer program. The purpose of this program is to provide practice on skills and knowledge so that students can remember and use what they have been taught.

The software was prepared in such a way that it ensured the following:

1. Letting students work at their own pace.
2. Providing immediate feedback and reinforcement.
3. Measuring performance quickly and giving students information on their performance.

### 2.2. Procedure

To evaluate the effectiveness of multimedia-based modules and to compare the achievement of the learners taught multimedia-based modular approach with that of traditional lecture method of teaching group and modernized multimedia-based modular method of teaching group, an achievement test was constructed. Questions of objective type nature were framed without omitting any unit. Multiple choice and fill in the blanks were the types of questions used in this achievement test. The questions were framed so as to suit the level of bachelor's degree students in physical education. Utmost care was taken to avoid ambiguity and ambivalence. The item analysis was included in the final form of achievement test selected on the basis of item analysis. Initially, 120 questions of objective type in nature were framed for tryouts. About 60% of multiple-choice questions and 40% fill in the blanks were framed for the achievement test. Multiple-choice test items were composed of a stem followed by a series of possible responses or options. The stem is a direct question or an incomplete statement ability to analyze and synthesize.

These test items are questions or incomplete statement, which require highly short and specific answers. The answer is usually a significant word or expression.

The experimental group was taught through multimedia-based modular approach for a period of 40 working days at the rate of 1 h/day, especially in the evening after the class hours. The students were taught using computers with multimedia software. The software was also used on turn basis since we could not provide a sufficient number of computers. Three units were covered the period of investigation. The experimental group learners were encouraged to make self-study with the help of the instructions given in the modules.

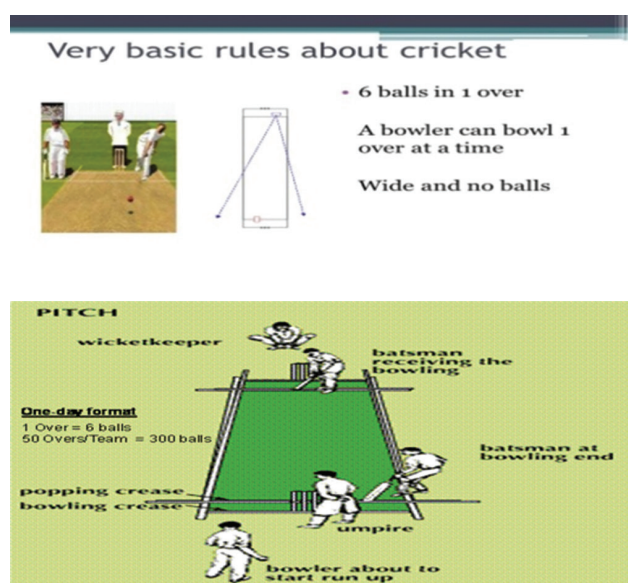
### 2.3. Collection of the Data

At the end of the experimental period, an achievement test was conducted to the learners of the multimedia-based modular method of teaching group and the traditional lecture method of teaching group. The responses given

by the statement in the test formed the vital data required for the analysis. The achievement test consisted of 100 questions. Out of 100 questions, 60 objective type questions and 40 fill in the blanks type questions were present. The total score of the test was 100. For each correct answer, the score was 1 and for each wrong answer, the score was 0.

#### 2.4. Statistical Tool Used

The independent “*t*” ratio was used to find out the significant differences, if any, between the traditional lecture method of teaching group and multimedia-based modular method of teaching group in teaching cricket rules. In all cases, 0.05 level of confidence was fixed to test the significance.



#### 2.5. Results

The results of the study show that the mean values of traditional lecture method of teaching group and multimedia-based modular method of teaching group

were  $50.75 \pm 2.89$  and  $70.25 \pm 2.998$ , respectively. The obtained “*t*” ratio value 20.61 was greater than the required table value 2.0246 for significance at 0.05 level of confidence with df 38. The result was shown that the experimental group has better understanding in basic cricket rules than the traditional lecture method group.

### 3. DISCUSSION AND CONCLUSION

The results of the study showed that there was a significant difference between the traditional lecture method of teaching group and multimedia-based modular method of teaching group in teaching cricket rules. This may be due to the fact that normally the video-based or television-based teaching produces subjects’ interest to listen the lesson. It also gives relaxation, motivates the learners by having attractive color letters, pictures, etc., in the video graphs or multimedia packages. The finding of the study yields the similar results of Antonisamy (1989), Bhatt (1992), Kalimathu (1991), and George (1974). The use of multimedia and the traditional method of teaching provides a future path, which enhances performance. There exist more software programs that pupils may use to find positive applications in physical education and to stimulate their learning.

### REFERENCES

- Antonisamy, L. “A Study of the Effectiveness of Teaching Environmental Concepts to School Dropouts through Video and Charts”, Unpublished M. Phil., Dissertation. Madurai: Madurai Kamaraj University; 1989.
- Balzert, H. *Lehrbuch der Software-Technik. Softwareentwicklung.* Heidelberg: Spektrum Akademischer Verlag; 2000.
- Goggin, N.I., Finkenberg, M.E., and Morrow, J.R. “Instructional Technology in Higher Education Teaching”, Online Source.
- Pillai. “Appropriate Instructional Media Selection in India”. *Media Technol Hum Resour Dev*, 1988, 1, 1.



# A Comparative Study of Strength and Coordinative Ability among School Level Male Kabaddi and Kho-Kho Players of District Warangal

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## ABSTRACT

The purpose of the study was to compare the arm and shoulder strength, abdominal strength, and coordinative ability among male Kabaddi and Kho-Kho players. To accomplish the study, a sample of 120 players, 60 players each of Kabaddi and Kho-Kho, studying in Government Senior Secondary Schools of District Warangal of Telangana was selected as subjects. It was hypothesized that no significant difference would appear between the Kabaddi and Kho-Kho players w.r.t. selected physical fitness variables. Data were collected using selected test items of AAHPERD physical fitness test battery. Mean, standard deviation, and *t*-test were used to analyze the data statistically. The level of significance was set at 0.05 level of confidence. The results showed a significant difference between the Kabaddi and Kho-Kho players w.r.t. physical fitness variables arm and shoulder strength and coordinative ability except abdominal strength where both Kabaddi and Kho-Kho players performed similarly.

**Keywords:** Coordinative ability, Kabaddi, Kho-Kho, Strength.

## 1. INTRODUCTION

Sports are as old as the human society, and it has achieved universal following in the modern times. It now enjoys popularity which strips out any other form of social activity. It has become an integral part of educational process. Millions of fans follow different sports events all over the world. Many participate in sports activities for the fun of it or for health, strength, and fitness. It is taking the shape of a profession to some with high skills, with ample financial benefits linked with high degree of popularity. Each sports activity demands different types and levels of different physical abilities. When a particular sport possesses qualities, it contributes to the development of specific physical fitness. It is this specific fitness which makes it possible for a player to perform unusual and extraordinary movements with a very high standard of efficiency. Regular training leads to improve one's physical fitness which includes strength, speed, flexibility, endurance, and coordination. Coordination ability plays a very vital role in all games and sports because when an athlete participant in games

and sports, he has to bring about a series of changes in direction and movement at various parts of the body. The main objective of the study was set to compare the Kabaddi and Kho-Kho players w.r.t. selected physical fitness variables, i.e., the arm and shoulder strength, abdominal strength, and coordinative ability.

### 1.1. Hypothesis

It was hypothesized that no significant difference would appear between the Kabaddi and Kho-Kho players w.r.t. selected physical fitness variables.





## 1.2. Procedure

In the present investigation, a survey type of study has been conducted. In total, investigator selected a sample of 120 players by means of purposive random sampling from 10 schools of the Warangal district of Telangana, out of which he selected 12 Kabaddi players each from the first five schools and 12 Kho-Kho players each from the other five schools. The subjects were boys of 10+1 and 10+2 classes of Government Senior Secondary Schools and were of 15–17 years age group only. Moreover, the present research was confined to only those players who had participated at the zonal level school tournament of district Warangal. Data regarding selected physical fitness variables were collected using selected test items of AAHPERD physical fitness test battery. Mean, standard deviation, and *t*-test were used to analyze the data statistically. The level of significance was set at 0.05 level of confidence.

## 2. RESULTS AND DISCUSSION

The mean, standard deviation, and “*t*” values of the investigated physical fitness variables of Kabaddi and Kho-Kho players are given in Tables 1-5 and their analysis and interpretation follow them.

Table 1 reveals that the mean scores of arm and shoulder strength variable of the selected Kabaddi and Kho-Kho players are 10.93 and 9.95, respectively, and the calculated “*t*”-value (3.09) for both the groups is higher than the table value at 0.01 level of significance. Thus, it is interpreted that the two groups differ significantly w.r.t. the variable arm and shoulder strength.

Hence, the formulated hypothesis for the Kabaddi and Kho-Kho players w.r.t. the variable arm and shoulder strength is rejected.

Table 2 reveals that the mean scores of abdominal strength variable of the selected Kabaddi and Kho-Kho players are 28.93 and 29.33, respectively, and the calculated “*t*”-value (1.19) for both the groups is less than the table value at 0.05 level of significance. Thus, it is interpreted that the two groups do not differ significantly w.r.t. the variable abdominal strength.

Hence, the formulated hypothesis for the Kabaddi and Kho-Kho players w.r.t. the variable abdominal strength is accepted.

**Table 1:** Mean values, standard deviation, and “*t*” value of arm and shoulder strength variable of Kabaddi and Kho-Kho players

	<i>n</i>	Mean	SD	SEM	Mean difference	Df	<i>t</i> -value
Kabaddi	60	10.93	1.68	0.22	0.98	118	3.09*
Kho-Kho	60	9.95	1.79	0.23			

\*Significant at 0.01 level

**Table 2:** Mean values, standard deviation, and “*t*” value of abdominal strength variable of Kabaddi and Kho-Kho players

	<i>n</i>	Mean	SD	SEM	Mean difference	Df	<i>t</i> -value
Kabaddi	60	28.93	1.77	0.23	0.400	118	1.19
Kho-Kho	60	29.33	1.90	0.25			

Not significant at 0.05 level

**Table 3:** Mean values, standard deviation, and “*t*” value of coordinative ability variable of Kabaddi and Kho-Kho players

	<i>n</i>	Mean	SD	SEM	Mean difference	Df	<i>t</i> -value
Kabaddi	60	11.12	0.22	2.86	0.111	118	3.09*
Kho-Kho	60	11.01	0.17	2.18			

\*Significant at 0.01 level

Table 3 reveals that the mean scores of coordinative ability variable of the selected Kabaddi and Kho-Kho players are 11.12 and 11.01, respectively, and the calculated " $t$ "-value (3.09) for both the groups is higher than the table value at 0.01 level of significance. Thus, it is interpreted that the two groups differ significantly w.r.t. the variable coordinative ability.

Hence, the formulated hypothesis for the Kabaddi and Kho-Kho players w.r.t. the variable coordinative ability is rejected.

### 3. CONCLUSION

Based on the analysis and interpretation of the data and within the limitations of the present investigation, the following conclusions are drawn:

The Kabaddi players are better than Kho-Kho players when compared against the physical fitness

variable arm and shoulder strength and coordinative ability.

The Kabaddi and Kho-Kho players have same level of physical fitness when compared against the physical fitness variable abdominal strength.

### REFERENCES

- Brar, G.S. A Comparison of Physical Fitness of Two Different Socio-economic Groups. Unpublished M.P.E. Thesis, Jiwaji University; 1975.
- Brenda, B. The relation of selected physical and psychological variables to the development of tennis player. *Diss Abstr Int*, 1995, 56.
- Craig, A.B. Physical fitness level of Canadian and South African school boys. *Diss Abstr Int*, 1976, 36.
- Gabbett, T., and Anderson, S. Change in skill and physical fitness following training in talent identified volleyball players. *J Strength Cond*, 2006, 20.

# Effect of Pessimistic and Optimistic Attitude on Personality Characteristics of Inter-University Cricket Players

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## ABSTRACT

The present study was conducted on 180 respondents belonging to Marathwada region, M.S., India. The respondents were selected using incidental-cum-purposive sampling technique. The purpose was to examine the effect of pessimistic and optimistic attitude on personality characteristic of interuniversity cricket players. Multi-assessment personality series inventory was used to measure the personality characteristics of the respondents. Besides, a personal data sheet was used to get other necessary information about the players. The obtained data were treated using t-ratio. Hypothesis of the study is optimistic interuniversity cricket players who were significantly high personality characteristics than the pessimistic interuniversity cricket players. The finding confirmed the hypothesis. It was concluded that optimistic interuniversity cricket players were significantly high personality characteristics than the pessimistic interuniversity cricket players and supported the hypothesis.

## 1. INTRODUCTION

The world's expert in the study of optimism is Dr. Martin Seligman, whose book, "Learned Optimism," is a classic in the field. Seligman's research shows that pessimistic athletes and teams believe that losses and even poor performance during crunch time reflect their lack of ability to succeed. These athletes and teams have learned to feel helpless in terms of controlling their performance and thus their success or failure.

The research shows that when these athletes are confronted by unfortunate circumstances such as, in tennis, a series of double faults, windy conditions, or the belief that their opponent is cheating, they will weaken, get angry, tighten up, and believe they cannot succeed. This self-fulfilling prophecy almost always leads to continued poor performance, so the athlete will ultimately lose the set and match. These pessimistic thinkers do not expect to win the next out and with this negative expectation; they most likely will lose subsequent matches. This, of course, reinforces their negative view of themselves and their abilities and the negative snowball is rolling downhill.

On the other hand, optimistic athletes look at the same negative events as temporary setbacks, and as opportunities to actually refocus and crank up their performance during the rest of the match. They recognize that they have ultimate control over their internal dialogue and how they view negative events. For example, they may "blame" a poor game or set on being distracted by fans cheering for their opponent or on the weather on getting irritated by the opponent cheating. They recognize that they can now change their thinking, refocus on their game plan, recapture the momentum, and still grasp victory. Even if they eventually lose the match, these optimistic thinkers understand how to change their internal dialogue before and during their next match. Accordingly, these players will go into the next match expecting success and usually win. The psychological dimensions of optimism have been the topic of a substantial amount of research (Carver and Scheirer, 2020a; Scheier and Carver, 2003; Scheier *et al.*, 2003). Optimistic individuals are categorized as having positive expectations and perceptions on life. Optimists also believe that the future holds desirable outcomes. In contrast, pessimistic individuals tend to represent a negative bias toward life



because the future is undesirable (Carver and Scheier, 2002a; Scheier and Carver, 2003).

Optimism has been linked to both psychological (Scheier and Carver, 1985; Carver and Gaines, 1987; Carver and Scheier, 2002a; Carver and Scheier, 2002b; Scheier *et al.*, 2003) and physical (Scheier *et al.*, 1989; Scheier and Carver, 2003) well-being. For example, Carver and Gaines found an inverse relationship between postpartum depression and optimism. More recently, Fournier, Ridder, and Bensing (2003) found that the impact of disease-related stressors on optimistic beliefs during a 1-year period was decreased when patients reported depressive symptoms. Scheier, Matthews, and Owens found optimistic post-operative coronary heart patients to report lower levels of hostility and depression and achieved recovery goals more quickly than pessimistic coronary heart patients. Gerend *et al.* (2004) found lower perceived susceptibility to particular disease (breast cancer, osteoporosis, and heart disease) in older women who are more optimistic.

Burke (2006) an exploratory investigation of superstition, personal control, optimism and pessimism in National Collegiate Athletic Association (NCAA) Division I intercollegiate student-athletes. The usage of superstitious behavior in relation to personal control and optimism and pessimism was examined among 208 NCAA Division I athletes. Questionnaires were administered to determine if personal control or optimism and pessimism was associated with the use of superstitious behaviors in Division I athletes. The previous research regarding locus of control (LOC) and the use of superstitions by athletes was equivocal. The superstitious ritual questionnaire (Bleak and Frederick, 1998), life orientation test-revised (Scheier *et al.*, 1994), and belief in personal control scale (Berrenberg, 1987) were the instruments used to assess the variables of interest. Findings supported the previous research (Bleak and Frederick, 1998; Todd and Brown, 2001) that LOC does not affect superstitious behavior in Division I athletes. Optimism and pessimism did not affect athletes' overall practice of superstitious behaviors. Athletes who had lesser beliefs in God-mediated control were less likely to be optimistic. A lesser belief in God-mediated control emerged as a slight predictor of less belief in the effectiveness of superstitions and therefore less usage of superstitious behaviors. Individual athletes were found to exhibit a higher internal LOC compared to team athletes. Contrary to the previous research, female athletes subscribed to different ritual habits than male athletes (Buhrmann *et al.*, 1982; Gregory and Petrie, 1975).

## 2. METHODOLOGY

### 2.1. Objective and Aim of the Study

The main objective and aim of the present study are to see the effect of pessimistic and optimistic attitude on personality characteristics of interuniversity cricket players.

### 2.2. Hypothesis

Optimistic interuniversity cricket players were significantly high personality characteristics than the pessimistic interuniversity cricket players.

### 2.3. Sample

For the present study, 180 samples were selected from Maharashtra state, India. The effective sample consisted of 180 subjects, 90 subjects were optimistic interuniversity cricket players and 100 subjects were pessimistic interuniversity cricket players. The age ranges of subjects were 18–25 years, ratio was 1:1, as well as the ratio of male and female was 1:1.

### 2.4. Tools

#### 2.4.1. Personal data sheet (PDS)

Personal data information sheet was used for collecting necessary information about the players.

#### 2.4.2. Multi-assessment personality series (MAPS) (1996)

This scale was constructed and standardized by Psy Com. It consists of 147 sentences and each item provides three alternatives, the subjects had to select one of the three alternatives and this test used split-half and test-retest reliability coefficients and factorial validity.

#### 2.4.3. Procedures of data collection

For data collection, first permission has been taken from respective sources then the response has been selected for data collection. PDS has been given to collect the premolar information with respect to subject's related variables then standardized test administer to the subjects. Before that, rapport was established with subjects. Moreover, they have been told that their response was kept confidential and the information is used for research purpose only.

The study was conducted in two phases. In the first phase, optimistic and pessimistic scale was give on the 180 interuniversity cricket players. The data were obtained and median value on optimistic and pessimistic scale was calculated. Students at and above median



Dimension of personality	Optimistic (n=90)		Pessimistic (n=90)		t-ratio	df	P
	Mean	SD	Mean	SD			
Competition	14.03	2.43	11.21	2.19	8.18**	178	<0.01
Enthusiasm	14.72	4.13	10.40	3.41	7.65**	178	<0.01
Leadership	13.70	3.78	9.60	3.01	8.05**	178	<0.01
Mental health	13.83	3.10	9.81	2.73	9.23**	178	<0.01
Self-control	14.18	3.57	11.33	3.03	5.77**	178	<0.01
Social warmth	14.09	2.69	13.93	3.10	0.37	178	NS
Tension	14.53	4.63	10.49	2.23	7.69**	178	<0.01

value were treated as having optimistic interuniversity cricket players and below median value were treated as having pessimistic interuniversity cricket players. From among 180 subjects, 90 subjects having optimistic interuniversity cricket players and 90 subjects having pessimistic interuniversity cricket players were selected. The selected subjects were subjected to MAPS test in the second phase. The obtained data analyzed using *t*-test.

## 2.5. Variables

Independent variables:

1. Players
  - a. Optimistic
  - b. Pessimistic

Dependent variables:

1. Personality characteristics

## 3. RESULTS AND DISCUSSION

The result related to the hypothesis has been recorded. The mean of competition score of the optimistic interuniversity cricket players is 14.03 and pessimistic interuniversity cricket players is 11.21. The difference between the two means is highly significant ( $t = 8.18$ ,  $df = 178$ ,  $P < 0.01$ ). The mean of enthusiasm score of the optimistic interuniversity cricket players is 14.72 and pessimistic interuniversity cricket players is 10.40. The difference between two means is highly significant ( $t = 7.65$ ,  $df = 178$ ,  $P < 0.01$ ). The mean of leadership score of the optimistic interuniversity cricket players is 13.70 and pessimistic interuniversity cricket players is 9.60. The difference between two means is highly significant ( $t = 8.05$ ,  $df = 178$ ,  $P < 0.01$ ). The mean of mental health score of the optimistic interuniversity cricket players is 13.83 and pessimistic interuniversity cricket players is 9.81. The difference between two means is highly significant ( $t = 9.23$ ,  $df = 178$ ,  $P < 0.01$ ). The mean of self-control score of the optimistic interuniversity cricket players is 14.18 and pessimistic interuniversity cricket players is 11.33. The difference between two

means is highly significant ( $t = 5.77$ ,  $df = 178$ ,  $P < 0.01$ ). The mean of social warmth score of the optimistic interuniversity cricket players is 14.09 and pessimistic interuniversity cricket players is 13.93. The difference between two means is not significant ( $t = 0.37$ ,  $df = 178$ ,  $P = NS$ ). The mean of tension score of the optimistic interuniversity cricket players is 14.53 and pessimistic interuniversity cricket players is 10.49. The difference between two means is highly significant ( $t = 7.46$ ,  $df = 178$ ,  $P < 0.01$ ).

## 3.1. Results

Optimistic interuniversity cricket players were significantly high personality characteristics than the pessimistic interuniversity cricket players.

## REFERENCES

- Carver, C.S., and Gaines, J.G. Optimism, pessimism and postpartum depression. *Cognit Ther Res*, 1987, 11, 449-462.
- Czech, D.R., Burke, K.L., Joyner, A.B., and Hardy, C.J. An examination of NCAA Division I athlete's optimism, pessimism and sport orientation levels. *Int Sports J*, 2002, 6, 136-146.
- Dember, W.N., Martin, S.H., Hummer, M.K., Howe, S.R., and Melton, R.S. The measurement of optimism and pessimism. *Curr Psychol*, 1989, 8, 109-119.
- Fontaine, K.R., Manstead, A.S.R., and Wagner, H. Optimism, perceived control over stress, and coping. *Eur J Pers*, 1993, 7(4), 267-281.
- Fontaine, M., Ridder, D., and Bensing, J. Is optimism sensitive to the stressors of chronic disease? The impact of Type 1 diabetes mellitus and multiple sclerosis on optimistic beliefs. *Psychol Health*, 2003, 18(3), 277-294.
- Scheier, M., and Carver, C. Optimism. In: Lopez, S.J., Snyder, C.R., (eds). *Positive Psychological Assessment: A Handbook of Models and Measures*. Washington, DC: American Psychological Association; 2003, pp. 75-89.
- Scheier, M.F., and Carver, C. Optimism, coping and health: Assessment and implications of generalized outcome expectancies. *Health Psychol*, 4(3), 219-247.

# Effect of Off-season Fitness Training Programs on Chest Circumference of Amravati District Amateur Cricket Association

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## ABSTRACT

It was a common practice that skilled development off-season training programs, a number of cricketers upgraded their performances at national level along with fitness components. Therefore, researcher was interested in investigating the study entitled as "Off-Season Fitness Training Programs and its Effect on Chest Circumference of Cricketers." A total of 75 male cricketers of Amravati District Amateur Cricket Association, who represented interschool or intercollegiate tournaments, were selected as subjects. The age of the selected subjects ranged between 17 and 25 years. Hence, all those subjects selected were the source of data. For the purpose of this study, a total of 75 cricketers were selected by adopting a simple random sampling method from the available cricketers of Amravati District Amateur Cricket Association, Amravati. All the selected subjects were randomly distributed into three groups in equal numbers. It may be concluded that both 60 and 90 days systematic training program significantly improve chest circumference of the selected subjects. Ninety-day systematic training program is more effective than the 60-day training program. The post-test mean difference of chest circumference between the groups is graphically represented which shows the clear difference of training effect on the chest circumference.

## 1. INTRODUCTION

It was a common practice that skilled development off-season training programs, a number of cricketers upgraded their performances at national level along with fitness components. Thus, researcher was interested in investigating the study entitled as "Off-Season Fitness Training Programs and its Effect on Chest Circumference of Cricketers." A total of 75 male cricketers of Amravati District Amateur Cricket Association, who represented interschool or intercollegiate tournaments, were selected as subjects. The age of the selected subjects ranged between 17 and 25 years. Hence, all those subjects selected were the source of data. For the purpose of this study, a total of 75 cricketers were selected by adopting a simple random sampling method from the available cricketers of Amravati District Amateur Cricket Association, Amravati. All the selected subjects were randomly distributed into three groups in equal numbers. It may be concluded that both 60 and 90 days

systematic training program significantly improve chest circumference of the selected subjects.

### 1.1. Procedure

The subject was asked to take off all the clothes from his upper body. A measuring tape was wrapped around his chest in such a way that it touched the body all around lightly. The tape should lie over the nipples in front and should pass just below the inferior borders of the scapulae at the back. To note the normal chest circumference, the subject was asked to breathe normally and the measurement was taken at the end of normal expiration.

### 1.2. Scoring

The score was recorded in centimeters.

From the above findings, it is quite clear that the chest circumference of the selected subjects of experimental

Table 1

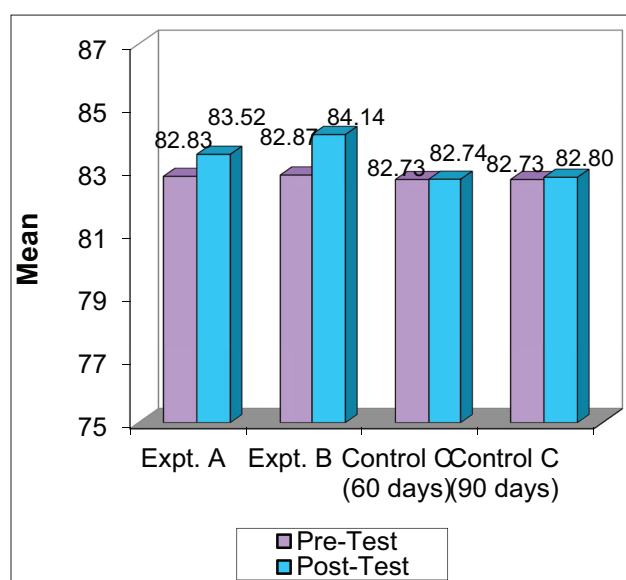
Group	Test	Mean	Standard deviation	Mean difference	Standard error	t-ratio
Expt. A	Pre	82.83	1.6489	0.69	0.46362	1.484@
	Post after 60 days	83.52	1.6293			
Expt. B	Pre	82.87	1.6247	1.28	0.45930	2.778*
	Post after 90 days	84.14	1.6230			
Control C	Pre	82.73	1.6173	0.01	0.45671	0.009@
	Post after 60 days	82.74	1.6122			
Control C	Pre	82.73	1.6173	0.07	0.45852	0.140@
	Post after 90 days	82.80	1.6249			

\*Significant at 0.05 level tabulated  $t_{0.05(24)} = 2.064@$  not significant at 0.05 level

Table 2

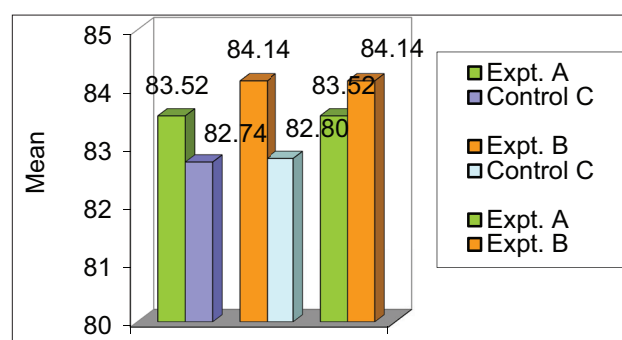
Group	Mean	Standard deviation	Mean difference	Standard error	t-ratio
Experimental A	83.52	1.6293	0.78	0.45842	1.701@
Control C (after 60 days)	82.74	1.6122			
Experimental B	84.14	1.6230	1.35	0.45933	2.935*
Control C (after 90 days)	82.80	1.6249			
Experimental A	83.52	1.6293	0.63	0.45996	1.365@
Experimental B	84.14	1.6230			

\*Significant at 0.05 level tabulated  $t_{0.05(48)} = 2.00@$  not significant at 0.05 level



**Figure 1:** Mean difference of chest circumference between the pre- and post-test of experimental A, experimental B, and control C groups

A and control C groups does not show significant improvement in post-test. Only the experimental B group showed significant improvement in chest circumference. It clearly indicates that 90-day systematic training program significantly increased the chest circumference of the subjects.



**Figure 2:** Post-test mean difference of chest circumference among the groups

The mean difference of chest circumference between the pre- and post-test of the experimental A, experimental B, and control C groups is graphically depicted in Figure 1.

From the above findings, it might be confirmed that significant increase occurs in the chest circumference of the experimental B group while compared to the control group, i.e. 90-day systematic training program significantly increases the chest circumference of the subjects.

The post-test mean difference of chest circumference among the groups is graphically represented in Figure 2.

## 2. CONCLUSION

Both 60 and 90 days systematic training program significantly improve chest circumference of the selected subjects. Ninety-day systematic training program is more effective than the 60-day training program. The post-test mean difference of chest circumference between the groups is graphically represented which shows the clear difference of training effect on the chest circumference.

## REFERENCES

- Clarke, H.H. *Application of Measurement to Health and Physical Education*. Englewood Cliffs: Prentice Hall Inc.; 1976.
- Creek, F.N.S. *Cricket*. London: W. L. St. Paul's House; 1973.
- Harold, M.B., and Rosemary, M. *A Practical Approach to Measurement in Physical Education*. Philadelphia, PA: Lee and Febiger; 1979.

# Influence of Extensive and Intensive Interval Training and Detraining on Anaerobic Power of Volleyball Players

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## ABSTRACT

The aim of this study was to find out the effect of extensive interval training (EIT) and intensive interval training (IIT) and detraining on anaerobic power of volleyball players. A group of 60 volleyball players was selected from different colleges. Before the experiment, the subjects were assessed of their anaerobic power, which formed the initial scores (ISs). The subjects were then given 6 weeks EIT, after the completion of EIT, the subjects were given IIT for 6 weeks, after the completion of IIT, the subjects were allowed to continue without any training for 3 weeks, which was considered as short-term detraining period and then they were allowed to undergo further detraining period of 3 weeks, which was considered as long-term detraining for this study and scores on anaerobic power were obtained after completion of each phase. The influence of EIT and IIT and detraining effects was determined by the IS, after EIT scores, after IIT scores, after short-term detraining scores, and after long-term detraining scores of the subjects. The statistical tool repeated analysis of variance (repeated ANOVA) was used. The results proved significant improvement due to EIT and IIT and there was no significant reduction during short- and long-term detraining phases. It was concluded that volleyball players could safely utilize EIT and IIT for their improved all-round physical fitness.

**Keywords:** Anaerobic power, Detraining, Extensive interval training, Intensive interval training.

## 1. INTRODUCTION

Athletes from different sports and games are interested in improving their strength, speed, and cardiovascular endurance through application through different forms of physical exercises and training. Interval training is a type of discontinuous physical training that involves a series of low- to high-intensity exercise workouts interspersed with rest or relief periods (Heyward, 2006). The high-intensity periods are typically at or close to anaerobic exercise, while the recovery periods may involve either complete rest or activity of lower intensity. Thus, interval training described as short periods of work followed by rest with the aim to improve speed and cardiovascular fitness. High-intensity interval training (HIIT) is an enhanced form of interval training, an exercise strategy alternating periods of short intense

anaerobic exercise with less intense recovery periods. These short, intense workouts provide improved athletic capacity and condition, improved glucose metabolism, and improved fat burning (Perry *et al.*, 2008). The extensive interval training (EIT) constitutes the intermittent variation of exertion and active recovery periods within a training unit. Characteristics of the extensive interval method are medium or large exertion periods within the basic endurance range or within the strength endurance range with the duration of the recovery periods being half as long as those of the exertion periods. The EIT constitutes the intermittent variation of exertion and active recovery periods within a training unit. Characteristics of the extensive interval method are medium or large exertion periods within the basic endurance range or within the strength endurance range with the duration of the recovery periods being



half as long as those of the exertion periods. It is important to note that the recovery periods must not result in full recovery. Parameswari and Elayaraja, 2010, and Faude *et al.*, 2013, compared the endurance effects of HIIT with high-volume running training during pre-season conditioning in 20 high-level youth football players and found that both training programs seem to be promising means to improve endurance capacity in high-level youth football players during pre-season conditioning. Buchan *et al.*, 2013, examined whether a high-intensity training intervention and found significant enhancements ( $P \leq 0.05$ ) in vertical jump performance, 10 m sprint speed, and cardiorespiratory fitness and concluded that high-intensity exercise interventions may be used in the school setting for adolescents as a mean of improving measures of physical fitness. Sandbakk *et al.*, 2013, tested whether a long duration of aerobic HIIT is more effective than shorter intervals at a higher intensity in highly trained endurance athletes and found a long duration of aerobic HIIT improved endurance performance and oxygen uptake at the ventilatory threshold more than shorter intervals at a higher intensity. Nytrøen *et al.*, 2012, demonstrated that a long-term, partly supervised and community-based HIIT program is an applicable, effective, and safe way to improve VO (2 peak), muscular exercise capacity, and general health. Parameswari and Elayaraja, 2010, evaluated the effects of IIT and EIT on selected physiological parameters and found that there was a significant mean difference exist among intensive interval training (IIT) group (IITG), EIT group (EITG), and control group (CG) on cardiorespiratory endurance and breath-holding time. The theoretical foundations laid proved that EIT and IIT could significantly improve speed and cardiorespiratory endurance of the athletes and adolescents. There is further scope for research to find out how far anaerobic power of volleyball players would be affected due to EIT and IIT whether the detraining process could eliminate the improved anaerobic power, if so to what extent are the research interest dealt in this article. Volleyball is a team game and played between two teams consisting of six players each side playing on either side of the court which is divided by a net. The ball is played by hitting with arm over the net. The teams try to score a point by downing the ball in opponents court (Gozansky, 1987). Skill is an art, craft, science, or similar aspects involving the hands or body (Barrow and McGee, 1989). Volleyball is an intense anaerobic sport (Polglaze and Dawson, 1992). There are two types of passes in volleyball: Underhand pass and overhead pass (Gregory, 2006). Service is the first act to start a game or a rally. Moreover, service

becomes an offensive tactics to score a point directly. It starts in the toss of the ball in the air and hit by one hand (Gregory, 2006). Spiking is defined as hitting the ball down over the net into the opposite court which involves as follows: Intermediary goals of approach, footwork, the jump, arm swing, head position, contact, and landing (Gregory, 2006). Blocking refers to the actions taken by players standing at the net to stop or alter an opponent's attack (Gregory, 2006). Muscular power enables a given muscle to produce the same amount of work in less time, which is significant for sprinting and jumping performance (Peterson *et al.*, 2006). Volleyball involves extensive explosive movements in both ways horizontal and vertical (Gabbett and Georgieff, 2007). Signifying that power influences vertical jumping performance and beneficial for volleyball players (Sheppard *et al.*, 2008). Interestingly, jumping ability is one of the key determining factors of high performance in volleyball (Stanganelli *et al.*, 2008). Training is defined as "systematic process of repetitive, progressive exercise involving the learning process and acclimatization" (Sreedhar, 2007). Earlier studies indicated that plyometric training seems to improve the vertical jump performance, strength, horizontal jump performance, flexibility, agility, and speed in volleyball players (Silva *et al.*, 2019).

The aim of this study was to find out the effect of EIT and IIT and detraining on anaerobic power of volleyball players.

## 2. METHOD

The aim of this study was to find out the effect of EIT and IIT and detraining on anaerobic power of volleyball players students. For this purpose, the investigator randomly selected 60 volleyball players was selected from different colleges in Chennai. Before the experiment, the subjects were assessed of their anaerobic power using Margaria-Kalamen anaerobic test, which formed the initial scores (IS). The subjects were then given 6 weeks EIT and the scores on anaerobic power were recorded. After the completion of EIT, the subjects were given IIT for 6 weeks. After the completion of IIT, the subjects were measured of their anaerobic power. Thereafter, the subjects were allowed to continue without any training for 3 weeks, which was considered as short-term detraining period and the anaerobic power was measured after short-term detraining period. Further, the subjects were allowed to undergo further detraining period of 3 weeks, which was considered as long-term detraining for this study and scores on anaerobic power

were obtained after long-term detraining phases. The influence of EIT and IIT and detraining effects was determined by the IS, after EIT scores, after IIT scores, after short-term detraining scores (STDSs), and after long-term detraining scores (LTDSs) of the subjects. The statistical tool repeated analysis of variance (repeated ANOVA) was used to find out the significance of the differences and Scheffe's *post hoc* analysis was used when significant F value was obtained.

### 3. RESULTS

As shown in Table 1, the initial anaerobic power test mean score (IS) of the volleyball players was 75.85, after 6 weeks, EIT (after EIT score [AEITS]) mean score of anaerobic power was 79.66, the scores obtained after 6 weeks, IIT (after IIT score [AIITS]) mean was 80.31, the scores obtained after 3 weeks, short-term detraining (STDS) mean was 79.83, the scores obtained after 3 weeks, long-term detraining (LTDS) mean was 78.58.  $F = 11.59$  was greater than the required table  $F = 2.45$  to be significant at 0.05 level [Table 2]. Hence, it was proved that there was a significant difference anaerobic power due to EIT and IIT and short-term detraining and long-term detraining phases. Since significant differences were found, the obtained results were further subjected to *post hoc* analysis using Scheffe's test.

### 4. DISCUSSION

The descriptive statistics due to EIT, IIT and short- and long-term detraining effects showed differences in means

while testing for the significance of the differences, the obtained F value was found to be significant ( $P < 0.05$ ). The *post hoc* analysis proved that comparing to IS there was a significant improvement in anaerobic power due to EIT and IIT. Although there was a small reduction in anaerobic power due to short-term and long-term

**Table 1:** Descriptive statistics due to extensive and intensive interval training and detraining on anaerobic power

S. No.	Different phases of training	Mean±SD
1.	Initial scores (ISs)	75.85±8.86
2.	After extensive interval training scores (AEITSs)	79.66±9.76
3.	After intensive interval training scores (AIITSs)	80.31±8.06
4.	Short-term detraining scores (STDSs)	79.83±7.51
5.	Long-term detraining scores (LTDSs)	78.58±7.94

SD: Standard deviation

**Table 2:** Computation of repeated measures ANOVA due to extensive and intensive interval training and detraining on anaerobic power of volleyball players

Source	Sum of squares	df	Mean squares	F
Subjects	17,707.22	55		11.59*
Trials	768.03	4	192.01	
Residual	4971.06	240	16.57	
Total	21,910.26	299		

F value required at 0.05 level 2.45, \*Significant

**Table 3:** Multiple comparisons showing pairs of means scores of anaerobic power under extensive and intensive interval training and detraining phases

Mean scores under different phases					Mean difference	Reqd. CI
IS	AEITS	AIITS	STDS	LTDS		
75.85	79.66				3.81*	2.33
75.85		80.31			4.46*	2.33
75.85			79.83		3.98*	2.33
75.85				78.58	2.73*	2.33
	79.66	80.31			0.65	2.33
	79.66		79.83		0.17	2.33
	79.66			78.58	1.08	2.33
		80.31			0.48	2.33
		80.31		78.58	1.72	2.33
			79.83	78.58	1.25	2.33

\*Significant at 0.05 level. IS: Initial score, AEITS: After extensive interval training score, AIITS: After intensive interval training score, STDS: Short-term detraining score, LTDS: Long-term detraining score

detraining, the reduction was not significant comparing to IS. It was also found that the differences between after EIT scores, there was small improvement due to IIT, and small reduction due to short-term and long-term detraining, however, the differences were not significant. Similarly, it was found that the differences between AIITS and reduction due to short-term and long-term detraining were not significant. Thus, the findings proved that the mean gain due to EIT and IIT was on anaerobic power which was not reduced during detraining phases among the volleyball players. Sandbakk *et al.*, 2013, found a long duration of aerobic HIIT improved endurance performance and oxygen uptake at the ventilatory threshold more than shorter intervals at a higher intensity. Nytrøen *et al.*, 2012, found HIIT program improved VO (2 peaks), muscular exercise capacity, and general health. Parameswari and Elayaraja (2010) found that there was a significant mean difference exists among IITG, EITG, and CG on cardiorespiratory endurance and breath-holding time. These findings proved that EIT and IIT contributed for the improvement of endurance, cardiorespiratory endurance, which contributed for the anaerobic power of the subjects. Thus, the findings of this study that EIT and IIT contributed for improved anaerobic power are in agreement with these previous researches. It was concluded that volleyball players could safely utilize EIT and IIT for their improved all-round physical fitness.

## 5. ACKNOWLEDGMENT

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## REFERENCES

- Silva, A.F., Clemente, F.M., Lima, R., Nikolaidis, PT., Rosemann, T., and Knechtel, B. The effect of plyometric training in volleyball players: A systematic review. *Int J Environ Res Public Health*, 2019, 16(16), 2960.
- Barrow, H.M., and McGee, R. *Practical Approach to Measurement in Physical Education*. 3<sup>rd</sup> ed. Philadelphia, PA: Lea and Fibiger; 1986.
- Buchan, D.S., Ollis, S., Young, J.D., Cooper, S.M., Shield, J.P., and Baker, J.S. High intensity interval running enhances measures of physical fitness but not metabolic measures of cardiovascular disease risk in healthy adolescents. *BMC Public Health*, 2013, 13, 498.
- Gregory, C. *Volleyball Step to Success*. USA: Human Kinetics; 2006. p. 38-47.
- Gozansky, S. *Championship Volleyball Techniques and Drills*. New York: Parker Publishing Company; 1987.
- Gabbett, T., and Georgieff, B. Physiological and anthropometric characteristics of Australian junior national, state, and novice volleyball players. *J Strength Cond Res*, 2007, 21, 902-908.
- Faude, O., Schnitzler, R., Schulte-Zurhausen, R., Müller, F., and Meyer, T. High intensity interval training vs. High-volume running training during pre-season conditioning in high-level youth football: A cross-over trial. *J Sports Sci*, 2013, 31(13), 1441-1450.
- Heyward, V.H. Designing cardiorespiratory exercise programs. In: *Advanced Fitness Assessment and Exercise Prescription*. 5<sup>th</sup> ed. Champaign, Illinois: Human Kinetics; 2006. p. 106-107.
- Nytrøen, K., Rustad, L.A., Aukrust, P., Ueland, T., Hallén, J., and Holm, I., *et al.* High-intensity interval training improves peak oxygen uptake and muscular exercise capacity in heart transplant recipients. *Am J Transplant*, 2012, 12(11), 3134-3142.
- Polglaze, T., and Dawson, B. The physiological requirements of the positions in state league volleyball. *Sports Coach*, 1992, 15, 32.
- Peterson, M.D., Alvar, B.A., and Rhea, M.R. The contribution of maximal force production to explosive movement among young collegiate athletes. *J Strength Cond Res*, 2006, 20, 867-873.
- Perry, C.G., Heigenhauser, G.J., Bonen, A., and Spriet, L.L. High-intensity aerobic interval training increases fat and carbohydrate metabolic capacities in human skeletal muscle. *Appl Physiol Nutr Metab*, 2008, 33(6), 1112-1123.
- Parameswari, and Elayaraja. Effects of intensive and extensive interval trainings on selected physiological parameters. *Asian J Sci Technol*, 2010, 8, 166-169.
- Sreedhar, K. *Sports Training Methods*. Chidambaram, Swamy Publications; 2007. p. 56.
- Sheppard, J.M., Cronin, J.B., Gabbett, T.J., McGuigan, M.R., Etzebarria, N., and Newton R.U. Relative importance of strength, power, and anthropometric measures to jump performance of elite volleyball players. *J Strength Cond Res*, 2008, 22, 758-765.
- Stanganelli, L.C., Dourado, A.C., Oncken, P., Mançan, S., and da Costa, S.C. Adaptations on jump capacity in Brazilian volleyball players prior to the under-19 world Championship. *J Strength Cond Res*, 2008, 22, 741-749.
- Sandbakk, O., Sandbakk, S.B., Ettema, G., and Welde, B. Effects of intensity and duration in aerobic high-intensity interval training in highly trained junior cross-country skiers. *J Strength Cond Res*, 2013, 27(7), 1974-1980.

# Combined Effect of Plyometric and Mobility Training on Selected Physical Variables among College Women Players

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## ABSTRACT

The purpose of the study was to find out the effect of the combined effect of plyometric and mobility training on selected physical variables among college women players. To achieve this purpose, 45 women players in the age group of 18–23 years from various Department of Annamalai University, Chidambaram, during the year 2019–2020 were selected as subjects at random from the total population of 90 students. The selected 45 subjects were divided into three equal groups of 15 each as two experimental groups and one control group, in which Group – I ( $n = 15$ ) underwent plyometric training for 3 days/week for 6 weeks, Group – II ( $n = 15$ ) underwent the combination of mobility and plyometric training for 3 days/week for 6 weeks, and Group – III ( $n = 15$ ) acted as control who are not participate any training apart from their regular activities. The selected criterion variables such as abdominal strength, speed, leg explosive power, and flexibility were assessed before and after the training period. The collected data were statistically analyzed using analysis of covariance and Scheffé's *post hoc* test. From the results of the study, it was found that there was a significant difference when compared with the control group.

## 1. INTRODUCTION

In sports, the word “Training” is generally understood to be a synonym for doing physical exercises. In a narrow sense, training is doing physical exercises for the improvement of performance.

Plyometric is a popular training technique used by many coaches today. It has been tested as a way to bridge the gap between sheer strength and power. Plyometric training is a method of developing explosive power and ultimately, improving athletic performance. Plyometric exercises include jumps, hops, skips, bounds, and throws.

Mobility, or joint mobility, is the ability to move a limb through the full range of motion – with control. Mobility is based on voluntary movement while flexibility involves static holds and is often dependent on gravity or passive forces. We use “mobility” to express how well you can move through the appropriate functional range of motion for a joint within a given movement pattern.

## 2. METHODOLOGY

To achieve this purpose, 45 women players in the age group of 18–23 years from various Department of Annamalai University, Chidambaram, during the year 2018–2019 were selected as subjects at random from the total population of 90 students. The selected 45 subjects were divided into three equal groups of 15 each as two experimental groups and one control group, in which Group – I ( $n = 15$ ) underwent plyometric training for 3 days/week for 6 weeks, Group – II ( $n = 15$ ) underwent the combination of mobility and plyometric training for 3 days/week for 6 weeks, and Group – III ( $n = 15$ ) acted as control who are not participate any training apart from their regular activities.

### 2.1. Analysis of Data

The data collected before and after the experimental periods on abdominal strength, leg explosive power, speed, and flexibility on combined of mobility and



plyometric training group, plyometric training, and control group were analyzed and presented in the following Table 1.

Further, to determine which of the paired means has a significant improvement, Scheffé *S* test was applied as *post hoc* test. The result of the follow-up test is presented in Table 2.

### 3. RESULTS

The analysis of covariance was used to find out the significant difference, if any, among the experimental groups and control group on selected criterion variables separately. In all the cases, 0.05 level of confidence was fixed to test the significance, which was considered as appropriate. Since there were three groups that were

**Table 1:** Analysis of covariance and F ratio for abdominal strength, speed, leg explosive power, and flexibility for combined of mobility and plyometric training, plyometric training, and control group

Variable name	Group name	Control group	Plyometric group	Combined group	F ratio
Abdominal strength (in numbers)	Pre-test (Mean±SD)	37.13±1.15	37.2±1.25	37.2±1.21	0.001
	Post-test (Mean±SD)	37.32±1.16	39.13±1.31	42.21±1.36	3.935*
	Adj. post-test (Mean±SD)	37.50	39.17	42.19	23.250*
Leg explosive power (in meters)	Pre-test (Mean±SD)	1.816±0.12	1.818±0.135	1.822±0.13	0.003
	Post-test (Mean±SD)	1.819±0.12	1.978±0.22	2.141±0.31	3.034*
	Adj. post-test (Mean±SD)	1.822	1.979	2.139	3.265*
Speed (in seconds)	Pre-test (Mean±SD)	7.9±0.008	7.89±0.0089	7.9±0.0083	0.006
	Post-test (Mean±SD)	7.88±0.0081	7.59±0.0092	7.48±0.0097	6.766*
	Adj. post-test (Mean±SD)	7.89	7.589	7.492	15.095*
Flexibility (in Centimeters)	Pre-test (Mean±SD)	5.91±0.71	5.9±0.72	5.9±0.71	0.001
	Post-test (Mean±SD)	5.89±0.70	7.19±0.92	8.42±0.97	3.657*
	Adj. post-test (Mean±SD)	5.912	7.187	8.439	29.012*

\*Significant at 0.05 level of confidence. The table value required for significance at 0.05 level of confidence with df 2 and 43 and 2 and 42 were 3.21 and 3.22, respectively, SD: Standard deviation

**Table 2:** Scheffé *S* test for the difference between the adjusted post-test mean of abdominal strength, leg explosive power, speed, and flexibility

Combined group	Plyometric group	Control group	Mean difference	Confidence interval at 0.05 level
Adjusted post-test mean of abdominal strength				
42.19		37.50	4.69*	0.601
42.19	39.17		3.02	0.601
	39.17	37.50	1.67*	0.601
Leg explosive power				
2.139		1.822	0.317*	0.037
2.139	1.979		0.16*	0.037
	1.979	1.822	0.157*	0.037
Speed				
7.492		7.89	0.398*	0.27
7.492	7.589		0.097	0.27
	7.589	7.89	0.301*	0.27
Flexibility				
8.439		5.912	2.527*	0.037
8.439	7.187		1.252*	0.037
	7.187	5.912	1.275*	0.037

\*Significant at 0.05 level of confidence



involved in this study, the Scheffè *S* test was used as *post-hoc* test and it is shown in Table 2.

Table 1 showed that the results of the study there was a significant difference between combined of mobility and plyometric training, plyometric training, and control group abdominal strength, speed, leg explosive power, and flexibility. Further, the results of the study showed that there was a significant improvement in abdominal strength due to 6 weeks of program. However, the improvement was in favor of the experimental group. The results of the study also shown that there was a significant difference between combined of mobility and plyometric training, plyometric training, and control group on abdominal strength, speed, leg explosive power, and flexibility.

#### 4. CONCLUSIONS

From the analysis of the data, the following conclusions were drawn.

1. There was a significant improvement due to the plyometric training and combination of mobility and plyometric training on abdominal strength, flexibility, explosive power, and speed when compared with the control group
2. The improvement in criterion variables such as abdominal strength was higher for the combination of mobility and plyometric group than the plyometric training group
3. The improvement in flexibility was higher for the combination of mobility and plyometric group

when compared with the plyometric training group and control group

4. Significant improvements noticed on selected motor ability components such as abdominal strength, flexibility, leg explosive power, and speed due to the combination of mobility and plyometric training and plyometric training.

#### REFERENCES

- Sayers, A.L., Farley, R.S., Fuller, D.K., Juvenile, C.B., and Caputo, J.L. The effect of static stretching on phases of sprint performance in elite soccer players. *J Strength Cond Res*, 2008, 22(5), 1416-1421.
- Faigenbaum, A.D., McFarland, J.E., Keiper, F.B., Tevlin, W., Ratamess, N.A., and Kang, J., *et al.* Effects of a short-term plyometric and resistance training program on fitness performance in boys age 12 to 15 years. *J Sports Sci Med*, 2007, 6, 519-525.
- Impellizzeri, F.M., Rampinini, E., Castagna, C., Martino, F., Fiorini, S., and Wisloff, U. Effect of plyometric training on sand versus grass on muscle soreness and jumping and sprinting ability in soccer players. *Br J Sports Med*, 2008, 42(1), 42-6.
- Kloubec, J.A. Pilates for improvement of muscle endurance, flexibility, balance, and posture. *J Strength Cond Res*, 2010, 24(3), 661-7.
- Kotzamanidis, C. Effect of plyometric training on running performance and vertical jumping in prepubertal boys. *J Strength Cond Res*, 2006, 20, 441-445.
- Little, T., and Williams, A.G. Effects of differential stretching protocols during warm-ups on high-speed motor capacities in professional soccer players. *J Strength Cond Res*, 2006, 20(1), 203-207.

# Effects of Yogic Exercises and Physical Fitness on the Performance of Back Pain of Gulbarga University Employees

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## ABSTRACT

Back pain as one of the most common powerful conditions affects the modern man and is related to insufficient physical activity, i.e., contemporary sedentary lifestyle (employees) back pain is almost evenly distributed among the sexes (58% of women and 45% of men suffer from it), which about 75% of the population have suffered an episode of back pain syndrome. The majority of people with back pain syndrome recover completely as a result of suitable medical treatment and body exercise; however, in a certain percentage of people, the acute phase turns into a chronic condition. Chronic back pain is a limiting condition which impacts individual efficacy but is also correlated with social and economical effects. In the treatment of alleviating the pain, physical movement and different types of body exercises play an important role, and the aim of the study is to select certain yoga postures/asanas on the basis of research done so far, as a possible mode of kinesiological operator in the treatment of back pain. Yoga exercises can lead to the increase in muscle strength, muscular and cardio respiratory endurance, range of movement, and general flexibility. However, it is very important to make the correct choice and the sequence of yoga asanas (exercises) which can be applied as a adequate kinesiological treatment of back pain taking into account the health status and physical shape of the patient/person. Based on the biomechanical laws and kinesiological knowledge, yoga instructors can position themselves in all programs aiming to prevent and treat back pain.

## 1. INTRODUCTION

Incomplete functioning of the locomotive system is frequently caused by limited movement and locomotion, resulting in pain in acute and chronic conditions of back pain is defined as pain or discomfort located below the 12<sup>th</sup> rib and above the gluteal crease, with or without the presence of leg pain. In people over 50 years of age, the symptoms of back pain syndrome are significantly more intense than in the younger population. Speaking of the younger population, a rise in back pain has been identified in the school population, 20–51%. The pain which appears sporadically or recurring pain, and can be of very strong intensity, has been identified in the population between the ages of 20 and 40. Evidently, the pain appears during the most productive period of a person's life and it is accompanied by reduced work capacity. The appearance of acute back pain is subject to physical therapy treatments and physical exercises which aim to eliminate the symptoms (pain, and limited

movement); however, in a certain percentage of the population, the pain turns into a chronic condition.

## 2. METHODOLOGY

### 2.1. Yoga as a Method of Physical Exercise

A multidisciplinary team of experts participates in the treatment of back pain (physiatrist, neurologist, neurosurgeon, psychologist, physical therapist, physical therapy technician, occupational therapist, and social worker), however, in addition to medication therapy, surgical treatment, and physical therapy, the central place is occupied by the method of kinesiotherapy which contributes to pain reduction and the improvement of the overall condition.

It is recommended that the patients diagnosed with back pain use the other types of physical activity, which would contribute to the improvement of the condition of their

**Table 1: Yoga kinesiological operator in back pain therapy**

<b>Respondents age</b>	<b>Kinesiological treatment/program (the duration of one treatment)</b>	<b>Program duration (weeks)</b>
30–65	Hatha yoga 60 min 2 times/week with the instructor asanas have not been named	6
20–64	Exercise/75 min seven aerobic exercises ten stretching exercises	26
23–67	Iyengar once a week, 90 min with the instructor and 5 times 30 min at home/individually 29 asanas	16
18–70	Iyengar 31 asanas	24
18–65	Viniyoga 75 min 17 postures	12
18–65	Iyengar 75 min does not state the asanas	12

locomotive system, especially the back segment. One of the alternative therapeutic methods which can be applied in the treatment of back pain is yoga practice. Connection and similarity between body exercises (movement and locomotion) in kinesiotherapy and yoga have been identified. Kinesiological operator for therapeutic purposes, hatha yoga is characterized by postures of asanas, is practiced to reduce pain, increases the range of movement and flexibility, strengthen muscles, and improves the overall physical condition, improves equilibrium, and developmental focus. It has been proven that practicing certain asanas – Swastikasana, Mayurasana, Matsyendranasana, Paschimottanasana, and Gomukhasana – leads to significant increase in the range of movement and flexibility that yoga exercises have sufficient impact on increased flexibility, muscular strength, and cardiorespiratory endurance, which is important for maintaining good physical condition and associates state that the exercises of segmentary stabilization and stretching exercises have significant effect on reduction of pain and physical disability.

The example of conditionally contraindicated postures forms the angle of kinesiological science (1) Urdhva, (2) Urdhva Dhanurasana, (3) Ustrasana, (3) Danurasana, and (4) Matsyasana. In all of the mentioned asanas, there is a pronounced hyperextension of the trunk and a pronounced lordosis in the given position. Deviation from the lordotic curvature (the normal curvature is between 15 and 30°) is one of the causes of back pain as well as insufficiently developed abdominal musculature, shortening of the back muscles, and the retroflexion of the mentioned positions worsens the condition and causes pain, especially in the acute phase of the back pain.

### 3. RESULTS

Table 1 is summarized the results of the studies treating back pain whose aim was the application of

yoga exercise. This work also shows the method, the kinesiological treatment based on which the initial/final condition of the respondents was determined the age of the sample, kinesiological operator applied, and the duration of the program.

### 4. CONCLUSION

According to the research performed so far, the use of yoga in treating back pain indicates the possibility of pain reduction and elimination. Yoga exercises may increase muscular strength, muscular, and cardiorespiratory endurance the range of motion and general flexibility. The studies cited in this paper indicate that practicing yoga is more efficient than any medication and standard medical treatments. However, the correct selection and the sequence of the yoga exercises are of vital importance in using yoga as a kinesiological operator and this should be done taking into account the general health status and physical condition of the patient/person. Yoga instructors can find their place in all programs aiming to prevent and treat back pain. However, it needs to be emphasized that they need to undergo advanced training in correct postural status and deviations from it. The knowledge of biomechanical laws and kinesiology principles contributes to the right choice of the asanas, physical postures, and good selection of exercise combinations, with the goal of eliminating and alleviating back pain. During the acute phase of back pain, the choice and the use of asanas contribute to relief in the lumbar segment. The asanas which are present in almost all systems of yoga exercises and are the most significant for the patients in the acute phase of back pain are: Supta Padangusthasana, Paschimottanasana, Halasana, Pawanmuktasana, Apanasana, Upavistha Konasana, Balasana, and Makarasana (initial position bending backward and hands bent in elbows and head resting on them).

## REFERENCES

- Almeida, I.C., Sa, K.N., Silva, M., Baptista, A., Matos, M.A., and Lessa, I. Prevalência de dor lombar crônica na população da cidade de Salvador. *Rev Bras Ortop*, 2008, 43(3), 96-102.
- Andersson, G.B. Epidemiological feature of chronic low-back pain. *Lancet*, 1999, 354, 581-585.
- Bal, B.S., and Kaur, P.J. Effects of selected asanas in hatha yoga on agility and flexibility level. *J Sport Health Res*, 2009, 1(2), 75-87.
- Chou, R., and Huffman, L.H. Nonpharmacologic therapies for acute and chronic back pain a review of the evidence for an American pain society/American college of physicians clinical practice guideline. *Ann Intern Med*, 2007, 147(7), 492-504.

# Effect of Yogic Exercise on Selected Physical Fitness Components and Physiological Variables at Secondary Educational Schools in Telangana State

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## ABSTRACT

The objective of the study was to find out the effect of yogic exercise on selected physical fitness components and physiological variables at secondary educational schools in Telangana state. Materials and Methods: The following physical fitness components are cardiorespiratory endurance, muscular endurance, body composition, physiological variables are the Harvard step test and vital capacity, were administered on secondary Educational school boys at Warangal district of Telangana state pre-test were administered and post-test were taken after systematic treatment of yogic exercises. The following tools were used for the study. Yogic Exercises are – Padmasana, Siddhasana, Paschimottanasana, Bhujangasana, Dhanurasana, Kurmasana, and Pranayama exercises. **Finding of the Study:** Cardiorespiratory endurance the mean value of pre-test is 4892.72, and for post-test the mean value is 6315.88. The muscular endurance, i.e., sit ups. The mean value of pre-test is 18.54, and for the post-test the mean value is 26.62. The body composition i.e., Body mass index the mean value of pre-test 23.1440, and for post-test the mean value is 21.2380 vital capacity, i.e., spirometer the mean value of pre-test is 2.3482, and for post-test the mean value is 3.7022. Harvard step test, i.e., resting pulse rate the mean value of pre-test is 106.30, and for post-test the mean value is 74.56. **Conclusions:** Physical exercises and the physical components of yoga practices have several similarities, but also important differences. Evidence suggests that yoga interventions appear to be equal and/or superior to exercise in nearly every outcome measured (Ross and Thomas, 2010).

**Keywords:** Body composition, Harvard step test and vital capacity, Muscular endurance, Physical fitness, Physiological.

## 1. INTRODUCTION

In today's, fast-paced world students work hard to achieve their objectives, and they leave home early in the morning without having breakfast, grab samosa or junk food on the way to school and attend classes on it and lunch they go to the canteen with friends for snacks such as samosa and junk food. This way they might achieve their objective of getting fantastic grades in exams but their overall health gets hit pretty much, and they might experience problems such as obesity and weakness. Yoga and physical exercise could prove beneficial for having a healthy life. Yoga helps in building the physical and mental health of an individual. Yogasana is a scientific procedure of exercise that affects the inmost parts of the body. Now, the Indian physical culture is accepted

world over and around 200 countries are now enjoying the fruits of our culture by celebrating the International Day of Yoga on June 21 every year.

### 1.1. The Objective of the Study

The objective of the study was to find out the effect of yogic exercise on selected physical fitness components and physiological variables at secondary educational schools in Telangana state.

### 1.2. Hypotheses

There may not be any significant difference between pre-test and post-test of the experimental group on the effect of yogic exercise on secondary educational



schools in Telangana state in relation to physical fitness components and physiological variables.

## 2. MATERIALS AND METHODS

The following physical fitness components are cardiorespiratory endurance, muscular endurance, body composition, Physiological Variables are the Harvard step test and vital capacity, were administrated on secondary Educational school boys at Warangal district of Telangana state pre-test were administrated and post-test were taken after systematic treatment of yogic exercises. The following tools were used for the study. Yogic exercises are – Padmasana, Siddhasana, Paschimottanasana, Bhujangasana, Dhanurasana, Kurmasana, and Pranayama exercises.

## 3. FINDING OF THE STUDY

The mean value of pre-test of secondary educational school boys at Warangal district of Telangana state is 4892.72, standard deviation (SD) value is 314.308, and for post-test of secondary educational school boys at Warangal district of Telangana state, the mean value is 6315.88 and SD value is 403.601. It is clear that a significant difference exists found between pre-test and post-test on secondary educational school boys at Warangal district of Telangana state with regard to the physical fitness variable on cardiorespiratory endurance, i.e., 12 min run or walk cooper test. The mean value of pre-test of secondary educational school boys at Warangal district of Telangana state is 18.54, SD value is 2.323, and for the post-test of secondary educational school boys at Warangal district of Telangana state, the mean value is 26.62 and SD value is 1.652. A significant difference was found between pre-test and post-test on secondary educational school boys at Warangal district of Telangana state with regard to the physical fitness variable on muscular endurance, i.e., sit-ups. The mean value of pre-test of secondary educational school boys at Warangal district of Telangana state is 23.1440, SD value is 2.28796, and for post-test of secondary educational school boys at Warangal district of Telangana state, the mean value is 21.2380 and SD value is 1.93843. A significant difference was found between pre-test and post-test on secondary educational school boys at Warangal district of Telangana state with regard to the physical fitness variable on body composition, i.e., body mass index. The mean value of pre-test on secondary educational school boys at Warangal district

of Telangana state is 2.3482, SD value is 0.16343, and for post-test of secondary educational school boys at Warangal district of Telangana state, the mean value is 3.7022 and SD value is 0.13081. A significant difference was found between pre-test and post-test on secondary educational school boys at Warangal district of Telangana state with regard to the physiological variable on vital capacity, i.e., spirometer. The mean value of pre-test of secondary educational school boys at Warangal district of Telangana state is 106.30, SD value is 8.624, and for post-test of secondary educational school boys at Warangal district of Telangana state, the mean value is 74.56 and SD value is 5.599. A significant difference was found between pre-test and post-test on secondary educational school boys at Warangal district of Telangana state with regard to the physiological variable on the Harvard step test, i.e., resting pulse rate.

## 4. CONCLUSIONS

It can be concluded that the pre-test and post-test on the effect of yogic exercise have shown a positive impact among selected physical fitness components and physiological variables at secondary educational schools in Telangana state. Physical exercises and the physical components of yoga practices have several similarities, but also important differences. Evidence suggests that yoga interventions appear to be equal and/or superior to exercise in nearly every outcome measured (Ross and Thomas, 2010). Emphasis on breath regulation, mindfulness during practice, and importance is given to maintenance of postures differentiates yoga practices from physical exercises. They also have differential effects on the body and the brain, both in healthy subjects and in persons suffering from various physical and mental disorders. In addition, yoga offers significant advantages in terms of enhancing positive mental health in the healthy population. Yoga is a multifaceted spiritual tool with enhanced health and well-being as one of its positive effects. The components of yoga which are very commonly applied for health benefits are asanas (physical postures), pranayama (regulated breathing), and meditation. In the context of asanas, yoga resembles more of a physical exercise, which may lead to the perception that yoga is another kind of physical exercise. Yoga, as it gains popularity from people of all walks of life, is also compared with many movement based practices, especially physical fitness exercises. The apparent similarity of external movements makes one sometimes to equate yoga with exercises.

## REFERENCES

- Robson, M. *Effect of Yoga on Flexibility and Respiratory Measures of Vital Capacity and Breath Holding Time*. Vyayam, 1974, 40.
- Sharma, P.S., and Sharma, N.L. *Yoga and Sex*. Bombay: B.I. Publications; 1973. p. 85.
- Gopal, K.S., et al. *The effects of yogasanas on Muscular Tone and Cardio Respiratory Adjustment*. Yoga Life. 1975. p. 31.
- Karthikeyan, P. *Influence of Yogic Exercises on Mentally Fatigued School Boys*. Karaikudi: Alagappa University; 1991.

# Comparative Analysis of Selected Psychological Variables among Inter-University Level of Cricket, Handball, and Volleyball Players

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## ABSTRACT

The purpose of the study was to investigate the “comparative analysis of selected psychological variables among inter-university level of cricket, handball, and volleyball players.” Hundred subjects of each in cricket, handball, and volleyball players from affiliated college of Kashmir University in Kashmir were selected at random between 18 and 28 years. Rainer *et al.* (1983), Illinois Self-evaluation Questionnaire, were used to measure cognitive anxiety, somatic anxiety, and self-confidence. This questionnaire consists of 27 questions of three components, namely, cognitive anxiety, somatic anxiety, and self-confidence. The data were statistically analyzed using one-way analysis of variance to find out the difference between psychological variables. It was concluded that there was a significant difference in cognitive anxiety among inter-university level, cricket, handball, and volleyball players. It was observed that cricket players have more cognitive anxiety as compared to handball and volleyball players and handball players have more somatic anxiety as compared to cricket and volleyball players. Handball players have more self-confidence as compared to cognitive anxiety and somatic anxiety and were concluded that there was a significant difference in cognitive anxiety, somatic anxiety, and self-confidence among inter-university level.

**Keywords:** Cognitive anxiety, Self-confidence, Somatic anxiety.

## 1. INTRODUCTION

It is very important to know the level of anxiety, especially the cognitive anxiety to take all necessary preparations to reduce it. As we know that, competition is a social process that takes place when prizes are given to people on the basis of the comparison of their performance with the performance of others participating in the same event (Coakley, 1994). In sports, pre-competitive anxiety refers to an unpleasant emotion which is characterized by imprecise but persistent feeling of uneasiness and fear before competition. Cognitive is the mental component, characterized by negative expectation about success or self-evaluation, negative self-talk, inability to cope, worry about performance, fear of failure, inability to concentrate, and attention narrowing (Jervis, 2002). Worry is identified as a

defining characteristic of trait anxiety (e.g. Eysenck and Van Berkum, 1992; Schwarzer, 1996). That is, players who are prone to experiencing anxiety have a tendency to worry because they have an attention disposition to observe situational threats (e.g. Mathews, 1990). A lack of consensus makes it difficult to clearly define anxiety and stress in sports, but one definition, proposed by sport psychology consultant Dr. Graham Jones in the book “Sport Psychology: A Self-Help Guide,” is that it is “the result of an interaction between the individual and the environment an emotional response to the demands placed upon the individual by the environment.”

## 2. MATERIALS AND METHODS

A prospective cross-sectional study was carried out and 100 subjects in each cricket, handball, and volleyball

players from the affiliated colleges of Kashmir University were selected as subjects of the age group of 18–25 years were taken randomly. Rainer *et al.* (1983), Illinois Self-evaluation Questionnaire, was used to measure cognitive anxiety, somatic anxiety, and self-confidence. This questionnaire consists of nine questions for each component. The question numbers of each component are as follows.

Cognitive anxiety: 1, 4, 7, 10, 13, 16, 19, 22, and 25.

Somatic anxiety: 2, 5, 8, 11, 14, 17, 20, 23, and 26.

Self-confidence: 3, 6, 9, 12, 15, 18, 21, 24, and 27.

### 3. RESULTS AND DISCUSSION

The data were collected from the subjects who were treated statistically, one-way analysis of variance was used to find out the difference between psychological variables among university level of cricket, handball, and volleyball players.

Table 1 represents the statistic of cognitive anxiety among inter-university level of cricket, handball, and volleyball players. There was a significant difference between the cricket, handball, and volleyball players. However, cognitive anxiety ( $P > 0.05$ ) was significantly higher than the cricket and handball players.

Graph 1 shows that the mean value of cricket players was 29.19, standard deviation (SD) was 4.5; the mean

value of handball players was 23.56, SD was 4.88; and the mean value of volleyball players 29.11, SD was 5. It had been hypothesized that there would be a significant difference in cognitive anxiety between cricket, handball, and volleyball players.

Table 2 represents the statistic of somatic anxiety among inter-university level of cricket, handball, and volleyball players. There was a significant difference between the cricket, handball, and volleyball players'. However, somatic anxiety ( $P > 0.05$ ) was significantly higher than the cricket and handball players.

Graph 2 shows that the mean value of cricket players was 26.02, SD was 4.94; the mean value of handball players was 28.31, SD was 3.78; and the mean value of volleyball players 22.7, SD was 4.37. It had been hypothesized that there would be a significant difference in cognitive anxiety between cricket, handball, and volleyball players.

Table 3 represents the statistic of self-confidence among inter-university level of cricket, handball, and volleyball players. There was a significant difference between the cricket, handball, and volleyball players'. However, self-confidence ( $P > 0.05$ ) was significantly higher than the volleyball and handball players.

Graph 3 shows that the mean value of somatic anxiety cricket players was 29.3, SD was 3.61; the mean value

**Table 1:** Descriptive analysis of variance of cognitive anxiety among inter-university level of cricket, handball, and volleyball players

Subjects	Total number of players	Mean±SD	95% confidence interval for mean		Minimum	Maximum
			Lower bound	Upper bound		
C.A cricket players	100	29.19±4.50	28.29	30.08	21.00	29.00
C.A handball players	100	29.11±5.00	28.11	30.10	20.00	29.00
C.A volleyball players	100	23.56±4.88	22.58	24.53	15.00	36.00

SD: Standard deviation

**Table 2:** Descriptive analysis of variance of somatic anxiety among inter-university level of cricket, handball, and volleyball players

Subjects	Total number of players	Mean±SD	95% confidence interval for mean		Minimum	Maximum
			Lower bound	Upper bound		
S.A. cricket players	100	26.02±4.94	25.03	27.00	15.00	36.00
S.A handball players	100	28.31±3.78	27.55	29.06	18.00	35.00
S.A. volleyball players	100	22.70±4.37	21.83	23.56	12.00	31.00

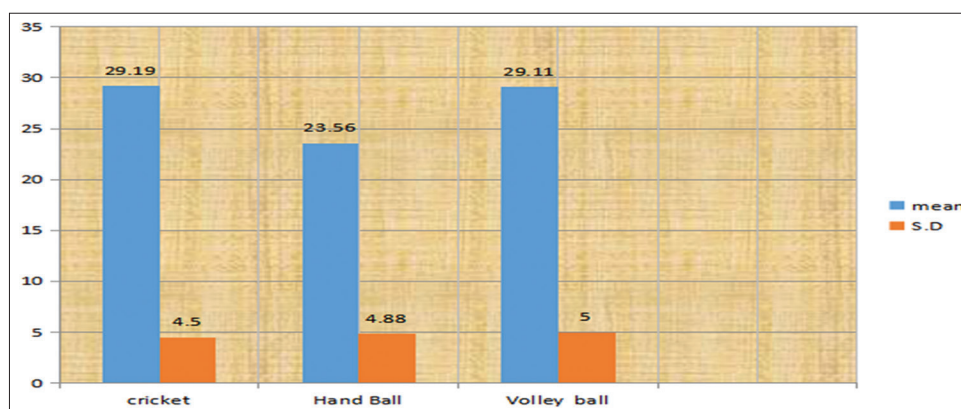
SD: Standard deviation

of handball players was 22.5, SD was 5.29; and the mean value of volleyball players 29.75, SD was 3.28. It had been hypothesized that there would be a significant difference in somatic anxiety between cricket, handball, and volleyball players.

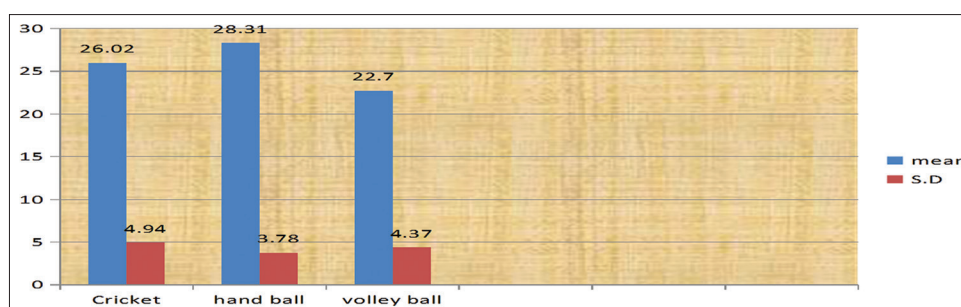
Table 4 represents the statistic of cognitive anxiety, somatic anxiety, and self-confidence in cricket players among inter-university level players. There was a significant difference between the self-confidence cricket players and somatic anxiety in cricket players. However,

cognitive anxiety, somatic anxiety, and self-confidence ( $P > 0.05$ ) were significantly higher than the self-confidence and somatic anxiety in cricket players.

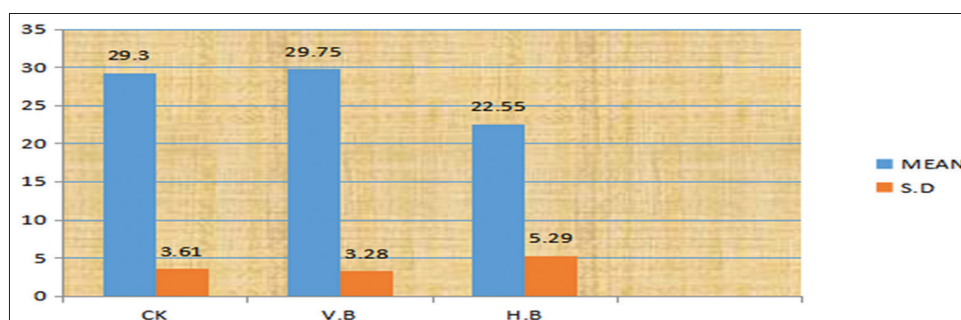
Graph 4 shows that the mean value of cognitive anxiety cricket players was 29.19, SD was 4.5; the somatic anxiety of cricket players was 26.02, SD was 4.94; and the self-confidence of cricket players 29.3, SD was 3.61. It had been hypothesized that there would be a significant difference in cognitive anxiety, somatic anxiety, and self-confidence cricket players.



**Graph 1:** The mean and standard deviation of cognitive anxiety between cricket, handball, and volleyball players among inter-university level players



**Graph 2:** The mean and standard deviation of somatic anxiety between cricket, handball, and volleyball players among inter-university level players



**Graph 3:** The mean and standard deviation of somatic anxiety between cricket, handball, and volleyball players among inter-university level players



Table 5 represents the statistic of cognitive anxiety, somatic anxiety, and self-confidence in handball players among inter-university level players. There was a significant difference between the self-confidence handball players and somatic anxiety in handball players. However, self-confidence and cognitive anxiety ( $P > 0.05$ ) were significantly higher than the somatic anxiety in handball players.

Graph 5 shows that the mean value of cognitive anxiety handball players was 29.11, SD was 5; the somatic anxiety of handball players was 28.31, SD was 3.78; and the self-confidence of handball players 29.75, SD was 1.8. It had been hypothesized that there would be a significant difference in cognitive anxiety, somatic anxiety, and self-confidence handball players.

Table 6 represents the statistic of cognitive anxiety, somatic anxiety, and self-confidence in volleyball players among inter-university level players. There was a significant difference between the cognitive anxiety and somatic anxiety in volleyball players. However, cognitive anxiety and somatic anxiety ( $P > 0.05$ ) were significantly higher than the self-confidence in volleyball players.

Graph 6 shows that the mean value of cognitive anxiety volleyball players was 23.56, SD was 4.88; the somatic anxiety of volleyball players was 22.7, SD was 4.37; and the self-confidence of volleyball players 22.55, SD was 5.29. It had been hypothesized that there would be a significant difference in cognitive anxiety, somatic anxiety, and self-confidence volleyball players.

**Table 3:** Descriptive analysis of variance of self-confidence among inter-university level of cricket, handball, and volleyball players

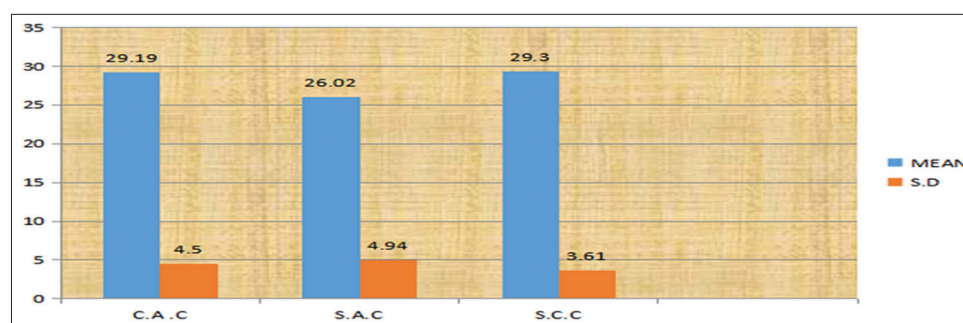
Subjects	Total number of players	Mean±SD	95% confidence interval for mean		Minimum	Maximum
			Lower bound	Upper bound		
S.C. cricket players	100	29.30±3.61	28.58	30.01	20.00	38.00
S.C. volleyball players	100	29.75±3.28	29.09	30.40	22.00	37.00
S.C. handball players	100	22.55±5.29	21.49	23.60	12.00	31.00

SD: Standard deviation

**Table 4:** Descriptive analysis of variance of cognitive anxiety, cricket somatic anxiety, and self-confidence among inter-university level players

Subjects	Total number of players	Mean±SD	95% confidence interval for mean		Minimum	Maximum
			Lower bound	Upper bound		
C.A. cricket players	100	29.19±4.50	28.29	30.08	21.00	39.00
S.A. cricket players	100	26.02±4.94	25.03	27.00	15.00	36.00
S.C. cricket players	100	29.30±3.61	28.58	30.01	20.00	38.00

SD: Standard deviation



**Graph 4:** The mean and standard deviation of cognitive anxiety, somatic anxiety, and self-confidence among inter-university level of cricket players

**Table 5:** Descriptive analysis of variance of cognitive anxiety handball, somatic anxiety handball, and self-confidence handball among inter-university level players

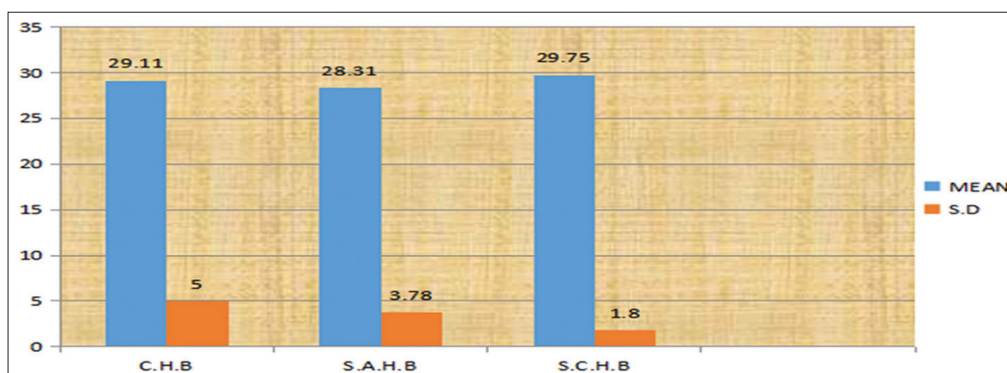
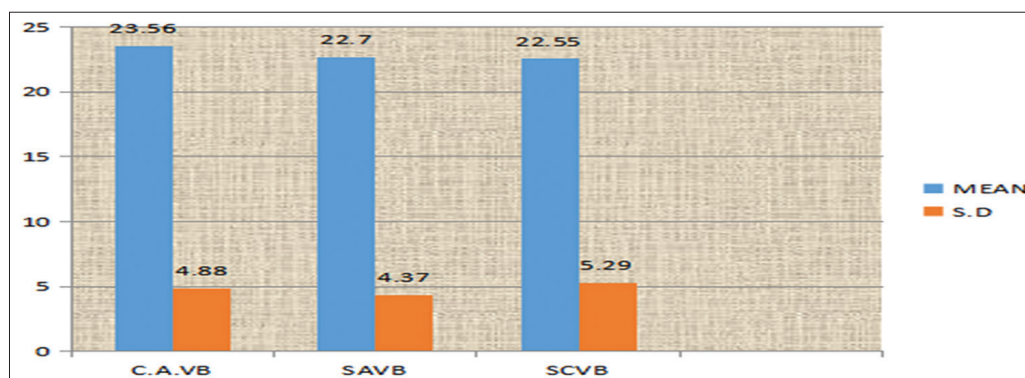
Subjects	Total number of players	Mean±SD	95% confidence interval for mean		Minimum	Maximum
			Lower bound	Upper bound		
C.A. handball players	100	29.11±5.00	28.11	30.10	20.00	39.00
S.A. handball players	100	28.31±3.78	27.55	29.06	18.00	35.00
S.C. handball players	100	29.75±3.28	29.09	30.40	22.00	37.00

SD: Standard deviation

**Table 6:** Descriptive analysis of variance of cognitive anxiety volleyball, somatic anxiety volleyball, and self-confidence in volleyball players among inter-university level players

Subjects	Total number of players	Mean±SD	95% confidence interval for mean		Minimum	Maximum
			Lower bound	Upper bound		
C.A. volleyball players	100	23.56±4.88	22.58	24.53	15.00	36.00
S.A. volleyball players	100	22.70±4.37	21.83	23.56	12.00	31.00
S.C. volleyball players	100	22.55±5.29	21.49	23.60	12.00	31.00

SD: Standard deviation

**Graph 5:** The mean and standard deviation of cognitive anxiety, somatic anxiety, and self-confidence among inter-university level handball players**Graph 6:** The mean and standard deviation of cognitive anxiety, somatic anxiety, and self-confidence among inter-university level volleyball players

## 4. CONCLUSION

The following conclusions are drawn.

1. It was concluded that cricket players have more cognitive anxiety as compared to handball and volleyball players
2. It was concluded that handball players have more somatic anxiety as compared to cricket and volleyball players
3. It was concluded that handball players have more self-confidence as compared to cricket and volleyball players
4. It was concluded that cricket players have more self-confidence as compared to cognitive anxiety and somatic anxiety in cricket players
5. It was concluded that handball players have more self-confidence as compared to cognitive anxiety and somatic anxiety in handball players
6. It was concluded that volleyball players have more cognitive anxiety as compared to somatic anxiety and self-confidence in volleyball players.

## REFERENCES

- Athan, A.N., and Sampson, U.I. Coping with pee-competitive anxiety in sports competition. *Eur J Nat Appl Sci*, 2013, 1(1), 1-9.
- Burton, D. Do anxious swimmers swim slower? Reexamining the elusive anxiety performance relationship. *J Sport Exerc Psychol*, 1988, 10, 45-61.
- Caruso, D.R., Mayer, J.D., and Salovey, P. Relation of an ability measure of emotional intelligence to personality. *J Pers Assess*, 2002, 79, 306-320.
- Eysenck, M.W., and Van Brum, J. Trait anxiety, defensiveness and the structure of worry. *Pers Individ Dif*, 1992, 13, 1285-1290.
- Kerketta, I. A comparative study of sports competition anxiety between district levels male volleyball and soccer players. *Int J Phys Educ Sports Health*, 2015, 1(3), 53-55.
- Qureshi, D.R. Comparative study of anxiety test between college level table tennis and volleyball players. *Sch Impact*, 2015, 2(1), 41-44.
- Sarason, I.G., Pierce, G.R., and Sarason, B.R., (eds). Domains of cognitive interference. In: *Cognitive Interference: Theories, Methods, and Findings*. Mahwah, NJ: Erlbaum; 1996. p. 139-152.
- Schwarzer, R. Thought control of action: Interfering self-doubts. In: Sarason, I.G., Pierce, G.R., and Sarason, B.R., (eds). *Cognitive Interference: Theories, Methods, and Findings*. Mahwah, NJ: Erlbaum; 1996. p. 99-115.
- Simon, J.A. and Martens, R. Children's anxiety in sport and nonsport evaluative activities. *J Sport Psychol*, 1979, 1, 160-169.
- Ampofo-Boateng, K. *Understanding Sport Psychology*. Selangor, Malaysia: UPENA; 2009.
- Cox, R.H. *Sport Psychology: Concepts and Applications*. 7<sup>th</sup> ed. New York: McGraw-Hill; 2012.
- Heather, B. Psychology: Motivation, Anxiety, Confidence and Goal Setting; 2010 Available from: <http://www.soccernh.org>.
- Humara, M. The relationship between anxiety and performance: A cognitive-behavioral perspective. *Online J Sport Psychol*, 2001, 1(2).
- Humphrey, J.H., Yow, D.A., and Bowden, W.W. *Stress in College Athletics: Causes, Consequences, Coping*. Binghamton. New York: The Haworth Half-court Press; 2000.
- Diagram Group. *Rules of the Game*. New York: Paddington Press; 1974. p. 126.
- Available from: <http://www.google.com>.
- Available from: <http://www.pubmed.com>.
- Available from: <http://www.rediffmail.com>.
- Available from: <http://www.medlin.com>.
- Available from: <http://www.yahoo.com>.

# Knee-injuries in Badminton: A Study

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## ABSTRACT

The performance of the player in the game is directly related to physical fitness of the concerned player. Mere rehabilitation of injured players is not sufficient to improve the performance; it also needs good awareness, management, and training of players. Knee injuries directly affect the performance of badminton players. The present study attempts to analyze, discuss the major causes and types of knee injuries of 50 university badminton players. Out of 50 incidences of knee injuries, about 60% knee injuries occurred due to jump and smash and round the head toss, followed by imperfect knowledge of skills (16%), lack of proper surface (8%), lack of proper shoes (6%), lifting (6%), dribble (4%) medial collateral ligament, and lateral collateral ligament knee injuries are highest (70%) among badminton players. To improve the physical fitness and performance of the badminton player, the investigator recommended: (1) Proper training of player under trained coaches, (2) awareness creation about major causes and types of knee injuries, (3) development of wooden and synthetic courts with proper required infrastructure, and (4) encouragement to players for punctual exercise.

**Keywords:** Medial collateral ligament and lateral collateral ligament, Physical fitness, Rehabilitation.

## 1. INTRODUCTION

Badminton is a versatile game. It needs physical fitness in great extent. Badminton is vigorous and speedy movement event. Badminton is a highly exhaustive game in which the explosive movements are required to play better competitive badminton. Although the technical and tactical factors are also very important, without having adequate or the optimum level of physical fitness, one cannot utilize his technical, and tactical efficiency. The game requires an enormous amount of agility and speed endurance along with reflex action and accuracy.

The previous study in badminton state that the injuries in badminton, adversely affected on the performance of badminton player. Most injured badminton players leave the practice or due to injuries, they are forced forest within the competition. It affects the performance of players.

Badminton courts are both wooden and synthetic which has vigorous frictions that cause knee injuries. Most of the knee injuries occur in badminton competition and at the time of practice/physical training. Knee injuries adversely affect the performance of badminton players.

Therefore, the analysis of knee injuries in particular game enables the players and coaches to undertake remedial measures and precautions.

Within the off season period due to overload training, the prime and assistant muscles developed strongly. But at the same time, due to concentration on the development of fast movement and momentum, unfortunately, the muscles which resist the movement and momentum are less concentrated and neglected by trainer and trainee. It positively widens the possibility of injuries.

Knee injuries and their rehabilitation and management have greater challenge before players and coaches. Knee injuries joint is the most complicated joint in the human body with the maximum number of ligaments and allied connected tissues to prevent various, valgus, varus hyperextension and rotatory monuments. The knee injuries constitute major share in the total number of lower limb trauma seen in physically active sportsmen.

The present study attempts to analyze the causes, classification and management of knee injuries in badminton.

**Table 1: Cause-wise classification of knee injuries in badminton**

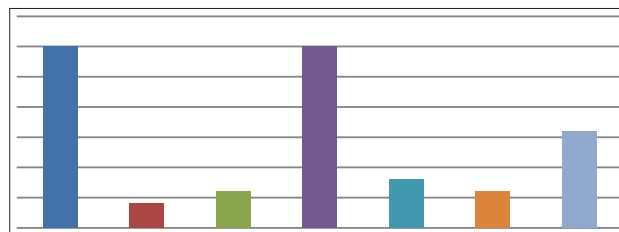
	Jump and Smash	Dribble	Lifting	Round the head toss	Lack of proper surface	Lack of proper shoes	Imperfect knowledge of skill	Total
No. of incidence	15	2	3	15	4	3	8	50
% to total injuries	30	4	6	30	8	6	16	100

## 2. METHODOLOGY AND SCOPE OF RESEARCH PAPER

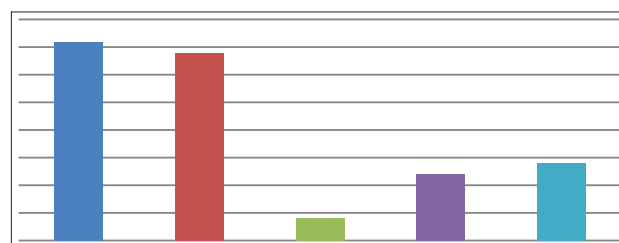
Fifty knee injured university badminton players were selected. The incidence and causes of knee injuries were noted. The medical reports of injured players such as X-ray, EMIR, and laparoscope are considered for the study. Most of the data were collected through the oral information given by injured players and documents of medical treatments. Wherever necessary, mathematical treatments have been given to collect data, so for, the area selected for the study was Nanded District.

### 2.1. Analysis and Findings

Out 50 incidences of knee injuries about 30% knee injuries occurred due to jump smash and round the head toss skills, followed by imperfect knowledge of various skills (16%), lack of proper surface (8%), lifting and lack of proper shoes (6%), and dribble (4%) of total knee injuries in badminton. Following graph shoe distribution of causes behind 50 knee injured badminton players.



**Graph 1: Percentage of injuries of badminton players and causes**



**Graph 2: Percentage of injuries of university badminton players with respect to their nature**

MISL – Injuries to the menisci of the knee, patella femoral syndrome (PFS), etc.

\*MCL injuries are higher (36%) in badminton players, followed by LCL (34%), miscellaneous (14%), CFF (12%), and FP (4%).

### 2.2. Causes of Injuries

**Table 2: Types of knee injuries in badminton**

	MCL	LCL	FP	CFF	Mislanious	Total
Nature of knee injuries	18	17	2	6	7	50
% to total injuries	36	34	4	12	14	100

MCL: Medial collateral ligament, LCL: Lateral collateral ligament, FP: Fracture of patella, CFF: Condylar fracture of femur

### 2.3. Types of Injuries

MCL – Medial collateral ligament

LCL – Lateral collateral ligament.

FP – Fracture of patella

CFF – Condylar fracture of femur.

### 2.4. Knee injury Rehabilitation and Management

The science of rehabilitation of knee injured badminton players is different from the sedentary person since their training program is the main focus and a matter of concern by the player, coaches and physician extensive rehabilitation program is needed for quick recovery and return the sports field. MCL and LCL injuries are highest among knee injured badminton players, in Nanded District. Immediate treatment is to apply “hydro therapy,” i.e., ice with the compressive wrap for 20 min and repeated every 3–4 h for the first 24–48 h. It also requires to restrict the movement of the knee. If the player is not fit to play, he should immediately be admitted to the hospital for further treatment.



### 3. CONCLUSION AND RECOMMENDATION

- Give them proper training under trained coaches
- Create the knowledge of knee injuries, causes, and types in badminton
- Provide them well-developed badminton court with all infrastructures
- Encourage them for punctual exercise and healthy diet
- Proper exercise lead of exercise should be scientific-based
- Follow through of concerned skill should be imported in training
- Proper shoes with proper grip should be used within the practice as well as within competition.

### REFERENCES

1. Management and Rehab of SP. Injuries O'Donghiue; 1984. p. 677.
2. Hutchinson, M., and Ireland, L. Knee injuries in female athlete. *Sports Med*, 1994, 19(4), 298-302.
3. Physical Training for Badminton by Boomosegaard. 1996. p. 4-6.
4. Kulund, D. *The Injured Athlete*. United States: Lippincott Williams and Wilkins; 1982. p. 201.
5. Fedrikson, M. Common injuries in runner-diagnosis, rehabilitation and prevention. *Sports Med*, 1995, 21(1), 142-146.
6. Garrick, J.G., and Webb, D.R. *Sport Injuries-diagnosis and Management*. Philadelphia, PA: Saunders; 1990.

# Importance of Yoga in Health and Sports

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## 1. INTRODUCTION

An intelligent yoga practice, when coupled with sports specific training, will increase mental concentration and significantly reduce levels of stress and anxiety. Yoga can also help the athlete feel better about their body by increasing strength, flexibility, and body awareness. It is very difficult for an athlete to encounter a true yogic experience, as they are naturally competitive and hard on themselves. Athletes are likely to push themselves physically, ignoring cues, and signs of pain in the body. A yoga practice will encourage a different level of body awareness. Yoga will encourage the athlete to listen to their body and note the difference between pain and discomfort. This will allow the athlete to prevent injury and possibly rehabilitate injury at a more appropriate pace. The yoga mat can offer a safe space for the athlete to remove their competitive nature and receive a much needed mental break from the pressures of the playing field. Yoga plays an important role in the sports. In sportsperson for various purpose in sports. Yoga improves their concentration. It helps in developing physical fitness and it is also good for relaxation, good for rehabilitation after injury. Yoga is for everyone, athletes included. Yoga works on strength, flexibility, balance, agility, endurance, core, and overall strength, among other things.... In particular, athletes in sports that require swinging action (tennis, golf, etc.) can benefit greatly. Flexibility in general also helps to prevent injury. Sports psychology is the study of how psychology influence sports, athletic performance, exercise, and physical activity. Some sports psychologists work with professional athletes and coaches to improve performance and increase motivation. The practice of yoga improves the psychological aspects of the individual.

The word "yoga" means "to join to Yoke together." It bright the body-mind together to become a harmonious experience. Man is physical, mental, and spiritual being; yoga helps promote a balanced development of all the three. Yoga is a method of learning that aims at balancing "Mind, Body, and Spirit." Yoga is a practice with historical origins in ancient Indian philosophy. The

ancient practice of yoga is thousands of years old. It was first brought to India 3500 years ago by nomads from central Asia practicing an intellectual discipline they referred to as "Yoga." It was a way of using the mind to restrain the sense and control the body. The main tradition practiced in Western Europe in Hatha Hoga which is based on the Hatha Yoga Pradipika, which is a sort of manual of Patanjali's Yoga Sutras. It describes how to train the body so that it can be used as a mean of enlightenment.

The Bhagavad Gita, the Yoga Sutras of Patanjali and the Hatha Yoga Pradipika all form the central concepts of yoga's philosophy of life. Yoga techniques were summarized from the first time by Patanjali so as to bring a practical form of yoga to the people. A total of 195 sutras were written in short, concise meaningful sentences. As in modern-day psychology, they are explanations of the nature of the mind, how it works and the obstacles, difficulties, and emotional disturbances that can affect its functioning in terms of self-knowledge and reflective action. Patanjali recommended an "Eight-Limb Path's" a way to change the mind positively. He believed that one of the minds fundamental characteristics was its inability and refusal to stay in the "here and now." He described it as a monkey jumping from one branch of thought to another. As you will hear me described in any of my classes, the mind is always wandering and being rebellious, never focusing on the moment, but instead getting distracted by past events, future plans, and all the sensations it has to process in the meantime. As it is led by thought patterns, habits, doctrines, perceptions, and conditioning have been learned and instilled over the lifetime of the person. These behaviors, thoughts, and attitudes have been reinforced through repetition, regardless of whether they are good or bad, right or wrong.

### 1.1. Important Components of Pranayama Are

1. Puraka intends to inhale
2. Kumbhaka intends to retain the breath
3. Rechaka intends to exhale.

## 2. TYPES OF PRANAYAMA

1. Surya Bhedana Pranayama
2. Sheethkari Pranayama
3. Bhastrika Pranayama
4. Moorcha Pranayama
5. Ujjayi Pranayama
6. Shitali Pranayama
7. Bhramari Pranayama
8. Plavini Pranayama
9. Samavritti Pranayama
10. Kapalbhatai Pranayama
11. Nadi Shodhana Pranayama.

## 3. ASANAS

Asanas imply holding body in a specific stance to bring stability to the body and balance to the brain. Types of asanas:

1. Padmasana
2. Vajrasana
3. Sukhasana
4. Trikonasana
5. Bhujangasana
6. Chakrasana
7. Tadasana
8. Halasana
9. Salabhasana
10. Dhanurasana
11. Savasana.

## 4. TYPES OF YOGA

There are different sorts of yoga. There are particular advantages of particular yoga. Some of imperative yoga are depicted beneath:

- Karma yoga (yoga of action)
- Jnana yoga (yoga of knowledge of wisdom)
- Hatha yoga (yoga of achieving physical and mental purity)
- Raja yoga (yoga of enlivening the psychic awareness and facilities)
- Mantra yoga (yoga of liberating the brain)
- Laya yoga (yoga of conscious disintegration of individuality)
- Bhakti yoga (yoga of extraordinary dedication).

## 5. EIGHT LIMBS OF YOGA

Yama – dealing with the world around us. This is our moral code of conduct. These are the moral principles

that govern the way you treat others and the world around you.

Niyama – dealing with yourself. These are five observances or rules of conduct, by which we should live our lives, i.e., purity, modesty, contentment, discipline, self-study, and acknowledgment of our own limits.

Asana – dealing with the body. These are the physical postures or exercise in yoga.

Pranayama – dealing with breathing. This is the conscious control of energy by practicing controlled breathing techniques.

Pratyahara – dealing with the sense. This denotes the withdrawal of the sense. It reaches us to close the doors to the senses so that the mind can still be aware of external stimuli but no longer responds to them.

Dharana – concentration. This is the ability to focus our entire concentration on one object, one question, or one consideration and keep it there.

Dhyana – meditation. This is an interaction with the object of concentration, whereby we become observes and views the object intuitively, free from subjective notions. It is an acceptance.

Samadhi – the absolute: The inner freedom. This is the complete feeling of being at one with the world. Knowledge of the true self. Ultimate enlightenment and inner happiness.

## 6. IMPORTANCE OF YOGA IN HEALTH AND SPORTS

Mental control: Yoga is useful in mental control, with the help breathing focusing techniques the levels of stress and tension can be decreased. Just a trail personality can give a better outcome in games performance.

Improve inner strength: Yoga can help us in upgrade our life. Really, that might be its most noticeable quality. It upgrades our determination power and it will enhance performance in general life and sports activities.

Improve flexibility: Flexibility is extremely essential for human body. On the off chance that your body is flexible then you will have the capacity to do errand effectively and productively. A similar way flexibility is the most essential thing for a sports person, it can save from different sorts of injuries.

Improve breathing function: Maximal lung health is essential for sports individual, particularly for the individuals who participate in aerobic-based sports, they require proficient lungs to deliver adequate oxygen intake.

Eases pain: Different reviews have found that asana can help in lessening the agony such as back torment, joint torment, and neck torment. Releasing torment can result in enhancing the level of bliss and activeness. Diverse exercises of games can bring about torment because of physical diligent work, so athletes can take profit from asana by eliminating the use of medications.

Increase blood flow: Yoga gets your blood streaming. It helps in the development of various types of cells like red blood cell (RBC), white blood cell (WBC), and platelets. RBC carries oxygen to the tissues. WBC enhances antibodies and platelets are useful in thickening of blood.

Improve concentration: Concentrate/or/is vital for all. It implies focusing on an assignment. It is vital in general and sports life if the concentration power is strong then an athlete can give better performance. A few games such as archery and shooting depend on fixation control. Yoga helps in enhancing concentration force of brain, which improve the proficiency of work.

Improve internal organs efficiency: Pranayama and asana enhance the worn productivity of our body's internal organs such as stomach-related framework, immune framework, respiratory framework, and so on.

#### 1. Physiological and physical benefits

- Reduced sympathetic dominance/increased parasympathetic activation
- Reduced blood pressure
- Reduced resting heart rate
- Reduced cholesterol
- Reduced blood glucose levels
- Improved lipid profile

- Decreased body weight
- Reduced waist-hip ratio
- Increased strength
- Increased core stability
- Increased balance.

#### 2. Cognitive benefits

- Improved concentration
- Sharper focus
- Increased mental clarity
- Increased ability to be present.

#### 3. Psychological (mental health, emotional) benefits

- Reduced sleep and sleep disturbance
- Reduced anxiety and negative effect
- Reduced depression
- Increased feelings of well-being
- Positive shifts in locus of control
- Improved coping.

## 7. CONCLUSION

Yoga is extremely essential in our life; it is enhancing our living standard, by adapting yoga in our life, we can remain strong by eliminating the danger of general medical issues. Yoga is the best a free treatment for skin, digestion, joint torment issues, etc. It can save us from diabetes, pulse issues, and obesity. Thus, yoga is helping us from the antagonistic impact of medications. Competition in sports is expanding day by day. Players confront such a large number of issues such as anxiety, pressure uneasiness, concentration, fear obesity, and sleeping disorder. These issues impact performance of games individual and impact of these issues can be reduced with assistance of yoga.

## REFERENCES

- (1) Sharma, V.K. *Health and Physical Education*. New Delhi: New Saraswati House.
- (2) Singh, A., Bains, J., Gill, J.S., and Brar, R.S. *Essential of Physical Education*. Kalyani Publishers.
- (3) Wuest, D.A., and Bucher, C.A. *Foundation of Physical Education and Sports*. London: McGraw-Hill; 1992.

# A Comparative Study of Physical Fitness among State Basketball and Hockey Players of Uttar Pradesh

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## ABSTRACT

Fitness denotes a person status of physique in relation to its physical achievements. The latest scientific evidence also edicts the fact that for internal or physiological soundness, physical fitness is necessary. Modern physical educators divided the factor of fitness into skill-related and health-related physical fitness. Physical fitness refers to the capacity of an athlete to meet the varied physical demands of their sport without reducing the athlete to a fatigued state. The components of physical fitness are strength, endurance, speed, flexibility, and coordination. For this study, 15 female state level basketball players and 15 female state level hockey players of Uttar Pradesh were selected as the subjects. All the players were specialized in basketball and hockey and undergoing training at the different centers/clubs in Uttar Pradesh. State level female hockey players have better average performance than state level female basketball players in speed. State level female hockey players are not having better average performance than state level female basketball players in  $10 \times 6$  m shuttle run. Basketball players are better than female hockey players in Bent and Reach component. The average performances of state level female hockey players are higher than state level female basketball players in endurance. The calculated value of *t*-ratio was higher than the tabulated value required at 0.05 level of confidence. The results of the study when compared with physical fitness of both the groups showed that both are not equal in physical fitness.

**Keywords:** Basketball players, Hockey players, Physical fitness, State level.

## 1. INTRODUCTION

Fitness is the term, which is widely used in the present-day health-conscious society. The people have realized the importance of fitness in day-to-day routines and also in achieving sports excellence. Fitness denotes a person status of physique in relation to its physical achievements. The latest scientific evidence also edicts the fact that for internal or physiological soundness, physical fitness is necessary. Modern physical educators divided the factor of fitness into skill-related and health-related physical fitness. It is also an undesirable fact that the health-related physical fitness, which is the main concern for physical educationists, is depended on the skill-related physical fitness of an individual. It is also a high concern for a coach to develop various skills and for this, the sportsperson's skill-related physical fitness should be upgraded and developed. Physical fitness refers to the capacity of an athlete to meet the varied physical demands of their sport without

reducing the athlete to a fatigued state. The components of physical fitness are strength, endurance, speed, flexibility, and coordination.

Physical fitness is one component of total fitness of an individual. Total fitness is a result of the genetic makeup and the interaction with the environment. The totally fit individual is psychologically stable, mentally alert, emotionally balanced, and socially adjustable to different circumstances prevailing in the society. For successful motor sequence to achieve, an accurate and efficient movement is needed whether it is a single effort as in a golf drive or a series of complex and rapidly changing movements as in basketball.

There is a significant impact of modern technology on human living. His muscles, on which he used to rely entirely for survival, are now used for less and less with inevitable results. Many researchers in such divergent fields as medicine, psychology, and



physiology, however, attest to the fact that exercise with attendant development of fitness has far-reaching effects on vital bodily processes and on the functional realization of one's growth and capabilities.

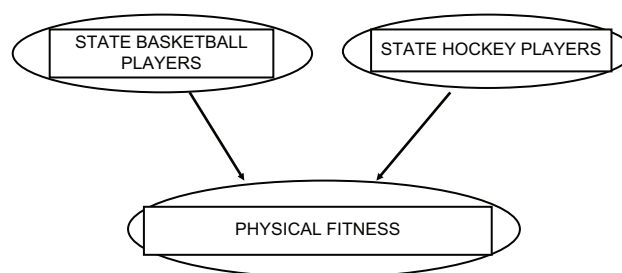
Sharma (1980) undertook a study to find out the effects of selected training programs of 6 weeks duration on the physical fitness and the motor ability of the B.Ed. women students. To carry out the study, the students were divided into five groups (31 each), of which four were experimental and one controlled group. The experimental groups were given training in calisthenics, circuit training, isotonic and isometric, and yogic exercises, whereas the students of control group were not given any training schedule. The finding of the study revealed that the isotonic and isometric exercises are best suited for the development of physical fitness, whereas circuit training is more suitable for developing general motor ability at 0.01 level of significance. Other two training methods, namely, yogic exercises and calisthenics also proved beneficial to a certain extent in the development of physical fitness and motor abilities.

Uppal and Roy (1987) conducted a study to assess the motor fitness components as a predictor of soccer playing ability. Male soccer players ( $n = 200$ ) were selected for the study. They were administered five tests of motor fitness components, namely, speed (50 yard dash), agility ( $4 \times 10$  m shuttle run), maximum leg strength (by dynamometer), explosive leg strength (standing broad jump), and cardiorespiratory endurance (Cooper's 12 min run/walk test). The soccer playing ability was assessed with the help of a panel of three judges. Statistical treatment of the data shows that all the independent variables (speed, agility, maximum leg strength, explosive leg strength, and cardiorespiratory endurance) have been found to be significantly related to the dependent variable (soccer playing ability). The regression equation developed was  $= 11.72$  (standing broad jump)  $+ 0.52$  (Cooper's 12 min run/walk test horses in 100<sup>th</sup> unit)  $- 2.06$  ( $4 \times 10$  m shuttle run)  $+ 4.94$ .

Gupta *et al.* (2002) conducted a study of the physical fitness spinal mobility and flexibility in footballers. The study deals with physical fitness, spinal mobility, and flexibility of 95 footballers of national and inter-university levels. The players' performance was compared with adequate controls. Three physical fitness tests, namely, sit-ups, standing broad jump and shuttle run, anterior and lateral spinal flexion, and spinal extension were conducted on all the subjects. The result of this study indicated a greater physical fitness in

footballers than control showing significant differences in sit-ups ( $t = 4.30$  for males and 5.76 females), standing broad jump ( $t = 7.12$  for males and 10.2 for females), shuttle run ( $t = 4.79$  in males), anterior spinal flexion ( $t = 3.24$  in males and 2.20 in females), lateral spinal flexion (value = 4.45 in males and 2.40 in females), and spinal extension ( $t = 2.27$  in males and 2.20 in females).

## 2. DESIGN OF THE STUDY



## 3. TOOLS USED

1. 30 m sprint: Standard electronic stopwatch
2.  $10 \times 6$  m shuttle run standard electronic stopwatch
3. Bent and Reach measuring tape (inches/centimeters), 2 ft stool
4. 2.4 km run standard electronic stopwatch.

## 4. SAMPLE OF THE STUDY

For this study, 15 female state level basketball players of Uttar Pradesh and 15 female state level hockey players of Uttar Pradesh were selected as the subjects. All the players were specialized in basketball and hockey and undergoing training at the different centers/clubs in Uttar Pradesh.

Table 1 indicates that the comparison of all variables, namely, 30 m sprint,  $10 \times 6$  m shuttle run, Bent and Reach, and 2.4 km run in respect of female state level basketball and hockey players of Uttar Pradesh. The calculated value of mean and standard deviation on the first variable shows in 30 m sprint 5.1293, 0.2085 and 5.2533, 0.2437, respectively, in respect of female state level basketball and hockey players of Uttar Pradesh. There is a little variation as the mean value of female basketball players is less than female hockey players and this can be interpreted that in this variable, hockey players are better than basketball players. The calculated value of mean and standard deviation on the second variable shows in  $10 \times 6$  m shuttle run

**Table 1: Comparison of physical components of state level basketball and hockey players of Uttar Pradesh**

Motor components	Subjects	Number of players	Mean	Standard deviation	Standard errors
30 m sprint	Basketball players	15	5.1293	0.2085	5.385E-02
	Hockey players	15	5.2533	0.2437	6.292E-02
10×6 m shuttle run	Basketball players	15	16.7673	0.6904	0.1782
	Hockey players	15	16.5347	0.3854	9.951E-2
Bent and Reach	Basketball players	15	15.6667	4.8648	1.2561
	Hockey players	15	12.0667	2.5204	0.6508
2.4 km run	Basketball players	15	11.1280	1.1530	0.2977
	Hockey players	15	12.2733	1.3207	0.3410

16.7673, 0.6904 and 16.5347, 0.3854, respectively, in respect of female state level basketball and hockey players of Uttar Pradesh. There is a little variation as the mean value of female basketball players is higher than that of hockey players and this can be attributed that in this variable, female hockey players are not better than female basketball players. The calculated value of mean and standard deviation on the third variables shows in Bent and Reach 15.6667, 4.8648 and 12.0667, 2.5204, respectively, in respect of female basketball and hockey players of Uttar Pradesh. There is a little variation as the mean value of female basketball players is higher than that of female hockey players and this can be explained that in this variable, state level basketball players are better than state level hockey players.

The calculated value of mean and standard deviation on the fourth variables shows in 2.4 km run 11.1280, 1.1530 and 12.2733, 1.3207, respectively, in respect of female state level basketball and hockey players of Uttar Pradesh. There is a little variation as the mean value of female state level basketball players is less than female state level hockey players and this can be explained that in this variable, female state level hockey players are better than female basketball players.

## 5. CONCLUSION

Based on the results of the above study, the investigator has drawn the following conclusions:

State level female hockey players have better average performance than state level female basketball players in speed. This speaks that 30 m sprint is speed event, which comes under sprinting distance. Hence, state level female hockey players are already having good speed and can cover 30 m sprint in less time compared to female basketball players. The reason is that female

hockey players of Uttar Pradesh training schedule include mostly activities such as strength training, explosive strength training, and speed training.

State level female hockey players are not having better average performance than state level female basketball players in 10 × 6 m shuttle run. This speaks that state level hockey players are not having good speed and agility. To improve speed and agility sports, female state level basketball players play the games which improve the agility such as the kho-kho, handball, volleyball, and short races. The average performances of state level female basketball players are better than female hockey players in Bent and Reach component. This speaks like that they are having good flexibility. To improve the flexibility in the body, their training schedule includes stretching, i.e., individual and partner stretching, individual flexibility, and partner flexibility.

The average performances of state level female hockey players are higher than state level female basketball players in endurance. To find out whether there is any significant difference among hockey players and basketball players of Uttar Pradesh, *t*-ratio was tabulated.

The calculated value of *t*-ratio was higher than the tabulated value required at 0.05 level of confidence. The results of the study when compared with physical fitness of both the groups showed that both are not equal in physical fitness.

This speaks that female state level basketball players and state level female hockey players of Uttar Pradesh do regularly two practice sessions in the morning and evening with each of 2–3 h duration daily. Their training schedule opted aimed to improve speed, strength, endurance, agility, etc., for achieving the high level of sports performance.

## REFERENCES

- Harrison, C.H., and David, C.H. *Research Process in Physical Education*. New Jersey: Prentice Hall Inc., Engle Wood Cliffs; 1984. p. 203.
- Bucher, C.A. *Foundation of Physical Education and Sports*. St. Luis, Missouri: C.V.M. Mosby Company; 1983. p. 143.
- Gupta, A., Sandhu, J.S., and Koley, S. A study on the physical fitness, spinal mobility and flexibility in footballers. *Indian J Sports Stud*, 2002, 6(1), 1-5.
- Kamlesh, M.L., and Sangral, M.S. *Principles and History of Physical Education*. Ludhiana: Prakash Brothers Educational Publishers; 1988. p. 34.
- Sharma, U.S. *A Comparative Study of the Effects of the Selected Training Programmes on Physical Fitness and General Motor Ability of Women Students*. New Delhi: Unpublished Doctoral Thesis, University of Delhi; 1980.
- Uppal, A.K., and Roy, P. *Assessment of Motor Fitness Components as Predicators of Soccer Playing Ability*. Vol. 3. U.S.A: SNIPES; 1987. p. 46-49.

# A Comparative Study of Yoga in Physical Education, Telangana

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## ABSTRACT

The aim of the present article is the role of some yoga elements in physical education and sports. Yoga is one of the Indian philosophical systems that emphasize the importance of the work with the body to develop healthy behaviors and thoughts. Among all its techniques, the physical postures, called asana in Sanskrit, are the ones that got. It is necessary to remember that sports and gymnastics belong to the scope of physical education. Once there was a time when people said "it is not the winning itself but the competing nobly that really matters," when the place where competitions took place was sacred and the respect between competitors was essential. In our modern society, the term physical education has been understood in different ways. Some say that it is the "education of the body," which is educating the body to achieve some skills and abilities as it is done, for example, in sports. Others think that it is the "education to the body," which is working out only to improve one's looks. Unfortunately, this is the main reason why people join gyms, especially before the summer. In fact, the expression of physical education originally means "education through the body." It is using the work with the body as a strategy to reach the noblest goals of education: Autonomy and ethics in our relationships with each other and the environment. It is necessary to remember that sports and gymnastics belong to the scope of physical education. Once there was a time when people said that "it is not the winning itself but the competing nobly that really matters," when the place where competitions took place was sacred and the respect between competitors was essential. Both yoga and physical education in their origin use the body as a tool for developing attitudes and abilities that are important to achieve physical and mental health. Nowadays, they can be considered complementary subjects. While the West developed the aerobic conditioning and the sports training and focused on its relationship with good health, the East pursued the same goals through concentration and relaxation.

**Keywords:** Exercise, Physical education and sports, Science, Yoga.

## 1. INTRODUCTION

The word "yoga" means "to join or Yoke together." It brings the body and mind together to become a harmonious experience. Man is a physical, mental, and spiritual being; yoga helps promote a balanced development of all the three. Yoga is a method of learning that aims at balancing "Mind, Body, and Spirit." Yoga is a practice with historical origins in ancient Indian philosophy. Yoga is distinctly different from other kinds of exercise as it generates motion without causing strain and imbalances in the body. Other forms of physical exercises, like aerobics, assure only physical well-being. They have little to do with the development of the spiritual or astral body. Yogic exercises recharge

the body with cosmic energy and facilitates. They have little to do with the development of the spiritual or astral body. Yogic exercises recharge the body with cosmic energy and facilitates.

## 2. BENEFITS FOR PHYSICAL EDUCATION

Yoga is then commonly taken as a system of physical education with a spiritual component, although the truth is the reverse: Yoga is a spiritual system with a physical component. The practice of asana is yet only a small part of the complete system of physical culture and education known as Hath Yoga. Role of yoga in education from

various angles including the type of education that was being provided to children throughout the world as well as the different levels of stress that children face in the classroom environment. The difficulties, problems, conflicts, distractions, and dissipation of their energies were also considered. We started using certain principles and practices of yoga, first, as an experiment to increase the children learning ability and, second, to inspire teachers to teach their subjects in a slightly different way. Our belief was, and still is, that we are educating our children without considering or caring for the growth of their entire personality. We are cramming their brains and minds with information without creating any support group outside the classroom environment where they can continue to imbibe education. We have to look at what science says about the growth of a child, what psychoanalysis says about child psychology, and how the hormones and glands alter and influence the rationality, emotional structure, and creative output of the child.

### 3. BENEFIT FOR SPORTS

Sports can lead to injury because of its repetitive nature and the resulting musculoskeletal imbalances. On a physical level, yoga restores balance and symmetry to the body, making it the perfect complement to sports. Runners are often drawn to yoga to deal with specific issues, such as improving flexibility or helping with an injury. Yet, many are shocked at the world it opens for them, specifically, the strengthening capacity, and the use of muscles they never knew they had. Let's take a closer look at the effects of yoga, both physical and mental, on runners.

Physical changes when we see practically in schools.

As seen in the preceding definitions, yoga encompasses more than mere physical postures. Nonetheless, the physicality of yoga is what draws most people to their first yoga class. The following summarizes the physical benefits that sportpersons can expect from yoga.

#### 3.1. Flexibility

Many sportsperson cite greater flexibility as the number one reason for beginning a yoga practice. This is a good reason because yoga stretches the muscles that are tight, which, in turn, increases the range of motion in related joints. Increased flexibility decreases stiffness, results in greater ease of movement, and reduces many nagging aches and pains.

#### 3.2. Strength

Like runners are strong in ways that relate to running. However, a running stride involves only the lower body and movement in one plan sagittal (i.e., forward and backward). Thus, certain muscles become strong while others are underused and remain weak. Runners have strong legs for running, but when faced with holding a standing yoga pose, they are quite surprised to find that their legs feel like jelly. This is simply because a properly aligned yoga pose involves using all the muscles in a variety of planes. The muscles that are weak fatigue quickly and those that are tight scream for release – thus, the jelly leg syndrome. In addition, a by-product of becoming stronger is greater muscle tone. Yoga helps shape long, lean muscles that do not hinder free range of movement in joints.

#### 3.3. Biomechanical Balance

Overusing some muscles while underusing others creates muscular imbalances, which affect the entire musculoskeletal balance and impairs biomechanical efficiency. For mostly sportpersons, biomechanical imbalances eventually lead to pain and injury. Depending on the action, a muscle is either contracting (i.e., an agonist) or lengthening (i.e., an antagonist). For example, if you make a fist and lift your forearm, the biceps contracts while the triceps stretches. If you want showy biceps and do repeated biceps curls to pump up the muscle, the triceps will shorten and you could lose the ability to straighten your arm. A healthy balance is to work to both contract and stretch to maintain muscle equilibrium as well as functionality. For example, when stretching the hamstrings, the quadriceps need to contract. This coordinated action not only creates a deeper and safer hamstring stretch but also provides an opportunity to strengthen the quadriceps, especially the inner quadriceps, which are weak in many runners.

This is crucial for runners because the hamstrings most likely need lengthening while the commonly weak inner quads need strengthening. Every yoga pose is a balance of stability (muscles contracting and strengthening) and mobility (muscles stretching and lengthening). At no time is only one muscle group used. Even the simplest yoga pose requires an awakening of every part of the body. Downward dog is an exemplary pose to demonstrate this. Following is a summary of the major muscle actions in this fundamental pose.

#### 3.4. Improved Breathing

Lung capacity is of prime importance for players because it creates the ability to maintain an even breathing pattern



through all phases of running. The better the lung capacity is, the more oxygen is circulated through the system, which is most helpful for running long and strong. However, the breathing pattern used in running and other forms of aerobic exercise involve quick and shallow inhalations and exhalations. This uses only the top portion of the lungs, leaving the middle and lower portions untouched. Yogic breathing involves slow, deep inhalations and long exhalations, making use of the upper, middle, and lower portions of the lungs. Yogic breathing has been shown to increase lung capacity, and greater lung capacity increases endurance and improves overall athletic performance. In Sanskrit, prana means “energy,” and yogic breathing is called pranayama. Through the breath, you bring in oxygen, feeding your cells and creating vital life force, and remove carbon dioxide, eliminating toxins. The use of the breath in yoga is vital. Whereas holding the breath creates internal tightness, tension, and anxiety, deep breathing releases tension, reduces stress and anxiety, and physically helps the body ease into poses, particularly those that are challenging. Through this conscious breathing, the body is energized as a result of increased oxygen circulation throughout all of its systems.

#### 4. CONCLUSION

Yoga offers new learning possibilities to a wider group of students than traditional sports or fitness curriculum,

making it a valuable addition to any educational program. In addition, adding yoga to a school’s curriculum will help provide a quality physical education program as modification of traditional physical education yoga in sports as important as other think it helps us in different ways and different levels in a sportsmen life. Yoga can play a key role in cultivating mind control and concentration which helps a sportsperson to perform at their game. It offers children and adults an opportunity to experience success in physical activity, which can help build a foundation of strong of life. However, curriculum specialists, teachers, trainers, and students should know and analyze seriously the real challenges of yoga education in classroom settings and real life as well.

#### REFERENCES

- [1] Dune, D. *The Manual of Yoga*. London: W. Fauloshan and Co. Ltd.; 1956. p. 144.
- [2] Foiershtain, G. *Encyclopedia of Yoga*. Sofia: LIK; 2001.
- [3] Central Council of BSFS. Protocol № 22, Decision № 1/19.VI. 1989.
- [4] Bersma, D., and Visscher, M. *Yoga Games for Children: Fun and Fitness with Postures, Movements and Breaths*. California: Hunter House Finger, A; 2003.
- [5] Finger, A. *Introduction to Yoga: A Beginner’s Guide to Health, Fitness and Relaxation*. New York: Three River Press.

# Role of Physical Education in Promoting the Physical Literacy among Schools in Telangana State

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## ABSTRACT

Topic of physical literacy tells about the importance of physical education and physical activities for all age groups in our society. It helps in the turnout of the number of rural admission of both the genders in the government schools. It is also helps in increasing the physical fitness levels of the enrolled students and increases participating levels of individual students, increasing the cognitive ability of the students. Physical education gives all-round development of a person. It also helps the children to become good citizens of our country by preventing them from lifestyle diseases such as obesity, cardiovascular diseases, and diabetes. It also helps the person to become a social citizen by providing them leadership qualities, cooperation, emotional strength, emotional development, and well-balanced personality in our society. It can make you feel you happier. Exercising regularly can improve your mood and reduce the feeling of anxiety and depression. Physical literacy will help our citizens to know about the upcoming threats such as obesity and diabetes and increase awareness to prevent them; it helps the children by avoiding them from today's social evils such as drugs, addiction to social media. Physical literacy will reduce our risk of chronic diseases. At by conclusion, physical education will help the people by providing them physical, mental, and social awareness and produce an intellectual society.

**Keywords:** Mental health, Physical fitness, Physical literacy, Social awareness.

## 1. INTRODUCTION

Research on physical literacy will help the administrators and policy-makers to formulate the policies which are helpful for citizens to aware of the importance of physical activities in their life. It will help the government to implement educational policies with the significance of physical education as compulsory subject at all levels of their education, i.e., school, college, and university levels for their healthy life. It will give valuable information for policy-makers to evaluate policies to bring the naturally talented players from grassroot levels of our society and mold them as Olympic winners. Prevention is better than cure, so physical literacy helps the government to implement this through educational programs to reach this to grassroot levels of our society, it helps us to establish new courses colleges and universities. Education should provide all-round development of a person, i.e., physical, mental, social, and vocational skills. It will help policy-makers to reduce psychological evils

such as depression and aggression and prevents them from to become as anti-social animals. It will help to formulate policies for tribal, low land, semi-urban, and rural areas. India is a country with unity and diversity, this can be achieved through promoting physical literacy among citizens of our country.

## 2. RESEARCH METHODOLOGY

There are various definitions of physical literacy. Long-term athlete development features five of these, but we have picked out three of the most well known.

Understanding the definitions can help fight childhood obesity and the rising inactivity among children. This problem needs to be addressed if we are to prevent the present generation of children from growing up unhealthily.

Research has also shown that without physical literacy, children can withdraw from physical activity and sport.

This can lead them to more inactivity and unhealthier choices during their lives. People need to feel confident in activity settings to enable them to be physically active in later life. This mainly comes from learning fundamental movement and sport skills as a child.

Physical literacy learning that integrates participant choice provides children with the opportunity to take ownership over their learning. It also encourages engagement in learning that matters most to the.

### 3. RESULTS

1. Elements of physical literacy: The elements of physical literacy are indicated below. Details are mentioned in Annexure to this G.O.
2. Body awareness and yoga
3. Movement skills
4. Rhythmic movements/group activities
5. Fun, creativity, leisure, and recreation
6. Multi environment exposure
7. Organized sports
8. Regional sports
9. Expressions/performance art.

### 4. CONCLUSION

Physical literacy will make us aware of the actual lifestyle of human beings. At first, parents should know about the importance of physical education and its importance in their life. Physical literacy will educate us to participate in physical activities which will improve physical strength which helps us to do our work more

productively. It will produce a healthy nation by preventing us from major chronic diseases.

Yoga and pranayama has become more popular from grassroot level in India to the world level similar importance of physical education which is achieved through physical literacy. Physical literacy will improve physical, mental, social, psychological, and emotional and improve moral values in us. At last, physical literacy will also improve nationalism, patriotism, and fraternity among citizens of our country.

### REFERENCES

1. Anshel, M.H. *Sport Psychology from Theory to Practice*. Scottsdale, Ariz: Gorsuch Scarrisbrick; 1997.
2. Vealey, R.S. *Psychology of Sports and Exercise*. In: Hoffman, S.J., and Harris, J.C., (eds). *Introduction to Kinesiology: Studying Physical Activity*. Champaign, III: Human Kinetics; 2000.
3. Caron, A.V. Group dynamics in sport and physical activity: Social psychological and performance consequences. *Int J Sport Psychol*, 1990, 21, 286-304.
4. Colman, A.M. *Oxford Dictionary of Psychology*. New York, USA: Oxford University Press Inc.; 2006.
5. Fisher, A.C. *Tests of Attentional Style for Volleyball, Diving, Soccer, Baseball, and field Hockey*. Ithaca, New York: Ithaca College.
6. Ikulayo, P.B. *Understanding Sports Psychology*. Lagos, Nigeria: EAITCN Press, Marina; 1990.
7. Levitt, E.E. *The Psychology of Anxiety Hillsdale*. New Jersey: Erlbaum; 1980.
8. Wuest, D.A., and Bucher, C.A. *Foundation of Physical Education, Exercise Science and Sport*. New York: McGraw-Hill; 2006.

# Relationship between Selected Fitness and Anthropometrical Parameters in Sports Population

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## ABSTRACT

The aim of the present work was to find out the relationship between selected fitness variables and anthropometrical parameters. The subjects for this study were 105 male sports persons belonging to various sports groups of Sports Authority of India schemes. The average age of the subjects was 15.54. Fitness parameters selected for the study were 30 m dash (Speed), 5, 10, and 15 m shuttle run (Agility) and 800 m run or walk test (endurance) and anthropometrical variables were height, weight, arm length, leg length, and foot length. There is a significant relationship between selected anthropometric and fitness variables. The “*r*” values found are statistically significant in almost all parameters. The height variable is considered to be the highly related variable with performance in 30 m run, 5, 10, and 15 m agility run and 800 m run and walk test with a value of 0.50, 0.574, and 0.408, respectively, in the subjects.

**Keywords:** Anthropometrical parameters, Endurance, Fitness, Speed.

## 1. INTRODUCTION

Sports performance is an end product of complex combination of several factors. Certain factors are dominate and other supportive. The ability to run at high speed, agility, and endurance is considered to be important prerequisite for achieving performance in competition or to improve performance determining factors during training for almost all the sports events.

Although the training is equally important to develop these abilities, at the higher level of competitions where the training is given to all the individuals, anthropometrical variables are of fundamental importance.

Nelson (1982) conducted a study to examine the AAHPERD test. The sample group was 12,362 boys and girls, ages 6–17 years, and found that age and body size characteristics are related to the test performance on all test items.

Rajni (1994) studied 20 there top ranking weight lifters belonging to three broad weight categories such as light class ( $n = 8$ ), medium class ( $n = 10$ ), and

heavy class ( $n = 5$ ). In the selected anthropometric measurements, the weight lifters of light, medium, and heavy classes have shown a gradient of increasing body measurement, i.e. the light class being the lightest and shortest and the heavy class being the heaviest and the tallest, with the middle class falling in between the both. *f*-ratio values are found to be highly significant in all the anthropometric variables such as age, body weight, and triceps among weightlifters of different weight categories.

Ward *et al.* (1979) reported anthropometric data relative to the performance of three masters and seven first-class Olympic weightlifters and found a positive relationship between body weight and the amount of weight lifted. A similar linear relationship was reported by Tappen (1950).

Brisswalter (1996) conducted a study to excess the relationship between running economy, stride length, and body dimensions. Body weight, body fat, height, sitting height, low extremity length (height – sitting height), relative low extremity length, leg length, thigh length, and foot length were determined. The results indicate an effect of the running speed on the

**Table 1: Mean and SD values of 30 m run, 5, 10, and 15 m agility run and 800 m run test performance and anthropometric measurements of the sports population**

	30 m run (s)	5, 10, and 15 m agility run (s)	800 m run (s)	Height (cm)	Weight (kg)	Leg length (cm)	Arm length (cm)	Foot length (cm)
Mean±SD	4.97±0.50	15.69±1.35	196.63±42.66	163.93±10.20	53.22±10.83	88.80±4.77	73.39±7.15	25.23±1.70

SD: Standard deviation

**Table 2: Relationship between anthropometrical variables and 30 m speed test, 5, 10, and 15 m agility test and 800 m run test performance**

Variables	30 m run test subjects (n=105) “r” value	5, 10, and 15 m agility test subjects (n=105) “r” value	800 m run test subjects (n=105) “r” value
Height	−0.50*	−0.574*	−0.408*
Weight	−0.38*	−0.448*	−0.198*
Leg length	−0.245*	−0.195	−0.232*
Arm length	−0.356*	−0.397*	−0.349*
Foot length	−0.223*	−0.442*	−0.149

Significant at 0.5 level. \*Negative sign of the correlation is due to the fact that running event performance is in terms of time

relationship between body dimensions, stride length, and VO<sub>2</sub>.

Shukla and Sharma (1996) conducted a study on basketball players and found no relationship between arm length, explosive arm strength, and leg length and explosive leg strength of basketball players.

## 2. METHODOLOGY

The subjects for this study were 105 boys of the average of age group of 15.54 from different games to sport, namely, hockey (27), gymnastics (5), fencing (28), Wushu (12), judo (28), and athletics (5) of various Sports Authority of India schemes.

The following tests for evaluating fitness parameters and anthropometric parameters were conducted.

Fitness test: Measuring unit

- 30 m Dash (Speed): Seconds
- 5, 10, and 15 m shuttle run (Agility): Seconds
- 800 m run or walk test (Endurance): Seconds.

Anthropometric variables:

- Height: Centimeters
- Weight: Kilograms
- Arm length: Centimeters
- Leg length: Centimeters
- Foot length: Centimeters.

## 2.1. Statistical Analysis

The Pearson's product-moment correlation coefficient (*r*) is calculated to find the relationship between selected physical fitness and anthropometric parameters.

## 3. RESULTS AND DISCUSSION

In Table 2, it is evident that there is a significant relationship between 30 m run performance and height (−0.5), weight (−0.38), leg length (−0.245), arm length (−0.356), and foot length (−0.223) in the subjects.

The relationship of 5, 10, and 15 m agility run performance with almost all the anthropometric measurements, except leg length, has been found significant.

The relationship values of −0.408, −0.198, −0.232, and −0.349 between 800 m run and height, weight, leg length, arm length, and foot length, respectively, are found to be significant.

The height variable is considered to be the highly related variable with performance in 30 m run, 5, 10, and 15 m agility run and 800 m run and walk test with a value of 0.50, 0.574, and 0.408, respectively, in the subjects.

The study conducted by Nelson (1982) and Ward *et al.* (1979) supported the result of the present study that there is a significant relationship between physical parameters and selected fitness variables.



#### 4. CONCLUSION

There is a significant relationship between selected anthropometric (height, weight, leg length, arm length, and foot length) and fitness variables (30 m run performance, 5, 10, and 15 m agility run performance, and 800 m run performance) in the sports population of average 16 years ago.

#### REFERENCES

- Brisswalter, J., Legros, P. and Durand, M. Running economy, preferred step length correlated to body dimensions in elite middle distance runners. *J Sports Med Phys Fitness*, 1996, 36(1), 7-15.
- Nelson, J.K. The function of age, gender, and body size characteristics on physical fitness performance. *Diss Abstr Int*, 1982, 43(7), 2276A.
- Rajni. A comparative study of fat assessment in top ranking Indian weight lifters. *NIS Sci J*, 1994, 17(2), 23-29.
- Shukla, N.B. and Sharma, S.S. Anthropometric and explosive strength relationship of arm and leg length of state level basketball players. *Indian J Prevent Soc Med*, 1996, 27(1-2), 7-10.
- SNIPES Journal, NS NIS Patiala, 10(1-2).
- Tappen, N.C. An Anthropometric and constitutional study of championships weightlifters. *Am. J. Phys. Anthropol*, 1950, 8, 49-64.
- Ward, T., Groppe, J.L. and Stone, M. Anthropometry and performance in master and first class Olympic weightlifters. *J. Sports med. Phys. Fit*, 1979, 19, 205-212.

# Enhancing in Health and Fitness through Archery Game

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## ABSTRACT

In the modern era, archery was just seen it simply using a bow and arrow without all those sports rules that people must be done precisely and in a correct manner. Bow and arrow is certainly considered to be one of the oldest weapons that deal with projectile motion. Archery is a physical activity with the walking and repetitively drawing the bow. Developing focus can have a positive impact on your mental health and well-being. The more focused you are on your target, the easier it will be for you to clear your mind and aim precisely both in practice and in competitions. These same skills will help you to deal with stress and clear your mind of worry. A competitive archer actually requires a significant amount of strength, endurance, and focus to perform well. The present paper focuses on the demands of the sport then you may be surprised to learn that there are several health benefits to participate in archery and archery can improve your mental health. Archery provides a very good avenue for relaxing and enjoying yourself. It can assist you in relieving stress and tension. The sport of archery requires precision, control, focus, physical ability, and determination. Top athletes train daily, and for hours at a time, but even recreational archery can carry huge benefits such as mental focus, self-confidence, neuromuscular, coordination, strength, control, balance, patience, and relax. One of the main advantages of archery is that it can be easily performed by both disabled and able bodied individuals. People with severe disabilities as well as the blind are capable of joining provided they make use of the special tactile equipment.

**Keywords:** Archery, Mental focus, Patience, Relaxation, Self-confidence, Strength.

## 1. INTRODUCTION

The traditional archery in a time where in detail, we are not yet fully established, archery was just seen it simply using a bow and arrow without all those sports rules that people must be done precisely and in a correct manner. Bow and arrow is certainly considered to be one of the oldest weapons that deal with projectile motion in India (Adivasi's and Tribal people). This weapon has been really around for quite some time how are originally this was used to slowly let a hunter catch its prey but soon as the middle age came in it was introduced in the army. Begin this weapon, we are seen as an advantage special in a long range combat become it is easier and does not require a great amount to train and individuals. Furthermore, aside from its advantages range, it is certainly easy to make.

Archery is a sport that can be practiced by all, no matter age, gender, or ability. Archery is a fitness activity that benefits areas from muscle development to

mental health. The sport of archery requires precision, control, focus, physical ability, and determination. Top athletes train daily, and for hours at a time, but even recreational archery can carry huge benefits to our health. Archers need to filter out all the distractions and focus primarily on their form releasing the bowstring consistently. Concentration also helps a person to cope up with the high-pressure situation which is helpful in daily life. The primary benefit of archery is that it improves hand-eye coordination. Aiming and firing the arrow increase your focus as well. Coordination can be improved with more and more practice. The body must be held in a constant position while making aim and taking a shot, this improves balance. Balance is also paramount to success in archery, as the body must be held still while aiming and making a shot. Overtime, the core becomes better at gaining control of the body's balance and helps with more accurate shooting. An athlete with a high level of coordination is able to combine all forms of fitness- not just those that are part of motor fitness- in an effective and

controlled way. The more coordinated and athlete is, the more efficient he/she will be during competitive activities.

If a country wants to sustain its position at national and international level on top, then there are some major challenges, i.e., high level of qualitative researches, accurate and effective guessing, and sound practicability of the things. Good prediction is one of the key skills necessary to be a successful competitive Pokémon player. There is only one scenario where you should completely disregard the potential risk and only concentrate on reward. That scenario is when, unless you take a bold, risky action, you are guaranteed to lose. The primary objective of any competitive game is to win by any legal means.

## 2. LITERATURE OF REVIEW

1. Subhash Chandre had studied “Benefit of Archery game to improve health and fitness,” he considered about the archery is one of the safest sports for children and archery improves a person’s self-confidence, mental focus, and patience.
2. Murtaz Ali and Dr. Ashish Yadav had research on “Comparative study of modern archers and traditional archer’s performance of Ladakh,” the two archer’s adopted a positive approach to the performance but compare to traditional archery, modern archery is more accurate.
3. As per Dr. Kshetrimayum Rojeet Singh and Dr. Anil Mili found that the differences between the levels of athletic achievement are minimal in their “Comparative study on Mental Toughness among the Archers and shooters.”

## 3. RESEARCH METHODOLOGY

This paper is based on secondary data collected from reputed books, journals, magazines, and newspapers. Facts and data collected from these sources have been supported by the observational facts by the researcher.

### 3.1. Objectives of the Research

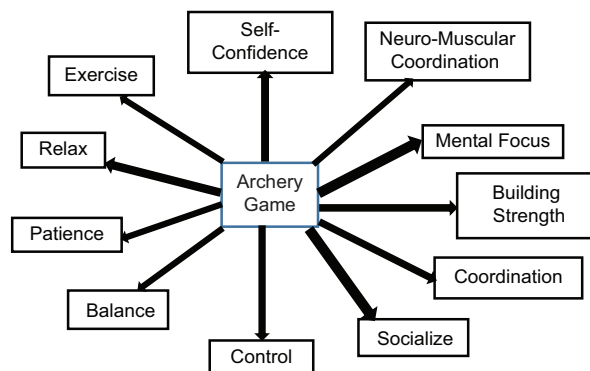
The objectives of the study were as follows:

1. To understand the need of archery game.
2. To know about the importance of archery game.
3. To investigate the role of archery in promoting health and fitness.

### 3.2. Hypotheses of the Study

In the present research paper, it is hypothesized that archery plays an important role to improve mental ability, self-confidence, patience, and relaxation.

### 3.3. How Archery Game Improves Health and Fitness



#### 3.3.1. Building strength

As an exercise requires short bursts of energy from core muscles, the act of drawing a bow puts tension in the chest, hands, arm, and large upper back muscles, and non-core areas of your anatomy like the rotator cuffs, which support your shoulders. The correct and continuous repetition of this movement strengthens these tissues. Tension on the muscle is maintained for many seconds before the string is been released. Repetitive activity results into muscle development.

#### 3.3.2. Exercise

At competition level, participants walk a lot carrying heavy loads. This helps to burn approximately 280 calories/h. It is the perfect form of exercise, does walking to the target end on end to collect arrows. So if you are concerned about your health, then consider practicing archery.

#### 3.3.3. Neuromuscular coordination

The steps require to create a good shot combine to form a high-precision routine that needs to be ingrained into an archer’s muscle memory and subconscious. There is so much happening at the same time – and with such little margin for error – that the coordination of all these movements becomes almost instinctive.

#### 3.3.4. Patience

Archery helps to build more patience. This sport requires immense patience because the game is not about speed but precision. Precision can take time and you should

be patient enough to maximize accuracy. Archery's easy to learn, but difficult to perfect. Although fun, it can be frustrating – and patience in practice is essential for a long-term future in the sport. Having the determination to precisely repeat a technique makes you a better archer and, consequently, a better person.

### **3.3.5. Control**

Archers learn to maintain focus on their shot routine, avoiding distractions such as wind, distance, noise, and their competitors to deliver the perfect arrow. That control is beneficial for other areas of life, too.

### **3.3.6. Relaxing**

Staying calm and accurate under pressure is an ability that archers develop by managing their breathing, concentration, and nervousness. When you are shooting well, hours can pass by in a blink of an eye – and, as much as the sport can be sociable, when you are on the line, archery is only about you and your bow. The perfect time for some internal meditation. Releasing an arrow and watching it hit the target can be extremely relieving. It can help you get rid of stress and make you feel relaxed. The act of focusing is a perfect package of relaxation.

### **3.3.7. Self-confidence**

Archery is a game where you can even compete against yourself. Similarly, it can be held against others as well. Results can be calculated to improve person's form and boost an individual's self-esteem and confidence. Even in competition, an archer's greatest opponent is himself. Identifying what to improve and setting clear goals is easy – after all, results are all based on easily measurable scores. Progression breeds confidence, and there is no better sport to measure that than archery.

### **3.3.8. Coordination**

Hand-eye coordination is an essential skill for archery. Archery trains your hands to work together while performing different tasks, aiming and firing your arrow based on input from your eyes. The more you practice, the better your coordination will become. This increase in coordination will result in better aiming of your bow and will help you in other sports and activities that use the hands as well.

### **3.3.9. Balance**

Balance is vital to success in archery as you have to be able to hold your body still while aiming and making a

shot. Practicing archery helps you to gain control over your balance as you focus on trying to hit the center of the targets you shoot at. The more you practice, the more your core muscles will become accustomed to balancing your body and keeping you steady as you aim and fire your arrow.

### **3.3.10. Mental focus**

Focus is important to success as an archer, and developing focus can have a positive impact on your mental health and well-being. The more focused you are on your target, the easier it will be for you to clear your mind and aim precisely both in practice and in competitions. These same skills will help you to deal with stress and clear your mind of worry when you are away from the archery range and will help you to remain more focused on tasks as well. The focus you learn from archery may even help you to overcome procrastination and distraction.

### **3.3.11. Hand and finger flexibility**

Finger and hand strength increase in archery. They also become more flexible because they are fully in use while aiming at the target. Strength building: The arms, core, hands, chest, and shoulders are all used when practicing a proper draw. Archery trains the hands to work together while performing different tasks, aiming and firing the arrow based on input from your eyes. Coordination improves with repetition and practice.

### **3.3.12. Socialize**

People of any age and any type can enjoy the sport. Archery is meant to be for everyone. It also teaches a person other benefits like teamwork. Furthermore, it is a good way to socialize. A person needs to have adequate socialization levels to sustain a healthy mental life. Archery is an ideal way. There are very few sports in the world that allow the world's best to compete on the target with someone fairly new. Tournaments in archery are, often, without barriers – and enable friendships between individuals from all walks of life. You never know who you will end up on a target with next.

### **3.3.13. Open to all**

Archery can be done by both able-bodied and disabled people. People with the most severe disabilities and even the blind use special tactile equipment and are able to join in – making this a great family sport.

#### 4. CONCLUSION

Archery plays an important role to improve mental ability. Archery is a sport that can be practiced by all, no matter age, gender, or ability. This paper is focused on correct and continuous repetition of this movement strengthens these muscles. Staying calm and accurate under pressure is an ability that archers develop by managing their breathing, concentration, and nervousness. Archery improves a person's self-confidence, mental focus, and patience. Hence, this study shows that archery plays an important role to improve health and fitness.

#### REFERENCES

1. Aggarwala, J. and Dhingra, M. Effects of autonomic control on performance of archers: A comparative study on novice and experienced archers. *Int J Biomed Res*, 2017, 8(4), 182-186.
2. Ali, M. and Yadav, A. Comparative study of modern archers and traditional archer's performance of Ladakh. *Int J Yoga Physiother Phys Educ*, 2018, 3(2), 228-229.
3. Sing, K.R. and Mili, A. Comparative study on mental toughness among the archers and shooters. *Int Educ Sci Res J* 2016, 2(11), 1-23.
4. Available from: <https://www.worldarchery.org/Archery>.
5. Available from: <https://www.indianarchery.info>.



# Khelo India Youth Games - A Springboard for Olympic Gold

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## 1. GENESIS

The Union Cabinet chaired by the Hon'ble Prime Minister of India approved the Khelo India Youth Games scheme at the cost of Rs. 1756/-crore only, for the period of 3 years from 2017–2018 to 2019–2020. This policy decision will be remembered as a watershed moment in the history of Indian sports. The program aims at mainstreaming and transforming youth sports for individual development, community development, economic development, and national development.

In university education, sports play an important role in the development of the integrated personality of the youth – a hope for the brighter future of the nation and a vanguard of the society. In the modern era, sports have become a prime need for developing a civilized society, helping to promote national integration, professional development, and interpersonal skills of the participants, etc.

India being an academically driven society has largely fallen short on sports as a mainstream career option; the neglect of sports led to the low performance level of Indian athletes at the Olympic Games and other global sporting competitions, so far. The major bottlenecks in the process of stimulating a vibrant sporting culture have been the lack of career opportunities and financial security.

## 2. VISION

The vision of sports ministry is to give impetus to the sporting culture in universities and colleges, for developing India as a sporting nation, in the near future. Further, promoting futuristic trends of active and healthy lifestyle among the youth, for improving the fitness level of younger generations is of paramount importance, for enhancing the productivity and strength of the nation, in all walks of life. Therefore, pursuit of sporting excellence is a wonderful privilege which imposes great duties of talent identification, the fulfillment of brilliant tasks of

talent development and realization of noble ideals of displaying credible sporting performance during highly contested Olympic Games: 2020.

Over a period of time, people of all ages are expected to adopt sports as a way of life, serving a socio-cultural function in our society and providing healthy means of entertainment and recreation to the people, especially the youth, with a view to channelize youthful energy into constructive directions as a nation-building process. Now, the youth is the main focus of attention and competitive sports is an emerging industry, through enough investments, with assured returns in terms of good results.

## 3. MISSION

The mission of Government of India is to create sporting culture, nurture identified talent, structure sports policy, and develop sporting infrastructure in the education sector, for producing world-beaters in competitive sports, in which India has potential and strength to reckon with. For this purpose, Khelo India Youth Games project was designed and planned to deliver the desired results at national and international level sporting competitions, within the time span of 8–10 years or so.

Further, this system put in place would increase Medal Tally of India at the Olympic Games and other World Championships. This platform will build-up the value of sports in higher education, giving a timely boost to strengthen India's position at Olympic Games, Asian Games, and Commonwealth Games, by providing advanced training and competitive exposure to top class athletes.

## 4. OBJECTIVES

Youth sports are considered to be a cradle and nerve-center of Indian Sports with abundant potential for achieving excellence at the international level, if the

talent is tapped and trained at an appropriate age, by a team of experts. The followings are the main objectives of the scheme:

- To Project India as a powerful sporting nation at global competitions by developing the base of University Sports, making it affordable and transparent for the holistic development of elite athletes, with a view to display creditable sporting performance at the international level.
- To take India into the league of top-performing countries, by introducing professionalism in the management of university sports, providing scientific support to athletes during advance training and competitive exposure, to bring a revolution in Indian sports in the near future.
- To attract and motivate the youth by providing adequate incentives to take-up competitive sports as their career option, through better employment opportunities in public and private sectors, as the case may be, for establishing large pools of talent at zonal levels.
- To produce Olympic Champions for winning a respectable number of medals in all other global sporting championships through pyramidal approach, involving universities and colleges across the country, for active participation, particularly in high priority sports.
- To promote a cadre of competent and capable sporting professionals, leaders, trainers, and sports scientists, enabling them to handle an important responsibility of creating a conducive environment for pursuing excellence in competitive sports at all levels.
- To create an inspirational value of sports among younger generations, by inspiring them to participate in Khelo India Youth Games, with the same enthusiasm as our national athletes look forward to participate and win medal(s) at global competitions.
- To build-up a robust platform for talent identification and talent promotion, with a professional approach for raising performance standards of the domestic events such as Khelo India Youth Games at par with the performance level of World University Games.
- To bench-mark technical conduct of Khelo India Youth Games as per the international rules and standards, for providing a rare opportunity to budding athletes, selected from all over the country, in a highly competitive environment, so as to compete against superior sportspersons with a strong will to win each event or championship.
- To give a feel of the test of fire to superior

sportspersons, Khelo India Youth Games were launched, enabling them to emerge as true champions.

## 5. COMPONENTS

The power of sports in promoting gender equity, social inclusiveness, and human resource development stands fully established. The important components are given below:

- Khelo India Youth Games is an unprecedented pan India Scholarship scheme, covering 1000/- only, most talented young sportspersons, each year across selected sporting disciplines, ensuring merit-based selection, advance training, and meaningful participation.
- Each athlete selected under Khelo India Youth Games scheme will receive an annual scholarship worth Rs. 5.00/-Lakh only for the period of 8 years.
- A long-term athlete development program would be made available to the gifted and selected sportspersons to pursue sporting excellence, especially in high potential sports, where they can compete and win a good haul of medals(s) in the Olympic Games.
- The initiative of promoting competitive sports in universities and colleges would be a game changer, inspiring people to adopt active and healthy lifestyle, involving all categories of citizens of the country, largely the younger generation in the long run.
- The scheme was designed to develop and promote 25 Universities (six in each zone) as hubs of sporting excellence, providing the required support to talented and elite athletes to pursue dual pathways of higher education and competitive sports as a career option.
- A strategic action plan would cover about 200 million Children and Youth in the age group of 8–15 years, under a massive National Physical Fitness Programme, with a view to enhance fitness level, ensuring their all-round development, in due course of time.

## 6. FEATURES

Khelo India Youth Games were a major policy decision taken by Government of India for laying a sound foundation of sports, by making it as a way of life, especially for the youth.

- The Scheme is an endeavor to provide maximum access to well-designed, well-structured,

well-organized, and well-supervised sporting competitions, for giving a timely boost to university sports in the country, for building a sound foundation.

- The project includes the use of latest user-friendly technology in the process of pursuing excellence in sports, such as use of mobile apps for the dissemination of advanced training and national sports talent contest portal and interactive web site, etc.
- The program seeks to engage potential youth in sporting activities, who are living in deprived and disturbed areas of the country, for keeping them away from anti-social elements, those who are involved in disruptive and unproductive activities.
- The action plan has an adequate sanctioned amount of money to avoid budgetary constraints as main hurdles in pursuit of excellence in university sports, followed by international exposure, before actual projection in international sporting events.
- Khelo India Youth Games are a new strategic long-term development game plan, including various measures/steps of preparation, execution and evaluation, for developing India as a sporting nation in the near future, within the period of 8–10 years.
- The sports ministry resolved to rope-in top industrials and corporate icons on the basis of public-private partnership, for required investment and management of National Sports Development Fund, as a non-taxable corpus for sports promotion.
- Government of India decided to establish an executive board, including those business houses, whose track-record in providing financial support to sports promotion in the country, through corporate social responsibility (CSR), was found to be encouraging in the past years.

## 7. SCOPE

Khelo India Youth Games program was introduced to accomplish the main objective of broad-basing and reviving sports culture in universities and colleges. The following major areas will be covered under the operation of professional management of sports in India:

- Playing Fields Development.
- Support to National/State Academies.
- Community Coaching Development.
- Physical Fitness of School Children.
- State Level Khelo India Centers.
- Competitive Sports for Women.
- Annual Sporting Competitions.
- Sports for People with Disabilities.
- Talent Search and Development.

- Sports for Peace and Development.
- Utilization of Sports Infrastructure.
- Promotion of Rural and Tribal Sports.

## 8. MAIN FOCUS

The process of holistic development of gifted and talented athletes is main focus of the attention of the professionals including – coaches, trainers, and sports scientists to show-case their performance at world level competitions. Following important aspects of the scheme are given below:

- Introduction of professionalism in the process of promoting competitive sports in universities and colleges, for developing sports culture at the grass-roots level.
- Professionally trained and adequately paid support staff were appointed for strict implementation of the project for achieving the desired performance.
- Provision of sound financial and technical support to elite sportspersons, ensuring advance training, and meaningful participation in various top class tournaments.
- National Skill Development Fund (NSDF) and CSR will play a pivotal role in the realization of the ultimate dream of talented athletes for winning Gold Medal in the Olympic Games and other World Championships.
- The talented athletes selected for receiving the NSDF grant should not only have a sense of their entitlement; rather they should look at delivering desired performance.
- Optimal utilization of mass media by the experts, to glamourize the process of sports promotion and revolutionize the performance of elite sportspersons.
- Khelo India Youth Games project is a well-defined and well-structured road-map, indicating proper growth and development of Youth Sports, in the education sector.
- All customized and latest training techniques to be provided to athletes, as per requirements of a sport or event, under careful observation of duly qualified coaches.
- Highly specialized coaches and competent fitness trainers would be attached with Indian Universities' contingents during advance training and active participation.
- The services of sports scientists with established caliber and credentials would be made available to observe the behavior of elite young sportspersons, enabling them to manage their stress and generate a "will to fight" in highly competitive environments.

- All possible efforts would be made to eradicate and prevent the use of banned drugs in competitive sports in the education sector, which is a serious violation of anti-doping rules.
- A strong and workable system would be put in place to prevent and redress the grievances of athletes related to sexual harassment, if any, within a stipulated period of time.

## 9. THRUST AREAS

Youth sports are considered to be one of the most important areas of operation for not only attaining high performance but also sustaining sporting achievements at global events. A few important thrust areas of the strategic action plan are given as under:

- A long-term development plan for fair selection, advance training, and meaningful participation of youth with potential for excellence in intensely contested sporting tournaments.
- A regular provision of adequate sources and resources for motivating talented athletes to take-up sports as a full-time profession, with a serious approach for their livelihood.
- An adequate amount of finances to be arranged from both public and private sectors, for promoting competitive sports, active, and healthy lifestyle in universities and colleges.
- Effective measures and steps for educating potential young athletes and prevention of the use of banned drugs during training and highly competitive sporting tournaments.
- Development of basic modern sporting infrastructure, for scientific training and active participation of sportspersons in tournaments, to polish their potential for excellence.
- Continuous scientific support to potential and selected athletes during advance training for successful performance in domestic competitions of Khelo India Youth Games-2020.
- International competitive exposure to talented sportspersons against superior for testing quality of genetic talent and scientific training, by a panel of experts and professionals.
- A monitoring mechanism for maintaining consistency in the sporting performance of elite athletes, with high-quality potential for pursuing excellence at national and international levels.
- Regular up-dating of professional knowledge and technical skills of support staff, so as to provide improved and latest training to outstanding athletes, before actual participation.

- Independent evaluation of the sporting performance of trained athletes, selected during Khelo India Youth Games:2020, in view of pre-defined target, by a team of experts periodically.

## 10. GLOBAL TRENDS

Today, athletes and coaches live in the intensely competitive sporting world, where those who cannot cope with changing times usually lag behind in the race for future success.

- Professional sports have become increasingly competitive due to economic, political, and social significance attached to the Medal Tally at the Olympic Games.
- In today's highly contested sporting world, including Olympic Games and other World Championships, potential athletes and specialized trainers are the midst of the revolution of rising expectations for meeting the pre-defined target of performance.
- Most of the performing nations are fired with a strong ambition to display their ever best sporting performance in concrete terms in world championships or events.
- The main focus of attention of sports coaches, fitness trainers, and sports scientists is the holistic development of world-class athletes, enabling them to display creditable sporting performance during World University Games, followed by Olympic Games.
- Almost all the developed nations in the world of competitive sports, sports science and advanced technology have created, an enabling environment, where top athletes, specialized coaches, sports scientists, corporate icons, and media-persons can work as a team, to design policy, develop plan, and deliver results, in a stipulated period of 8–10 years, or so.
- Presently, there is a trend of maintaining a fine balance of "Autonomy and Accountability" in the functioning of sports promoting bodies all over the world, so that hard-earned money of tax payers should not go down the drain, without any gainful achievements.

## 11. TOP PRIORITY

There is a fascinating question as to what extent an elite athlete is able to perform with credible and outstanding performance in top-class sporting championships, under extreme competitive environmental conditions, without



suffering injuries from overloading of rigorous training, followed by intensely contested competitions?

This process includes optimization of genetic endowment in prevailing environmental conditions and customized training elements, best suited to requirements of top athletes, related to their health, fitness, performance, etc. For this purpose, Khelo India Youth Games project was planned and launched, for enabling polished and outstanding athletes to compete against World-beaters neck-to-neck and achieve set target of performance in the future.

The emerging paradigm shift in scientific research and professional management of competitive sports has come of age and carved a niche, which athletes and trainers can ignore only at their own peril. Therefore, the significance of scientific support to elite sportspersons, for achieving successful performance stands well established. Hence, this trend of promoting sports, with scientific approach has created a strong interest among top-performing nations, to produce a “Second String” of trained athletes, making their presence felt in international events.

## 12. SCIENTIFIC SUPPORT

The contribution of sports sciences to the peak performance in competitive sporting competitions is highly indispensable at all levels, especially in the Olympic Games, World Championships, etc. Accordingly, a team of sports scientists will be attached with athletes, selected purely on merit basis to provide the scientific support during training and participation in Khelo India Youth Games 2020. Further, effective coordination and mechanism would be introduced between “Human Performance Laboratory” and “Practical Field Work,” indicating a fine understanding between Sports Scientists and Specialized Coaches, in all the disciplines of events and sports included in the scheme of Khelo India Youth Games: 2020.

Every potential athlete selected under Khelo India Youth Games project, while pursuing excellence in a sport or event of his/her choice and ability, dreams of taking the world by storm. However, few dreamers make their dreams come true, because it takes a lot of tireless efforts to become world-beaters. Hence, top athletes need to be trained in such a way that they feel at ease in the war-like situations of sporting competitions, as they are in the boardroom.

## 13. PSYCHOLOGICAL PREPARATION

In the 21<sup>st</sup> century, a practical and vibrant society of experts is rapidly emerging in the market, where professional knowledge is the primary production resource instead of capital and man-power. Further, the experienced and trained coaches can feel the pulse of promising athletes and analyze their performance both manually and scientifically during rigorous training and intensely stressful competitive environment.

The psychological conditioning of outstanding athletes is more important than physical and technical preparation for generating a “will to win,” while competing against superior athletes during stressful international tournaments. As a result, stress becomes an integral part of performing an athlete’s professional life. Further, to achieve a higher target of sporting performance quickly, athletes, and coaches over-work beyond their physical and mental capacity and limits. Therefore, a higher degree of stress arises out of their own actions and perceptions.

Sports psychologists are of the firm opinion that a moderate level of competitive stress is absolutely necessary for successful performance in highly contested competitions. When the level of stress rises beyond control, it is bound to affect the performance of athletes adversely. Now, the most important aspect of advance training is the all-round development of the elite athletes, including to condition and train talented athletes, how to manage stress or use stress to their advantage. Therefore, stress management is both an art and science in sports.

## 14. GENETIC FACTORS

Several scientific studies reveal that the genetic richness of athletes plays an important role in achieving a successful performance during world-class sporting events. Therefore, sporting excellence is the question of biology; any athletic activity requires muscle-power in terms of bulk and oxygenation capacity. The genetic factors and socio-economic conditions can be responsible for our sport deficient culture, from 30 genes to our finer bone structure, from our cereal-rich diet to nutrition-deficient status, leading to India’s dismal performance at international level.

According to Dr. Shashank Joshi, “the 30 genes that Indians have developed following bouts famine and epidemics over the years. As a genetic conservation



mechanism, our genes learned to hoard fat to survive. However, the 30 genes are making Indians living in a Zip Zap Zoom urban milieu susceptible to obesity with excess fat, less muscle creatures.”

Basically, it is the question of poor nutrition over generations that developed Indian mentality which does not encourage to participate and promote competitive sports. Hence, to overcome these lacunae, sustained efforts would be made to select genetically rich athletes, who are physically strong for training and participation in Khelo India Youth Games: 2020 and preparing them for 4–6 years to represent India in Olympic Games and World Championships.

## 15. CONCLUSIONS

In the modern times, youth sports are considered to be the nerve-center and cradle of Indian Sports, with abundant potential to perform at global level competitions, if tapped at an appropriate age and trained on Scientific Principles.

- An effective implementation of the strategic action plan of Khelo India Youth Games is expected to give timely boost to Indian sports, especially in high priority sports, in the long run.
- The younger generation may be attracted and inspired to take up competitive sports as full-time career option, as professional sports are increasingly becoming a big industry in the country that needs to be marketed with a commercial approach, by the panel of experts.
- The young population has started adopting games and sports as an active and healthy lifestyle for improving and maintaining fitness level, to increase the productivity of our nation.
- Youth sports are being recognized as a practical training of the youth, ensuring their holistic development including – body, mind, and spirit, so as to face eventualities of life.
- Khelo India Youth Games are a futuristic plan with a special purpose to foster an urge among the youth of the country, to be self-reliant, well-disciplined, well-behaved, and well-adjusted in their fast changing competitive professional and social environment as well.

- The expert opinion reveals that once “Sporting Excellence” is equated with “Academic Excellence” in our society, on account of its significant contribution to national development, it would definitely be a milestone in the history of Indian Sports.

## 16. RECOMMENDATIONS

Now, it is crystal clear that pursuing excellence in competitive sports enhances the sense of achievement, national pride, and team-work. It also facilitates beneficial recreation, improves productivity, and social harmony. Some major recommendations for making the project of Khelo India Youth Games a grand success are given below:

- India needs to design a comprehensive road-map for effective marketing of Khelo India Youth Games, for the generation of adequate finances, as the state funding is bound to fall short in the long run, while implementing the project of Khelo India Youth Games effectively.
- High allocation of funds needs to be sanctioned, especially for high priority sports under Khelo India Youth Games Scheme launched by the Ministry of Youth Affairs and Sports.
- The menace of drug abuse in youth sports, being a serious issue needs to be eradicated and tackled immediately, with a scientific approach, to protect sportspersons, with high quality of potential from deadly side-effects of banned drugs on their health and performance.
- Participation of women section in Khelo India Youth Games must be increased for maximizing their potential by improving basic health and fitness level of the younger generations.
- The electronic media, including private channels should be suitably mobilized and optimally utilized, for strengthening the much-needed sporting culture, especially in the education sector, so as to throw-up abundant fully trained talent in the national stream on the regular basis.
- The evolution of Khelo India Youth Games is most essential for revolution in the performance of Indian sportspersons while participating at international level competitions.

# Effects of Breathing Exercise, Meditation, and Combined Training on VO<sub>2</sub> Max among Intercollege Students

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## ABSTRACT

The purpose of the study was to find out the influence of 16 weeks breathing exercise, meditation, and combined breathing and meditation on Vo<sub>2</sub> max among intercollege boys. Twenty-five subjects were randomly selected from the study. The subject's age ranged from 16 to 18 years. The Harvard step tests were used to find the Vo<sub>2</sub> max of intercollege students. Pre-test and post-test scores were carried out before and after the 16 weeks of breathing, meditation, and combined breathing and meditation exercises. Group I was given a breathing exercise, Group II was given a meditation exercise, and Group III was given a combined breathing and meditation exercises. Analysis of covariance was applied to determine the significance and meditation training significantly improves the Vo<sub>2</sub> max.

**Keywords:** Breathing exercise, Meditation, Vo<sub>2</sub> max and analysis of covariance.

## 1. INTRODUCTION

Physical education is an essential and integral part of the total education program and makes significant contributions toward the achievement of desirable education and health outcomes through the medium of physical activity. They are based on a planned sequence of experience in a wide variety of activities beginning with basic movement skill and progressing toward more complex sport, dance, and other forms of movement. Quality physical education programs promote the physical growth and development of children and youth while contributing to their general health and well-being. Ultimately, they should help young people keep physically fit and enjoy many forms of physical activity during the college years and continuing throughout life.

Breath is the life force that sustains life. Breathing correctly is important for your overall well-being while its benefits are uncountable. When you are the feel-good hormones, breathing deep supplies more oxygen to all

our body parts, including our digestive system, thus making it work more efficiently. When you are angry, tensed, or scared, your muscles are tightened and your breathing becomes shallow. Yoga developed a special system and pranayama helps to control this life force in a superior and extraordinary way to reap maximum benefits.

## 2. METHODOLOGY

For this study, a random group of 60 students was selected as subjects. They were divided into three groups without a control group. All the three groups were given training. The subjects chosen for the study were treated with breathing exercise, sound meditation, and combined breathing exercise and meditation for a period of 16 weeks, the exercise was given for 6 days in a week everyday at early hours 6:30 am–7:30 am. The subjects were informed about the purpose of this study to secure their full cooperation. All the subjects were tested before and after experimentation.

**Table 1: Analysis of covariance for Vo2 max of breathing group, meditation group, and combined group**

	Breathing group	Meditation group	Combined group	SOV	SS	df	M. sq	"F" ratio
Pre-test mean	52.08	49.22	53.80	B	164.72	2	79.49	31.64
				W	1347.57	46	32.84	
Post-test mean	61.35	57.44	55.70	B	572.73	2	286.39	12.34
				W	998.87	49	24.85	
Adjusted post-test mean	60.15	57.59	55.65	B	579.59	2	284.35	12.16
				W	996.24	48	28.16	

**Table 2: Scheffe's *post hoc* test for mean difference between groups for Vo2 max**

Mean value			Mean difference	L.S
Breathing group	Meditation group	Combined group		
59.86	54.62	--	5.72	Ns
--	54.62	50.47	4.12	Ns
59.86	--	50.47	9.02	

\*Required CI value at 0.06 level=6.74

### 3. RESULTS AND INTERPRETATION

Table 1 shows that the pre-test means are Vo2 max of the breathing group, which are 54.08, the meditation group are 50.22, and the combined group are 55.80. The "F" ratio 3.67 is found to be insignificant at 0.08 level of confidence. The post-test means of the breathing group are 62.08, the meditation group are 57.50, and the combined group are 55.62, and the "F" ratio is 12.34. This shows that there is a significant difference among the three groups post-test means. The calculated "F" ratio 12.24 is higher than the table value that is 5.67 at 0.01 level of confidence, for adjusted means of the breathing group, meditation group, and combined group which show that there is a significant difference among the group in the physiological variable, namely, Vo2 max test.

Table 2 shows that the mean difference between breathing group and meditation group is 5.72, the difference between meditation group and combined group is 4.12. The mean difference of breathing group and combined group is 9.02, which is found to be significant at 0.05 level of confidence in the Vo2 max test.

### 4. CONCLUSION

The significant difference was found among the breathing, meditation, and combined breathing and meditation of Vo2 max.

### REFERENCES

- Srivivasn, N. and Baijal, S. Concentrative meditation enhances preattentives processing: A mismatch negativity study. *J Neuro Rep*, 2007, 18(16), 1709-1712.
- Sarang, P.S. and Telles, S. Oxygen consumption and respiration during and after two yoga relaxation techniques. *J Appl Psychophysiol Biofeedback*, 2000, 25(4), 221-227.
- Ganapathi, K. Effects of breathing exercise, and combined training in Vo2 max among higher secondary school students. *India J*, 2(3), 2. Available from: <http://www.everthing.com/glos/definition.phpword-heart+rate>.

# Effect of Yogic Practices on Mental Toughness, Mental Health, and Stress among Intercollegiate Athletes

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## ABSTRACT

The purpose of the present study was to find out the effect of yogic practices on mental toughness, mental health, and stress among intercollegiate athletes. For achieving the purpose of the study, a total of 30 men students were selected as samples from the Arts and Science College. All the selected subjects were studying undergraduate courses and represented for the college in the intercollegiate athletic competitions. Their age group between 18 and 24 years and the selected subjects were divided into two groups equally with 15 each as control and experimental groups. The experimental group underwent yogic practice for 8 weeks in a schedule of weekly 3 days with 1 h session each. Analyze of covariance was used as a statistical tool. The statistical findings of the study revealed that the experimental group done the yogic practices significantly improved the mental toughness and mental health and significantly reduced the stress qualities.

**Keywords:** Mental health, Mental toughness, Stress and yogic practice.

## 1. INTRODUCTION

Yoga promotes a harmonious working together of the body's components, leading to both physical and mental training. Yoga is a scientific system which brings harmony in body and mind. Yoga helps psychologically to relax and handle stressful situations more easily. Yoga teaches to have a calm mind and can focus our energy on the particular activity. Yoga brings positive thoughts and self-acceptance. Yoga is a great form of exercise for mind-body that can have physical, mental, and emotional benefits. Yoga also is an effective way to develop greater self-awareness, acceptance, and the ability to be present in the moment. Yoga is perhaps the only form of activity which massages all the internal glands and organs of the body in a thorough manner. Yoga ensures the optimum blood supply to various parts of the body, by gently stretching muscles and joints as well as massaging the various organs. Regular yoga practice brings about mental clarity and calmness, increases body awareness and also relieves chronic stress patterns, relaxes the mind, and improves attention and also concentration.

Mental health refers to the overall well-being of an individual. It is about the balance of the social, physical, spiritual, and emotional aspects of life. Our mental health is characterized by our personal growth, sense of purpose, self-acceptance, and positive relationship with other people. It is the psychological state of well-being. Yoga has a tremendous positive effect on our mental health. Mental health is human ability to face and solve problems and select the correct alternative that results in happiness of mind. Yoga and mental health are closely interrelated. Those who are regularly practicing yoga exercises get tremendous benefits that result in a deep effect on their mental health. The study done by Mohinder (2000) supports the findings that yoga has significantly improved the psychological fitness. Vijayendra (1968) found that the short-term yoga training has shown favorable result toward mental health.

Yoga is a method of learning that aims to attain the unity of mind, body, and spirit through three main yoga structures: Exercise, breathing, and meditation (Gilbert, 1999). Yoga is a great way to relieve stress-related problems that many people deal with on a daily

basis. Yoga is a good way to ease stress because it is a non-competitive method that above all tries to attain the proper balance and healthy calm to one's body. Yoga contains a healing aspect that allows many people to relieve their stress levels through different poses and especially through breathing. Roth and Creaser (1997) conducted the 8-week meditation based on stress reduction and relaxation program and they found considerable reduction in stress due to meditation. Yoga strives to increase self-awareness on both physical and psychological level. Maddux *et al.* (2018) found out that yoga training significantly reduced the stress among employees.

Mental toughness is having the psychological edge that allows one to perform at peak maximum effort and efficiency during the demands that are placed on them during training, practice, or competition. Specifically, when the demands are greatest or the conditions become adverse. Mentally tough athletes are self-confident, self-assured, and they are unaffected by competition or adversity. These athletes have a strong belief that they control their own destiny (Clough *et al.*, 2002). Goldberg defined (1998) that "Mental toughness is an ability to cope with or handle pressure." Dennis (1981) defined that "Mental toughness is an ability to overcome or rebound from failure." Yoga can help with improving balance, stamina, mental focus, performance anxiety, stress relief, injury prevention, and eliminating tension from the body. Mentally tough athletes are determined and committed to success. These athletes want to succeed more than their competitors and are willing to commit the necessary time and dedication to win.

Every body's accept that yoga can improve the coordination between the body and the mind. In all fields of endeavor, those who would achieve outstanding results must develop mental toughness and mental health. Developing mental toughness and mental health are just one aspect in improving the overall quality of life.

The individual is mentally tough who can face any challenges in any field. Yoga has become an accepted part of the training regimen to improve psychic powers as well as physical skills. Yoga is becoming a common part of the preparation and workout routines in all the sports and games. The present study is also with the sole aim to find out the effect of yogic practices on mental toughness and mental health among college students.

## 2. METHODOLOGY

The selection of subjects, training procedure, testing procedure, and statistical procedure were explained below.

### 2.1. Selection of Subjects

For achieving the purpose of the study, a total of 30 subjects were selected as samples from the college students residing in the hostel from Chennai city. Their age group between 18 and 24 years and the selected subjects were divided into two groups equally with 15 each as control and experimental groups. All the selected subjects were undergraduate men students studying various courses in arts and science college.

### 2.2. Training Procedure

The experimental group underwent yogic practice for 8 weeks in a schedule of weekly 3 days with 1 h session each. The 1 h yoga training includes 15 asanas and two pranayamas. The asanas are Padmasana, Sarvangasana, Halasana, Bhujangasana, Matsyasana, Chakrasana, Dhanurasana, Ardhamatsyenderasana, Vazerasana, Padahastana, Trikonasana, Sirsasana, Viparitkarni, and Savasana and pranayamas are Kapalabati and Shitali.

### 2.3. Testing Procedure

The pre- and post-test were conducted on selected psychological variables of mental toughness using Dr. Alan Goldberg Mental Toughness Questionnaire (MTQ); MTQ consisted of 30 statements and it measures five dimensions of rebound ability, ability to handle pressure, concentration ability, level of confidence, and motivation. Each answer will have 1 mark and the statement having true as well as false answers. The overall score of 26–30 indicates strength in overall mental toughness. Scores of 23–25 indicate average to moderate skill in mental toughness. Scores of 22 or below mean that you need to start putting more time into mental training area. Mental health was assessed through mental health inventory constructed by Jagdish and Srivastava (1983). It consists of 55 statements with 4-point rating scale. The score ranges from 55 to 220. Stress was assessed with the help of Everly and Girdano stress scale. This scale consists of 14 questions with four options and score ranges from 0 to 42.

### 2.4. Statistical Procedure

Analysis of covariance was used as a statistical tool to determine the significant difference, if any exciting



between pre- and post-test data on selected variable of mental toughness, mental health, and stress. The level of significance was fixed at 0.05 levels.

### 3. RESULTS AND DISCUSSION

The statistical analysis of data on mental toughness is shown in Table 1.

It was observed from Table 1 that there was no significant difference in the pre-test (0.390). The significant

difference was observed in post-test (6.687) for df 1 and 28 at 0.05 level of confidence and also in adjusted post-test (8.397) for df 1 and 27 with df 1 and 27. The result of the study indicated that there was a significant improvement on mental toughness due to 8 weeks yogic practice among the intercollegiate athletes.

The statistical analysis of data on mental health is presented in Table 2.

It was observed from Table 1 that there was no significant difference in the pre-test (0.006) and post-test (5.356)

**Table 1: Analysis of covariance for pre-test, post-test, and adjusted mean on mental toughness of the experimental and control groups**

Test	Group		SV	Sum of squares	df	Mean square	F ratio
	Con.	Exp.					
Pre-test mean	18.13	18.66	B	2.133	1	2.133	0.39
			W	153.066	28	5.466	
Post-test mean	18.6	20.86	B	38.5333	1	38.533	6.687*
			W	161.333	28	5.7619	
Adjusted mean	18.78	20.67	B	26.420	1	26.419	8.397*
			W	84.943	27	3.146	

\*Significant at 0.05 level of confidence for the degree of freedom 1 and 28 is 4.20 and degree of freedom 1 and 27 is 4.21

**Table 2: Analysis of covariance for pre-test, post-test, and adjusted mean on mental health of the experimental and control groups**

Test	Group		SV	Sum of squares	df	Mean square	F ratio
	Con.	Exp.					
Pre-test mean	140.86	139.93	B	6.533	1	6.533	0.006
			W	26,760.66	28	955.73	
Post-test mean	150.2	175.46	B	4788.033	1	4788.03	5.356*
			W	25,030.13	28	893.93	
Adjusted mean	149.85	175.81	B	5053.94	1	5053.94	13.406*
			W	10,178.53	27	376.98	

\*Significant at 0.05 level of confidence for the degree of freedom 1 and 28 is 4.20 and degree of freedom 1 and 27 is 4.21

**Table 3: Analysis of covariance for pre-test, post-test, and adjusted mean on stress of the experimental and control groups**

Test	Group		SV	Sum of squares	df	Mean square	F ratio
	Con.	Exp.					
Pre-test mean	29.46	29.06	B	1.2	1	1.2	-0.005
			W	-6041.82	28	-215.779	
Post-test mean	28.53	23.6	B	182.533	1	182.533	13.06*
			W	391.333	28	13.976	
Adjusted mean	28.54	23.59	B	183.913	1	183.913	12.29*
			W	403.729	27	14.952	

\*Significant at 0.05 level of confidence for the degree of freedom 1 and 28 is 4.20 and degree of freedom 1 and 27 is 4.21

for df 1 and 28 at 0.05 level of confidence. However, a significant difference was observed in adjusted post-test (14.406) for df 1 and 27. The result of the study indicated that there was a significant improvement on mental health due to 8 weeks yogic practice among the intercollegiate athletes.

The statistical analysis of data on stress is shown in Table 3.

It was observed from Table 3 that there was no significant difference in the pre-test (0.005) and post-test (13.06) for df 1 and 28 at 0.05 level of confidence. However, a significant difference was observed in adjusted post-test (12.29) for df 1 and 27. The result of the study indicated that there was a significant improvement on stress due to 8 weeks yogic practice among the intercollegiate athletes.

#### 4. CONCLUSIONS

From the analysis and discussions of the present study, the following conclusions were drawn:

- Due to yogic training overall mental toughness and mental health of the college students significantly improved.
- Due to yogic training the stress level of the college students significantly decreased.
- Further, the result of the study indicated that the yogic training also included the curriculum of the syllabus to develop the student's mental toughness and mental health and to reduce stress, which is essential to get success in all spheres of life.

- Further, we can say that yoga is useful for better mental state for sportsmen too.

#### REFERENCES

1. Clough, P.J., Earle, K., and Sewell, D. Mental toughness: The concept and its measurement. In: *Solutions in sport psychology*. London: Thompson; 2002. p. 32-43.
2. Dennis, P.W. Mental toughness and the athlete. *Ont Phys Health Educ Assoc*, 1981, 7, 37-40.
3. Goldberg, A.S. *Sports Slump Busting: 10 Steps to Mental Toughness and Peak Performance*. Champaign, IL: Human Kinetics; 1998.
4. Gilbert, C. Yoga and breathing. *J Bodyw Mov Ther*, 1999, 3, 44-54.
5. Gould, D., Eklund, R., and Jackson, S. Coping strategies used by U.S. Olympic wrestlers. *Res Q Exerc Sport*, 1993, 64, 83-93.
6. Jagdish, and Srivastava, A.K. *Mental Health Inventory*. Varanasi: Manovagyanik Parikchan Sansthan; 1983.
7. Maddux, R.E., Daukantaitė, D., and Tellhed, U. The effects of yoga on stress and psychological health among employees: An 8-and 16-week intervention study. *Anxiety Stress Coping*, 2018, 31(2), 121-134.
8. Singh, M. *Effects of Selected Yogic Exercise on Physical and Psychological Fitness*. Haryana: Unpublished Ph. D. Dissertation, Kurukshetra University, Kurukshetra; 2000.
9. Pratap, and Vijayendra. Steadiness in normal before and after yogic practices-an exploratory study. *Yoga Mimamsa*, 1968, 11, 2, 1-13.
10. Roth, B., and Creaser, T. Mindfulness meditation-based stress reduction: Experience with a bilingual inner-city program. *Nurse Pract*, 1997, 22(3), 150-152.

# An Analytical Study on Selected Anthropometric Variables and Motor Abilities between Women Kho-Kho and Kabaddi Players of Warangal District

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## 1. INTRODUCTION

Anthropometry refers to the measurement of the human individual. An early tool of physical anthropology, it has been used for identification, for the purposes of understanding human physical variation, in pale anthropology and in various attempts to correlate physical with racial and psychological traits. Anthropometry involves the systematic measurement of the physical properties of the human body, primarily dimensional descriptors of body size and shape. Anthropometry refers to the measurement of the size and proportion of human body and its different parts. It is the comparative study of the dimensions of the human body. It involves making precise, highly standardized measurements so that size and shape can be described objectively. Anthropometry precisely is the systematic quantitative representation of the human body. Anthropometric techniques are used to measure the absolute and relative variability in size and shape of the human body.

Physical fitness is one of the most important aspects in the field of physical education. However, physical fitness is not synonymous with health, it plays an essential role in all aspects of health because they are very much related. Good health provides a solid foundation on which fitness rests and at the same time, fitness provides one of the important keys to health and living one's life to the fullest. Fitness is not a state for the young; it is a reality for all ages. Fitness is a product of exercise and training has been shown through research to possess important implication in the general health of people. Proper nutrition, adequate rest relaxation, health appraisal, and good habits are all factors of implementation. The physical fitness is a concept which has both an absolute and a relative meaning. In absolute term, the man can run faster, jump higher, lift and handle the heaviest burdens, and attain the highest output

during a working day, must be most fit the person for the particular activity. On the other hand, when considered fitness in a relative term, a person of small size may not be able to complete in weight lifting with a bigger man and his maximum work output may be much less. However, still, he may be physiologically most fit.

### 1.1. Objective of the Study

The study is to determine the comparative study on selected anthropometric variables and Motor abilities between women kho-kho and kabaddi players of Warangal district.

### 1.2. Hypothesis

There may not be any significant difference between the women kho-kho players and kabaddi players of Warangal district in relation to anthropometric variables and motor abilities.

## 2. MATERIALS AND METHODS

A total of 50 subjects were randomly chosen for this study. Out of 50 players, 25 players were from kho-kho and 25 from kabaddi from Warangal district. The age of the players ranged from 18 to 24 years. All these subjects played the game of kho-kho and kabaddi for a number of years and were trained by the qualified coaches. They represented state and national levels.

**Table showing the sample of the study**

S. No.	Warangal district	Number of subjects
1.	Kho-kho players	25
2.	Kabaddi players	25
Total		50

## 2.1. Tools Used

Criterion measure in the present study was height, weight, arm length, length, cardiorespiratory endurance, abdominal muscle strength endurance, agility, leg explosive strength, and speed. All motor fitness components were measured by AAHPER Youth Physical Fitness Test. The basic statistical parameters were calculated for all the data: The mean and standard deviation (SD). To determine the differences, if any, between two groups of players, the independent *t*-test was calculated. The data were processed by means of the MS Excel Data Analysis tool pack. Statistical significance was tested at 0.05 level of confidence.

## 3. RESULTS

**Table 1:** Representing mean, SD, mean diff., and *t*-value in height, weight, arm length, length and sit-ups, shuttle run, SBJ, and speed between kho-kho players and kabaddi players

Motor variables	Kabaddi players Mean±SD	Kho-kho players Mean±SD	Mean difference	Std. error	<i>t</i> -value
Height (cm)	156.12±3.90	156.32±3.90	0.20	3.98	0.85
Weight (kg)	51.64±5.87	51.00±4.10	0.64	5.99	0.65
Arm length	71.24±4.10	71.88±4.58	0.64	4.60	0.60
Leg length	90.92±6.56	91.72±6.71	0.80	6.14	0.67
Sit ups (no)	32.48±6.08	32.4±5.51	0.08	5.98	0.96
SBJ (m)	2.03±0.21	2.06±0.23	0.02	0.22	0.66
50 (yrd)	8.63±0.54	7.96±0.52	0.66	0.53	5.45
St. run (s)	9.67±0.45	9.35±0.60	0.31	0.44	0.04

SD: Standard deviation, SBJ: Standing broad jump

## 4. FINDING AND DISCUSSION

Table 1 shows that mean  $\pm$  SD of height of kabaddi and kho-kho players were, respectively,  $156.12 \pm 3.90$  and  $156.32 \pm 3.90$  and the calculated  $t = 0.85$ . The mean  $\pm$  SD of weight of kabaddi and kho-kho players were, respectively,  $51.64 \pm 5.87$  and  $51 \pm 4.10$  and the calculated  $t = 0.65$ . The mean  $\pm$  SD of arm length for kabaddi players were  $71.24 \pm 4.10$  and kho-kho players were  $71.88 \pm 4.58$ , respectively, mean difference 0.64, standard error 4.60; leg length of the mean  $\pm$  SD of kabaddi players was  $90.92 \pm 6.56$  and kho-kho players

was  $91.72 \pm 6.71$ , mean difference 0.80, standard error 6.14. The mean  $\pm$  SD of AMSE (sit ups) for kabaddi players were  $32.48 \pm 6.08$  and kho-kho players were  $32.40 \pm 5.51$ , respectively, mean difference 0.08, standard error 5.98, and the calculated  $t = 0.96$ ; LES (standing broad jump) of the mean  $\pm$  SD of kabaddi players was  $2.03 \pm 0.21$  and kho-kho players was  $2.06 \pm 0.23$ , mean difference 0.02, standard error 0.22, and the calculated  $t = 0.66$ ; speed (50 yrd) of the mean  $\pm$  SD of kabaddi players  $8.63 \pm 0.54$  and kho-kho was  $7.96 \pm 0.52$ , mean difference 0.66, standard error 0.53, and the calculated  $t = 0.545$ . The mean  $\pm$  SD of agility (St. run) of kabaddi players and kho-kho players were, respectively,  $9.67 \pm 0.45$  and  $9.35 \pm 0.60$  and the calculated  $t = 0.04$ .

In the above table, the *t* value shows that in anthropometric variables, namely, height, weight, arm length, and leg length, there is no significant difference between kho-kho and kabaddi players, but average height, arm length, and leg length show that the kho-kho players are greater than the kabaddi players. The performances of different motor abilities of two groups have no significant difference which was observed between the fitness variables of kabaddi and kho-kho players. When compared to the mean values of both the groups, finally, it has been found that kho-kho players have considerably better than kabaddi players in speed and agility; on the other hand, the kabaddi players are slight better than the kho-kho players in sit-ups.

## 5. CONCLUSION AND RECOMMENDATIONS

Based on the results of the present study, we highlight anthropometric and fitness variables of kho-kho and kabaddi players. The following recommendations are made on the basis of the results from the study which may be useful for future research work. The study may be repeated to other physiological and physical fitness variables on the same subjects. The same study may be repeated on the other class of the society for different age groups. In this study, five variables were taken, but this can be done on more or less variables. The study can be carried on the basis of different regions.

## REFERENCES

- Fleck, S.J., Case, S., Puhl, J., and Van Handle, P. physical and physiological characteristics of elite women volleyball players. *Can J Appl Sports Sci*, 1985, 10, 122-126.
- Getchell, B. *Physical Fitness: A Way of Life*. New York:

Wiley and Sons, Inc.; 1979.

Hakkinen, K. Changes in physical fitness profile in female volleyball players during the competitive season. *J Sports Med Phys Fitness*, 1993, 33, 223-232.

Hosler, W.W., Morrow, J.R., and Jackson, A.S. Strength, anthropometric and speed characteristics of college women volleyball players. *Res Q*, 1978, 49, 385-388.

Kansal, D.K., Gupta, N., and Gupta, A.K. A study of intrasport differences in physique of Indian university football players In: James, A., (ed). *Perspectives in Kinanthropometry*. Champaign: Human Kinetics Publishers; 1986.

Malhotra, M.S., Ramaswamy, S.S., Joseph, N.T., and Sen

Gupta, J. Functional capacity and body composition of Indian athletes. *Indian J Physiol Pharmacol*, 1972, 16, 301.

Kumar, M. A comparative study of co-ordinate abilities of kabbadi and kho-kho female players at college level. *Int J New Innov Eng Technol*, 2013, 2(1), 29-32.

Sindhu, L.S., Sing, J., Sing, S.O., and Kaur, G. Morphological characteristics of sports bodys ranging in age from 11 to 19 years. *Indian J Sports Sci Phy Educ*, 1996, 8(1), 37-49.

Spence, D.W., Disch, J.G., Fred, H.L., and Coleman, A.E. Descriptive profiles of highly skilled women volleyball players. *Med Sci Sports Exerc*, 1980, 12, 299-302.



# **A Comparative Study on Selected Physical and Physiological Fitness Components of Hockey Players and Football Players**

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## **1. INTRODUCTION**

In today's techno-scientific age, the world has completely changed in all aspects due to discovery and research. In the field of games and sports also, there has been a great change with the help of scientific coaching and training. The athlete is being trained on scientific guidelines with highly sophisticated means for better achievement in their concerned sport to enable the coaches to get optimum performance with minimum expenditure of energy and time. They are being exposed to the exercise and training methods, which have got beneficial effect for achieving higher standard. The main aspect to be emphasized to achieve a high level of performance is the efficient function of the body. They must function well enough to support the particular activity that the individual is performing since different activities make different demands on the organism with respect to blood circulation, respiration, metabolic neurological, and temperature regulating functions; physiological fitness is specific to activity.

Human body is highly adaptable to exercise. The response of each system is discrete, hard work in the heat is necessary to improve the fitness of the temperature regulatory mechanism. Each task has its major physiological components and fitness for the task required is effective functioning of the appropriate system. In competitive sports, for the selection of particular sports, one has to consider measures of human body and physical fitness which play a dominant role at a higher level of sports competitions.

Scientists and physiologists have been of the view that anthropometry and physical components of an athlete have a lot to do with the performance, more than the techniques and tactics of a player of a team. The research

findings show that a high level of technical perfection alone has nothing to do with the success in competitive sports. Most of the game demands a greater amount of speed, strength, endurance, flexibility, coordination and maximum fitness of the organism. Modern scientific methods of training players or team place greater responsibility on the coaches and physical educators. They are also responsible for the selection of team taking into consideration the physical and physiological qualities essential for the game. The performance of football and hockey depends on many characteristics. The skill and physical condition play a major role, but the physiological factors and games experience cannot be overlooked. In India, men football and hockey are in infancy stage. It has to go long way to catch the world standard and in order to catch the world standard; there should be proper planning and implementation of the program. Moreover, the implemented program should be evaluated from time to time so that the best result can be attained.

### **1.1. Objective of the Study**

The study is to determine the comparative study on selected physical and physiological fitness components of hockey players and football players.

### **1.2. Hypothesis**

There may not be any significant between hockey players and football players in relation to physical and physiological fitness components.

## **2. MATERIALS AND METHODS**

For the purpose of the study, thirty players – 15 from the game of hockey and 15 from football have been

selected on purposively and randomly basis selected from Osmania University, who have participated in inter university competition. All the subjects were regularly practicing and competing in their respective sports competition. Tools used: The necessary data were collected with standardized procedure by administering selected physical and physiological abilities tests as suggested by Singh and Cooper. The necessary work was done before the start of the test. All the tests were administered and explained to the subjects categorically and left no ambiguity. Any doubts of the subjects raised were clarified before taking the test, but no special training was given to the subjects. To find out the difference between hockey players and football players of Osmania University, on their selected physical and physiological variables the required statistical calculation were computed with the help of SPSS software in the computer. The difference among all the selected variables, the data were collected and analyzed using the descriptive statistics and *t*-test. The level of significance was set at 0.05 level. When a two-tailed equal group statistical significance mean comparison *t*-test was employed on both the set of data hockey players and football players on selected variables, the result found evident significantly in the majority of the variables.

### 3. RESULTS AND DISCUSSION

The following variables were found significant at both 0.05 and 0.01 level of confidence such as height *t*-value 5.09, body mass index *t*-value 7.11, speed test by 40 m dash *t*-value 5.89, standing broad jump *t*-value 4.24, and cardiovascular endurance in form of 12 min run/walk test, *t*-value 5.61, which were significant at both 0.05 and 0.01 level of confidence, while the tabulates value required 2.01 and 2.68, respectively. However, the body weight value found the *t*-value 1.77 which was not found significant at 0.05 level of confidence. Since it is calculated, *t*-value was less than the tabulated value. The significant difference was found in the body mass index – in relation to the hockey players and football players. The football players group was have more BMI showing greater body mass than the hockey players group. The significant difference was found in the speed ability – 40 m sprint test; the football players group had better speed in comparison to the hockey players group. The significant difference was found in the standing broad jump a test of explosive strength in relation to the hockey players and football players. The hockey players group had high explosive strength, showing greater jumping ability than the football players group.

The significant difference was found in the height. The hockey players group had better height in comparison to the football players group. The significant difference was found in the 12 min run/walk test of cardiovascular endurance in relation to the hockey and football players. The football players group had better cardiovascular endurance, showing greater heart and lungs capacity than the hockey players group. There was not found any significant difference in relation to body weight.

### 4. CONCLUSION

The study has drawn certain conclusion and suggested some recommendations for the future research which may be conducted in related area. The similar study may be conducted by taking others important variables which affects the performance of the hockey players and football players along with others important physical, physiological, and psychological variables. The similar study may be undertaken by comparing the players of the other team games sports competition and comparing the players of the other teams' games sports competition. A similar study may be undertaken by comparing the players of the individual sports competition and comparing the players belonging to different socioeconomic status, geographical conditions, and variation in ethnicity. The same type of study can be conducted on other different level of subjects such as Senior National or International level. It is also recommended that the training program for hockey players and football players should be different as per their respective needs and requirements of the games.

### REFERENCES

- Bharshandar, J.R., Bharshankar, R.N., Deshpande, V.N., Kaore, S.B., and Gosavi, G.B. *Effects of Yoga on Cardio Vascular System in Subjects Above 40 Years*. Nagpur: Department of Physiology, Govt., Medical College; 2003. p. 22-26.
- Bhomik, and Kumar, A. *Comparison of Selective Physiological Parameters Between Soccer and Kabaddi Players*. Unpublished Master's Dissertation; 1987.
- Biddle, S. *European Perspectives in Exercise and Sports Psychology*. Champaign, IL: Human Kinetic Publishers and Inc.; 1995. p. 180.
- Birkel, D.A., and Edgren, L. *Hatha Yoga-improved Vital Capacity of College Students*. Muncie, USA: School of Physical Education, Ball State University; 2000. p. 55-63.
- Roy, C. *The Body Size, Strength Muscular Endurance and Power of Top Flight English Rugby and Soccer Players*. Completed Research in Health, Physical Education and Recreation; 1964. p. 135.

- Wuest, D.A., and Bucher, C.A. *Foundation of Physical Education and Sports*. 10<sup>th</sup> ed. St. Louis: Times Mirror/Mosby College Publishing; 1987. p. 188.
- Debnath, T.K. *Comparative Study of Selected Physiological Variables in Football, Kho-kho and Table-tennis Players*, *Bibliographical Dissertation Abstracts*. Amaravati, Maharashtra: H.V.P.M. Publication; 1990.
- Latika, K. *A Study of Selected Physical and Physiological Characteristics in Women Cricket Players*. Unpublished; 2007. p. 1-2.
- John, D.L. *The Learning and Performance of Physical Skills*. New Jersey: Prentice Hall, Inc., Englewood Cliffs; 1977. p. 45.
- Michael, C.M., Arnold, L., and Anthony, E.B. Psychological skills assessment and athletic performance in collegiate athletes. *J Sports Behav*, 1966, 19(2), 132-145.
- Mohammad, J. Selective physiological, psychological and anthropometric characteristics of Kuwaiti world cup soccer team. *Int J Sports Sci Phys Educ*, 1991, 3(1).
- Narang, P. *Play and Learn Hockey*. New Delhi: Khel Sahitya Kendra; 2003. p. 72.
- Ray, D.N. *Status of Physical Fitness and Physiological Parameters of Offensive and Defensive Players of Soccer and Hockey*. Unpublished Master's Dissertation; 1989. p. 33.
- Singh H. *Science of Sports Training*. New Delhi: DVS Publication; 1991.
- Zerigher, E.F. *Physical Education and Sports: An Introduction*. Philadelphia, PA: Lea and Febiger; 1982.

# **A Study of Physical Fitness and Influence of Physical Exercise, Circuit Training, and Yogic Practice on Speed among Male Students Attending Jawaharlal Nehru Technological University Hyderabad**

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## **1. INTRODUCTION**

Physical fitness is a general state of health and well-being or specifically the ability to perform aspects of sports or occupations. Physical fitness is generally achieved through correct nutrition, exercise, hygiene, and rest. It is a set of attributes or characteristics that people have or achieve that relates to the ability to perform physical activity. Before the industrial revolution, fitness was the capacity to carry out the day's activities without undue fatigue. However, with automation and changes in lifestyles, physical fitness is now considered a measure of the body's ability to function efficiently and effectively in work and leisure activities, to be healthy, to resist hypokinetic diseases, and to meet emergency situations.

Regular physical activity is one of the most important things one can do for health. It can help control the weight, lower the risk of heart disease, lower the risk for type 2 diabetes and metabolic syndrome, lower the risk of some cancers, strengthen the bones and muscles, improve the mental health and mood, improve the ability to do daily activities, and prevent falls if you're an older adult. Circuit training is a fast-paced class in which one does one exercise for 30 s–5 min and then move on to another exercise. It is like a game of musical chairs: Everyone begins at a station (that is, a place where an exercise is done), and when the instructor yells "Time!" everyone moves to the next free station. Some classes alternate an aerobic activity (such as stepping or stationary cycling) with a muscle-strengthening activity (like using weight machines). Others focus exclusively on muscle toning or aerobic exercise.

The circuit training comprises 6–10 strength exercises that are completed one exercise after another. Each exercise is performed for a specified number of repetitions or for a set time before moving on to the next exercise. The exercises within each circuit are separated by a short rest period, and each circuit is separated by a longer rest period. The total number of circuits performed during a training session may vary from two to six depending on your training level (beginner, intermediate, or advanced), your period of training (preparation or competition), and your training objective.

### **1.1. Objective of the Study**

The purpose of the study was to find out the influence of physical exercise, circuit training, and yogic practice on speed among male students attending Jawaharlal Nehru Technological University (JNTU) Hyderabad.

### **1.2. Hypothesis**

It was hypothesized that speed may be improved due to physical exercise than circuit training and yogic practice.

## **2. MATERIALS AND METHODS**

The study was designed to study the influence of physical exercise, circuit training, and yogic practice of male students attending JNTU Hyderabad on selected physical fitness components. The variable selected as dependent variable was speed. The three training means, namely, physical exercise training, circuit training, and yogic practice, were considered as independent

variables. To achieve this purpose, 120 male students attending JNTU Hyderabad were selected randomly as subjects. Their age ranged from 18 to 22 years.

They were assigned to three experimental groups (Group I, Group II, and Group III) and a control group (Group IV) of 30 each. The experimental groups were subjected to their respective training programs during morning hours namely physical training, circuit training, and yogic practices over a period of 6 days in a week in addition to their regular schedule. However, the control group was not exposed to any specific training, but they participated in the regular schedule. All the subjects of the four groups were tested on selected dependent variables before and after the treatment.

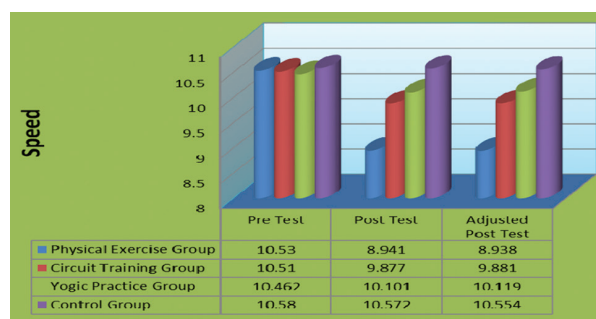
The data pertaining to the variables in this study were examined using a dependent *t*-test to find out significant improvement and analysis of covariance (ANCOVA) for each variable separately to determine the differences if any among the adjusted post-test means. Whenever “F” ratio for adjusted post-test was found to be significant, the Scheffe’s test was used as *post hoc* test to determine the three paired mean differences. The level of significance was fixed at 0.05 level of confidence for all the cases. The analysis of the dependent *t*-test on the data obtained for speed of the pre-test and post-test means of linear speed package training and control groups has been analyzed and presented in Table 1.

Table 1 shows the summary of mean, standard deviation, and dependent *t*-test for the pre-test and post-test and adjusted post-tests on speed of experimental and control groups (speed scores are expressed in 1/10<sup>th</sup> s)

The ANCOVA on speed of physical exercise, circuit training, yogic practice, and control groups has been analyzed and presented in Table 2. ANCOVA for the data on speed among experimental and control groups.

To find out which of the paired means had a significant difference, the Scheffe’s *post hoc* test was applied and the results are presented in Table 3. Scheffe’s test for the differences between the adjusted post-test paired means of speed.

The graph shows the pre-test and post-test and adjusted post-test mean values of physical exercise, circuit training, yogic practice, and control groups on speed.



		Physical exercise group	Circuit training group	Yogic practice group	Control group
Pre-test	Mean±SD	10.530±0.277	10.510±0.232	10.462±0.264	10.580±0.279
Post-test	Mean±SD	8.941±0.179	9.877±0.446	10.101±0.063	10.572±0.225
<i>t</i> -test		30.004*	7.478*	7.619*	0.283

Adjusted post-test means				Sources of variance	Sum of squares	Mean squares	F-ratio
Physical exercise group	Circuit training group	Yogic practice group	Control group				
8.938	9.881	10.119	10.554	Between	41.900	13.967	214.732*
				Within	7.480	0.065	

Physical exercise group	Circuit training group	Yogic practice group	Control group	Mean difference	Confidential interval
8.938	9.881			0.943*	0.187
8.938		10.119		1.181*	0.187
8.938			10.554	1.615*	0.187
	9.881	10.119		0.238*	0.187
	9.881		10.554	0.673*	0.187
		10.119	10.554	0.435*	0.187



### 3. FINDING AND DISCUSSION

Table 1 shows that the pre-test mean values of physical exercise, circuit training, yogic practice, and control groups on speed are 10.530, 10.510, 10.462, and 10.580, respectively, and the post-test mean values on speed are 8.941, 9.877, 10.101, and 10.572, respectively. The obtained dependent *t*-ratio values between the pre- and post-test means of physical exercise, circuit training, yogic practice, and control groups on speed are 30.004, 7.478, 7.619, and 0.283, respectively. The table value required for the significant difference at 0.05 level is 1.699. Since the obtained *t*-ratio values of experimental groups are greater than the table value, it is understood that physical exercise, circuit training, and yogic practice groups had significantly improved the performance of speed. However, the control group had not improved significantly on the performance of speed. Since the obtained *t*-value is less than the table value, as they were not subjected to any specific training.

Table 2 shows that the adjusted post-test means of physical exercise, circuit training, yogic practice, and control groups on speed are 8.938, 9.881, 10.119, and 10.554, respectively. The obtained F-ratio value is 214.732, which is higher than the table value 2.687 and 115 required for significance at 0.05 level. Since the value of F-ratio is higher than the table value, it indicates that there exist significant differences among the adjusted post-test means of physical exercise, circuit training, yogic practice, and control groups on speed.

Table 3 shows that the adjusted post-test mean difference on speed between physical exercise and circuit training, physical exercise and yogic practice, and physical exercise and control group, circuit training and yogic practice, circuit training and control group, and yogic practice and control group is 0.943, 1.181, 1.615, 0.238, 0.673, and 0.435, respectively, which are higher than the confidence interval value of 0.0187 at 0.05 level of confidence. The result of the study indicates that all the

experimental groups were significantly differed when compared to the control group on speed. However, it is further revealed that the experimental group, namely, physical exercise training group, had improved the performance of speed better than the other three groups.

### 4. CONCLUSIONS

The result of this study indicates that the control group does not show any significant difference on speed. The dependent variables such as speed had shown significant improvement due to the training effects of physical exercise, circuit training, and yogic practice. The effect of physical exercise training was greater than circuit training and yogic practice on speed among male students attending the JNTU Hyderabad. The findings of this study were also in accordance with the results which suggested the existence of the effect of physical exercise training on speed, endurance, and agility.

### REFERENCES

- Heyman. Analyse of Aerobic Fitness During an Incremental Submaximal Test. 2005.
- Ishii, T. Evaluated the effect of exercise training on serum leptin levels. *Metabolism*, 2001, 50.
- Katzel, L.L.I., Bleecker, E.R., Colman, E.B., Rogus, E.M., Sorkin, J.D., and Goldberg, A.P. Effects of weight loss vs aerobic exercise training on risk factors for coronary heart disease in healthy, obese, middle-aged and older men: A randomized controlled trial. *J Am Med Assoc*, 1995, 274, 1915-21.
- Stefanick, M.L., and Wood, P.D. Physical activity, lipid and lipoprotein metabolism, and lipid transport. In: Bouchard, C., Shephard, R.J., Stephens, T., (eds). *Physical Activity, Fitness and Health: International Proceedings and Consensus Statement*. Champaign, III: Human Kinetics; 1994.
- Morrato, E.H. A Study on the Risk of Obesity and Diabetes and Benefit of Exercise in Disease Prevention and Management. 2007.

# Effect of 6 Weeks Training on the Physical Fitness Performance of Girls Hockey Players at Hyderabad District

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## 1. INTRODUCTION

Physical fitness is central to all objectives of physical education. It is essential for the reconstruction and enjoyment of life. The movement like "Fitness for all and sports for all" is formed the basis of community building that is a directive for fitness awareness among the people. Everyone agrees that physical fitness is a basic necessity without which one cannot perform or carry out assigned tasks comfortably. In India, there have been two national attempts to develop such batteries; physical fitness includes speed, flexibility, rhythm, power, strength, coordination, muscular endurance, cardiovascular endurance, and agility. These characters are all equated with the healthy functioning of the body. Another important part of physical fitness is the athletic powers. The various aspects of physical fitness and skills are interrelated. Physical fitness is the ability of a person's body to meet the demands placed on it by his work, by his way of life and by the necessity to meet emergency situations. Fitness is one of the basic elements which are essential for better performance. The players must need to be in top physical condition. Physical fitness is considered as the fitness of the body, but in the modern concept, physical fitness means fitness of both body and mind.

### 1.1. Objective of the Study

The study is to determine the effect of 6 weeks training on the physical fitness performance of girl's hockey players at Hyderabad district.

### 1.2. Hypothesis

There may not be any significant difference between pre-test and post-test of physical fitness performance of hockey players in relation to 6 weeks training.

## 2. MATERIALS AND METHODS

The subjects for the present study consist of 50 girls' hockey players within the age of 14–16 years of Hyderabad district. The selected subject's physical fitness was measured in five motor tests – speed, flexibility, agility, strength, and endurance. Further, the sample was given training for 6 weeks during the morning and evening sessions. After the training, physical fitness is again measured in terms of performance of the players in all the five physical fitness tests which were used in pre-training condition. Statistical analysis treated and interpreted in accordance with the rule. The mean, standard deviation (SD), and *t*-test are calculated and data analyzed.

### 2.1. Tools Used

The physical fitness variables and test, physical fitness test American Alliance for Health, Physical Education and Recreation.

Variables	Test
Speed	50 m dash
Flexibility	Sit and reach
Agility	Shuttle run (4×10 yards)
Strength	Flexed arm hang
Endurance	12 min cooper run and walk

Table 1 shows the five physical tests performance of hockey girls in two conditions (pre and post).

Analysis and interpretation of result Table 2 indicate that the pre-test mean value of speed test performance of the pre-test is 9.21 and post-test is 8.96. The mean value shows that the hockey girls have taken more time to complete

Tests	Conditions	Mean±SD	t-value	Significant at 0.05 level
Speed	Pre-test	9.21±0.593	5.622	Significant $P<0.05$
	Post-test	8.96±0.556		
Flexibility	Pre-test	12.97±5.974	7.061	Significant $P<0.05$
	Post-test	17.59±5.620		
Agility	Pre-test	10.67±0.548	1.519	Not significant
	Post-test	10.61±0.496		
Strength	Pre-test	7.27±4.811	6.614	Significant $P<0.05$
	Post-test	13.65±8.257		
Endurance	Pre-test	2486.89±479.469	4.761	Significant $P<0.05$
	Post-test	2582.84±403.888		

\*Significant at 0.05 levels, SD: Standard deviation

the given task in pre-training while less time is taken in post-training condition. The SD of speed in pre and post is 0.593 and 0.556, respectively, whereas  $t$ -value is 5.622. The difference in mean score is significant at 0.05 level. The mean value of flexibility test performance is 12.97 and post-test is 17.59. The results show that flexibility is found to be improved after post-training. The SD of pre- and post-training is 5.974 and 5.620, respectively, whereas  $t$ -value is 7.061 which is significant at 0.05 level. The pre-test mean value of agility test performance is 10.67 and post-test mean value is 10.61. There is a difference of 0.6 s. It shows that girls have taken more time to complete the given task in pre-training while less time taken after pre-training condition. The SD of pre and post is 0.548 and 0.496, respectively, whereas  $t$ -value is 1.519. Hence, there was no significant difference which was found in regard to agility. It is also evident that the pre-test mean value of strength test performance is 7.27 and post-test mean value is 13.65. It indicates that the hockey girls' strength is found better after post-training condition. The SD of pre and post is 4.811 and 8.257, respectively, whereas  $t$ -value is 6.614 which is significant at 0.05 level. The pre-test mean value of 12 min cooper run and walk test performance is 2486.89 and post-test mean value is 2582.84. It indicates that hockey girls have covered less distance in pre-training while more distance is covered in post-training conditions. The SD of endurance in pre and post is 479.469 and 403.888, respectively, whereas  $t$ -value is 4.761 significant at 0.05 level.

### 3. CONCLUSION

It is concluded that there is a significant difference in physical fitness test performances of speed, flexibility, agility, strength, and endurance. There is no significant difference which was found in the physical fitness test performance of agility test performance between pre- and post-training condition.

### REFERENCES

- Heyman. Analyse of Aerobic Fitness During an Incremental Submaximal Test. 2005.
- Ishii, T. Evaluated the effect of exercise training on serum leptin levels. *Metabolism*, 2001, 50.
- Katzel, L.L.I., Bleecker, E.R., Colman, E.B., Rogus, E.M., Sorkin, J.D., and Goldberg, A.P. Effects of weight loss vs aerobic exercise training on risk factors for coronary heart disease in healthy, obese, middle-aged and older men: A randomized controlled trial. *J Am Med Assoc*, 1995, 274, 1915-21.
- Stefanick, M.L., and Wood, P.D. Physical activity, lipid and lipoprotein metabolism, and lipid transport. In: Bouchard, C., Shephard, R.J., Stephens, T., (eds). *Physical Activity, Fitness and Health: International Proceedings and Consensus Statement*. Champaign, III: Human Kinetics; 1994.
- Morrato, E.H. A Study on the Risk of Obesity and Diabetes and Benefit of Exercise in Disease Prevention and Management. 2007.

# Effect of Plyometric Training on Selected Physical Fitness Variables among Jawaharlal Nehru Technological University Hyderabad Basketball Players

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## 1. INTRODUCTION

Plyometric movements, in which a muscle is loaded and then contracted in rapid sequence, use the strength, elasticity and innervations of muscle and surrounding tissues to 23 jumps higher, run faster, throw further, or hit harder, and depending on the desired training goal. Plyometric is used to increase the speed or force of muscular contractions, providing explosiveness for a variety of sport-specific activities. Plyometric has been shown across the literature to be beneficial to a variety of athletes. Benefits range from injury prevention, power development and sprint performance among others. Plyometric exercise refers to those activities that enable a muscle to reach maximal force in the shortest possible time. "Plyometric" is a combination of Greek words that literally means to increase measurement plyometric exercise is a quick, powerful movement using a pre-stretch or countermovement, which involves the stretch-shortening cycle. Plyometric (also known as "ploys") is a type of exercise training designed to produce fast, powerful movements, and improves the functions of the nervous system, generally for the purpose of improving performance in sports.

The purpose of plyometric exercise is to increase the power of subsequent movements using both the natural elastic components of muscle and tendon and the stretch reflex. To effectively use plyometric as part of a training program, it is important to understand:

1. The mechanics and physiology of plyometric exercise
2. Principles of plyometric program design
3. Methods of safely and effectively performing specific plyometric exercises.

Plyometric involve power jumping, repetitive bounding, and quick force production. When your muscles

eccentrically contract, or shorten, then immediately stretch and lengthen, they produce maximal power ideal for athletic situations. It is a fast movement that happens over a short period. Plyometric is ideal for athletes or people looking to improve muscular power, speed, and strength (Baechele, 2008).

Basketball is one of the fastest games in which high-level conditioning and coordinative abilities with technical and tactical potentials are essential to perform every skill at the desired or required level. In basketball is the same speed, leg explosive power, and agile.

### 1.1. Objective of the Study

The purpose of the study is to determine the effect of plyometric training on selected physical fitness variables among basketball players.

### 1.2. Hypothesis

There may not be any significant difference between pre-test and post-test on selected physical fitness among basketball players in relation to plyometric training.

## 2. METHODOLOGY

The purpose of this study was to explore the effect of plyometric training on selected physical fitness variables among basketball players. To achieve this purpose of the study, 30 basketball players were selected from Jawaharlal Nehru Technological University, Hyderabad, and were randomly selected as subjects. Their age ranged between 18 and 22 years. The subjects were divided into two groups, namely, plyometric group and control group. The plyometric group was subjected to plyometric training (for weekly 3 days Monday,

**Table 1:** Comparison of mean and “*t*”-values of physical fitness variables between pre- and post-test among plyometric and control groups

S. No.	Physical fitness variables	Groups	Test	Mean	“ <i>t</i> ”-values
1.	Speed	Plyometric group	Pre-test	7.81	13.43
			Post-test	7.77	
		Control group	Pre-test	7.81	0.48
			Post-test	7.82	
2.	Agility	Plyometric group	Pre-test	20.61	13.16
			Post-test	20.58	
		Control group	Pre-test	20.77	1.75
			Post-test	22.34	
3.	Leg explosive power	Plyometric group	Pre-test	35.06	15.04
			Post-test	37.80	
		Control group	Pre-test	34.26	0.52
			Post-test	34.13	

Wednesday, and Friday) at the evening session for 6 weeks. Speed, agility, and leg explosive power were selected as the dependent variable. After the collection of appropriate data, it was statistically analyzed.

### 2.1. Tools Used

- Speed AAPHERD youth fitness test (50 m Dash) in seconds,
- Agility JCR test (shuttle run) in seconds,
- Leg explosive power JCR test (VERTICAL JUMP) in centimeters.

### 2.2. Training Program

For plyometric group underwent their training program, as 3 days/week for 6 weeks. The training was given in the evening session. The training session includes warming up and cool down. Every day the workout lasted for 45–60 min approximately. The subjects underwent their training programs as per the schedules such as side to side ankle hops, double leg hops, split jumps, lateral cone hops, and single-leg bounding under the strict supervision of the investigator. During the experimental period, the control group did not participate in any of the special training.

## 3. RESULTS AND DISCUSSION

Table 1 reveals that the obtained mean values of pre-test and post-test of plyometric group for speed, agility, and leg explosive power were 7.81 and 7.77, 20.61 and 20.58, and 35.06 and 37.80, respectively; the obtained “*t*”-ratio was 13.43, 13.16, and 15.04, respectively.

“*t*”-value is 2.14 at 0.05 level of confidence for the degree of freedom 14. “*t*”-ratio was greater than the table value. It is found to be a significant change in speed, agility, and leg explosive power of the basketball players. The obtained mean values of pre-test and post-test scores of the control group were 7.81 and 7.82, 20.77 and 22.34, and 34.26 and 34.13, respectively, the obtained “*t*”-ratio was 0.48, 1.75, and 0.52. The required table value is 2.14 at 0.05 level of confidence for the degree of freedom 14. The “*t*”-ratio was lesser than the table value. It is found to be insignificant changes in speed, agility, and leg explosive power of the basketball players.

The results of the study indicated that the selected physical fitness variables such as speed, agility, and leg explosive power were improved significantly after undergoing plyometric training. The changes in the selected parameters were attributed to the proper planning, preparation, and execution of the training package given to the players. The results of the present study indicate that the plyometric training methods are appropriate protocol to improve speed, agility, and leg explosive power of school level boys basketball players. From the result of the present study, it is very clear that the selected physical fitness variables such as speed, agility, and leg explosive power improvement significantly due to plyometric training.

## 4. CONCLUSIONS

It was concluded that the practice of plyometric training helped to improve selected physical fitness variables of school level boys’ basketball players. It was also found



that there is a progressive improvement in the selected criterion variables of the plyometric group of JNTUH basketball players after 6 weeks of the plyometric training program. Further, it also helps to improve selected physical fitness variables such as speed, agility, and leg explosive power.

## REFERENCES

- Annadurai, R. Effect of Swiss ball and plyometric training programme on selected physical variables and skill performance of inter collegiate men volleyball players. *Acad Sports Sch*, 2014, 3, 5.
- Saini, H.K., and Bhardwaj, V. Effect of plyometric and circuit training on anthropometry of Punjab state basketball players. *Int J Physiol Nutr Phys Educ*, 2018, 3, 92-95.
- Kumar, M.K., and Raj, S. Effect of plyometric and weight training programs on vertical jump in female basketball players. *Int J Phys Educ Sports Health*, 2016, 3, 3.
- Rajan, N., and Faiz, P.A. Plyometric training on selected bio motor abilities of basketball players. *Int J Physiol Nutr Phys Educ*, 2018, 3, 1.
- Varathan, R. Effect of plyometric training on speed, speed endurance and agility of sedentary college men. *Int J Phys Educ Sports Health*, 2018, 5, 2.
- Veeramani, S. Effect on package of low impact plyometric exercise on selected performance related fitness variables among volleyball players. *Int J Phys Educ*, 2015, 2(1), 20-22.

# Analysis of Injuries among the Kho-Kho Players of Osmania University

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## ABSTRACT

Engaging in sports activities has numerous health benefits but also carries the risk of injury. Sports trauma commonly affects joints of the extremities, i.e., knee, ankle, hip, shoulder, elbow, and wrist. The objective of the study is to investigate the frequency of injuries among Kho-Kho Players of Osmania University. The sample for the study consists of 100 Male Kho-Kho Players who participated in the Osmania University Inter College Kho-Kho Championships for the year 2018–2019 between the age group of 18 and 25 years. All the players were given a questionnaire regarding sports injuries occur while playing the Kho-Kho during the practice and competition. The results of the study show that lower extremities injuries are 54%, upper extremities 36%, head 12%, neck 4%, and spine 4%. It is concluded that Kho-Kho players must have good conditioning and prevention to avoid the injuries in the game of Kho-Kho this type of study is useful to coaches to give proper coaching for the development of motor qualities for the prevention of injuries in Kho-Kho.

**Keywords:** Head, neck, and spine, Injuries, Lower extremities, Upper extremities.

## 1. INTRODUCTION

Kho-Kho is a contact team sport played between two teams of nine players each. The objective of the game is for a nine-player on offense, referred as a chasers (Sitting Players) to sit in the eight squares of the court, and one active runner gives the Kho to chasers or he can be caught the defender team runners, with in the time bound of 9 min, how many they caught that is the points of their team. The same chance will be given to the opponents, their team also in the 9 min time caught the defenders (runners), finally which team will get the more points, their team is declared the winners. Each team is given two innings of 9 min time, two teams are called chasers and runners, each team will get two chasing chances and two running chances, after the completion of two innings of the game of two teams, which team will get more points that team is declared as the winners.

Engaging in sports activities has numerous health benefits but also carries the risk of injury. At every age, sports persons sustain a wide variety of soft tissue, bone, ligament, tendon, and nerve injuries caused by

direct trauma or repetitive stress. Different sports are associated with different patterns of injuries, whereas age, gender, and type of activity influence the prevalence of injuries.

Sports trauma commonly affects joints of the extremities, i.e., knee, ankle, hip, shoulder, elbow, wrist, and spine. The sports injuries that occur in competition or practice has a loss of time for participation in sport.

According to Translating Research into Injury Prevention Practice model (Finch, 2006), the first step in injury research is to understand the extent of the problem. The prevalence and prevalence proportion of sports injuries have been widely investigated across sports. Unfortunately, such studies have only included groups selected by either one or more criteria, such as specific sport (Jacobsson *et al.*, 2012), level (Hall *et al.*, 2013), age (Scase *et al.*, 2012) or injury type (Maselli *et al.*, 2015). The recruitment of selected groups has further limited the external validity of the study results to the general population. In addition, knowledge about the prevalence of sports injuries on a general population level is, alongside injury severity and treatment costs,

important to identify whether sports injuries are a public health burden, as well as to identify whether certain sports contribute to a larger number of injuries than others (Finch, 2006). To the best of our knowledge, no studies have yet investigated the total prevalence of sports injuries in a general population-based sample, and subsequently compared the prevalence and prevalence proportion of sports injuries between different sports.

### 1.1. Purpose of Research

The objectives of the study are to investigate the frequency of injuries among Kho-Kho players of Osmania University. This study was designed to investigate the most common types of injuries, mechanisms of injury, activities leading to injury, time and place of injury occurrence, and time lost to injury.

### 1.2. Scope of Research

The scope of research is to study the frequency of injuries among Kho-Kho players of Osmania University during practice and matches.

### 1.3. Population and Sample Group

The sample for the study consists of 100 Male Kho-Kho players who participated in the Osmania University inter-college Kho-Kho championships for the year 2018–2019 between the age group of 18 and 25 years.

### 1.4. Research Instruments

All the players were given a questionnaire regarding sports injuries occur while playing Kho-Kho during the practice and competition. All the sportspersons are doing regular practice for minimum past 2 years.

The questionnaire consisting of the following injuries as follow:

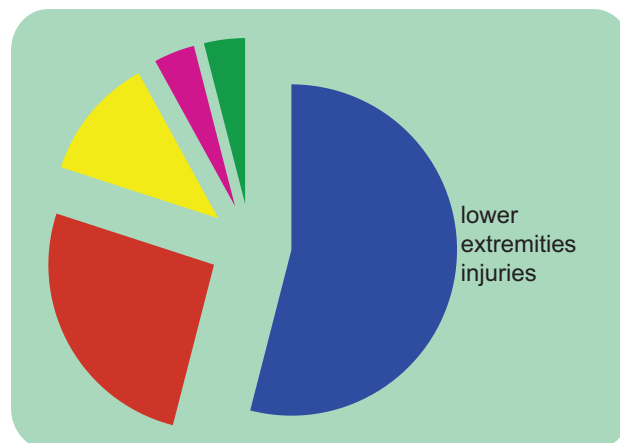
1. Lower extremities
2. Upper extremities
3. Head
4. Neck
5. Spine.

### 1.5. Data Collection

The data were collected personally in the Osmania University Inter College Kho-Kho matches for the year 2018–2019. Some Kho-Kho players data were collected during their practice session at L.B. Stadium and Osmania University grounds in Hyderabad.

## 2. RESULTS

The results of the study show that lower extremities injuries are 54%, upper extremities 36%, head 12%, neck 4%, and spine 4%.



Lower extremities injuries	Upper extremities	Head	Neck	Spine
54	36	12	4	4

The majority of sports injuries are soft tissue in nature and because many of the injuries arise in Kho-Kho are due to improper body mechanics and improper sports techniques.

## 3. DISCUSSION

It is concluded that lower extremities injuries are 54%, upper extremities 36%, head 12%, neck 4%, and spine 4%.

Sprains and strains are the most common lower extremity injuries in Kho-Kho game. The severity of these injuries varies. Cartilage tears and anterior cruciate ligament sprains in the knee are some of the more common injuries that may require surgery. Other injuries include fractures and contusions from direct blows to the body.

Shin splints (soreness in the calf), patellar tendinitis (pain in the knee), and Achilles tendinitis (pain in the back of the ankle) are some of the more common in Kho-Kho.

Injuries to the head, neck, and face include cuts and bruises, fractures, neck sprains, and concussions. A concussion is any alteration in a player's mental state due to head trauma and should always be evaluated by a physician.

### 3.1. Research Recommendations

Sufficient warm-up, proper technique, correct biomechanics, proper conditioning, optimizing balance, coordination, optimizing reaction times, optimal diet, adequate rest, and positive attitude will reduce the risk of injuries. Increase, your flexibility by performing dynamic warm-up before practice and competition followed by static stretching post activity.

### 3.2. Recommendations' for Further Research

Consult a Coach or Physical Trainer to incorporate the conditioning Programmes during the practice. Have a pre-season physical examination and follow your doctor's recommendations.

## REFERENCES

1. Finch, C. A new framework for research leading to sports injury prevention. *J Sci Med Sport*, 2006, 9(1-2), 3-9.
2. Jacobsson, J., Timpka, T., Kowalski, J., Nilsson, S., Ekberg, J., and Renstrom, P. Prevalence of musculoskeletal injuries in Swedish elite track and field athletes. *Am J Sports Med*, 2012, 40(1), 163-169.
3. Maselli, F., Ciuro, A., Mastro Simone, R., Cannone, M., Nicoli, P., and Signori, A., *et al.* Low back pain among Italian rowers: A cross-sectional survey. *J Back Musculoskeletal Rehabil*, 2015, 28(2), 365-376.
4. Nielsen, R.O., Ronnow, L., Rasmussen, S., and Lind, M. A prospective study on time to recovery in 254 injured novice runners. *PLoS One*, 2014, 9(6), e99877.
5. Rosenbaum, A.J., Uhl, R.L., Rankin, E.A., and Mulligan, M.T. Social and cultural barriers: Understanding musculoskeletal health literacy: AOA critical issues. *J Bone Joint Surg Am*, 2016, 98(7), 607-15.
6. Scase, E., Magarey, M.E., Chalmers, S., Heynen, M., Petkov, J., and Bailey, S. The epidemiology of injury for an elite junior Australian football cohort. *J Sci Med Sport*, 2012, 15(3), 207-212.
7. Schmidt, M., Pedersen, L., and Sorensen, H.T. The Danish civil registration system as a tool in epidemiology. *Eur J Epidemiol*, 2014, 29(8), 541-549.
8. Available from: [https://www.stopsportsinjuries.org/stop/prevent\\_injuries/soccer\\_injury\\_prevention.aspx](https://www.stopsportsinjuries.org/stop/prevent_injuries/soccer_injury_prevention.aspx).

# Effects of Ultrasound Therapy, Interferential Therapy, and Combination of Ultrasound Therapy with Interferential Therapy on Both Anterior Cruciate Ligament Injury (Sprain) and Bursitis of Knee in Sports

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## ABSTRACT

Sports play a great role in our life as it keeps us healthy, wealthy, and active. We can have a healthy mind only when we have a healthy body. Sports injuries are more likely to occur, in this research, the researcher is interested to find out effects of ultrasound therapy (UST), interferential therapy (IFT), and combination of UST with IFT (USIFT) in treatment of both anterior cruciate ligament (ACL) injury (sprain) and bursitis of knee joint. Even though there are different knee injuries, the investigator selected the players suffering with both ACL injury (sprain) and bursitis of knee for this study. To test the effect of these different treatments, namely, UST, IFT, and combination of USIFT on the players who were suffering from both ACL injury and bursitis of knee. The researcher selected perceived pain, swelling, and range of motion as dependent variables. Thirty players suffering from both ACL injury and bursitis of knee were selected as subjects for this study. The subjects were in the age group of 16–25 years. The differences between means of initial and final scores on selected criterion variables were subjected to statistical treatment using analysis of covariance. The results of the study proved that UST, IFT, and combination of USIFT were significantly contributed to the treatment of both ACL injury and bursitis of knee as measured through pain, swelling, and range of motion. Among the treatment groups, the combination of USIFT was significantly better than the other two treatment groups, namely, UST group and IFT group in reducing pain, swelling, and improving range of motion for both ACL injury and bursitis of knee in the players.

**Keywords:** Anterior Cruciate Ligament, Bursitis, Interferential Therapy, Pain, Range of Motion, Swelling, Ultrasound Therapy.

## 1. INTRODUCTION

Sports are very important for one's life and participation in sports should always be encouraged. Participation in sports makes us active, healthy, fit, and also the development of our social and communication skills. The most common saying, "Healthy mind lives in Healthy body" is so true because for a man to be successful, his physical, as well as mental state, should be well. Sports are the greater source of recreation. Sports remove stress and provide relaxation to our mind and body. In contemporary sports, one must train for at least 10 years or 10,000 h, especially in speed, power, and endurance sports. Getting injury is very much common in present

sports because a sportsman has to swim in the ocean of lactic acid to achieve the medal in international competitions. A sportsman may get different kinds of sports injuries. This does not mean one should avoid sports. Everyone from well-conditioned athletes to weekend warriors can suffer a sports injury. Sports injuries are most commonly caused by poor training methods, structural abnormalities, and weakness in muscles, tendons, ligaments, and unsafe exercising environments. The medical community is playing an increasing active role in encouraging fitness enhancement, whether by threats (the dangerous of high cholesterol or low-density lipoprotein, osteoporosis, or cardiovascular disease) or promises (enhanced competitive performance or lowered body



fat) (Ried, 1992). Ligamentous injuries bursitis and its combination at the knee joint are the most common sporting injuries, especially in jumping sports (e.g., basketball, volleyball, etc.). They are not always well managed. Associated injuries are frequently not diagnosed and the rehabilitation of ligamentous injuries is often inadequate leading to a high rate of recurrence (Khan and Bruker, 1998). Physiotherapy plays an integral part in the multidisciplinary approach to the management of sports injuries. The aim of physiotherapy is to treat and fully rehabilitate the athlete post-injury, postoperatively, to prevent further injury and to return the athlete to sport in the shortest possible time. Effectiveness of therapeutic ultrasound for pain, musculoskeletal injuries, and soft tissue lesions remains questionable. A study has proven that ultrasound helps in enhancing the metabolic activities of cells. Thus, ultrasound treatment helps in tissue repair, especially in soft tissue injuries (Baker *et al.*, 2001). IFT along with ultrasound can be applied to ease pain and swelling symptoms as well. This well applied together to the nerve tract of irritated or inflamed tissue can shorten the inflamed region and reduce pain (Heidt *et al.*, 1996 and McConnell, 2002). Thus, there are different physiotherapy methods being used to treat both anterior cruciate ligament (ACL) injury and bursitis of knee. In this research, the researcher is interested to find out the effects of ultrasound therapy (UST), interferential therapy (IFT), and combination of ultrasound therapy with IFT (USIFT) in the treatment of both ACL injury (sprain) and bursitis of knee. To test the effect of these different treatments, namely, UST, IFT, and combination of USIFT on the players who were suffering from both ACL injury (sprain) and bursitis of knee. The researcher selected pain, swelling, and range of motion as dependent variables.

## 2. SPORTS INJURIES

Sports injuries are injuries that occur in athletic activities or while exercising. Sports injuries may be classified as acute, sub-acute, and chronic injuries (overuse injuries).

### 2.1. Knee Injuries

Knee is the most complex joint and made up of many important structures, any of which can be injured. The most common knee injuries include fractures around the knee, dislocation, sprains, strains, bursitis, and tears of the meniscus. Pain, swelling, and reduced range of motion are the most common signs and symptoms of knee injury.

### 2.2. ACL Injury (Sprain) of Knee

ACL knee injury is common in sports that involve sudden changes of direction, such as football and basketball. An ACL injury is the over-stretching or tearing of the ACL in the knee. An ACL tear may be partial or moderate or complete.

### 2.3. Bursitis of Knee

The bursa is a sac filled with lubricating fluid located between tissues such as bone, muscle, tendons, and skin that decreases rubbing, friction, and irritation. Bursitis is the inflammation or irritation of the bursa. Localized inflammation and swelling can be produced.

## 3. PHYSIOTHERAPY FOR BOTH ACL SPRAIN AND BURSITIS OF KNEE

When undergoing treatment for knee injuries, healing of the injured ligament without loss of mechanical stability is the main treatment goal. Whether is an injury to the meniscus, ligament, bursa, or cartilage, the principles of the treatment are the same.

### 3.1. UST

Therapeutic ultrasound refers generally to any type of ultrasonic procedure that uses ultrasound for therapeutic benefit. Ultrasound is a method of stimulating the tissue beneath the skin's surface using very high-frequency sound waves, between 800,000 Hz and 2,000,000 Hz, which cannot be heard by humans. Three primary benefits with the UST are speeding up the healing process, reducing the pain, and gentle massage to the soft tissues.

### 3.2. IFT

Interferential current therapy has been in use for many years, and there have been numerous case studies and research reports that have documented its versatility in treating diverse symptoms, accelerating the healing process, and restoring normal movement. IFT was developed by Dr. Hans Nemec in 1950. IFT is an effective therapy option used by many physiotherapy clinics to relieve pain and accelerate the self-healing process, getting your body back to a healthy, pain-free states.

## 4. STATEMENT OF THE PROBLEM

The purpose of this study was to trace out the effects of UST, IFT, and combination of USIFT in the treatment of both ACL injury (sprain) and bursitis of knee in sports.

#### 4.1. Hypotheses

In the light of the theoretical foundations laid so far on the treatment effects, the investigator hypothesized the following for the purpose of this study. It was hypothesized that the three treatments, namely, UST, IFT, and combination of USIFT would significantly reduce pain and swelling and improve range of motion for both the ACL injury and bursitis among injured players of knee.

#### 4.2. Selection of Subjects

The subjects were the students studying Master of Physical Education (M.P.Ed.), Bachelor of Physical Education (B.P.Ed), and Diploma in Physical Education (D.P.Ed.) in Rayalaseema College of Physical Education, Proddatur, and also the students of other nearby Degree and P.G. Colleges in Proddatur, YSR Kadapa District, Andhra Pradesh, who got both ACL injury and bursitis approached Physiotherapy Department of Rayalaseema College of Physical Education for treatment during the academic years 2014–2015 to 2017–2018. The players who reported pain, swelling, and reduced range of motion were selected as subjects by administering a brief questionnaire. Thirty players suffering from both ACL injury and bursitis of knee were selected as subjects for this study. The subjects were in the age group of 16–25 years. Further, the subjects were randomly subdivided into three groups consisting of 10 in each. Group I underwent UST, Group II underwent IFT, and Group III underwent a combination of USIFT.

#### 4.3. Selection of Variables

Several researches in the field of sports injuries pointed out that the common injury of knee is ACL injuries (sprain) and bursitis of knee. The acute level of the injury was determined through three common variables, namely, pain, swelling, and range of motion. Thus, within these broader parameters, the investigator selected the following dependent and independent variables for this study.

The selected dependent variables for the study were as follows:

1. Pain at and around the knee joint
2. Swelling may be of any degree near the knee joint and
3. Range of motion due to ACL injury or bursitis of knee.

The selected independent variables for the study were as follows:

1. UST
2. IFT
3. Combination of USIFT.

### 5. RESEARCH DESIGN OF THE STUDY

The methodology and design of experiments adopted in this study are discussed here. The experimental design used in this study was random group design. Before the experimental treatments, all the subjects were measured pain, swelling, and range of motion at knee joint. The experimental treatments were given to the subjects as per description and supervision of the experienced physiotherapist for 15 days. All the subjects were tested before treatment and after completion of 15 days of treatment on selected dependent variables, namely, perceived pain, swelling, and range of motion. The difference between initial and final means of pain, swelling, and range of motion were considered as the effect of selected treatment on selected injury.

#### 5.1. Selection of Criterion Measures

The tests selected for this research are highly standardized, relevant to the study, and ideal to assess the selected variables. Having the expert consultation in the field of physiotherapy, physical education, and sports sciences, and scanning various literatures related to the study, the investigator has selected the following test items as criterion measures and used to collect the relevant data on selected dependent variables.

#### 5.2. Selection of Tests

After reviewing the available literature, the following standardized tests were selected and used to collect the relevant data on the selected dependent variables and they are presented in Table 1.

#### 5.3. Selection of Treatments

The following experimental treatments were given to the subjects as per the description given below under the supervision of medical officer and the investigator, who is a qualified physiotherapist.

#### 5.4. UST

Experimental Group I underwent 15 days UST. The following mode of treatment was followed for UST.

**Table 1: Selection of tests**

Variables	Test	Unit of measurement
Pain due to both ACL injury (sprain) and bursitis knee	Visual analog pain scale	In numbers
Swelling due to both ACL injury (sprain) and bursitis knee	Swelling measurement	In centimeters
Range of motion due to both ACL injury (sprain) and bursitis knee	Goniometric measurement	In degrees

ACL: Anterior cruciate ligament

#### 5.4.1. Mode of treatment

Mode of treatment	Continuous mode
Duration of treatment	10 min
Intensity	1.2 W/cm <sup>2</sup>
Sitting per day	1 session
Duration	15 days

#### 5.4.2. IFT

Experimental Group II underwent 15 days IFT. The following mode of treatment was followed for IFT.

Duration of treatment	10 min
Sitting per day	1 session
Total duration	15 days

#### 5.4.3. Combination of UST and IFT

Experimental Group III underwent a combination of USIFT for 15 days. The following mode of treatment was followed.

For this group, both ultrasound treatments with IFT have given to the subject at the same time.

### 5.5. Collection of Data

Before the start of the treatments, namely, UST, IFT, and combination of USIFT, scores on pain, swelling, and range of motion were collected, which formed the pre-test scores of the subjects. On completion of 15 days of treatment, tests were again conducted to measure variables such as pain, swelling, and range of movement using visual analog pain scale, flexible tape, and goniometer among the subjects. It was considered as a post-test.

### 5.6. Statistical Techniques

The differences between means of initial and final scores on selected criterion variables were subjected to statistical treatment using analysis of covariance (ANCOVA). When a significant difference among the treatment group was detected, a pair-wise comparison of the programs was done by Scheffe's *post hoc* test to

identify significant differences between the treatment groups. In all the cases, 0.05 level of confidence was fixed to test the significance, which was considered as appropriate. The data were analyzed by computer using statistical packages.

## 6. ANALYSIS OF THE DATA AND RESULTS OF THE STUDY

The data on each criterion variable of ACL injury (sprain) of the knee were analyzed separately and the results are presented below.

### 6.1. Results on Pain of Both ACL Injury (sprain) and Bursitis of Knee

The descriptive statistics on obtained data on pain of ACL injury (sprain) of knee due to UST, IFT, and combination of USIFT are presented in Table 2.

The table value for significance at 0.05 level with df 2 and 27 and 2 and 26 is 3.35 and 3.37, respectively.

Table 2 shows that the pre-test means on pain of both ACL injury and bursitis of knee of UST, IFT, and USIFT groups are 7.60, 7.10, and 7.30, respectively. The obtained F ratio of 0.62 for pre-test means is less than the table value of 3.35 for df 2 and 27 required for significance at 0.05 level. This shows that there was no significant difference in means of the groups at initial stage. The post-test means on pain of both ACL injury and bursitis of knee of UST, IFT, and USIFT groups are 3.30, 3.00, and 1.20, respectively. The obtained F ratio of 5.83 for post-test means is greater than the table value of 3.35 for df 2 and 27 required for significance at 0.05 level. This shows that there was a significant difference in means of the groups at the end of treatment. The adjusted post-test means on pain of both ACL injury and bursitis of knee of UST, IFT, and USIFT groups are 3.22, 3.07, and 1.21, respectively. The obtained F ratio of 5.70 for adjusted post-test means is greater than the table value of 3.37 for df 2 and 26 required for significance at 0.05 level. The result of the study indicates that there is a significant difference among adjusted post-test means

of UST, IFT, and USIFT groups on pain of both ACL injury and bursitis of knee. To determine the significant difference among the three paired means, the Scheffe's test was applied as *post hoc* test and the results are presented in Table 3.

Table 3 shows that the adjusted post-test mean difference on pain of both ACL injury and bursitis of knee between UST group and USIFT group is 2.01 which is greater than the confidence interval value 1.99. It may be concluded

from the result that there is a significant difference between UST group and USIFT group on pain of both ACL injury and bursitis of knee. Further, Table 3 shows that the adjusted post-test mean difference on pain of both ACL injury and bursitis of knee between UST group and IFT group and between IFT group and USIFT group is 0.15 and 1.86, respectively, which is lesser than the confidence interval value 1.99. It may be concluded from the result that there is no significant difference between UST group and IFT group and between IFT

**Table 2:** Analysis of covariance for the pre-test, post-test and adjusted post-test data on pain of both ACL injury and bursitis of knee with UST, IFT, and combination of USIFT groups

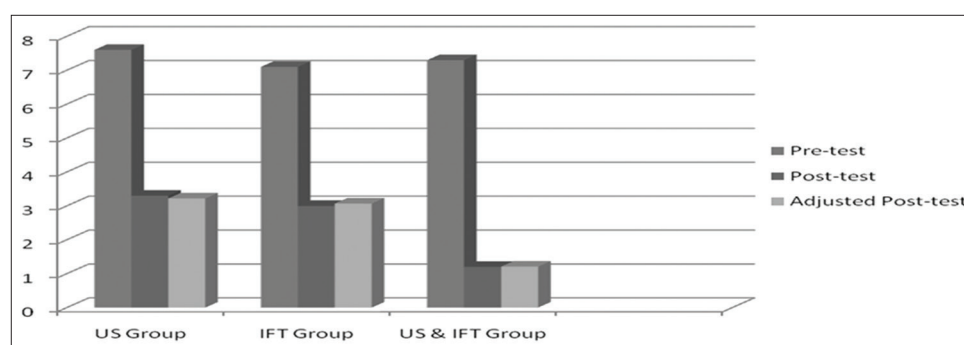
Tests/groups	UST group	IFT group	UST and IFT group	SOV	Sum of squares	df	Mean squares	F ratio
Pre-test								
$\bar{x}$	7.60	7.10	7.30	B	1.27	2	0.63	0.62
$\sigma$	0.84	1.10	1.06	W	27.40	27	1.06	
Post-test								
$\bar{x}$	3.30	3.00	1.20	B	25.80	2	12.90	5.83*
$\sigma$	1.64	1.83	0.79	W	59.70	27	2.21	
Adjusted post-test								
$\bar{x}$	3.22	3.07	1.21	B	25.01	2	12.51	5.70*
				W	57.00	26	2.19	

\*Significant at 0.05 level of confidence. SOV: Source of variance; B: Between, W: Within, UST: Ultrasound therapy, IFT: Interferential therapy, USIFT: Ultrasound therapy with interferential therapy, ACL: Anterior cruciate ligament

**Table 3:** Scheffe's *post hoc* analysis for the difference between the adjusted post-test paired means on pain of both ACL injury and bursitis of selected groups

Adjusted post-test means			Mean differences	Confidence interval 0.05 level
UST group	IFT group	UST and IFT group		
3.22	3.07	--	0.15	1.99
3.22	--	1.21	2.01*	1.99
--	3.07	1.21	1.86	1.99

\*Significant at 0.05 level of confidence. ACL: Anterior cruciate ligament, UST: Ultrasound therapy, IFT: Interferential therapy



**Figure 1:** Bar diagram showing pre-test, post-test, and adjusted post-test means on pain of both anterior cruciate ligament injury and bursitis of ultrasound therapy, interferential therapy, and ultrasound therapy with interferential therapy groups

group and USIFT groups on pain of both ACL injury and bursitis of knee. The adjusted post-test mean values on pain of both ACL injury and bursitis of knee of UST, IFT, and combination of USIFT groups are graphically depicted in Figure 1.

## 6.2. Results of the Study and Discussion on Hypotheses

The results presented in Tables 2 and 3 show the descriptive statistics, ANCOVA results, and post-analysis, respectively, on pain of ACL injury (sprain), due to the treatments, namely, UST, IFT, and combination of USIFT. The results proved that all three treatment groups were able to reduce pain of ACL injury significantly. The formulated hypothesis No. 1 that the three treatments, namely, UST, IFT, and combination of USIFT, would significantly reduce pain of ACL injury of knee was accepted at 0.05 level.

Further, the results proved that the combination of USIFT was found to be significantly better than the other two treatments, i.e., UST and IFT in reducing the pain of ACL injury at knee. The formulated hypotheses No. 4 that the combination of UST and IFT (USIFT) would significantly reduce perceived pain of ACL injury, when compared to the other two treatments, i.e., UST and IFT were accepted at 0.05 level.

## 7. CONCLUSIONS

From the analysis of the data, the following conclusions were drawn:

1. It was concluded that the three treatments, namely, UST, IFT, and combination of USIFT, have significantly reduced pain of ACL injury (sprain) of knee. It was further concluded that the combination of USIFT was significantly better when compared with the two other treatments, namely, UST and IFT, in reducing pain of ACL injury of knee.
2. It was concluded that the three treatments, namely, UST, IFT, and combination of USIFT, have

significantly reduced swelling of ACL injury (sprain) of knee. It was further concluded that UST was significantly better when compared with the two other treatments, namely, IFT and combination of USIFT, in reducing swelling of ACL injury of knee.

3. It was concluded that the three treatments, namely, UST, IFT, and combination of USIFT, have significantly improved range of motion of ACL injury (sprain) of knee. It was further concluded that the combination of USIFT was significantly better when compared with the two other treatments, namely, UST and IFT, in improving range of motion of ACL injury of knee.

## REFERENCES

1. Akbari, A., Sarmadi, A., and Zafardanesh, P. The effect of ankle taping and balance exercises on postural stability indices in healthy women. *J Phys Ther Sci*, 2014, 26(5), 763-769.
2. Bot, S., Verhagen, E., and van Mechelen, W. The effect of ankle bracing and taping on functional performance: A review of the literature review article. *Foot Ankle Online J*, 2015, 5, 1-10.
3. Baker, K.G., Robertson, V.J., and Duck, F.A. A review of therapeutic ultrasound: Biophysical effects. *J Phys Ther*, 2001, 81(7), 1851-1858.
4. Moreira, V., and Antunes, F. Ankle sprains: From diagnosis to management. *Acta Med Port*, 2008, 3, 285-292.
5. Seil, R., Rupp, S., Tempelhof, S., and Kohn, D. Sports injuries in team handball. A one-year prospective study of sixteen men's senior teams of a superior nonprofessional level. *Am J Sports Med*, 1998, 26, 681-687.
6. Westwater-Wood, S., Adams, N., and Kerry, R. The use of proprioceptive neuromuscular facilitation in physiotherapy practice. *Phys Ther Rev*, 2010, 15, 23-27.
7. Websites Visited.
8. <http://www.anklesprainssymptomsemedicinehealth.com>. [Last accessed on 2010 Jan 22].
9. Ankle, Ankle + joint at eMedicine Dictionary.
10. Available from: <http://www.en.wikipedia.org/wiki>.
11. Available from: <http://www.article-voip.com/article/the-importance-of-physical-fitness-education/209>.



# Explosive Strength of Volleyball and Basketball Male Players Intercollege University

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## 1. INTRODUCTION

Physical fitness is an inseparable part of sports performance and achievement. The quality of the utilitarian value is directly proportional to the level of performance which means that the greater the level of fitness, the greater the ability of a person to attain a higher level of performance. World's top most sporting nations are very much conscious of these facts and concentrate on the development of the basic physical fitness components and the related aspects. They start training a child, concentrating on those fitness factories which are supposed to play a significant role in future performance of sports and game such as flexibility, agility, reaction time, balance, speed, coordination, strength, power, endurance, and etcetera which are appropriate for the specific age group.

Movement is a complex quality and is influenced by many forces. The main or important physical performance factors which underline the actions for all movements are speed, agility, strength, power, etc., and are revealed through the fundamental skills of running, jumping, throwing, climbing, hanging, etc. There are a few structural factors in which others help or hinder movement. They are age, height, weight, body type, and structure. Certain sociopsychological factors include attitudes, interest, values appreciations, and adjustments influence behavior and ultimately affect the movement to a marked degree.

### 1.1. Purpose

The purpose of the study was to measure the athletic strength in general and explosive strength in particular between volleyball and basketball players.

### 1.2. Procedure

To achieve the purpose of the study, 30 volleyball players and 30 men basketball players were selected, who have

participated in the Hyderabad city intercollegiate tournaments. All the subjects under study had received regular training in their respective activities, the sample for the present study consisted of 60 collegiate level sportsmen. The subjects were in the age group of 18–25 years. The explosive strength was measured by administering sergeant jump; standing board jump and medicine ball put test were used to measure the explosive strength of the subjects. Three trials were given and the best one is considered as score for the study.

### 1.3. Collection of Data

To collect necessary data for the study, three test items of vertical jump, standing board jump, and two-hand medicine ball put were administered on the selected subjects.

### 1.4. Statistical Technique

The data collected from the subjects of this study treated with the statistical technique's test with the Statistical Package for the Social Sciences.

## 2. RESULTS

The data collected were analyzed with statistical technique's test and results are presented in the following tables.

Table 1 indicates the horizontal jumping ability of volleyball and basketball male players. There is a significant difference between the selected subjects and volleyball players found better than the basketball players in the study.

Table 2 indicates the vertical jumping ability of volleyball and basketball male players. There is a

significant difference between the selected subjects and basketball players found better than the volleyball players in the study.

Table 3 indicates the shoulder girdle strength of volleyball and basketball male players. There is a significant difference between the selected subjects and basketball players found better than the volleyball players in the study.

### 3. DISCUSSION

In the present study, the results showed that there was a significant difference in the mean performance scores of volleyball and basketball player's in horizontal jump, vertical jump, and two hand medicine ball put. This may be attributed to the factors of practice effect and training effect, especially with regard to jumping movements involved in the games, number of jumps, and overcoming resistance of the body weight during such jumps, different modes of training used by coaches and players, with special emphasis on training for different forms of strength.

**Table 1:** The results of sergeant jump test between volleyball and basketball male players

Horizontal jump	n	Mean±standard deviation	t-value
Volleyball	30	2.2350±0.1195	2.081
Basketball	30	2.1587±0.1616	

Significance at 0.05 level

**Table 2:** The results of standing board jump test between volleyball and basketball male players

Vertical jump	n	Mean±standard deviation	t-value
Volleyball	30	0.555300±0.136500	2.129
Basketball	30	0.488000±0.106500	

Significance at 0.05 level

**Table 3:** The results of medicine ball test between volleyball and basketball male player

Vertical jump	n	Mean±standard deviation	t-value
Volleyball	30	4.6360000±0.372000	2.168
Basketball	30	4.849700±0.391300	

Significance at 0.05 level

This may be attributed to the demand placed by the two games in respect of qualities required by players who play these games. The demand placed by the two games in respect of certain skills such as rebounding and spiking and throwing and hitting may require explosive actions. In either case, this may also be due to the impact of modes of strength training and importance attached to strength training in the training schedule in both volleyball and basketball games.

### 4. CONCLUSION

In the present study, the results showed that there was a significant difference in explosive strength between volleyball and basketball players. This significant difference was evident in standing board jump and vertical jump favoring the volleyball group. In two-hand medicine ball put, there was a significant difference between volleyball and basketball players favoring basketball players.

### REFERENCES

1. Harold, B.M., and McGee, R. *A Practical Approach to Measurement in Physical Education*. US: Lea and Febiger; 1975.
2. Blattner, S., and Noble, I. Relative effects of isokinetic and plyometric training on vertical jumping performance. *Res Q*, 1979, 50, 583-588.
3. Lloyd, B.R., and Anderson, R.L Jr. Relationship of jump and reach measures of power to intelligence sports and athletic performance. *Res Q*, 1955, 26, 28-35.
4. Clarke, H.H., and Clarke, D.H. *Application of Measurement to Physical Education*. United States: Prentice Hall; 1987.
5. Chu, D.A. *Jumping into Plyometrics Training*. Human Kinetics; 1991.
6. Costill, L.D., Miller, S.J., Nyers, W.C., Kehoe, F.M., and Hoffman, W.M. Relationship among selected test of explosive strength and power. *Res Q Am Assoc Health Phys Educ Recreation*, 1968, 39, 785-787.
7. Fleck, S.J., Case, S., Puhl, J., and Vanhandle, P. Physical and physiological characteristics of elite volleyball players. *J Strength Cond Res* 2000, 14, 162-169.
8. Clarnce, B.L., and Barnhart, R.K. *The World Book Dictionary*. Thorndike-Barnhart World Book; 1980.
9. John, R.B. *America's Sporting Heritage*. United States: Addison-Wesley; 1974.
10. Abraham, R. Comparative Study of Fitness of High Jumper and Long Jumper. 1974.

# Effects of Weight Training Program on Selected Physiological Components of Kabaddi Players at Nizamabad District

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## 1. INTRODUCTION

To elicit a central circulatory training effect, the training activity should produce a heart rate between 120 and 140 beats per minute for at least 5 min. Jogging, swimming, and cycling are good examples of activities to use as training media. However, they should be performed at a sub-maximum level to prevent major mobilization of anaerobic processes. This involves the intensity and duration of exercise. If a trainee jogs at 80% of maximum for 30 min, depending somewhat on that person's level of fitness, the major energy source should be the oxygen transport system (aerobics). This type of training influences muscle capillaries and fuel storage, myocardial efficiency through increased contractile power and stroke volume, and the respiratory processes.

Exercise must be frequent daily if possible—but under ideal conditions, 3 times per week might be enough. Duration, intensity, and frequency are basic in any fitness program. Exercise must be carried past a feeling of discomfort or perhaps even pain, a point that is frequently referred to as one's psychologic limits. As tolerance for exercise is increased, the individual can begin to reduce the difference between psychologic and physiologic limits. It is at this point in training with the repetition of sessions of intensive type of activity that the trainee begins to experience the phenomenon of "second wind," a physiologic adjustment of the cardiorespiratory system to the increased demands for oxygen and the elimination of the oxidation products. When the second wind occurs, the participant obtains relief from the distress and discomfort of breathlessness and lethargy and is able to continue the effort with renewed vigor and efficiency. While the physiologic basis of the second wind is not clearly understood, the changes in several physiologic bases of second wind are not clearly understood, the changes in several physiologic functions

an onset are easily distinguished. There appear to be adaptations in not only the cardiorespiratory system but also the muscles, peripheral circulation, and the brain.

Another principle involved in fitness concerns the application of the overload. This principle is in operation when the exercise load is increased in intensity. Muscles gain in size and strength in only one of two ways; through maturation and through the application of the overload principle. This principle can be applied in three ways; (1) by increasing the resistance (weights, etc.), (2) by increasing the speed of repetitions, and (3) by increasing the number of repetitions.

### 1.1. Objective of the Study

The study is to determine the effects of weight training program on selected physiological components of kabaddi players at Nizamabad district

### 1.2. Hypothesis

There may not be any significant difference on selected physiological components of kabaddi players at Nizamabad district in relation to weight training program.

## 2. MATERIALS AND METHODS

For the purpose of the study, 50 students were selected randomly in the age group of 18–24 years of at Nizamabad district players. All the subjects were having 4-day weight training program. A specific weight training program was conducted for the duration of 7 weeks. The following physiological components were selected for the study – hemoglobin and cardiovascular endurance. Pre- and post-tests were conducted before and after the systematic training program.

## 2.1. Tools Used

- Hemoglobin: Sahli's hemometer was used to measure hemoglobin percentage in g/100 ml.
- Cardiovascular endurance: Hard ward step test was used to measure cardiovascular endurance. Weight training program was adopted for the study.

Day	Components	Type	Sets and repetition	
1 and 4	Chest	Bench press	3×8	
		Inclined bench press	2×8	
		Parallel bar dips	2×capacity reps	
	Shoulders	Front press	2×8	
		Side raises or bend over lateral raises or front raises	2×8	
	Triceps	Triceps barbell extensions	2×8	
		Pulley push down or French press or kickback or triceps dips	1–2×8	
	Abs	Sit-ups or leg raises	2×20 slow	
	2 and 5	Legs	Calf raises	2×maximum reps
			Squats	3×8
Leg curls			1×8	
Back		Chinning	2×maximum reps	
		Lat pull down	2×8	
		Ground pulley or T-bar rows or barbell rows or dumbbell rows	2×8	
Biceps		Barbell curls	2×8	
		Bumble curls or preacher curls or concentrate curls or hammer curls	1–2×8	
Traps		Shrugs	2×8	
		Cardios – 20–30 min if one is overweight		
3, 6 and 7		Rest not even abs or running, etc.		

## 3. RESULTS AND DISCUSSION

Table 1 indicates that the obtained “*t*” value (0.959) between pre and post of college students in hemoglobin was found to be insignificant at 0.05 level of confidence as we obtained the value of 2.00.

**Table 1:** The significant difference of the mean of hemoglobin between pre- and post-tests

Variable	Test	Mean±SD	SE	MD	Ot	Tt
Hemoglobin	Pre	14.186±0.875	0.21	0.202	0.959	2.00
	Post	14.389±0.755				

Significance at 0.05 level. SD: Standard deviation

**Table 2:** The significant difference of the mean of cardiovascular endurance between pre- and post-tests

Variable	Test	Mean±SD	SE	MD	Ot	Tt
Cardiovascular endurance	Pre	67.033 ±4.180	1.21	5.575	4.595	2.00
	Post	72.608 ±5.165				

Significance at 0.05 level. SD: Standard deviation

Table 2 indicates that the obtained “*t*”-value (4.595) between pre and post of college students in cardiovascular endurance was found to be significant at 0.05 level of confidence as we obtained the value of 2.00.

## 4. CONCLUSION

It is concluded that the effect of 7 weeks weight training program had shown improved performance with regard to cardiovascular endurance which is significant and in hemoglobin, performance is improved, but it is insignificant.

## REFERENCES

- Singh, N.M. *Basics of Health and Physical Education*. New Delhi: Khel Sahitya Kendra; 2008. p. 234.
- Kaukab, A., and Al Ameer, A. Effect of weight training programme on body composition, muscular endurance, and muscular strength of males. *Ann Biol Res*, 2013, 4(2), 154-156.
- Body Building World India's First Bodybuilding-Fitness-Nutrition Magazine, 2011, 17(2). Available from: <http://www.rniredg.no.tun/bil/00802/35/al/tc/94postalregd.no.pb/jal/363>.
- Kawanpure, S.A. Effects of weight training on physical fitness components of CBSE school students. *Int J Phys Educ Sports Health*, 2015, 1(5), 41-45.
- Gutin, B., and Michael, R.J. Effect of exercise intensity on cardio vascular fitness, total body composition and visceral adiposity of obese adolescents. *Am J Clin Nutr*, 2002, 75, 818-826.
- Maclaren, D. *Sports and Exercise Physiology*. New York: Bios Scientific Publishers; 2007. p. 178-179.
- Best, J.W. *Research in Education*. New Delhi: Prentice-Hall of India Pvt. Ltd.; 1983.

# **An Assessment of the Availability and Utilization of Physical Education Resources for Early Childhood Care Education in Gumel Local Government, Jigawa State, Nigeria**

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## **ABSTRACT**

Early childhood care education (ECCE) prepares children physically, mentally, emotionally, and socially before the statutory age of beginning primary school. The exposure of children to physical activities prepares them to be ready for primary education. A positive relationship is expected between a good ECCE implementation and performance of children at school level. However, proper implementation of ECCE curriculum could not be achieved without adequate provision and proper utilization of learning resources. It is against this background that this study investigated the availability and utilization of physical education resources for ECCE. The study adopted a descriptive survey design. The population for the study was 100 teachers sampled from 25 ECCE centers under Gumel Local Education Authority. Instruments used for data collection were researcher-developed questionnaires and interview schedules. Data collected were analyzed using descriptive statistic. The qualitative data were thematically analyzed. The results show that ECCE material resources were inadequate, and the available ones were not utilized appropriately. Inadequate trained ECCE teachers, overcrowded ECCE centers, and poor funding were also identified as major constraints to proper utilization of learning resources and implementation of the entire program. The findings of this study will benefit teachers, parents, and policymakers on the constraints for proper implementation of ECCE program. The study recommends that government and community-based organizations should provide adequate resources to achieve the objectives of ECCE as enshrined in the national policy on education for Nigeria. Suggestions and recommendations were also given.

**Keywords:** Availability, Early Childhood Care Education, Material Resources, Utilization.

## **1. INTRODUCTION**

To facilitate teaching and learning in our schools, a variety of material resources should be readily available for use. The relevance of material resources in early childhood education (ECE), therefore, should not be overemphasized. Proper utilization of instructional materials in teaching the children of today can ease the work of the teacher as well as facilitate learning among the children. Physical education is an integral part of the general education that deals with an all-round development of the children. Due to its importance to human development, especially the school children, curriculum developers make it part of the Early Childhood Care Education (ECCE) programs. Teachers

must be supported with quality preparation and professional development opportunities that include in-depth, hands-on pedagogical training, ongoing support, and access to the latest instructional materials and facilities, especially in ECE.

ECE includes all kinds of education taking place before compulsory primary education is provided in different settings (International Labour Office, 2012). While Sooter (2013) refers to ECE, as the education offered to children who have not yet reached the statutory age of beginning primary school. The need for ECE is an emergent issue in education sector in Nigeria, which led the federal government to launch the Universal Basic Education Scheme (Chukwura, 2011). The need



arose in the first place as a preparatory ground for entry into primary school. The idea is to catch them young at the most important formative stages. Sooter (2013) reiterated that early years in life are the most important to the formation of intelligence, personality, and social behavior of a child. The year before a child reaches kindergarten is among the most critical in his or her life to influence learning.

Furthermore, the philosophy of early childhood care and primary education embedded in the Nigeria Certificate in Education minimum standards states that the early years (0-5) are crucial for the development of individual and supports given at this stage helps to promote development. This requires well trained and qualified teachers to be able to handle these children effectively (National Commission for Colleges of Education, 2012). To achieve this, The Nigerian Government in the National Policy on Education (2004) place emphasis on the training of teachers to enhance their quality and meet the challenges of the 21<sup>st</sup> century. Despite this effort by the government, Chukwura (2011) pointed out that in Nigeria, there is a gap between the quality of teachers and the practice of ECE. Most of the early childhood educators in Nigeria did not receive relevant training that qualifies them to teach in ECE centers. It is against this problem facing the teacher education programs that the Nigerian government (National Commission for Colleges of Education, 2012) outlined some steps which include among others making provision in teacher training institutions for the production of specialist teacher in pre-primary education and ensuring that the main method of teaching in the pre-primary institutions will be through play and that the curriculum of teacher training colleges is appropriately oriented to achieve these objectives. To achieve these objectives, government should make provision for adequate and relevant material resources.

Resources constitute a very important factor in the functioning of educational system (Olatoun, 2012), which according to Chidiebere (2011) resources are categorized into human and material resources. Hallak (1990) identified material resources in education to include school buildings, classrooms, furniture, libraries, laboratories, recreational equipment, and other instructional aids. While Onyejemezi (1998) explained instructional materials as resources or teaching materials which a teacher utilizes to enhance his lesson and make it understandable to the learner. In this study, material resources refer to the physical education instructional materials and other facilities that facilitate teaching/learning process in ECCE.

Studies (Hallak, 1990; Onyejemezi, 1998) show that for a teacher to be efficient in classroom, material resources should be made available.

Availability, according to Ibrahim (2007) in Asogwa *et al.* (2013), refers to the condition of being obtainable or accessible at a particular point in time. In this study, availability refers to the presence of obtainable physical education instructional materials for effective teaching in ECCE at a point in time for effective utilization.

Utilization, according to Ragbu (2009) is the transformation of a set of input into goods or services. It involves creation of value in things. Utilization, in this context, refers to how often physical education instructional material in ECCE is put into use by teachers.

It is a known fact that education is a backbone of any nation's development. Sunday (2012) stated that national development all over the world depends on the educational development in which the teacher is an important figure. Owolabi (2012) reported that teachers who are well prepared and trained are more effective in the classroom and have the greatest impact on students' learning. However, it is noteworthy that no matter how prepared the teacher is he cannot deliver well without relevant material resources. This research work, therefore, set out to find out the availability and utilization of physical education resources for ECCE in Gumel Local Government, Jigawa State, Nigeria.

### 1.1. Purpose of the study

The purpose of this study is to determine the availability and utilization of physical education resources for ECCE in Gumel Local Government, Jigawa State, Nigeria.

Specifically, the study was to:

- Determine the availability of physical education material resources for ECCE in Gumel Local Government, Jigawa State.
- Determine the extent of utilization of physical education material resources for ECCE by teachers in Gumel Local Government, Jigawa State.
- Determine the constraints to the utilization of physical education material resources for ECCE by teachers in Gumel Local Government, Jigawa State.

### 1.2. Research Questions

The following research questions were raised:

- What are the available physical education material resources for ECCE in Gumel Local Government, Jigawa State.

- What are the extents of the utilization of physical education material resources for ECCE by teachers in Gumel Local Government, Jigawa State.
- What are the constraints to the utilization of physical education material resources for ECCE by teachers in Gumel Local Government, Jigawa State.

## 2. METHODS

The study adopted a descriptive survey design. It aimed at eliciting information from the respondents on the availability and utilization of physical education material resources for ECCE by teachers in Gumel Local Government, Jigawa State. The population for the study consists of 100 teachers in Gumel Local Government, Jigawa State. Due to the small number of the population, no sampling was conducted. The researcher developed 50 items structured questionnaire which was used for this study. The instrument consists of four sections (A-D). Section A elicits information on personal data, Section B dealt with the availability, Section C dealt with utilization, and Section D dealt with the constraints for utilization of materials/facilities for ECCE in Gumel Local Government ECCE Centers, Jigawa State. The instrument was validated by three experts, two experts from physical and health education department and one expert from the Department of Curriculum Studies of Jigawa State College of Education, Gumel. Section B of the instrument had response options of available and not available which were weighted as 1 – not available and 2 as available. Section C had response options of very great extent (GE) – 4, GE – 3, low extent (LE) – 2, and very low extent (VLE) – 1. Section D had response options of strongly agree (SA) – 4, agree – 3, disagree – 2, and strongly disagree (SD) – 1. Any response option in Section B with 0–49% is regarded as not available and 50–100% is regarded as available. While any response option in Section C with mean score between 1.00 and 1.99 is regarded as VLE, 2.00–2.49 as LE, 2.50–3.49 as GE, and 3.50–4.00 as very GE (VGE) of utilization. While in Section D, response options with mean score between 1.00 and 1.99 are regarded as strongly disagree, 2.00–2.49 disagree (D), 2.50–3.49 agree (A), and 3.50–4.00 as SA with the statement on the constraints to the utilization of the resources. The reliability of the instrument was determined using Cronbach's alpha method which yielded a coefficient of 0.84. The researcher seeks the permission of the headteacher to administer the questionnaire, 100 copies were distributed to the respondents and 90 were collected back after 5 days. Interviews were conducted with ten respondents (five teachers and five headteachers). The quantitative data collected were analyzed using

percentages for research question one, mean score and limit of real numbers were used to analyzed research questions two and three, respectively. The qualitative data were thematically analyzed.

## 3. RESULTS

### 3.1. Research Question One

- What are the available physical education material resources for ECCE in Gumel Local Government, Jigawa State.

Table 1 show that majority (numbers 1, 2, 3, 8, 9, 12, 13, 14, 15, 17, 18, 19, and 20) of the items had their percentages ranging from 50% to 100%, which implies that these material resources are available, except items (numbers 2, 4, 5, 6, 7, 10, 11, and 16) that had their percentages ranging from 9% to 40% that fall below the criterion of 50%, which implies that these material resources are not available in their schools.

**Table 1:** Responses on the availability of physical education material resources for ECCE in Gumel Local government (n=90)

Material resources	No. of respondents	%	Remarks
Balance step	54	60.0	Available
Plastic bicycles	25	28.0	Not available
Growth chart/weighing scale	45	50.0	Available
Catching scarves	9	10.0	Not available
Maze and balance board	8	09.0	Not available
Plastic bats	36	40.0	Not available
Bounce and catch disc	36	40.0	Not available
Plastic hoops	90	100.0	Available
Sit on scooters	63	70.0	Available
Plastic wheel walker	9	10.0	Not available
PVC play tunnel	27	30.0	Not available
Charts and wall drawings	63	70.0	Available
Sandpit	90	100.0	Available
Seesaw	53	59.0	Available
Beans bag	63	70.0	Available
Rocking horse	18	20.0	Not available
Skiping rope	63	70.0	Available
Assorted balls	63	70.0	Available
Toys and models	54	60.0	Available
Swings	63	70.0	Available

### 3.2. Research Question Two

- What are the extents of the utilization of physical education material resources for ECCE by teachers in Gumel Local Government, Jigawa State.

Table 2 shows that items (numbers 5, 6, 7, 10, 11, and 16) had their mean scores ranging from 1.00 to 1.99 indicating that they were utilized to a VLE and items (numbers 2, 3, 4, 9, 14, and 17) had their mean scores ranging from 2.00 to 2.49 indicating a LE utilization of these material resources. While items (number 1, 15, 19, and 20) had their mean scores ranging from 2.50 to 3.49 indicating a GE of utilization and items (number 8, 12, 13, and 18) had mean scores ranging from 3.50 to 4.00 indicating that they were utilized to a VGE by ECCE teachers in demonstration school.

### 3.3. Research Question Three

- What are the constraints to the utilization of physical education material resources for ECCE by teachers in Gumel Local Government, Jigawa State.

Table 3 revealed that lack of facilities (3.40), inadequate funds (3.10), lack of qualified ECCE teachers (2.80), inadequate material resources (2.90), inadequate nannies (2.90), lack of supervision (2.50), lack of proper maintenance (3.20), and poor skill-based competencies of teachers (3.00) had their mean scores between the range of 2.50 and 3.49 indicating that the respondents agree that they were regarded as constraints to utilization of material resources by ECCE teachers in Gumel Local Government. The table also revealed that lack of enough space/rooms (1.90) and lack of parents cooperation (1.80) had their mean scores fall between the range of 1.00 and 2.49 indicating that the respondents disagree that these were constraints to the utilization of material resources by ECCE teachers in Gumel Local Government.

The qualitative data revealed that most of the respondents believed that inadequate material resources and lack of qualified professional ECCE teachers were regarded as major constraints to the utilization of material resources in the ECCE centers in various schools.

## 4. DISCUSSION

Findings in Table 1 show that 12 items had their percentages from 50% and above and seven items had below 50%. This implies that the respondents agreed

**Table 2:** Mean score responses on the extent of utilization of physical education material resources for ECCE by teachers in Gumel Local Government, Jigawa State ( $n=90$ )

Material resources	$\bar{x}$	Remarks
Balance step	3.30	GE
Plastic bicycles	2.40	LE
Growth chart/weighing scale	2.30	LE
Catching scarves	2.50	LE
Maze and balance board	1.70	VLE
Plastic bats	1.80	VLE
Bounce and catch disc	1.70	VLE
Plastic hoops	3.60	VGE
Sit on scooters	2.50	LE
Plastic wheel walker	1.80	VLE
PVC play tunnel	1.50	VLE
Charts and wall drawings	3.60	VGE
Sandpit	3.70	VGE
Seesaw	2.50	LE
Beans bag	3.40	GE
Rocking horse	1.50	VLE
Skipping rope	2.40	LE
Assorted balls	3.60	VGE
Toys and models	3.30	GE
Swings	3.40	GE

**Table 3:** Mean score responses on the constraints to the utilization of physical education material resources for ECCE by teachers in Gumel Local Government, Jigawa State ( $n=90$ )

Constraints to the utilization of material resources	$\bar{x}$	Remarks
Lack of available facilities	3.40	A
Lack of proper maintenance	3.20	A
Poor skill-based competencies of teachers	3.00	A
Inadequate fund	3.10	A
Lack of enough space/rooms	1.90	D
Lack of qualified ECCE educators	2.80	A
Inadequate material resources	2.90	A
Inadequate nannies	2.90	A
Lack of supervision	2.50	A
Lack of parents cooperation	1.80	D

that 13 material resources are available except eight that includes plastic bicycles, catching scarves, maze and balance board, plastic bats, bounce and catch discs, wheel walker, PVC play tunnel, and rocking horse that

are not available in the schools. The finding that some material resources are not available is not expected and therefore surprising because these materials are very essential in teaching and learning process, lack of them could pose a major hindrance in the teaching of children at ECCE level. This finding is in consonance with the findings of Ezeoba (2007) who found that the media availability average was <20% over 50%, and Daudu (2012) who also found that some human and material resources were not available in the library of the school the study was conducted. Lack of some material resources may not be unconnected with inadequate funding of schools by the state government.

The findings in Table 1 that some material resources are available are expected and therefore not surprising, due to the importance of these materials in teaching and learning process. This is in agreement with the findings of Asogwa *et al.* (2013) who found that out of all the instructional materials recommended for teaching to students, eight of them are available, five are accessible, and eight are often utilized by teachers. The availability of some materials in this study may be as a result of interventions to schools by some NGOs supporting education sector in Nigeria.

The finding in Table 2 revealed that some material resources are greatly utilized, which is expected and therefore not surprising because studies reveal the importance of these materials in teaching and learning process. Therefore, teachers will be willing to utilize them to enhance their lessons. This finding is in consonance with the finding of Okobia (2011), Asogwa *et al.* (2013) who revealed that instructional materials are grossly inadequate and underutilized by teachers in schools.

The findings in Table 3 that revealed lack of facilities (3.40), inadequate funds (3.10), lack of proper maintenance (3.20), poor skill-based competencies of teachers (3.00), lack of qualified ECCE teachers (2.80), inadequate materials (2.90), inadequate nannies (2.90), and lack of supervision (2.50) had their mean scores between the range of 2.50 and 3.49 indicating that the respondents agree that they were regarded as constraints to utilization of material resources. The table also revealed that lack of enough space/rooms (1.90) and lack of parents cooperation (1.80) had their mean scores fall between the range of 1.00 and 2.49 indicating that the respondents disagree that these are constraints to the utilization of material resources in the schools.

The finding in Table 3 shows that the respondents agree that some items are regarded as constraints to the utilization of material resources is not expected and therefore surprising because all the ECCE centers should be well equipped with the necessary resources and proper supervision. This finding is in line with the finding of Asogwa *et al.* (2013) who revealed that 12 challenges were encountered by teachers in accessing and utilizing available instructional materials in senior secondary schools in Benue State, while the finding that some items are not regarded as constraints to the utilization of the material resources is expected because of the series of workshops organized for stakeholders in various institutions on the management of both human and material resources for quality assurance.

## 5. CONCLUSION

The findings on availability show that the majority of the items had their percentages ranging from 50% to 100%, which implies that these material resources are available, except few items that had their percentages fall below the criterion of 50% that are not available in their schools. The findings also indicate that most of the materials were utilized to a LE, while very few of the materials were utilized to a VGE by ECCE teachers in their schools.

The findings further revealed that lack of facilities, inadequate funds, lack of qualified ECCE teachers, inadequate material resources, inadequate nannies, lack of supervision, lack of proper maintenance, and poor skill-based competencies of teachers were regarded as constraints to the utilization of material resources by ECCE teachers in Gumel Local Government, while the findings also revealed that lack of enough space/rooms and lack of parents cooperation were not regarded as constraints to the utilization of material resources by ECCE teachers in Gumel Local Government.

Teachers who are well prepared and trained are more effective in the classroom and have the greatest impact on students' learning. Material resources facilitate teaching-learning process; their proper utilization depends to a large extent on their availability and the constraints to utilization at a point in time. Policy initiatives to encourage adequate utilization of material resources in Nigerian pre-primary education have met with serious challenges. However, positive results can be achieved if really, the government is sincerely willing to boost education at all levels.



## 6. RECOMMENDATIONS

- Local education authority should embark on regular supervision to monitor the activities of teachers in their various classrooms and constantly sensitize them on the importance of material resource utilization.
- Local education authority efforts should be doubled in continuing teacher professional development in ECE.
- Local education authority in collaboration with NGOs should provide adequate material resources for ECCE.

## REFERENCES

- Asogwa, V.C., Onu, D.O., and Egbo, B.N. Availability and utilization of instructional materials for effective teaching of fish production to students in senior secondary schools in Benue State Nigeria. *Afr J Agric Res*, 2013, 8(49), 6601-6607.
- Chidiebere, O.O. Challenges to effective management and utilization of teaching resources in Nigerian schools. *J Arts Manage Educ Law Soc Sci*, 2011, 1(1), 118-127.
- Chukwura, E.N. Teachers' role in improving early childhood education in Nigeria. *J Res Dev*, 2011, 2(1), 169-174.
- Daudu, H.M. Assessment of availability and use of information resources and services in the institute of education library, Ahmadu Bello university, Zaria. Nigeria. *J Teach Educ*, 2012, 10(1), 230-241.
- Ezeoba, K.O. Instructional media. An assessment of the availability, utilization and production by nursery school teachers. *J Appl Lit Read*, 2007, 3, 33-38.
- Nigerian Educational Research and Development Council. *National Policy on Education*. Yaba, Lagos: NERDC Press; 2004.
- Hallak, J. *Investing in the Future: Setting Educational Priorities in the Developing World*. Paris: UNESCO-11EP; 1990.
- International Labour Office. *Right Beginning: Early Childhood Education and Educators. Reports for Discussion at the Global Dialogue Forum on Condition of Personnel in Early Childhood Education*, 22-23 Feb, 2012. Geneva: International Labour Office; 2012.
- National Commission for Colleges of Education. *Nigeria Certificate in Education Minimum Standard for Early Childhood Care and Primary Education*. Abuja: National Commission for Colleges of Education; 2012.
- Olatoun, A.A. Resource utilization and internal efficiency in Nigerian secondary schools: Implications for socio problems of education. *Int J Soc Anthropol*, 2012, 4(1), 23-30.
- Onyejemezi, O.E. *Practical Instructional Materials*; 1998. Available from: <http://www.google.com>. [Last accessed on 2013 Apr 03].
- Owolabi, T. Characteristics of professional development and impact of training on science teachers' classroom practices. *Univ J Educ Gen Stud*, 2012, 1(5), 119-125.
- Ragbu, U. *Utilization of Economic Resources*; 2009. Available from: <http://www.google.com>. [Last accessed on 2013 May 06].
- Sooter, T. Early Childhood Education in Nigeria: Issues and Problems. *J. Educ. Soc. Res*, 2013, 3(5), 173-179.
- Sunday, E.O. Teacher professional development in the 21<sup>st</sup> century Nigeria: The journey, the potholes and the patches. *Glob Voice Educ*, 2012, 1(1), 3-4.



# Effect of Core Muscles with Strength Training on Selected Motor Fitness Variables of Intercollegiate Kabaddi Players

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## ABSTRACT

The purpose of this study was to find out the effect of core muscles with strength training on selected motor fitness variables of intercollegiate kabaddi players. The investigator selected 24 college level men kabaddi players who are studying in MSR College of Physical Education, Gopala Krishna College of Physical Education, and Siddhartha College of Physical Education, Nalgonda, Telangana. Their age is ranged from 19 to 24 years. The selected subjects were considered as two groups in that 12 subjects were acted as control group and no training was given this group and another 12 subjects were acted as experimental group, this group was undergone the training. The criterion variables, namely, shoulder strength, balance, and endurance, have been selected as dependent variables for this study. The training period would be 6 weeks. The data were analyzed by the use of dependent “t”-test. The level of significance was at 0.05. The result shows that shoulder strength, balance, and endurance of the selected subjects were significantly improved on the experimental group due to the effect of core muscles with strength training.

**Keywords:** Balance and Endurance, Core Muscle, Shoulder Strength.

## 1. INTRODUCTION

The goal of core stability is to maintain a solid foundation and transfer energy from the center of the body out to the limbs. Core strength training is an important part of any running or sports fitness program. A strong core will support running, training, and any other sports or physical activity. Strong core muscles provide a strong base and are key in supporting a strong and enduring stride. Without strong core muscles, the stride will be weak and lack endurance. Build to take force on the bone and direct autonomic force, through various joints, in the desired direction. The core muscles align the spine, rib, and pelvis of a person to resist a specific force, whether static or dynamic. Major muscles included are the pelvic floor muscles, transversus abdominis, multifidus, internal and external oblique, rectus abdominis, erector spine (sacrospinalis), especially the longissimus thoracis, and the diaphragm. Minor core muscles include the latissimus dorsi, gluteus maximus, and trapezius. Core stability relates to the bodily region bounded by the abdominal

wall, the pelvis, the lower back, and the diaphragm and its ability to stabilize the body during movement.

The game kabaddi is one of the most ancient forms of outdoor sports for the entire human race. Its origin could be traced to prehistoric times when men learned to defend groups against predatory beasts or attack weaker animals individually or groups to meet the demand of their natural food before the invention of any weapons for attack and defense. The practice of these reflexes and responses in a game like a kabaddi stimulates pleasurable feelings of joy and thrill. In the Indian epic “Mahabharata,” it is narrated in one chapter that the youngest warrior of Pandavs, Abhimanyu, was directed to fight against seven war heroes of the enemy camp (Kauravas) inside the perimeter of the enemy line of defense. The greatest fighter Abhimanyu adopted a strategy to enter into the line of defense put up by the enemy. In fact, he was successful in entering into the arena of the enemy camp and fought gallantly, but unfortunately, Abhimanyu could not come out of

the place encircled by the seven heroes of Kauravas and ultimately, he met his death fighting gallantly like a hero. The same planning and strategy is found in kabaddi game when a raider goes to attack in the court of the opponent with seven anties. The purpose of the study is to investigate “the effect of core muscles with strength training on selected motor fitness variables of intercollegiate kabaddi players.”

## 2. METHODOLOGY

To achieve this purpose total (N-24) men college level kabaddi players. Selected from MSR College of Physical Education, Gopala Krishna College of Physical Education, and Siddhartha College of Physical Education, Nalgonda, Telangana. The subjects were equally divided in randomly into two groups, namely, Group-I – experimental group and Group-II – control group. The subject's age was ranged from 19 to 24 years. The selected variables, namely, shoulder strength, balance, and endurance. Experimental group: Twelve players are assigned randomly to the experimental group and they have undergone 6 weeks of training using the core muscles with strength training. Control group: Another 12 players are assigned randomly to the control group who did not participate in any kind of training. The selected criterion variables measured by shoulder strength pull-ups test, balance-stork balance test, and endurance 12 min run/walk test. The prior and after test data were collected and treated with dependent “*t*”-test. The level of confidence was fixed at 0.05.

## 3. RESULTS

### 3.1. Shoulder Strength

The data obtained on shoulder strength of the experimental and control groups were analyzed using the dependent “*t*”-test, as shown in Table 1.

Table 1 shows the mean values of shoulder strength experimental and control groups. The experimental group obtained “*t*”-test result is 15.25, which is greater than the table value, so it is significant. The control group obtained “*t*”-test result is 0.41, which is lesser than the table value, so it is insignificant.

### 3.2. Balance

The data obtained on balance of the experimental and control groups were analyzed using the dependent “*t*”-test, as shown in Table 2.

Table 2 shows the mean values of balance experimental and control groups. The experimental group obtained “*t*”-test result is 18.66, which is greater than the table value, so it is significant. The control group obtained “*t*”-test result is 1.02, which is lesser than the table value, so it is insignificant.

### 3.3. Endurance

The data obtained on endurance of the experimental and control groups were analyzed using the dependent “*t*”-test, as shown in Table 3.

Table 3 shows the mean values of endurance experimental and control groups. The experimental

**Table 1:** The mean, standard deviation, and “*t*”-test value of the experimental and control groups on shoulder strength

Group	Test	Mean±SD	DM	σ DM	“ <i>t</i> ”
Experimental group	Pre-test	5.47±1.13	2.03	0.13	15.25*
	Post-test	7.50±0.93			
Control group	Pre-test	5.53±1.36	0.07	0.16	0.41
	Post-test	5.60±1.42			

\*Significant level of confidence 0.05 with df 11 table value 2.20.

SD: Standard deviation

**Table 2:** The mean, standard deviation, and “*t*”-test value of the experimental and control groups on balance

Group	Test	Mean±SD	D.M	σ DM	“ <i>t</i> ”
Experimental group	Pre-test	16.42±7.54	3.36	0.18	18.66*
	Post-test	19.78±7.15			
Control group	Pre-test	11.18±1.47	0.08	0.078	1.02
	Post-test	11.26±1.57			

\*Significant level of confidence 0.05 with df 11 table value 2.20. SD:

Standard deviation

**Table 3:** The mean, standard deviation, and “*t*”-test value of the experimental and control groups on endurance

Group	Test	Mean±SD	DM	σ DM	“ <i>t</i> ”
Experimental group	Pre-test	2279.46±232.97	128.16	14.64	8.76*
	Post-test	2407.62±185.14			
Control group	Pre-test	2252.44±218.16	1.66	1.10	1.51
	Post-test	2250.78±218.63			

\*Significant level of confidence 0.05 with df 11 table value 2.20. SD:

Standard deviation

group obtained “*t*”-test result is 8.76, which is greater than the table value, so it is significant. The control group obtained “*t*”-test result is 1.51, which is lesser than the table value, so it is insignificant.

#### 4. DISCUSSION ON MOTOR FITNESS VARIABLES

From the result of the present investigation, it was concluded that the kabaddi players are undergone the 6 weeks training on core muscles with strength training; it improved on selected motor fitness variables (shoulder strength, balance, and endurance). The results consent with other studies’ effect of core strength and endurance training on performance in college students (Schilling *et al.*, 2013). Effects of a 9-week core strengthening exercise program on vertical jump performances and static balance in volleyball players with trunk instability (Sharma A *et al.*, 2012).

##### 4.1. Discussion on Hypotheses

The hypothesis stated that there may be a significant improvement with the core muscle with strength training on selected motor fitness variables (shoulder strength, balance, and endurance) at 0.05 level of confidence. Hence, the hypothesis held true and the researcher’s hypothesis accepted.

#### 5. CONCLUSION

Within the limitation of this study, the following conclusions have been drawn:

1. It was concluded that motor fitness variables (shoulder strength, balance, and endurance) have significantly improved through core muscle with strength training.

#### 6. RECOMMENDATIONS

The following recommendation may be from the study for further research:

1. The similar study may be conducted in different disciplines of games.
2. The similar study may be conducted on female subjects too.
3. The similar study may be conducted different variables such as anthropometrical, biomechanical, physiological, psychological, and biochemical variables.
4. The similar study may be conducted different levels of players (district, state, national, and international)
5. The similar study may be conducted on school or different age levels.
6. A similar study may be conducted on other skill performance variables also.

#### REFERENCES

- Hardayal, S. *Science of Sports Training*. New Delhi, Girinagar, Kaikaji: DVS. Publication; 1991.
- Carboch, J., Süß, V., and Kocib, T. Ball machine usage in tennis: Movement initiation and swing timing while returning balls from a ball machine and from a real server. *J Sports Sci Med*, 2014, 13(2), 304-308.
- Chandler, T.J., Kibler, W.B., Stracener, E.C., Ziegler, A.K., and Pace, B. Shoulder strength, power, and endurance in college tennis players. *Am J Sports Med*, 1992, 20(4), 455-458.
- Fernandez-Fernandez, J., Sanz-Rivas, D., Kovacs, M.S., and Moya, M. In-season effect of a combined repeated sprint and explosive strength training program on elite junior tennis players. *J Strength Cond Res*, 2014, 29, 351-357.

# Effect of Specific Training on Selected Motor Fitness Components of School-Level Kabaddi Players

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## ABSTRACT

The purpose of this study was to find out the effect of specific training on selected motor fitness components of school-level kabaddi players. The investigator selected 24 boys school level kabaddi players who are studying in ZP High School, Haliya, and ZP High School, Pulimamidi, Nalgonda. Their age is ranged from 13 to 15 years. The selected subjects were considered as two groups in that 12 subjects were acted as control group and no training was given this group and another 12 subjects were acted as experimental group this group was undergone the training. The criterion variables, namely, speed, agility, and leg explosive power have been selected as dependent variables for this study. The training period would be the 6 weeks. The data were analyzed by the use of dependent “t”-test. It is the level of significance at 0.05. The result shows that speed, agility, and leg explosive power of the selected subjects was significantly improved on the experimental group of due to the effect of specific training.

**Keywords:** Agility and Leg Explosive Power, Specific Training, Speed.

## 1. INTRODUCTION

Specificity is a principle of training that states and sports training should be relevant and appropriate to the sport for which the individual is training to produce a training effect. The specificity principle simply states that training must go from highly general training to highly specific training. The principle of specificity also implies that to become better at a particular exercise or skill, one must perform that exercise or skill. To be a good cyclist, one must cycle. The point to take away is that a runner should train by running and a swimmer should train by swimming and so on.

There are thousands of different sports and exercises that can help achieve our physical body goals; however, the game of Kabaddi is unique in the essence that while it helps to build a strong body at the same time develops a strong soul. Kabaddi is a popular sport in India. It is one of the most popular sports in India, played mainly among people in villages. It is regarded as a Team Contact sport as a recreational form of combat training. Besides, kabaddi is primarily an Indian game basically an outdoor team game, and other countries in Asia

adopted this indigenous game of India. Kabaddi is one of the few games, which does not require any equipment what soever and the rules of the game are very easy to comprehend. “Kabaddi” may have been derived from the term “kaun bada” which means “a challenge to the opponent.” This is one of the combative and body contact type of game, in which offence is an individual effort whereas defense is a group effort.

## 2. METHODOLOGY

To achieve this purpose, total (N-24) boys school-level kabaddi players selected from ZP High School, Haliya, and ZP High School, Pulimamidi, Nalgonda. The subjects were equally divided in randomly into two groups, namely, Group-I experimental group and Group-II, control group. The subject's age was ranged from 13 to 15 years. The selected variables, namely, speed, agility, and leg explosive power. Experimental group: Twelve players are assigned randomly to the experimental group and they have undergone 6 weeks of training using the specific training. Control group: another 12 players are assigned randomly to the control

group did not participate in any kind of training. The selected criterion variables measured by speed – 50 m dash test, agility – shuttle run test, and leg explosive power – standing broad jump test. The prior and after test, data were collected and treated with dependent “*t*”-test. The level of confidence was fixed at 0.05.

### 3. RESULTS

#### 3.1. Speed

The data obtained on the speed of the experimental and control group were analyzed using the dependent “*t*”-test, as presented in Table 1.

Table 1 shows mean values of speed experimental and control groups. The experimental group obtained “*t*” – result is 4.48 which is greater than the table value, so it is significant. The control group obtained “*t*” – result is 1.52 which is lesser than the table value, so it is insignificant.

#### 3.2. Agility

The data obtained on the agility of the experimental and control group were analyzed using the dependent “*t*”-test, as presented in Table 2.

Table 2 shows mean values of agility experimental and control groups. The experimental group obtained “*t*” – result is 8.07 which is greater than the table value, so it is significant. The control group obtained “*t*” – result is 1.58 which is lesser than the table value, so it is insignificant.

#### 3.3. Leg Explosive Power

The data obtained on leg explosive power of the experimental and control group were analyzed using the dependent “*t*”-test, as presented in Table 3.

Table 3 shows mean values of leg explosive power experimental and control groups. The experimental group obtained “*t*” – result is 4.12 which is greater than the table value, so it is significant. The control group obtained “*t*” – result is 1.66 which is lesser than the table value, so it is insignificant.

### 4. DISCUSSION ON MOTOR FITNESS VARIABLES

From the result of the present investigation, it was concluded that the kabaddi players are undergone the

**Table 1:** The mean, standard deviation, and “*t*”-value of experimental and control group on speed

Group	Test	M±SD	DM	σDM	t-ratio
Experimental group	Pre-test	8.01±0.85	0.28	0.06	4.48*
	Post-test	7.73±0.69			
Control group	Pre-test	8.00±0.90	0.19	0.13	1.52
	Post-test	8.19±0.83			

\*Significant Level of confidence 0.05 with df 11 table value 2.20.  
SD: Standard deviation

**Table 2:** The mean, standard deviation, and “*t*”-value of experimental and control group on agility

Group	Test	M±SD	DM	σDM	t-ratio
Experimental group	Pre-test	22.77±1.46	1.06	0.13	8.07*
	Post-test	21.71±1.14			
Control group	Pre-test	22.77±1.46	0.07	0.04	1.58
	Post-test	22.84±1.42			

\*Significant level of confidence 0.05 with df 11 table value 2.20.  
SD: Standard deviation

**Table 3:** The mean, standard deviation, and “*t*” value of experimental and control group on leg explosive power

Group	Test	M±SD	DM	σDM	t-ratio
Experimental group	Pre-test	2.01±0.20	0.19	0.05	4.12*
	Post-test	2.20±0.08			
Control group	Pre-test	2.01±0.20	0.04	0.03	1.66
	Post-test	1.97±0.19			

\*Significant level of confidence 0.05 with df 11 table value 2.20.  
SD: Standard deviation

6 weeks training on core muscles with strength training; it improved on selected motor fitness variables (shoulder strength, balance, and endurance). The results consent with other studies effect of core strength and endurance training on performance in college students (Schilling *et al.*, 2013). Effects of a 9-week core strengthening exercise program on vertical jump performances and static balance in volleyball players with trunk instability (Sharma *et al.*, 2012).

#### 4.1. Discussion on Hypotheses

The hypothesis stated that there may be a significant improvement with the core muscle with strength training on selected motor fitness variables (shoulder strength, balance, and endurance) at 0.05 level of confidence. Hence, the hypothesis held true and researcher’s hypothesis accepted.



## 5. CONCLUSION

Within the limitation of this study, the following conclusions have been drawn.

It was concluded that motor fitness variables (shoulder strength, balance, and endurance) have significantly improved through core muscle with strength training.

## 6. RECOMMENDATIONS

The following recommendation may be from the study for further research.

1. The similar may be conducted different disciplines of games.
2. The similar study may be conducted on female subjects too.
3. The similar study may be conducted with different variables such as anthropometrical biomechanical physiological, psychological, and biochemical variables.

4. The similar study may be conducted with different levels of players ( district, state, national, and international).
5. The similar study may be conducted on school or different age levels.
6. A similar study may be conducted on other skill performance variables also.

## REFERENCES

- Hardayal, S. *Science of Sports Training*. New Delhi, Girinagar, Kaikaji: DVS. Publication; 1991.
- Carboch, J., Süß, V., and Kocib, T. Ball machine usage in tennis: Movement initiation and swing timing while returning balls from a ball machine and from a real server. *J Sports Sci Med*, 2014, 13(2), 304-308.
- Chandler, T.J., Kibler, W.B., Stracener, E.C., Ziegler, A.K., and Pace, B. Shoulder strength, power, and endurance in college tennis players. *Am J Sports Med*, 1992, 20(4), 455-458.
- Fernandez-Fernandez, J., Sanz-Rivas, D., Kovacs, M.S., and Moya, M. In-season effect of a combined repeated sprint and explosive strength training program on elite junior tennis players. *J Strength Cond Res*, 2014, 29, 351-357.

# A Comparative Study on Agility among the Volleyball Players and Basketball Players of Nirmal District, Telangana State

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## 1. INTRODUCTION

### 1.1. Agility

Agility is the ability to perform a series of explosive power movements in rapid succession in opposing direction. Agility plays an important role in physical education activities, especially in such events as gymnastics, diving, basketball, high jumping, and in the maneuvering of the ends and backs in football. It is revealed to a great extent in sports involving efficient footwork and quick changes in body position. Agility is more effective when it is combined with high levels of strength endurance and speed.

Agility is important in all activities involving quick changes in positions of body and its parts fast starts, stops, and quick changes in direction and fundamental to good performance in particularly all-court games, such as tennis, volleyball, basketball, baseball, soccer, and badminton, these games require running ability. Gymnastics and diving also depend (largely on rapid movements and quick changes in body position). Skipping, figure skating, and certain forms of dance require rapid adjustments in position and quick changes in direction. The greater the agility of a sportsman, the more precise, quick, and more effective are his movements restore balance.

Previously, it is believed that agility is a single factor by itself. Recently, it is believed that agility is a combination of several athletic traits, including reaction time, speed of movement, coordination, power, and strength. It is demonstrated in such movements as dodging, zigzag running, stopping, starting, and changing body position quickly.

### 1.2. Measurements of Agility

Measurements of agility factors were done by administering the different tests of agility on all the selected subjects. The investigator was of the opinion that only one test of agility was not sufficient to achieve the purpose of the study. The investigator felt that performance in only one type of agility test may be influenced by a particular body type or characteristic of the selected subjects.

Therefore, the investigations administer the following three tests of agility the tests are

1. Shuttle run test (which is the fourth item in AAHPER youth fitness test).
2. Zigzag run test (which is the second test item in the Barrow Motor ability test).
3. Dodging run test (which is the sixth item in Cozen's test of general ability).

## 2. METHODOLOGY

The main purpose of the study was to find out the agility among the basketball and volleyball players of Nirmal District to achieve the purpose of the study twenty basketball and twenty volleyball players were selected as subjects whose age fall between 14 and 16 years only care was taken in selecting the subjects who actually participating in this respective games until recently each subject was to oriented as to the procedure of the sequence and administration of the test before the administration of the tests the research scholar explained that testing procedure to the subjects in detail. To control other factors influencing, this performance in each selected test of agility. Care was taken to administer one test a day on all the subjects under similar conditions so

that there was no ambiguity in these minds the subjects cooperated with zeal and enthusiasm.

### 3. RESULTS

**Table 1:** Difference of the mean, standard deviation, standard error, and t-ratio of the volleyball and basketball players

	Mean		Standard deviation		Standard error	
	Basket ball	Volley ball	Basket ball	Volley ball	Basket ball	Volley ball
Zigzag run	23.31	24.02	1.34	0.71	0.19	0.35
Shuttle run	10.71	11.12	0.50	1.12	0.14	0.30
Dodging run	21.02	20.51	1.82	0.79	0.47	0.21

### 4. DISCUSSION

The results obtained from this comparative study of basketball players and volleyball players were analyzed and interrupted. Table 1 clearly shows that there are no significant differences among volleyball and basketball players. Further, the comparison has been brought using the difference between the means, standard error, where an insignificant difference exists in mean gains.

The *t*-ratio value on the above three tests showed insignificant differences in respect of zigzag run, shuttle run, and dodging run away volleyball and basketball players.

A comparative bar diagram is drawn for showing the agility of basketball and volleyball players and which shows insignificant difference in this agility. Finally, it attributed that the basketball players have shown

insignificant difference on agility where compared with volleyball players and it is clearly shown in this chart.

### 5. CONCLUSION

Within the limitations of the study, the following conclusions were drawn from the results obtained and presented in the previous chapter.

1. Insignificant difference exists between the basketball players and volleyball players in three tests, i.e., shuttle run, zigzag run, and dodging run on agility.
2. The subjects who had a low score in agility had a slow movement and jumping ability.
3. Better agility will help the individual to perform better in most of the sports activities and other major games which needed greater speed, jumping ability, coordination, and reaction time.
4. The place of agility exercises in a coaching schedule for lawn tennis, volleyball, basketball, hockey, and other major games requiring greater ability will bring results.

### REFERENCES

1. Barrow HM, Megee R. *AAHPER Youth Fitness Test Manual*. Washington, DC: American Association for Health, Physical Education and Recreation; 1980. p. 191-195.
2. Barrow, M., and Megee, R. *A Practical Approach to Measurement in Physical Education*. Philadelphia, PA: Lea and Febiger; 1964. p. 123.
3. Barrow, M., and Megee, R. *Principles of Physical Education*. Philadelphia, PA: Lea and Febiger; 1954. p. 572.
4. Esendchade, A. Development of motor co-ordination in boys and girls. *Res Q*, 2013, 18, 30-44.
5. Singh, R.M. *Physical Fitness Norms of Panjab High School Boys*. Chandigarh: Unpublished Doctoral Thesis, Panjab University; 1986.

# Effect of Plyometric Training on Selected Physical and Physiological Variables among College Level Volleyball Players

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## ABSTRACT

This study was designed to investigate the effect of plyometric training on selected physical and physiological variables among college volleyball players. To achieve the purpose of the study, 30 intercollegiate male volleyball players were selected from affiliated colleges of Osmania University, Hyderabad. The subjects were randomly assigned to two equal groups ( $n = 15$ ). Group I underwent plyometric training and Group II was acted as control group (CG). The plyometric training was given to the experimental group for 3 days/week (Monday, Wednesday, and Friday) for the period of 12 weeks. The CG was not given any sort of training except their routine work. A pilot study was conducted to assess the initial capacity of the subjects to fix the load. The physical parameters of speed (50 m dash), leg explosive power (vertical jump), and physiological parameters (breath-holding time, resting heart rate) before and after training period. The data collected from the subjects were statistically analyzed with “*t*”-test to find out significant improvement if any at 0.05 level of confidence. The result of the speed, leg explosive power, breath-holding time, and resting heart rate speculated significant improvement due to the influence of plyometric training with the limitations of (diet, climate, and lifestyle) status and previous training. The result of the present study coincides with the findings of the investigation done by different experts in the field of sports sciences. Plyometric training group significantly improved speed, leg explosive power, breath-holding time, and resting heart rate college male volleyball players.

## 1. INTRODUCTION

Plyometric (also known as “ploys”) is a type of exercise training designed to produce fast, powerful movements, and improve the functions of the nervous system, generally for the purpose of improving performance in sports. Plyometric movements, in which a muscle is loaded and then contracted in rapid sequence, use the strength, elasticity and innervations of muscle and surrounding tissues to 23 jump higher, run faster, throw further, or hit harder, depending on the desired training goal. Plyometric is used to increase the speed or force of muscular contractions, providing explosiveness for a variety of sport-specific activities. Plyometric has been shown across the literature to be beneficial to a variety of athletes. Benefits range from injury prevention, power development, and sprint performance among others.

Plyometric can improve strength in both your upper and lower body. Examples of lower body plyometric are tuck jumps, squat jumps, box jumps, and depth jumps. The goal of these jumps is to get higher, utilizing your leg strength to improve the height of your jump. Upper body plyometric includes clapping push-ups, medicine ball chest press throw, and overhead throws. These help improve strength in your upper body.

Volleyball is a dynamic, fast-paced game. The purpose of strength training for volleyball is not to build big muscles, but to develop the physical attributes necessary to improve a player's performance. Hence, strength training is very important to volleyball and should not be developed independently of other abilities such as agility, quickness, and endurance. When watching a great volleyball player, the one word that comes to the mind is

“quick.” Everything the player does is short and quick. There are no long drawn out motions like sprinting in other sports. There is simply a succession of explosive bursts that keep the ball in play and control the flow of the game. The quickness that must be focused on, when training a volleyball player is not only quickness from side to side and front to back but also quickness from up to down. Unique from other sports, volleyball players must be able to quickly change direction from the upward motion of a vertical jump to the downward motion of a point saving dig (or vice versa). To play volleyball, one has to be good at vertical jump, known as explosive power.

## 2. METHODOLOGY

Experimental approach to the problem to address the hypothesis presented herein, we selected 30 intercollegiate men volleyball players from affiliated colleges of Osmania University, Hyderabad. The subjects were randomly assigned into two equal groups, namely, plyometric training group (PTG) ( $n = 15$ ) and control group (CG) ( $n = 15$ ). A pilot study was conducted to assess the initial capacity of the subjects to fix the load. The respective training was given to the experimental group 3 days/week (alternate days) for the training period of 12 weeks. The CG was not given any sort of training except their routine.

### 2.1. Design

The evaluated physical parameters were physical parameters of speed (50 m dash) and leg explosive power (vertical jump) and the unit of measurement was in counts, and breath-holding time and resting heart rate the unit of were measured at baseline and after 12 weeks of yogic practices were examined.

### 2.2. Training Program

The training program was lasted for 45 min for a session in a day, 3 days in a week for a period of 12 weeks duration. These 45 min included 10 min warm-up, plyometric training for 25 min, and 10 min warm down. Every 3 weeks of training, 5% of intensity of load was increased from 65% to 80% of workload. The volume of aerobic dance training is prescribed based on the number of sets and repetitions. The equivalent in plyometric training is the length of the time each action in total 3 days/week (Monday, Wednesday, and Friday). The intensity of exercise for 10 weeks before tapering off during 11<sup>th</sup> and 12<sup>th</sup> weeks as removal by

**Table 1: Plyometric training schedule for impact per session**

Training week	Name of the aerobic dance exercises	Sets and repetition	Intensity (%)
I and II	Side-to-side ankle hops	2×5	55
	Double leg hops	2×5	
	Split jumps	2×5	
	Lateral cone hops	2×5	
	Single leg bounding	2×5	
III and IV	Side-to-side ankle hops	3×7	60
	Double leg hops	3×7	
	Split jumps	3×7	
	Lateral cone hops	3×7	
	Single leg bounding	3×7	
V and VI	Side-to-side ankle hops	2×7	65
	Double leg hops	2×7	
	Split jumps	2×7	
	Lateral cone hops	2×7	
	Single leg bounding	2×7	
VII and VIII	Side-to-side ankle hops	3×8	70
	Double leg hops	3×8	
	Split jumps	3×8	
	Lateral cone hops	3×8	
	Single leg bounding	3×8	
IX and X	Side-to-side ankle hops	4×7	75
	Double leg hops	4×7	
	Split jumps	4×7	
	Lateral cone hops	4×7	
	Single leg bounding	4×7	
XI and XII	Side-to-side ankle hops	3×8	70
	Double leg hops	3×8	
	Split jumps	3×8	
	Lateral cone hops	3×8	
	Single leg bounding	3×8	

Piper and Erdman (1998). The intensity of training was tapered so that fatigue would not be a factor during post-testing.

### 2.3. Statistical Analysis

The collected data before and after training period of 12 find out the significant improvement between pre- and post-test. In all cases, the criterion for statistical significance was set at 0.05 level of confidence.

Table 2 reveals the computation of mean, standard deviation, and “*t*”-ratio on selected physical and physiological parameters, namely, speed, explosive



**Table 2:** Computation of “*t*”-ratio on selected plyometric training variables of college men volleyball players on the experimental group and CG

Group	Variables	Mean	<i>n</i>	Std. deviation	Std. error	<i>t</i> -ratio
Experimental group	Speed					
	Pre-test	7.81	15	0.04	0.003	13.43*
	Post-test	7.77	15	0.43		
	Leg explosive power					
	Pre-test	28.60	15	2.16	0.62	8.46*
	Post-test	33.93	15	2.68		
	Breath-holding time					
	Pre-test	30.26	15	4.12	0.26	4.34*
	Post-test	31.37	15	3.53		
	Resting heart rate					
	Pre-test	76.53	15	2.45	0.22	8.67*
	Post-test	74.67	15	2.09		
Control group	Speed					
	Pre-test	7.81	15	0.41	0.02	0.48
	Post-test	7.82	15	0.43		
	Leg explosive power					
	Pre-test	26.73	15	3.01	0.80	1.07
	Post-test	27.60	15	3.06		
	Breath-holding time					
	Pre-test	29.14	15	4.28	0.67	1.01
	Post-test	29.84	15	4.60		
	Resting heart rate					
	Pre-test	77.33	15	4.15	0.44	1.50
	Post-test	76.67	15	3.83		

\*Significant level 0.05 level degree of freedom (2.14, 1, and 14). CG: Control group

power, breath-holding time, and resting heart rate experimental group. The obtained “*t*”-ratio on speed, explosive power, breath-holding time, and resting heart rate was 13.43, 8.46, 4.34, and 8.67, respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained “*t*”-values were greater than the table value, it was found to be statistically significant.

Further, the computation of mean, standard deviation, and “*t*”-ratio on selected physical and physiological parameters, namely, speed, explosive power, breath-holding time, and resting heart rate CG. The obtained “*t*”-ratio on speed, explosive power, breath-holding time, and resting heart rate was 0.48, 1.07, 1.01, and 1.50, respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained “*t*”-values were lesser than the table value, it was found to be statistically not significant.

### 3. CONCLUSIONS DISCUSSION FINDINGS

The present study experimented on the impact of plyometric training on physical and physiological parameters of volleyball players. The result of the study indicated that the plyometric training improved the physical parameters such as speed, explosive power, breath-holding time, and resting heart rate; the findings of the present study had similarity with the findings of the investigations referred in this study. However, there were a significantly changes of subjects in the present study, the speed, explosive power, breath-holding time, and resting heart rate were significantly improved of subject in the group which may be due to the plyometric training. It is speculated that the observed changes in speed, explosive power, breath-holding time, and resting heart rate may properly design plyometric training, which are suitable for men volleyball players at college level.

## REFERENCES

1. Abolghasem, M., and Naser M. Effects of plyometric training on skill performance in soccer players. *Int J Curr Res Acad Rev*, 2014, 2, 242-247.
2. Annadurai, R. Effect of swiss ball and plyometric training programme on selected physical variables and skill performance of inter collegiate men volleyball players. *Acad Sports Sch*, 2014, 3, 5.
3. Atanaskovic, A. Effect of plyometric training on the explosive power of the lower extremities of handball players. *Sport Sci Pract*, 2013, 3, 17-27.
4. Andrade, D.C., Izquierdo, M., and Ramírez-Campillo, R. Effects of plyometric training volume and training surface on explosive strength. *J Strength Cond Res*, 2013, 27(10), 2714-2722.
5. Taheri, E., Nikseresht, A., and Khoshnam, E. The Effect of 8 weeks of plyometric and resistance training on agility, speed and explosive power in soccer players. *Eur J Exp Biol*, 2014, 4(1), 383-386.
6. Manikandan, S. Effect of weight training and combination of weight and plyometric training on selected physical fitness variables of university men handball players. *Asia Pac J Res*, 2014, 1, 154.
7. Raj, R.V. Effect of plyometric training on selected physical and physiological variables among college level volleyball players. *Int J Yoga Physiother Phys Educ* 2017, 2, 181-184.

# Effect of Uphill Training on Selected Physical and Physiological Variables among Long-Distance Runners of Hyderabad District

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## ABSTRACT

The main purpose of this study is to find out the effect of uphill training on selected physical and physiological variables among long-distance runner. For the present study, the researcher takes the male long-distance runners from Hyderabad district taken as sources of data. Thirty male long-distance runners, who had participated in intercollegiate tournaments, were preferred as the area under discussion for this study. The age of the subject matter was ranging from 18 years to 25 years. The criterion measures adopted for the study measuring the physical and physiological variables are given below. To measure the physical variables, 600 m run for speed endurance, 12 min run and walk for cardiorespiratory endurance, pulse count for resting pulse rate, and Harvard step test for VO<sub>2</sub> max, the effect of uphill training on selected physical variables and physiological variables among long-distance runners, the independent “t”-test was used at 0.05 level of significance. There was a significant difference in experimental groups in speed endurance, cardiorespiratory endurance, resting pulse rate, and VO<sub>2</sub> max.

## 1. INTRODUCTION

Sports' training is a scientifically based and pedagogical process of sports perfection which through a systematic effect on psychophysical performance ability and performance readiness aims at leading the sportsmen to high and highest performance (Harre, 1981).

Hill running has a strengthening effect as well as boosting your athlete's power and is ideal for those athletes who depend on high running speeds – football, rugby, basketball, cricket players, and even runners. To reduce the possibility of injury, hill training should be conducted, once the athlete has a good solid base of strength and endurance.

## 2. PHYSICAL VARIABLES

Skill-related physical fitness consists of those components of physical fitness that has a relationship with enhanced performance in sports and motor skills. The components are commonly defined as arm strength, leg explosive power, and abdominal strength.

- Speed endurance.
- Cardiorespiratory endurance.

## 2.1. Physiological Variables

The physiological effects of exercise are fairly well known. When a large muscle group goes into action, it requires the increased supply of food together with an increased supply of oxygen for the conversion of food into energy. It requires also more rapid disposal of waste products. Heart and lungs together speed up their action to meet this demand. Due to this heightened organic activity, assimilation is accelerated, digestion improved, and general nutrition heightened, as evidenced in improved appetite and a loss of body fat. Keeping pace with these nutritional demands, elimination by means of kidney, lungs, intestines, and skin is increased. These effects are made possible which controls organic activity.

- Resting pulse rate.
- VO<sub>2</sub> max.

## 3. METHODOLOGY

To achieve the purpose of this study, 30 male long-distance runners were selected at random, from Hyderabad district. The age of the subjects ranged from 18 to 25 years. The selected subjects were divided into one experimental group and one control group

at random. The investigator reviewed the available scientific literature and on the basis of discussion with experts, feasibility, criteria, availability of instruments, equipment, and the relevance of the variables to the present study. The following variables were selected for the present study.

### 3.1. Statistical Techniques

Analysis of “*t*”-ratio will be used in this study. The level of significance is 0.05 level of confidence which will be considered to be the appropriate one for this study.

## 4. RESULTS

**Table 1:** Physical and physiological variables

Physical and physiological variables	Test item	Unit of measurement
Speed endurance	600 m run	Seconds
Cardiorespiratory endurance	Cooper’s test	Meters
Resting pulse rate	Pulse rate	Counts
VO <sub>2</sub> max	Harvard step test	

## 5. DISCUSSION ON FINDINGS

The investigator had a through and vision that steps aerobic training would improve men long-distance

runners speed endurance, cardiorespiratory endurance, resting pulse rate, and VO<sub>2</sub> max which, in turn, would help them to play better. The investigator selected exercises that are uphill training for long-distance runners.

The statistical values presented in table proved that there was a significant improvement in selected physical and physiological variables among long-distance runners due to uphill training. Obtained “*t*”-value of speed endurance is 12.92, cardiorespiratory endurance is 12.65, resting pulse rate is 6.32, and VO<sub>2</sub> max is 12.89, respectively, which is greater than the required “*t*”-value to be significant for the degrees of freedom 2.15 at 0.05 level of confidence.

Thus, the hypothesis of this study that there would be a significant improvement due to uphill training on selected physical and physiological variables among long-distance runners was accepted at 0.05 level of confidence.

## 6. CONCLUSIONS

Based on the results of the present study, the following conclusions are as follows:

1. The results of the study showed that there were significant improvements in physical variables on speed endurance and cardiorespiratory endurance

**Table 2:** Computation of “*t*”-ratio between the pre- and post-test mean values of physical and physiological variables on the experimental group and control group

Variables	Group	Test	Mean	SD	df	“ <i>t</i> ”-ratio
Speed endurance	Control group	Pre test	46.46	1.39	14	0.24
		Post-test	46.45	1.24		
	Experimental group	Pre-test	46.27	1.08	14	12.92*
		Post-test	45.61	1.16		
Cardiorespiratory endurance	Control group	Pre-test	2660.46	143.16	14	1.71
		Post-test	2680.40	160.27		
	Experimental group	Pre-test	2648.73	108.41	14	12.65*
		Post-test	2702.40	109.35		
Resting pulse rate	Control group	Pre-test	75.20	4.17	14	0.69
		Post-test	75.46	2.97		
	Experimental group	Pre-test	75.00	5.66	14	6.32*
		Post-test	72.73	5.20		
VO <sub>2</sub> max	Control group	Pre-test	76.72	0.95	14	1.22
		Post-test	76.88	0.75		
	Experimental group	Pre-test	76.13	1.51	14	12.89*
		Post-test	76.46	1.50		

\*Insignificance at 0.05 level of confidence, df (14) is=2.15

after 6 weeks uphill training among long-distance runners.

2. The results of the study showed that there were significant improvements in physical variables on resting pulse rate and VO<sub>2</sub> max after 6 weeks uphill training among long-distance runners.

## REFERENCES

1. Jakeman, J.R., McMullan, J., and Babraj, J.A. Efficacy of a four week uphill sprint training intervention in field hockey players. *J Strength Cond Res*, 2016, 30(10), 2761-2766.
2. Barnes, K.R., Hopkins, W.G., McGuigan, M.R., and Kilding, A.E. Effects of different uphill interval training programs on running economy and performance. *Int J Sports Physiol Perform*, 2013, 8(6), 639-647.
3. Panneer, S.R., and Sundar, M. Effect of uphill training on selected physical and physiological variables among long distance runners. *Int J Adv Res Ideas Innov Technol*, 2018, 4(6), 762.
4. Ferley, D.D., Osborn, R.W., and Vukovich, M.D. The effects of uphill vs. level-grade high-intensity interval training on VO<sub>2</sub>max, Vmax, V(LT), and Tmax in well-trained distance runners. *J Strength Cond Res*, 2013, 27(6), 1549-1559.
5. Kavaliauskas, M., Kilvington, R., and Babraj, J. Effects of in-season uphill sprinting on physical characteristics in semi-professional soccer players. *J Sports Med Phys Fitness*, 2017, 57(3), 165-170.
6. Morais, G.P., da Rocha, A., Pinto, A.P., Oliveira, L.D., de Vicente, L.G., Ferreira, G.N., de Freitas, E.C., and da Silva, A.S. Uphill running excessive training increases gastrocnemius glycogen content. *Physiol Res*, 2018, 67(1), 107-115.
7. Padulo, J. The effect of uphill stride manipulation on race walking gait. *Biol Sport*, 2015, 32(3), 267-271.



# A Comparative Study on Speed and Agility among Tribal and Non-tribal Students of Telangana State

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## 1. INTRODUCTION

Physical fitness refers to the ability of your body systems to work together efficiently to allow you to be healthy and perform activities of daily living. Being efficient means doing daily activities with the least effort possible. Physical fitness and wellness are inter-related to each other. The most important aim of the sports exercise is to improve and maintain the physical fitness and wellness of the human being. Exercise is an essential element in the achievement and maintenance of physical fitness and wellness of human being. Physical fitness covers organic fitness as an individual. The main components of physical fitness are speed, strength, endurance, flexibility, agility, cardiovascular fitness, and coordinative ability.

Speed is the ability to move quickly across the ground or move limbs rapidly to grab or throw. Speed is not just how fast someone can run (or cycle, swim, etc.) but is dependent on their acceleration (how quickly they can accelerate from a stationary position), maximal speed of movement, and also speed maintenance (minimizing deceleration). Movement speed requires good strength and power, but also too much body weight and air resistance can act to slow the person down.

Agility is the ability to move and change direction and position of the body quickly and effectively while under control. It requires quick reflexes, coordination, balance, speed, and correct response to the changing situation.

### 1.1. Objective of the Study

The study is to determine the significant difference on speed and agility among tribal and non-tribal students of Telangana State.

### 1.2. Hypothesis

There may not be significant difference among tribal and non-tribal students of Telangana State in relation to speed and agility.

### 1.3. Delimitations of the Study

The present study is delimited into the following aspects.

The study is delimited to 100 male students (50 tribal and 50 non-tribal students) from Telangana State.

The study is respected to the age group range from 14 to 18 years only.

### 1.4. Limitations of the Study

The following study limited to the following.

The diet of the subjects is not restricted with strict observation.

The heredity of the subjects will not be considered in this study.

The meteorological variations such as atmospheric temperature, relative humidity, and atmospheric pressure, during the training and testing session which could not be controlled, are considering as the limitations of this study.

### 1.5. Test Administration

The present study under investigation selected the following physical fitness variables.

- Speed (50 yards dash).
- Agility (4\*10 m Shuttle Run).

**Table 1:** The mean, SD, and “*t*”-values of tribal and non-tribal male students of Telangana State on speed

Group	Mean±S.D.	<i>n</i>	df	<i>t</i> -value	<i>P</i> -value
Tribal	9.01±0.989	50	98	3.053	1.658
Non-tribal	11.66±1.276	50			

SD: Standard deviation

**Table 2:** The mean, SD and “*t*”-values of tribal and non-tribal male students of Telangana state on agility

Group	Mean±S.D.	<i>n</i>	df	<i>t</i> -value	<i>P</i> -value
Tribal	9.36±1.212	50	98	4.23	1.563
Non-tribal	10.26±1.865	50			

SD: Standard deviation

## 2. METHODOLOGY

For the purpose of the study, 100 male students, 50 tribal male and 50 non-tribal male students have been selected on purposively from Telangana State and those age group was 14–18 years.

## 3. RESULTS AND DISCUSSION

Table 1 reveals that the mean of tribal and non-tribal male students of Telangana State is 9.01 and 11.66, respectively; moreover, the difference between the two mean is highly significant “*t*” (98) = 3.053. It was found that the tribal students had significantly high speed than the non-tribal students.

Table 2 reveals that the mean of tribal and non-tribal male students of Telangana State is 9.36 and 10.26, respectively; moreover, the difference between the two mean is highly significant “*t*” (98) = 4.23. It was found that the tribal students had significantly high agility than the non-tribal students.

## 4. CONCLUSION

Within the limitations and delimitations of this study, the following conclusions were drawn. It was concluded

that the tribal students had more speed and agility than the non-tribal students. However, there was a similar difference between tribal students and non-tribal students in case of body density.

## 5. RECOMMENDATIONS AND SUGGESTIONS

The result of the study suggesting the following recommendations as follows:

1. The result of the study showed a significant difference between tribal and non-tribal students in favor of tribal students; this would help to the physical educationists and coaches in selection of the teams in which physical parameters play a dominant role.
2. It is recommended that a similar study may be conducted with different age groups.
3. The similar study may be conducted with different criterion variables.
4. The similar study may be conducted with different geographical locations.

## REFERENCES

- Srivastav, A. *Test of Measurement in Physical Education*. Nagpur: Amit Brother Publications; 1995.
- American College of Sports Medicine. *ACSM's Resource Manual for Guidelines for Exercise Testing and Prescription*. 3<sup>rd</sup> ed. Baltimore: Lippincott Williams and Wilkins; 1998.
- Barrow, H.M., and Rosemary, M. *A Practical Approach to Measurement in Physical Education*. 3<sup>rd</sup> ed. Philadelphia, PA: Lea and Febiger; 1979.
- Dintiman, G.B. Effects of Various training programme on running speed. *Res Q*, 1964, 35, 456.
- Harrison, H.C., and Clark, D.H. *Application of Measurement in Physical Education*. New Jersey: Prentice Hall Inc.; 1987.
- Donald, K.M. *Measurements in Physical Education*. Philadelphia, PA: WB Saunders and Company; 1973.
- Tobu, A. *Tests and Measurements in Physical Education and Sports*. Chennai: Rajmohan Pathipagam; 1987.

# **A Study on Comparison of Physical Fitness Variables between Throwball and Kho-Kho Players of Warangal**

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## **1. INTRODUCTION**

Physical education is an integral part of every child from kinder garden through 12. Therefore, every student should have the opportunity to participate in a quality physical education program. It is the role of quality physical education programs to help students develop health-related fitness, physical competence in movement activities, cognitive understanding, and positive attitude toward physical activity so that they can adopt healthy and physically active lifestyles. Quality programs are also important because they provide learning experiences that meet a student's developmental need, which in turn helps to improve the mental alertness, academic performance, readiness, and enthusiasm for learning. Ultimate aim of exercise is achieving the highest possible individual performance in a given discipline. Specialized in one event or any other discipline should not be equated with one sidedness of training. These exercises should help directly to improve the performance in the given event so that usefulness of each individual exercise should be carefully considered.

In today's age of scientific knowledge, man is making rapid progress in all walks of life and it is true in the area of games and sports. Furthermore, scientific knowledge has revolutionaries' the standards of human performance in sports disciplines. The athletes are now trained on scientific lines and using highly sophisticated technology for top performance in their specific sports, with minimum expenditure of energy and time.

So as to have the utmost efficiency, consistent improvement and balanced abilities, a sportsperson must participate in year round conditioning programs. For that, they must put their bodies under a certain amount of stress to increase physical capabilities. Physical exercise is extremely important for maintaining physical fitness, including healthy weight; building and maintaining healthy bones, muscles and joints;

promoting physiological well-being; and strengthening the immune system. To improve or maintain a desired level of physical fitness, there is a need to constantly administer an adequate training intensity while exercising. Different training modalities are used for the development of different features of physical fitness, as each sportsperson requires different types and levels of physical composure.

Most weight training systems in use today are based on variation of the De Lorne method. If properly carried out, weight may improve speed of physical composure.

Circuit weight training is one of the effective means to improve all-round physical and cardiovascular fitness, whereas plyometric training is one of the most effective methods for improving explosive power, as stated by Fleck and Kreamer (2004). A wide variety of athletes can benefit from power training, particularly if it follows or coincides with a strength training program.

### **1.1. Hypothesis**

It was hypothesized that the kho-kho players may have better physical fitness than throwball players.

### **1.2. Delimitation**

The subjects were selected at random from Warangal district schools. The test administrated for on 20 throwball players and 20 kho-kho players within the age group of 12–15 years.

## **2. METHODOLOGY**

The purpose of the study was to a comparison of physical fitness variables between school level throwball and kho-kho players. The subjects were selected at random from Warangal schools. The test administrated for on 20

**Table 1: Showing flexed arm hang, 30 yard run, sit, and reach test throwball players and kho-kho players**

	Number student	Throwball	Kho-Kho mean	Standard deviation	t-ratio
Strength	20	0.3060	0.478	0.2179	0.476
Speed	20	33.128	0.592	0.44	16.71
Flexibility	20	37.2	29.15	3.86	4.602

Level of significance 0.05

throwball players and kho-kho players within the age group of 12–15. For the study, the subject by selected at random, independently drawn from 20 throwball players and 20 kho-kho players who actively participated in the SGFI tournament in their respective game. Hence, the design of the subjects chosen for the study was based on independently random group design.

### 2.1. Criterion Measures

Variables	Test/instruments	Unit of measurements
Strength	Flexed arm hang	Seconds
Speed	30 yard run	Seconds
Flexibility	Sit and reach	Centimeters

### 3. RESULTS

The test conducted by selecting 20 throwball players and kho-kho players from Warangal district ZPHS Schools. The data were collected by concocting endurance test. The collected data were subjected to the t-ratio test of analysis for significance.

### 4. DISCUSSION

Table 1 clearly shows that mean value of speed for throwball was calculated 0.3060, 33.128, and 37.2 with standard deviation (S.D.) 0.2179, 0.44, and 3.86 kho-kho players was calculated 0.478, 0.592, and 29.15 with S.D. 0.2179, respectively. The obtained *t*-value on speed is 33.128, which is greater than the required table value (2.021) with 38 df and at 0.05 level of confidence.

### 5. CONCLUSIONS

This shows that there is a significant difference exit when speed flexibility and strength are considered among throwball players and kho-kho players. This is showing that kho-kho showed greater speed flexibility and strength when compared with throwball players.

### REFERENCES

Wikipedia, Kho Kho and Throw Ball.

# **A Study on Coordinative Abilities among Male Softball Players and Cricket Players of Guru Nanak Engineering College, Hyderabad**

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## **1. INTRODUCTION**

Cricket and softball are the best-known members of a family of related bat and ball games, despite their similarities, the two sports also have many differences. Although these games are similar in nature and are both derived from England, they have various differences among them including rules, regulations, game play, and bat and ball, while the principle is same, the two games differ in their rules, terminology, playing equipment, number of players, field size, etc.

In sports today, the best performance can only be achieved through accurately planned, executed, and controlled training system loosed on scientific knowledge, theoretical, and methodical fundamental of sports training. A sportsman can compete effectively only by a certain coordinative mastery of the technique. Coordination ability means an ability to quickly and purposefully perform difficult spatiotemporal movement structure. Within this context, coordination abilities are understood as an externally visible manifestation of the control and regulation process of motor activity of central nervous system. Coordinative abilities enable the sportsman to do a group of movements with better quality and effect.

The speed of learning of skill and its stability is directly dependent on the level of various coordinative abilities. Coordinative abilities are needed for maximal utilization of conditional abilities, technical skills, and tactical skills. In different sports, the requirement of coordinative abilities is different and these abilities ensure higher movement efficiency and movement economy, whereas in sports events, they help in higher movement frequency and high explosiveness and force application. In sports, seven coordinative abilities are of key importance. In different sports, the relative importance of these abilities is, however, different.

Differentiation ability enables the sportsman to perceive micro-difference regarding the temporal, dynamic, and spatial aspect of movement execution and differentiation can be in regard to an implement or movement. Orientation permits the sportsman to determine the position and movement of his own body and of a moving object with regard to space. Coupling and combination movement allows the sportsman to coordinate partial movement of his body with regard to space, time, and dynamics. Reaction ability permits the sportsman to effective action quickly and purposefully according to a signal and for a sudden change in situation. Rhythmic ability enables the sportsman to perceive the externally given rhythm and to reproduce it in a motor action. It also denotes the ability to reproduce a rhythm, existing in motor memory in motor action. The optimally developed coordinative ability, especially in childhood, is an individual asset for learning of complex technique in advancement stage which is dependent on the level of required coordinative ability. They are prerequisite of sports and game performance.

### **1.1. Objective of the Study**

The study is to determine the comparative study on coordinative abilities among male softball players and cricket players of Guru Nanak Engineering College, Hyderabad.

### **1.2. Hypothesis**

There may not be any significant difference between softball players and cricket players of Guru Nanak Engineering College, in relation to coordinative abilities.

## **2. MATERIALS AND METHODS**

Selection of 50 male subjects aged between 18 and 25 years, who participated in inter-university



competitions from Guru Nanak Institutions, Hyderabad, were selected for this study. The purposive sampling technique was used to attain the objectives of the study. They were further divided into two groups of 25 each (i.e., 25 cricket players and 25 softball players).

Table showing the sample of the study

Osmania University players	Number of subjects
Cricket players	25
Softball players	25
Total	50

### 2.1. Tools Used

- **Reaction ability:** Reaction ability was the distance measured in centimeters from the top of the planks to the point where the subject stopped the ball. Three trials were given and the best was recorded as the score.
- **Orientation ability:** Orientation ability was noted in seconds. Three trials were given and the best was recorded as the score.
- **Differentiation ability:** Differentiation ability judged through 1 kg medicine ball touching the mat – 1 point, 1 kg medicine ball touching the circle line – 2 points, 1 kg medicine ball touching inside the circle – 3 points, and 1 kg medicine ball touching the 2 kg medicine ball – 4 points.
- **Rhythmic ability:** Rhythmic ability was scored as a difference between the timing of the first and second attempt was taken as a score.

## 3. RESULTS AND DISCUSSION

The results pertaining to the significant difference between cricket players and softball players were assessed using the independent *t*-test and results are presented in Table 1.

It is evident from Table 1 that significant differences were found in reaction ability between the inter-university level cricket players and softball players of Guru Nanak Engineering College since the calculated “*t*”-value 2.31

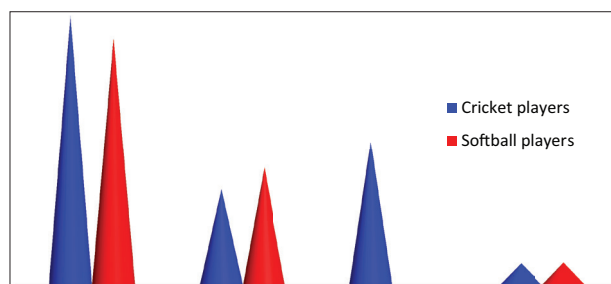


Figure 1: Graphical representation of reaction ability, orientation ability, differentiation ability, and rhythmic ability between cricket players and softball players

was greater than tabulated “*t*”-value 2.021 at 0.05 level of significance. The table shows the results of inter-university level cricket players and softball players of Guru Nanak Engineering College, with regard to orientation ability. The descriptive statistics show that the calculated “*t*”-value 2.48 was greater than the tabulated “*t*”-value 2.021 at 0.05 level of significance. Thus, it was found statistically significant. The study reveals that the cricket players have demonstrated significantly better on orientation ability than the softball players. The table shows the results of inter-university level cricket players and softball players of Guru Nanak Engineering College, with regard to differentiation ability. The descriptive statistics show that the calculated “*t*”-value 2.39 was greater than the tabulated “*t*”-value 2.021 at 0.05 level of significance. Thus, it was found statistically significant. The study observed that cricket players have demonstrated significantly better on differentiation ability than the softball players.

## 4. CONCLUSION

It is concluded from the above finding that significant difference was found in reaction ability, orientation ability, and differentiation ability; the cricket players had better reaction ability, orientation ability, and differentiation ability in comparison to softball players. The insignificant difference was found in rhythmic ability; softball group had better rhythmic ability in comparison to cricket group.

Variables	Mean		SD		<i>t</i> -value	<i>P</i> -value
	Cricket players	Softball players	Cricket players	Softball players		
Reaction ability	20.97	19.21	3.52	2.54	2.31*	0.20
Orientation ability	7.45	9.13	0.87	0.78	2.48*	0.24
Differentiation ability	11.20	10.16	1.95	2.43	2.39*	0.29
Rhythmic ability	1.712	1.77	0.19	0.29	1.05	0.28

## REFERENCES

- Croft, J.L., Button, C., and Dicks, M. Visual strategies of sub-elite cricket batsmen in response to different ball velocities. *Hum Mov Sci*, 29(5), 751-763.
- Singh, H. *Science of Sports Training*. New Delhi: DVS Publications; 2006. p. 164.
- Allan, P.D., and Kornak, J.E. *Measurement and Evaluation in Physical Education*. Vol. 220. New York: John Willy and Sons Inc.; 1979. p. 299-280.
- Ruhal, G.S., Ruhal, A.S., and Singh, M.K. Coordinative abilities of cricket players in relation to different playing positions. *Hum Kinet*, 2010, 1(1), 42-46.
- Raghupathi, K., and Krishnaswamy, P.C. Comparative analysis of coordinative and balancing abilities among 10-15 years of rural and urban school boys. *Glob Res Anal*, 2013, 2(5), 214-216.
- Shumway, C.A., and McCollum, G. Assessment and treatment of balance deficits. In: Montgomery, P.C., and Connolly, B.H., (eds). *Motor Control and Physical Therapy: Theoretical Framework and Practical Applications*. Hixson, TN: Chattanooga Group Inc.; 1991. p. 123-137.
- Hockey, R.V. *Physical Fitness Pathway to Healthful Living*. 4<sup>th</sup> ed. USA: Mosby Company; 1983. p. 294.

# Recreation and Rehabilitation – Sports Tour

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## ABSTRACT

In education academics, in every school, curriculum activities are planned. Cocurricular activities are a part of curriculum activities. A sports tour is a part of cocurricular activities. In every school, the educational tour is organized. The tours are planned based on historical places. Sports tourism places are not involved in their plans. In every school, students at primary levels they should participate in every sports and to develop sports spirit in them sports tours that should be organized by the schools. Moreover, the sports tourism inspires the students to achieve and to show good performance in the games that they participate. From the primary education, itself organization of sports tourism helps the children to develop an interest in the different sports and games. By organizing sports tourism, children can visit stadiums such as indoor/outdoor and can see various sports gymnastic equipments, gymnasium, synthetic tracks, swimming pools, all playing sectors, sports hostels, and sports training center and can meet the famous player or sportsmen. Students can know the players' experience and performance of sports and games which are useful for the students in future sports activities which help to increase the performance and motivate them. In this paper, I have made a survey and comparison, in which I selected 50 schools that are both private and government schools that which schools are giving more preference to the sports tourism and which of the school students are getting more usefulness from the sports tourism and what are the contributions that they are getting from government or management.

**Keywords:** Sports tourism helps to motivate the students in sports achievement.

## 1. INTRODUCTION

To create interest in sports in students and to make their dream of sports to come true, sports tourism is very important in cocurricular activities along with education. In academics for the oral development of students, cocurricular activities are very significant in the life of students. From primary to higher education, knowledge and awareness in education can be possible through cocurricular activities as it has been proved by the research works of national and international universities.

Tourism is a part of cocurricular activities. To make the students educated, the tours are organized to historical places and monuments and remain of architecture and sculptures. As all students may not have same type of interest and it may vary student to student. In primary to higher education, the students will have different types of desires, ambitions, and interests that they take an important role in a part of education.

Therefore, not only the historical places sports development sectors but also to be made as tourism places. Meeting the players who participated in the Olympics, national stadiums, swimming pools, gymnasium halls and equipments, and sports training centers can visit all these places and enhance the interest of sports in students.

Indira Gandhi Indoor Stadium, Chidambaram Stadium in Chennai, Gacchibowli Stadium in Hyderabad, Chinnaswamy Stadium of Bengaluru, and Bengaluru Sports Authority of India, Sports Training Center in Patiala, Jhansi Rani Laxmibai Sports University in Gwalior, etc., visiting to all these places students can be able to increase their interest in sports and come out with their talents in sports.

### 1.1. Hypothesis

The students or children who admit in the government schools are mostly middle-class people. In these schools,

the admission fee will be paid by the government itself. The government has made a scheme to these schools called “Karnataka darshana” as a tourism program to historical places, but this did not get success, or there is no facility. Government should plan and contribute to the sports tourism in these schools so that the students can visit sports development sectors and know about them.

When compared to government schools to private schools, the students of government schools participate more in the folk or rural games and show interest in that. In private schools, students show interest in modern games, but they participate less in number. There will be no encouragement or support from the parents as well as teachers. The private schools give importance to tourism as well. The private schools visit both historical and sports place and they give importance to the recreation of students. In government schools, if they give more importance to the sports tourism, it will be helpful for the development of sports and interest in them.

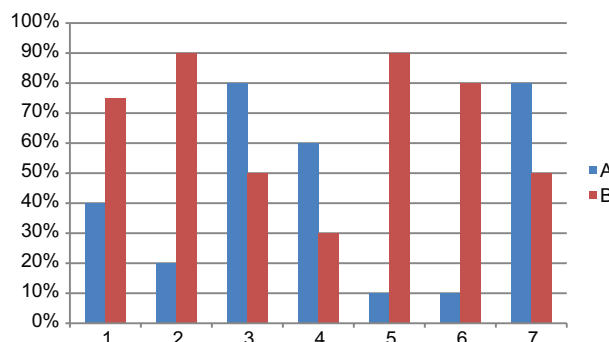
## 2. METHODOLOGY

I have selected twenty schools in Hosapete Taluk, Bellary district. In these, 25 government schools and 25 private schools are selected. In both the schools, educational tourism plan has been collected that they collect for the tourism, the number of schools organized; the number of students participates in sports, the number of students participates in folk games, and the number of students participates in modern games. Moreover, the students are interested more in sports, either government or private. Questionnaires are formed, the information has been collected, and the survey has been done. This has been applied Standard Division (SD) and t-test compared according to the percentages.

A. Government schools.

B. Private schools.

Collection of tour fee	A – 40%	B – 75%
Organization of sports tour in schools	A – 20%	B – 90%
The number of students participated in the sports	A – 80%	B – 50%
The number of students participated in the rural games	A – 60%	B – 30%
The number of students participated in the modern games	A – 10%	B – 60%
Visit the schools to sports development sectors	A – 10%	B – 80%
The interest of students in sports recreation	A – 80%	B – 50%



## 3. CONCLUSION

- The government and private schools have been taken for the survey of sports tourism.
- In government schools, sports facilities will be very few to the students, they have a playground, but there will be a lack of sports coaches.
- The equipments of sports will be not there properly.
- In private schools, there will be no lack of sports facilities.
- A sports coach will be provided and the required sports equipments are available.
- The students of government schools have the sports interest up to 80%.
- In private schools, the students have 60% of sports interest which is less.
- The students of government schools mostly participate in folk or rural games.
- Private school students participate in sports in very few number that is 30%.
- In government schools, the students participating in the modern games will be less.
- In private schools, the students who participate in the modern games are more.
- In tour plans, the private schools also plan for the sports tourism as we already mentioned.
- However, in government schools, they only plan to historical places, where they think expensive for sports tourism.

## 4. SUGGESTIONS

- Government should make a plan as the sports tourism compulsory in schools.
- In private schools, the students can afford for sports tour fee, whereas in government schools, the students cannot afford for tour fee, so in that case, the government should contribute.
- In schools, the physical trainers should be appointed.

- The schools should plan as the students should participate in all the sports and make them get involved in all the games and provide the needed facilities to the schools and give the marks or points to the games.

## REFERENCES

Pasodi, M.S. *Test and Measurement in Evaluation*. Karnataka: Gulbarga University.

Vastrad, B. *Research Methodology in Physical Education and Sports*. New Delhi: Khel Sahitya Kendra.

Manilal, K.P. *Writing Thesis Format and Style for Physical Education and Sports Sciences*. New Delhi: Sports Publication.

Rao, S. *Research Methodology*. Hyderabad: Paras Medical Books.

Vastrad B. *History of Physical Education*. New York: Harper and Row.



# Educational Status and Level of Participation of Polo (Sagol Kangjei) Players of Manipur

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## ABSTRACT

The modern polo originated in Manipur, it has been the national game of Manipur for centuries for 1550 A.D. The British army led by the father of modern polo Lt. General Joe Sherer took a key role in the evolution of the game from the Sagol Kangjei to the modern polo. The name polo was given to the game by a player of Calcutta Polo Club in the 1860s. Till date, polo is a popular sport in Manipur. A review of the literature shows that no study has been made on the educational status and level of participation of polo players in Manipur. The purpose of this study is to find out the educational status and level of participation of the polo players of Imphal East district of Manipur. A total of 30 players belonging to seven polo clubs affiliated to the Manipur Horse Riding and Polo Association were taken as samples. The educational status of the players was collected by means of a questionnaire. For the level of participation of players, the tournament records of the past 10 years of the state association were used. To find out the relationship between educational status and level of participation, the “t”-ratios and “P” were worked out as 2.083 and 0.046, thereby showing that there was a significant relationship between the educational status and level of participation. Pearson’s test was carried out for the test of the hypothesis. The results of the study indicated varying degrees in the relationship between educational status and level of participation of polo players of Manipur.

**Keywords:** Educational status, Participation, Polo players, Sagol Kangjei, Tournament records.

## 1. INTRODUCTION

Polo is an elegant game being played by over 75 countries in the world. It was a national game of the small princely state of Manipur for 1550 A.D. The game was first known as hockey sitting on horseback as recorded by Captain R.B. Pemberton in 1834. When the British tea planters took up the game in Cachar during the 19<sup>th</sup> century, it was from Manipuris that they learned to play it. The Silchar Kangjei Club, the first polo club of the world, was set up in 1859, and the first rules of the game were drafted there in 1863 as rules of Kangjei. Another polo club was set up in 1863, named Calcutta Hockey Club, which indicates that the name polo was not yet adopted for the game. Lieutenant General Joseph Ford Sherer, the father of modern polo, played a key role in setting up both the clubs and the spread of polo from Manipur to other places of British India and the world. According to Encyclopedia Britannica (1984), the term

polo is a Balti word meaning “ball” and English term for game of Sagol Kangjei or hockey on horseback has been derived from that, and the Calcutta Polo Club claims to have given the name “Polo” to the game in early days after it was set up in 1863. The Guinness Book of Records acknowledged the game to have originated from Manipur, it recorded that “Polo can be traced to origin in Manipur state, C. 3100 B.C. when it was played as Sagol Kangjei.”

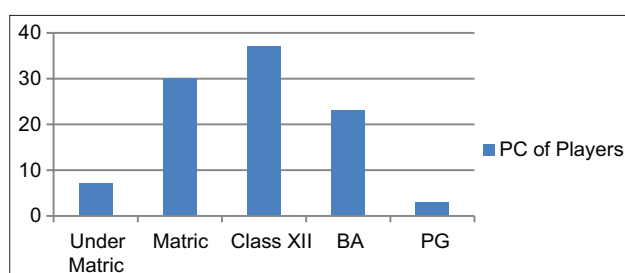
Studies have been made to find out the background of a player with his performance in a game. In all societies, it is people in high income, high education, and high status occupational groups that have the highest rates of active sports participation, attendance at sports events, and even watching of sports on television. Further, the players have to divide their time and energy between their education and the game of choice, giving more in one shall affect the other.

However, no studies have been made to establish the relationship between these two.

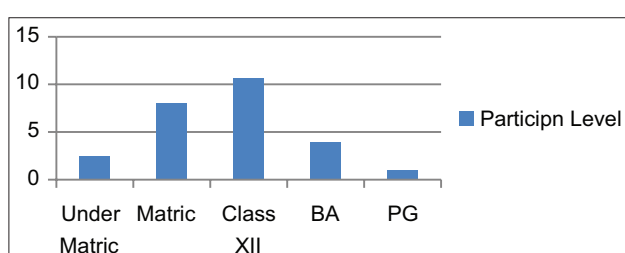
A good education is universally believed to increase the capacity of a person in any walk of life. Vlashopoulos and Makri (2017) found that games and sports are widely integrated into the traditional education process. In India, physical education and sports have formed an integral part of national education policy 2019, and this policy shall have an impact on the sports performance of the players at various educational levels. In sports, the coaches and teachers can articulate better with players of higher educational levels. The schools and colleges have now become a good stage for professional pursuits in sports as the interschool and intercollege sports have reached competitive level, thus forming development grounds for serious sportspersons. However, according to a report by Florida National University, the physically active people are not only healthier but also perform better on tests of cerebral ability, but when it comes to serious sports, things can get tricky. However, Laura Fredrick and others (2000) are of the opinion that coaches find out good players in educational places and mold them to good players which give a relationship between educational level and sports participation.

### 1.1. Purpose

As polo is a popular game in Manipur, it is desirable to find out the educational status of the polo players. The purpose of this study was to find out the educational level



**Figure 1:** Distribution of samples into different educational level groups



**Figure 2:** Educational level and level of participation

and its relation with the level of participation among the polo players of Imphal East District of Manipur.

## 2. METHODOLOGY

### 2.1. Selection of Subject

The present study was conducted on 30 male polo players belonging to seven polo clubs Imphal East District of Manipur by random selection. The random selection was from among the registered players whose age lies between 20 and 28 years. The seven polo clubs are all affiliated to Manipur Horse Riding and Polo Association (MHRPA) which is an affiliated body of the Indian Polo Association.

### 2.2. Instrumentation

The socioeconomic status (SES) scales developed by various social scientists emphasize the academic status of the parents but grossly ignore the educational level of subjects, and it has been true for the commonly used scales of Kuppaswamy, Uday Pareekh and Dr. Ashok Kalia, and Sudhir Sahu. Whereas, education is an important aspect of the development of a player's mental stability and aptitude it also helps a player to understand the rules of the game and other intricacies of the game such as strategic planning and positional advantage in the progress of a game. The researcher collected the data on the educational level along with the other SES questionnaire by making sure that such collection does not interfere with the SES data collection and its prescribed scales. The educational level was divided into under matric, matric, Class XII, graduate, and postgraduate, and the subject had to simply mark his (this study was for male polo players only) level of education. For the level of participation, the tournament records of state, national, and international tournaments for the past 10 years maintained by MHRPA were obtained.

## 3. RESULTS

To find out the significant effect of educational level on the level of participation of male polo players, the standard deviations and *t*-ratios were computed from the collected data, and data pertaining to this are shown in Tables 1 and 2.

It has been observed that there is a significant difference in the educational level of the polo players of Manipur. Hence, the players were grouped into five groups, under

**Table 1:** Descriptive statistics of the level of participation of male polo players of different socioeconomic groups

Group	Postgraduate		BA		Class XII		Matric		Under matric	
Parameters	<i>n</i>	M±SD	<i>n</i>	M±SD	<i>n</i>	M±SD	<i>n</i>	M±SD	<i>n</i>	M±SD
Level of participation	1	1±0	7	3.9±3.63	11	10.6±17.06	8	8.0±9.75	2	2.5±0.71

*n*: No of samples, M: Mean, SD: Standard deviation

**Table 2:** Paired samples statistics

	Mean	<i>n</i>	Standard deviation	Standard error mean
Pair 1				
Educa.	2.8667	30	0.97320	0.17768
Parti.	7.4000	30	11.81057	2.15631

Educa.: Educational level, Parti.: Level of participation

matric, matric, Class XII, graduate, and postgraduate. The distribution of the samples, however, concentrated in the middle level than high or low educational level. There is also a significant difference in the level of participation among the polo players of Manipur.

The level of participation of the players was statistically analyzed in relation to their educational level. The paired sample statistics are calculated through SPSS and are given in Table 2.

The value of “*t*” and “*P*” has been determined using SPSS. It has been observed that the calculated value of “*t*” 2.083 is greater than “*t*” table value 1.699, which indicates that there is a significant difference in the level of participation of the polo players of different educational level groups. “*P*” value is similarly at 0.046, which is lower than the critical degree of significance ( $\alpha$ ) of 0.05. Hence, the null hypothesis is to be rejected and approve of the alternative hypothesis.

Pearson’s Chi-square test was applied to the levels of participation of the polo players in various tournaments, state, national, and international levels. The calculated value of  $\chi^2$  was 11.87 against the table value of  $\chi^2_{05}(4)$ , which is 7.81. As the calculated value was higher than the table value at 0.05 confidence level, the  $H_0$  was rejected and alternative  $H_1$  which states that there is significant difference in the participation levels that have been approved.

#### 4. DISCUSSION

In this study, it has been found that the majority of the sample belongs to matric (30%) and Class XII (37%),

followed by graduates (27%). The under matric players have very low representation (7%) and postgraduates have the lowest representation (3%). Graphical analysis shows that the players with lower educational level show low participation and increased in higher secondary and graduation level but declined again at postgraduation level. The increase in the participation level from under matric to Class XII standards may be due to an increase in understanding with higher education. The performance declined as the educational level increases as the time and energy required for higher academic level increases.

#### 5. CONCLUSIONS

- Educational status had a positive effect on the participation level of the polo players of Imphal East District of Manipur.
- The performance of players at XII to graduation is highest, whereas the performance of postgraduation level players is the lowest.
- The polo players mostly belong to the matric and Class XII, followed by graduates. The players below matric and above graduation level are very less.

#### REFERENCES

1. Vlashopoulos, D., and Makri, A. The effect of games and simulations on higher education: a systematic literature review. *Int J Educ Technol Higher Educ*, 2017, 14, 5-33. Retrieved on 21-12-2019.
2. Encyclopaedia Britannica. United States: BiblioLife; 1984.
3. Geoffrey, E., and Brett-James, A. Imphal; 1962. p. 10.
4. Laffaye, H.A. *The Evolution of Polo*. London, UK: McFarland & Co.; 2009.
5. McFarland, D. *Sports*. London: Guinness Book of World Records; 1992.
6. Singh, L.I. *Introduction to Manipur*. 4<sup>th</sup> ed. Imphal: Global Publications; 1960. p. 225-226.
7. Available from: <http://www.calcuttalpolo.com>. Retrieved on 14-2-2020.
8. Florida National University. The Link Between Sports and Academic Performance. 2019. Available from: <http://www.fnu.edu>. Retrieved on 21-12-2019.

# Effect of Freehand Exercises on Elementary School Student's Physical Fitness

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## ABSTRACT

Physical activity programs using freehand exercises such as push-ups, squats, abs crunches, and leg lifts have the potential to improve health in schoolchildren. The purpose of this study was to examine the effect of a school-based freehand exercises program on physical fitness in elementary school students. **Methods:** The sample was 50 male children (age group = 5–11 years) from kindergarten to fifth grade. Participants performed 15-min freehand exercises in each school day. Physical fitness outcomes were assessed using the President's Physical Fitness Challenge test. Measures were collected at baseline and after 6-month post-test. **Conclusions:** A 6-month freehand exercise program improved upper body strength, abdominal strength, and cardiorespiratory endurance in elementary school-aged children. The use of freehand exercise intervention during the school day can be effectively used to promote physical fitness and ultimately improve the health of children.

**Keywords:** Freehand exercise, Physical fitness.

## 1. INTRODUCTION

The prevalence of obesity in Indian children and teenagers has increased significantly during 1990–2017, with an annual rise of 4.98%, according to the study. It is also projected an overall 17.5% of child overweight prevalence in 2030 and found that 23 states, including Delhi (23.1%), had surpassed the national average. According to the WHO, obesity is one of today's most blatantly visible yet most neglected public health problems.

A 2018 survey by Sir Ganga Ram Hospital revealed that 30% of children's attending private schools in the capital were obese with many suffering from prediabetic and hypertensive conditions. The study Adolescent Obesity in Asian Indians a Rising Menace' noted that the alarming rise in obesity, both in urban and rural children, is leading to a huge need for disease prevention and management. We see approximately 50 minors in the 2–18 years age group every week for obesity and related issues. This is just the tip of the iceberg; most of these children have severe obesity or complications related to obesity. Obese children are more at risk of high

blood pressure, high cholesterol, breathing difficulties, bone and joint problems, and even type 2 diabetes. They are also more likely to have weight problems as adults. Therefore, an optimal development of young children's physical fitness is of significant importance for their overall health condition.

School is an appropriate setting where young people can improve their health and well-being. It has been well documented that school-age children's physical fitness (i.e., cardiorespiratory endurance, muscular fitness, flexibility, and body composition) benefits from various types of school-based physical activity programs, such as recreational game, Comprehensive School Physical Activity Program, and physical education curriculum.

## 2. METHODS

A sample of 50 kindergarten through fifth grade male children (mean age = 5–11 years) was selected from a rural elementary school located in the South Kashmir, Bhan Kulgam.

The children undergo daily 15 min freehand exercises, such as push-ups, squats, abs crunches, leg lifts, planks, wall sit, and calf raise in morning followed by prayer in each school day.

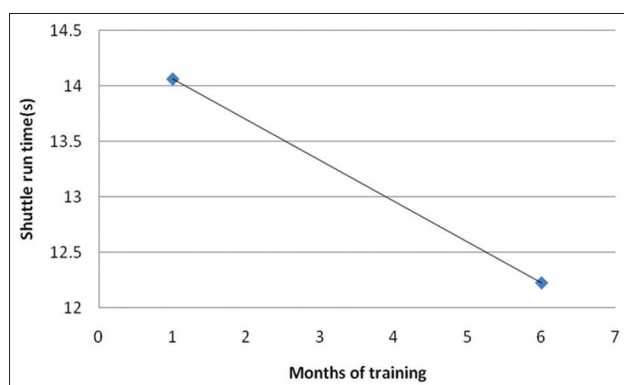
## 2.1. Instrumentation

Participants' physical fitness level was assessed by the President's Physical Fitness Challenge test. The test assesses physical fitness across five components with five subtests, which consists of the 1-mile walk/run, 1-min bent-knee curl-ups, flexed-arm hang, sit and reach, and 30-feet shuttle-run. Only a select number of testing items were employed in the current study. The 1-mile walk/run was used to measure the cardiorespiratory endurance, participants in this study were encouraged to cover the 1-mile distance as quickly (minutes and seconds) as possible, walking may be interspersed with running during the test. The shuttle run test was used to measure the speed and agility, and participants ran back and forth in-between two parallel lines 30

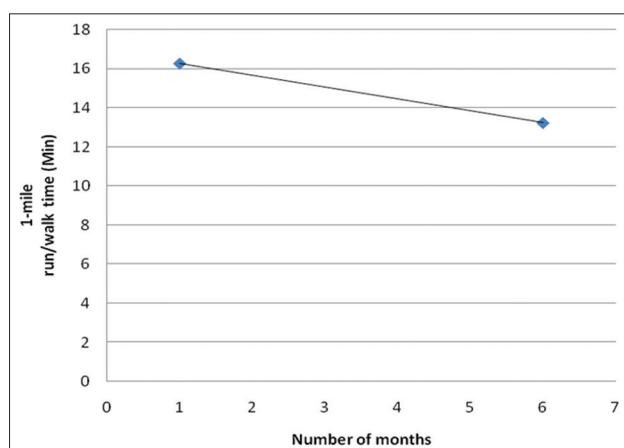
feet apart, score was recorded to the nearest tenth of a second. One-min bent-knee curl-ups test was used to measure abdominal strength/endurance, participants were lying down with knees flexed, arms were crossed with hands placed on opposite shoulders, and elbows held close to the chest. On the signal, participant raised the trunk, curling up to touch the outside of forearms and elbows to thighs and then lowering the back to the floor so that the scapula touched the floor, for one curl-up. The score was recorded in the repetition of the curl-up within 1 min. Flexed-arm hang was employed to assess children's upper body strength/endurance by maintaining flexed-arm hang position as long as possible, participant's chest must be held close to the bar with legs hanging straight. Timing is stopped when participant's chin touched or fell below the bar. Sit and reach was used to measure the flexibility of children's lower back and hamstrings. During the test, participant's legs must remain straight, soles of feet against box, and fingertips of both hands must reach evenly along the measuring line. Each participant had three practice reaches, the fourth reach was held, while the distance was recorded to the nearest centimeter. These items were chosen because they represent important fitness often utilized in physical activity and sports settings.

## 3. PROCEDURE AND RESULTS

This study uses a repeated measures design. All the subjects in the present study attended the freehand



**Figure 1:** Differences in shuttle run time before and after 6 months



**Figure 2:** Differences in the 1-mile run/walk time before and after 6 months

**Table 1:** Statistical measurements at baseline (Mean±SD)

Test items	(Mean±SD)
Shuttle run (s)	14.06±2.55
One-mile/run-walk (min)	16.28±2.52
Curl-ups (reps)	48.69±17.41
Flexed-arm hang (s)	13.44±2.82
Sit and reach (cm)	18.55±8.63

SD: Standard deviation

**Table 2:** Statistical measurements after 6 months (Mean±SD)

Test items	(Mean±SD)
Shuttle run (s)	12.22±1.55
One-mile/run-walk (min)	13.23±2.12
Curl-ups (reps)	49.20±18.21
Flexed arm hang (s)	15.44±2.22
Sit and reach (cm)	21.55±5.63

SD: Standard deviation



exercise program for an entire school year with the support from all the school administrative and classroom teachers. The fitness outcome variables were measured twice at baseline and after 6-month post-test.

The data collected at baseline and after 6 months are analyzed and presented in the following Tables 1 and 2, respectively.

#### 4. CONCLUSIONS

All the physical fitness components show improvement after the 6-month school-based freehand exercise program significantly among the elementary school-aged children.

#### REFERENCES

1. American College of Sports Medicine. *ACSM's Health-Related Physical Fitness Assessment*. 15<sup>th</sup> ed. Baltimore: Lippincott Williams & Wilkins; 2017.
2. Astorino, T.A., Rohmann, R.L., Firth, K., and Kelly, S. Caffeine-induced changes in cardiovascular function during resistance training. *Int J Sport Nutr Exerc Metab*, 2007, 17(5), 468-477.
3. Behringer, M., Vom Heede, A., Matthews, M., and Mester, J. Effects of strength training on motor performance skills in children and adolescents: A meta-analysis. *Pediatr Exerc Sci*, 2011, 23(2), 186-206.
4. Brooks, G., Fahey, T., and White, T. *Exercise Physiology*. 2<sup>nd</sup> ed. Mountain View: Mayfield Publishing Company; 1996.

# Effectiveness of Yoga on Trait Anxiety Level among Adolescent Students

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## ABSTRACT

This research paper is an attempt to study the effect of yogasanas training on the trait anxiety level of adolescent students. To achieve this purpose of 60 subjects, whose age was ranged between 17 and 19 years were selected from the Gurukrupa Junior College, Siddipet District, Telangana. The subjects were randomly assigned into two equal groups (control group and experimental group) of 30 men each. The descriptive survey method was used for the data collection and for assessing the variables of the study. The pre-test was conducted on the selected variable for both the control and experimental groups. The subjects of the experimental group then participated in a 6 weeks yogasanas training program, whereas the subjects of the control group were not given any kind of training. The post-test was conducted for all the subjects of both the control and experimental groups. The level of trait anxiety was measured using the "State-Trait Anxiety Inventory" developed by psychologists Spielberger *et al.* (1970). The data so collected were analyzed statistically by employing mean, standard deviation, and *t*-test. The level of significance was kept at 0.05 level. The results reveal that there was a significant difference in trait anxiety levels in the experimental group than the control group.

**Keywords:** Adolescence, Trait Anxiety, Yogasanas.

## 1. INTRODUCTION

### 1.1. Adolescence (Meaning "To Grow Up")

It is a transitional stage of physical and psychological development that generally occurs during the period from puberty to legal adulthood (age of majority). Adolescence is usually associated with the teenage years, but its physical, psychological, or cultural expressions may begin earlier and end later. For example, puberty now typically begins during preadolescence, particularly in females. Physical growth (particularly in males) and cognitive development can extend into the early 20s. Thus, age provides only a rough marker of adolescence, and scholars have found it difficult to agree on a precise definition of adolescence.

A thorough understanding of adolescence in society depends on information from various perspectives, including psychology, biology, history, sociology, education, and anthropology. Within all of these perspectives, adolescence is viewed as a transitional

period between childhood and adulthood, whose cultural purpose is the preparation of children for adult roles. It is a period of multiple transitions involving education, training, employment, and unemployment, as well as transitions from one living circumstance to another.

Adolescence is usually accompanied by an increased independence allowed by the parents or legal guardians, including less supervision as compared to preadolescence.

### 1.2. Anxiety

It is a state of inner unrest or uneasiness often described as "nervousness." Worry, jitteriness, sweating, an increased heart rate, rapid breathing, and other feelings and symptoms commonly accompany anxiety. A long-held and still popular distinction between "state" and "trait" anxiety allows anxiety to be thought of in two ways: As a temporary emotional state that nearly everyone experiences and as a consistent personality attribute.

The American Psychological Association defines anxiety as “an emotion characterized by feelings of tension, worried thoughts, and physical changes such as increased blood pressure.”

## 2. STATEMENT OF THE PROBLEM

The purpose of the present study was to study the effect of 6 weeks yogasanas training program on the trait anxiety level of adolescent students of the Gurukrupa Junior College, Siddipet district, Telangana.

## 3. HYPOTHESIS

It was hypothesized that the 6 weeks yogasanas training program may show a significant difference in the trait anxiety level of adolescent students.

## 4. METHODOLOGY

The descriptive survey method was used for the data collection and for assessing the trait anxiety level of the subjects.

## 5. SAMPLE

The study was conducted on a sample of 60 randomly selected subjects of Gurukrupa Junior College, Siddipet district, Telangana. The age of the samples was between 17 and 19 years. The subjects were divided into two equal groups (control group and experimental group) of 30 men each. The subjects generally hail from different socioeconomic status, different dietary habits, mode of living, etc. Hence, certain factors, such as daily routine lifestyle, environmental conditions, and food habits, were not taken into consideration.

## 6. VARIABLES

Yogasanas training was considered as an independent variable and trait anxiety level was considered as a dependent variable.

## 7. TOOLS USED FOR DATA COLLECTION

The “State-Trait Anxiety Inventory (STAI)” developed by psychologists Spielberger *et al.* (1970) was used to collect the data. The STAI is a psychological inventory based

on a four-point Likert scale and consists of 40 questions on a self-report basis. The STAI measures two types of anxiety: State anxiety (anxiety about an event) and trait anxiety (anxiety level as a personal characteristic).

The STAI tests two different types of anxiety: State anxiety and trait anxiety. The STAI is one of the first tests to assess both state and trait anxiety separately. Each type of anxiety has its own scale of 20 different questions that are scored. Scores range from 20 to 80, with higher scores correlating with greater anxiety. Each scale asks 20 questions each and is rated on a four-point scale. Low scores indicate a mild form of anxiety, whereas median scores indicate a moderate form of anxiety, and high scores indicate a severe form of anxiety.

The STAI is made up of 40 questions and distinguishes between a person’s state anxiety and trait anxiety. The two forms of anxiety are separated in the inventory, and both are given their own 20 separate questions. When participants rate themselves on these questions, they are given a four-point frequency scale. The frequency scales differ between the two types of anxiety.

Here, only the “trait anxiety questionnaire” was selected for this study. The four-point scale for trait anxiety is as follows: (1). Almost never, (2). sometimes, (3). often, and (4). almost always.

## 8. TRAINING PROTOCOL

The subjects of the experimental group had 30 min of practice of the yogasanas (Sukhasana, Uttanasana, Prasarita Padottanasana, Sasangasana, Vajrasana with Garudasana, Dhanurasana, Matsyasana, and Shavasana) in the initial days, but the total time was increased up to an hour gradually by increasing the number of repetitions and time duration in a progressive load method. The subjects practiced the yogasanas 6 days a week for a total of 6 weeks in a common room selected for the purpose. The scheduled time of the practice lasted for 1 h between 6.00 am and 7.00 am and was conducted instead of the student’s regular conditioning period. Each and every practice session was concluded with 5 min of Shavasana. The subjects of the control group were not given any kind of training.

## 9. DATA COLLECTION PROCEDURE

The subjects were met personally and explained clearly the purpose of the study, process of the data collection,

and gave instructions regarding the method for answering the questions. Then, the questionnaires were distributed to the subjects. The subjects went through the instructions, read each statement carefully, and indicated their responses. All the filled-in questionnaires were collected from the subjects and scoring was done. The test was administered for both experimental and control groups before and after 6 weeks yogasanas training and the scores were recorded as pre-test and post-test values, respectively. The subjects of the control group were not given any kind of training. The investigator explained to the subjects of the experimental group about the benefits of performing yogasanas.

## 10. STATISTICAL TOOLS USED

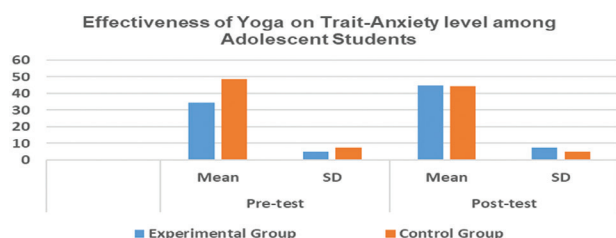
With respect to the type of study, the data collected were statistically analyzed through mean, standard deviation (SD), and *t*-ratio was applied. The level of significance was fixed at 0.05 level of confidence.

**Table 1:** Showing the results of effectiveness of yogasanas on trait anxiety level among adolescent students

Groups	n	Pre-test	Post-test	<i>t</i> -ratio
		Mean±SD	Mean±SD	
Experimental group	30	34.66±5.08	44.80±7.63	6.851*
Control group	30	48.53±7.56	44.26±5.11	2.085*

SD: Standard deviation

Graphical illustration showing the mean and SD values of both the experimental and control groups of adolescent students.



## 11. DISCUSSION

The experimental group mean value of trait anxiety level of pre-test is 34.66 and post-test is 44.80. The post-test trait anxiety level performance is less than pre-test trait anxiety level performance. The *t*-ratio (6.851) is also more than the table value (2.04). Hence, it indicates the significant development of trait anxiety level performance. The control group mean value of trait anxiety level of pre-test is 48.53 and post-test is 44.26. The post-test trait anxiety level performance is more than pre-test trait anxiety level performance. The *t*-ratio (2.085) is slightly more than the table value (2.04). Hence, it indicates the insignificant development of trait anxiety level performance.

## 12. CONCLUSION

Within the limitation of the study and on the basis of the obtained results from this study, it was concluded that the experimental group which participated in a 6 weeks yogasanas training program had significantly improved in reducing the trait anxiety levels among adolescent students. Hence, the research hypothesis is accepted.

## REFERENCES

1. Costello, E.J., and Angold, A. Epidemiology. In: March, J., (ed). *Anxiety Disorders in Children and Adolescents*. New York: Guilford; 1995. p. 109-124.
2. Mangal, S.K. *Advanced Educational Psychology*. New Delhi: Prentice-Hall of India Pvt. Ltd.; 2007.
3. Royal College of Psychiatrist. *Anxiety and Phobias*. London: Public Education Editorial Board; 2010b.
4. Spielberger, C.D., Gorsuch, R.L., and Lushene, R.E. *Manual for the State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press; 1970.
5. Available from: <https://www.en.wikipedia.org/wiki/adolescence>.
6. Available from: <https://www.en.wikipedia.org/wiki/anxiety>.

# Evaluation of Physical Fitness Components between Hockey Players and Football Players of Telangana State

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## 1. INTRODUCTION

The concept of physical fitness dominates much of current thinking and research in the field of physical education. Each person has a certain level of physical fitness at which he can live most effectively. A fit man is well adapted to the environment; his mind and body are in harmony and can meet the normal demands made on him, both mentally and physically without under fatigue. The high level of physical fitness produces significant effects on the working of the human being. Physical fitness is to the human body what fine-tuning is to an engine. It enables us to perform up to our potential. Physical fitness may be describe as a condition that helps us look, feel, and do our best. More specifically, it is: "The ability to perform daily tasks vigorously and alertly, with energy left over for enjoying leisure-time activities and meeting emergency demands. It is an ability to endure, to bear up, to withstand stress, and to carry on in circumstances where an unfit person could not continue and is a major basis for good health and well-being." Physical fitness involves the performance of the heart and lungs and the muscles of the body. What we do with our bodies also affects what we can do with our minds, fitness influences to some degree of qualities such a mental alertness and emotional stability.

The concept of fitness has a long and involved history. According to the literature on the subject, it can be traced to the work done by Charles Darwin of the survival of the fittest. Always the ward fitness suggests the ability of an animal or a human to work and play with a maximum degree of physical efficiency and to be prepared to meet unforeseen danger or destruction. Fitness is the capacity to do prolonged herd work and recover to the same state of health in short duration of time; this is the result of the degree of strength speed power endurance agility and flexibility one assesses there an element of physical fitness are useful for different games and sports. Physical fitness depends

on several factors such as heredity, hygienic living nutrition, and body maneuver of an individual. Among these body maneuvers ever play activities, differently.

Many psychologists are impressed by the fact so far as our attested scientific knowledge goes mind seems to be invariable associated with matter not indeed with all trams of matter put with certain physical and chemical processes in animal organisms they are also influenced by growing evidence of detailed interconnections between particular functions of human body and in the result some of them hold they every mental activity has a physiological correlates or cause while others 20 further and assert that mental activities are themselves really physiological correlates or cause while others 20 further and assert that mental activities are themselves really physiological. An erroneous nation is prevalent among a sizeable section of people in India that atheist to general and less intelligent and less than non-athletes they think too much of the physical energy of an athlete is spend in these athletic pursuits. This drain not only his physical energy but also makes him mentally dull consequently his intelligence and mental ability suffer; they, therefore, are of the opinion that the time develop to sports and games on the plane field is a waste in terms of energy less and of time, which could be more usefully employed in other gainful activity. The researcher, therefore, has made an attempt to study whether a physically let person is intelligently fit since physical education supposedly contributes to the physical as well as mental aspect of the personality.

In its most general meaning, physical fitness is a general state of good physical health. Obtaining and maintaining physical fitness is a result of physical activity, proper diet and nutrition, and, of course, proper test for physical recovery. In these simplest terms, physical fitness is to human body what fine – training is to an engine. It enables people to perform up to their potential, regardless of age, fitness can be described



as a condition that helps individual's looks, feel, and do their best. Thus, physical fitness trainers describe it as the ability to perform daily tasks vigorously and alertly, with leftover energy to enjoy leisure – time activities and meet emergency demands. Specifically true for senior citizens, physical fitness is the ability to endurance, bear up, withstand stress, and carry on in circumstances where or unfit person could not continue. For one to be considered physically fit, the heart, lungs, and muscles have to perform at a certain level for the individual to continue feeling capable of performing an activity. At the same time, since what humans do with their bodies directly affects the state of mind, fitness influences to some degree qualities such as mental alters and emotional expression.

### 1.1. Objective of the Study

The objective of the study was as follows:

- To compare the speed, one of the physical fitness component between hockey players and football players of Telangana State.
- To compare the explosive power of legs, one of the physical fitness component between hockey players and football players of Telangana State.
- To compare the agility, one of the physical fitness component between hockey players and football players of Telangana State.
- To compare the flexibility, one of the physical fitness component between hockey players and football players of Telangana State.

### 1.2. Hypothesis

- There may not be any significant difference between hockey players and football players of Telangana state in relation to speed.
- There may not be any significant difference between hockey players and football players of Telangana state in relation to explosive power.
- There may not be any significant difference between hockey players and football players of Telangana state in relation to agility.
- There may not be any significant difference between hockey players and football players of Telangana state in relation to flexibility.

## 2. MATERIALS AND METHODS

For the purpose of the study, 100 players of 50 hockey players and 50 football players were selected randomly in the age group of 18–24 years of Telangana state.

### 2.1. Tools Used

The following four physical fitness test were selected for the study:

- 30 m run test – To measure speed.
- Standing broad jump – To measure explosive power of legs.
- Zigzag run test – To measure agility.
- Forward bend and reach test – To measure flexibility.

## 3. RESULTS AND DISCUSSION

The findings of the study in relation to speed showed that the hockey players of Telangana State had better speed in comparison to the football players of Telangana State. This may be attributed to the fact that speed plays an important role in the performance of hockey players and football players of Telangana State. The findings of the study revealed that significantly higher strength was found in the football players of Telangana State than the hockey players of Telangana State. This may be attributed to the fact that explosive strength of legs plays an important role in the performance of hockey players and football players of Telangana State. The findings of the study in relation to agility showed that the hockey players of Telangana State had better agility in comparison to the football players of Telangana State. This may be attributed to the fact that agility plays an important role in the performance of hockey players and football players of Telangana State. The finding of the study in relation to flexibility showed that the football players of Telangana State had better than the hockey players of Telangana State. This may be attributed to the fact that flexibility plays an important role in the performance of hockey players and football players of Telangana State.

**Table 1:** The comparison of physical fitness components between the Telangana State's hockey players and football players

Variable	n	Game	Mean±SD	S.E.D	"t"
Speed	50	Hockey players	4.16±0.39	0.59	0.284
	50	Football	4.18±0.37		
Explosive power of arm	50	Hockey players	2.19±27.15	5.57	0.410
	50	Football	2.17±28.96		
Agility	50	Hockey players	16.46±1.06	0.22	2.35
	50	Football	15.90±1.08		
Flexibility	50	Hockey players	17.67±3.33	0.76	2.129
	50	Football	16.04±3.97		

Significant at 0.05 levels. SD: Standard deviation

#### 4. CONCLUSION

It is concluded that the hockey players of Telangana State had better speed in comparison to the football players of Telangana State. Football players of Telangana State had better explosive strength of legs than the hockey players of Telangana State. Hockey players of Telangana State had better agility in comparison to the football players of Telangana State had better flexibility than the hockey players of Telangana State.

#### REFERENCES

- Lawton, C.L. The effects of breakfast on behavior and academic performance in children and adolescents. *Front Hum Neurosci*, 2013, 7, 425.
- Vinod, K. 2013, 2(8). Available from: <http://www.ijirs.com>.
- Manly, B.M. Promoting healthy lifestyles in high school adolescents: A randomized controlled trial. *Am J Prev Med* 2013, 45, 407-415.
- Hughes, C.W. Depressed adolescents treated with exercise (DATE): A pilot randomized controlled trial to test feasibility and establish preliminary effect sizes. *Ment Health Phys Act*, 2013, 6(2).
- Gúlias-González, R., and Castillo-La, M. Spain. *Eur J Podiatry*, 2013.
- Salinardi, T.C. Lifestyle intervention reduces body weight and improves cardio metabolic risk factor in worksites. *Am J Clin Nutr*, 2013, 97, 667-676.
- Pulgarón, E.R. Childhood obesity: A review of increased risk for physical and psychological co morbidities. *Clin Ther*, 2013, 35, A18-A32.
- Raj, S. Assessment of health-promoting behaviour and lifestyle of adolescents of a North Indian city. *Int J Prev Med*, 2013, 4, 1189-1193.
- Parle, M. Lifestyle related health hazards. *Int Res J Pharm*, 2013, 4(11), 1-5.
- Tells, S. Child adolescent psychiatry mint health. *BMC*, 2013, 7, 37.
- Forrest, C.B. Health and school adolescence. *J Adolesc Health*, 2013, 52, 186-194.
- Edgerton, C.R. Joy in physical activity. *Glob J Health Phys Educ Pedagogy*, 2013, 2(2), 3.

# Study of Social Adaptation

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## ABSTRACT

Human beings, as a social being, have to adjust himself in the social environment in his daily life; he commands others and works according to his one or other's rules and regulations. In a family, every member is dependent on each other. Sometimes even parents obey the rules of their children. This type of situation influences them to adjust in the social environment. Social adjustment is an attempt made to cope with standards, values, and needs of a society by an individual in society. This research aimed to find out whether there is any significant difference in the variable of social adjustment between the students of Northeast and other states of India.

## 1. INTRODUCTION

The concept of social adaptation is old as a human race on each. It is a household word we speak of people as being well-adjusted or poorly adjusted.

Psychologists use the term adaptation of varying conditions of social and interpersonal relation in society. Thus, adaptation can be called the reaction to the demands and pressures of the social environment imposed on the individual. Human beings are born with a number of internal needs, for example, need for food, water, and oxygen. The frustration of which leads to discomfort and sometimes to death. Many of these physiological needs and in the course of development some additional needs emerge, these physiological demands go on increasing and become more complicated. Infact, life is a continuous process of adjusting, self-understanding, personality integration self-actualization, and frustration tolerance contributes to the effective social adaptation.

Adaptation is a biological phenomenon of acclimatization. It is a dynamic process, where a person develops a harmonious relationship between himself and environment. In other words, adaptation leads to modification of one's behavior an attitude toward the changed environment. Adaptation is commonly defined in terms of freedom from tension and adapting oneself to the needs of other individuals. Adaptation is a process by which living organism maintains a balance between its requirements and situation that influence.

In social science, a social relation reflected in social interaction refers to a relationship between two (i.e., a dyad), three (i.e., a triad), or more individuals (e.g., a

social group). Social relations, derived from individual agency, form the basis of the social structure.

Social adaptation can be differentiated into

- Accidental (also known as social contact) – not planned and likely not repeated. For example, asking a stranger for directions or shopkeeper for product availability.
- Repeated – not planned, bound to happen from time to time. For example, accidentally meeting a neighbor from time to time when walking on your street;
- Regular – not planned, but very common, likely to raise questions when missed. Meeting a doorman or a security guard every workday in your workplace, dining every day in the same restaurant, etc.
- Regulated – planned and regulated by customs or law will definitely raise questions when missed. Interaction in a workplace (coming to work, staff meetings, etc.) family, etc.

## 2. EMOTIONAL ADAPTATION (EA)

EA, also called neuroticism, emotional equilibrium, and emotional stability, is one of the constructs that systematically appear to determine "personality structure." It constitutes a dimension in most of personality theories. This capacity is an important aspect of mental health and where it is compromised, or not developed, psychopathology and mental disorder can result.

## 3. SOCIAL ADATAPTION

Social maturity and adoption involves learning to properly relate to acquaintances, family, neighbors, friends, and

intimate relationships. It involves understanding how to honor and respect those in authority. This can include parents, employers, or police.

Adult development and maturity theories include the purpose in life concept, in which maturity emphasizes a clear comprehension of life's purpose, directedness, and intentionally, which contributes to the feeling that life is meaningful.

#### 4. STATEMENT OF THE PROBLEM

Social adaptation is very important for success in life. To live a successful life in society, an individual needs to change in habitual conduct or behavior which makes him most fit into the community in which he lives. Hence, the researcher decided to undertake the study stated as "Study of social adaptation."

#### 5. PURPOSE OF THE STUDY

The main purpose of the study will be to know the social adaptation between the students of Northeast and other states of India. Another purpose of this study is to determine the differences between the students of Northeast and other states of India in the variable of social adaptation.

##### 5.1. Hypotheses

On the basis of discussion with the experts and scholar's own understanding, it is hypothesized that

- There will be a positive relationship of social adaptation between the students of Northeast and other states of India.
- There will be a significant difference in the variable of social adaptation among the students of Northeast and other states of India.

#### 6. DELIMITATIONS

The study will be restricted to the following aspects:

- The male students of D.C.P.E. will be selected as the subjects from the following five Northeast states only instead of seven states.

- Assam, Manipur, Meghalaya, Nagaland, and Sikkim.
  - Other states of India, i.e., Bihar, Delhi, Haryana, Maharashtra, and W. Bengal.
- Data will be collected through the questionnaire method.

#### 7. LIMITATIONS

- No specific motivational technique will be adopted to motivate or discourage the subjects during the experiment.
- No control over an experience and thoughts of the students while collecting the data.

#### 8. ANALYSIS AND INTERPRETATION OF DATA

The raw data pertaining to the study were tabulated for statistical treatment of one-way analysis of variance (ANOVA) and least significant difference *post hoc* test was applied to find out the differences in the selected variables among the undertaken subjects.

##### 8.1. Level of Significance

To test, the hypothesis level of significance was set at 0.05, which was considered adequate for the present study.

#### 9. FINDINGS

The value of "*t*" required to be significant at 0.05 level with (98) degree of freedom was 1.987.

It can be observed from Table 1 that there is no significant difference in social adjustment between the students of Northeast and other states of India.

This has been further confirmed also applying "*t*"-test. It was found that the calculated "*t*" is 1.964, while the tabulated value of "*t*" at 0.05 level with (98) degree of freedom is 1.987.

**Table 1:** Mean, standard deviation, and *t*-ratio for the data on social adjustment of Northeast and the states of India

Groups	Mean±standard deviation	Mean difference	Standard error	<i>t</i> -ratio
Northeast states	111.84±28.84	9.46	4.816	1.964 <sup>@</sup>
Other states	102.38±18.116			

<sup>@</sup>Not significant at 0.05 level, Tabulated  $t_{0.05(98)}=1.994$

Since the calculated value of “*t*” was less than the tabulated value of “*t*”, it was concluded that there is no significant difference in social adjustment between the students of Northeast and other states of India.

The value of “*F*” required to be significant at 0.05 level with (9, 90) degree of freedom was 1.980.

It can be observed from Table 2 that there is no significant difference in the variable of emotional adjustment of social adjustment among the students of Northeast and other states of India.

This has been further confirmed also applying one-way ANOVA. It was found that the calculated “*F*” is 1.560 while the tabulated value of “*F*” at 0.05 level with (9, 90) degree of freedom is 1.980.

Since the calculated value of “*F*” was less than the tabulated value of “*F*”, it was concluded that there is no significant difference in the variable of emotional adjustment of social adjustment among the students of Northeast and other states of India.

The value of “*t*” required to be significant at 0.05 level with (98) degree of freedom was 1.987.

It can be observed from Table 3 that there is no significant difference in the variable of emotional adjustment of social adjustment between the students of Northeast and other states of India.

**Table 2:** Summary of ANOVA for the data on emotional adjustment among the students of Northeast and other States of India

Source of variation	Sum of squares	DF	Mean square	F-ratio
Between groups	3404.64	9	378.294	1.560 <sup>@</sup>
Within groups	21812.6	90	242.363	
Total	25217.24	99		

<sup>@</sup>Not significant at 0.05 level, tabulated  $F_{0.05(9,90)}=1.980$

**Table 3:** Mean, standard deviation, and *t*-ratio for the data on emotional adjustment of Northeast and the states of India

Groups	Mean±standard deviation	Mean difference	Standard error	<i>t</i> -ratio
Northeast states	46.58±13.26	0.64	3.174	0.201 <sup>@</sup>
Other states	45.94±18.11			

<sup>@</sup>Not significant at 0.05 level, tabulated  $t_{0.05(98)}=1.994$

This has been further confirmed also applying “*t*”-test. It was found that the calculated “*t*” is 0.201 while the tabulated value of “*t*” at 0.05 level with (98) degree of freedom is 1.987.

Since the calculated value of “*t*” was less than the tabulated value of “*t*”, it was concluded that there is no significant difference in the variable of emotional adjustment of social adjustment between the students of Northeast and other states of India.

## 10. TESTING OF HYPOTHESIS

In the beginning of the study, it was hypothesized that

- There would have a positive relationship of social adjustment between the students of Northeast and other states of India.
- There would have a significant difference in the variable of social adjustment among the students of Northeast and other states of India.

The result of the present demonstrated that

- There is a negative relationship of social adjustment between the students of Northeast and other states of India.
- There is no significant difference in the variable of emotional adjustment between the students of Northeast and other states of India.
- There is no significant difference in the variable of social maturity between the students of Northeast and other states of India.

## 11. CONCLUSIONS

- There is a negative relationship of social adjustment between the students of Northeast and other states of India.
- There is no significant difference in the variable of emotional adjustment between the students of Northeast and other states of India.



## REFERENCES

- Rubio, V.J., Aguado, D., Hontangas, P.M., and Hernandez, M.J. Psychometric properties of an emotional adjustment measure: An application of the graded response model. *Eur J Psychol Assess*, 2007, 23(1), 39-46.
- Oddy, M., Couchlan, T., Tyerman, A., and Jenkins, D. Social adjustment after closed head injury: A further follow-up seven years after injury. *J Neurol Neurosurg Psychiatry*, 1985, 48(6), 564-568.
- Reddy, O.T., Reddy, P.T., and Singh, S. A study of social adjustment as a socio-psychological differential among sports achievers, non-achievers and non-participants' female tribal. *Indian J Mov Educ Exerc Sci Biannual Refereed J*, 2011, 1.
- Patel, M.I., Schupp, C.W., Gomez, S.L., Chang, E.T., and Wakelee, H.A. How do social factors explain outcomes in non-small-cell lung cancer among Hispanics in California? Explaining the Hispanic paradox. *J Clin Oncol*, 2013, 31(28), 3572-3578.
- Ikenouchi-Sugita, A., Yoshimura, R., Sugita, K., Hori, H., Yamada, K., Sakaue, M., and Nakamura, J. The effects of a walking intervention on depressive feelings and social adaptation in healthy workers. *J UOEH*, 2013, 35(1), 1-8.
- Tan, J.D., Butow, P.N., Boyle, F.M., Saw, R.P., and O'Reilly, A.J. A qualitative assessment of psychosocial impact, coping and adjustment in high-risk melanoma patients and caregivers. *Melanoma Res*, 2014, 24(3), 252-260.
- Caplan, M., Weissberg, R.P., Grober, J.S., Sivo, P.J., Grady, K., and Jacoby, C. Social competence promotion with inner-city and suburban young adolescents: Effects on social adjustment and alcohol use. *J Consult Clin Psychol*, 1992, 60(1), 56-63.
- Akkaya, C., Sarandol, A., Esen Danaci, A., Sivrioglu, E.Y., Kaya, E., and Kirli, S. Reliability and validity of the Turkish version of the social adaptation self-evaluation scale (SASS). *Turk Psikiyatri Derg*, 2008, 19(3), 292-299.
- Available from: [http://www.shodhganga.inflibnet.ac.in/bitstream/10603/280/10/10\\_chapter3.pdf](http://www.shodhganga.inflibnet.ac.in/bitstream/10603/280/10/10_chapter3.pdf).
- Available from: [http://www.psychology.wikia.com/wiki/emotional\\_adjustment](http://www.psychology.wikia.com/wiki/emotional_adjustment).

# Study of Fat Percentage and Muscle Mass of College Students of Rural and Urban Area of Amravati City

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## ABSTRACT

The study aimed to compare study of fat percentage and muscle mass of college students of rural and urban area of Amravati city. A total of 50 subjects, of which 25 were selected from rural and 25 from rural and urban areas of Amravati city and all of them were randomly selected for the study through a special sampling technique called as simple random sampling. The age of the subjects ranged between 18 and 25 years. To analyze the fat percentage and muscle mass of college students of the both groups, the following tests and equipments were used, skinfold caliper for measuring fat percentage. Weighing machine for measuring weight and then fat percentage of each individual subject was subtracted from their actual weight to get the muscle mass of the subjects. The analysis of data was done using statistical technique "t"-test for finding the significance difference of fat percentage and muscle mass of college students of rural and urban area of Amravati city and the level of significance was set at 0.05 levels ( $P < 0.05$ ). The findings mean and standard deviation of college students from urban areas, namely, fat percentage is  $7.23 \pm 3.19$  and muscle mass is  $59.87 \pm 3.76$ . Hence, it is clear that the students from rural areas are fatty and with least muscle mass as compared to that of living in rural areas the reason behind all this might be the tracking habit of people living in rural areas as these areas have good facilities of transport, so people in urban areas consume extra energy as compared to rural areas.

**Keywords:** Fat percentage, Muscle mass, Skinfold caliper weighing machine.

## 1. INTRODUCTION

In physical fitness, body composition is used to describe the percentages of fat, bone, and muscle in human bodies. Since muscular tissue takes up less space in our body than fat tissue, our body composition, as well as our weight, determines leanness. Two people of equal height and body weight may look completely different from each other because they have a different body composition. The human body is composed from many major components at the cellular and tissue levels. These include water, minerals, protein, and fat. Increases in the levels of fat components are detrimental to health and also sports performance. On the other hand, increases the protein component result from more muscle mass and hence are beneficial to athletes. The mineral component is mainly associated with bone. The density of bone can be problematic in the elderly where osteoporosis arises. The assessment of body composition is not only common in sport and exercise sciences but also in medicine. Most of the interest is in quantifying body fat in relation to health and to sports performance.

## 2. SKINFOLD METHOD

The skinfold estimation methods are based on a skinfold test, also known as a pinch test, whereby a pinch of skin is precisely measured by calipers at several standardized points on the body to determine the subcutaneous fat layer thickness. These measurements are converted to an estimated body fat percentage by an equation. Some formulas require as few as three measurements, others as many as seven. The accuracy of these estimates is more dependent on a person's unique body fat distribution than on the number of sites measured. As well, it is of utmost importance to test in a precise location with a fixed pressure. Although it may not give an accurate reading of real body fat percentage, it is a reliable measure of body composition change over a period of time, provided the test is carried out by the same person with the same technique. Skinfold-based body fat estimation is sensitive to the type of caliper used and technique. This method also only measures one type of fat: Subcutaneous adipose tissue (fat under the skin).

### 3. PROCEDURE AND METHODOLOGY

Fifty subjects were selected for the collection of data, which include 25 subjects from rural areas and 25 from urban areas of Amravati city. The subjects were selected by simple random sampling method. The age of the subjects ranged between 18 and 25 years. For the data of fat percentage, the skinfold was picked up and the reading was taken from three major areas of the body where mostly the fat gets accumulated. These areas are chest, abdomen, and thigh. After taking the measurement of these areas, the values were added and then compared with nomograph to know the percentage of fat in the body. This is measured to the nearest millimeter. This nomograph consists of two scales. One scale indicates the level of the age of males and females; the second one indicates the percentage of fat. The scores or values from the three areas after adding are compared with the scale of fat percentage to know the fat percentage in the body and the data related to muscle mass were obtained by following steps given below:

- Step-1: Weigh yourself with a body fat scale. The scale will automatically calculate your percentage of body fat.
- Step 2: Subtract your body fat percentage from 100 to get your lean mass percentage. Here is an example:  $100 - 25\% \text{ body fat} = 75 \text{ percent lean mass}$ .
- Step 3: Divide your lean mass percent by 100 to calculate the decimal for your lean mass percent. Here is an example:  $100/75 = 0.75$ .
- Step 4: Multiply your lean mass decimal by your total body weight to calculate your lean mass weight. If you weigh 175 lbs., multiply 175 by 0.75 for 131.25 lbs. of lean mass.

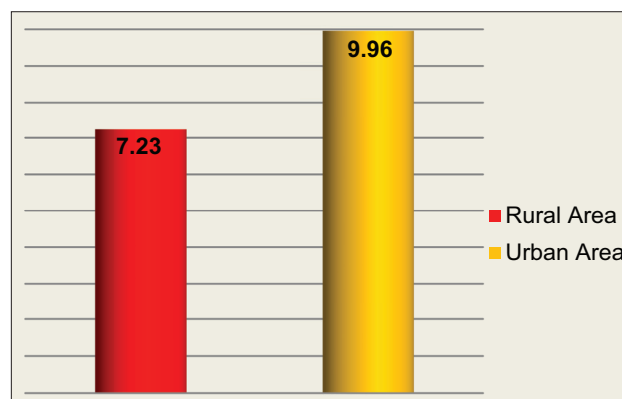
### 4. EQUIPMENTS USED FOR COLLECTION OF DATA

The various equipments that were used for the collection of data were hemometer for measuring hemoglobin percentage and peak flow meter for measuring exhale capacity. A digital stopwatch for recording time during pulse rate count  $\text{Vo}_2\text{max}$  and Bench for cardiovascular endurance.

**Table 1:** Comparison of fat percentage of college students of rural and urban areas of Amravati city

Group	Mean $\pm$ S.D	M.D	D.F	O.T	T.T
Rural area	7.23 $\pm$ 3.19	2.73	58	3.81	2.00
Urban area	9.96 $\pm$ 2.28				

SD: Standard deviation

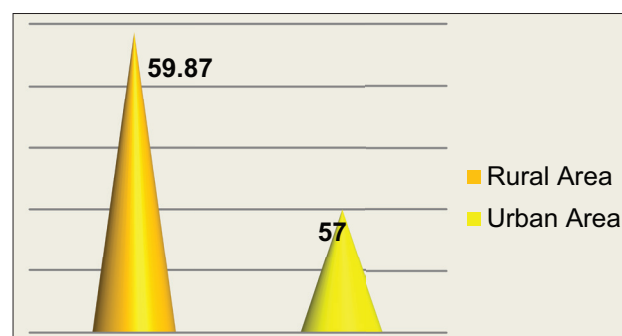


**Graph 1:** Graphical representation of mean value of college students between rural and urban area of Amravati city

**Table 2:** Comparison of muscle mass of college students rural and urban area of Amravati city

Group	Mean $\pm$ S.D	M.D	D.F	O.T	T.T
Rural area	59.87 $\pm$ 3.76	2.86	58	3.86	2.00
Urban area	57.00 $\pm$ 1.51	2.86			

SD: Standard deviation



**Graph 2:** Graphical representation of mean value of college students between rural and urban area of Amravati city

### 5. CONCLUSION

Within the limitations of the study and from the statistical analysis, the following conclusion was drawn.

There was found a significant difference in fat percentage and muscle mass of college students of rural and urban areas of Amravati city. From the result of this survey type of study, we come to this conclusion that students living in rural areas of Amravati city gain more fat and have less muscle mass as compared to students from rural areas. The reason behind all this might be inactiveness or comfortable life in urban areas as compared to students living in rural areas and all this is not good sign for the students of rural areas of Amravati city, so the students of

rural areas are recommended through this study to take initiatives to get rid of this problem by taking active part in running, walking, and other physical activities to burn this accumulated fat; otherwise, it may prove fatal to them.

## REFERENCES

1. Maclaren, D., *et al. Sports and Exercise Physiology*. New York: Bios Scientific Publishers; 2007.
2. Sharma, J.P. *Exercise Physiology*. New Delhi: Vivek Thani Khel Sahitya Kendra; 2010.
3. Lakshmi, V. *Physical Fitness*. New Delhi: Vivek Thani Khel Sahitya Kendra; 2009.
4. Gabbett, T., Kelly, J., and Pezet, T. Relationship between physical fitness and playing ability in rugby league players. *J Strength Cond Res*, 2007, 21, 1126-1133.
5. Clarke, H.H. The relationship of strength and anthropometrics measurement to physical performance involving the and legs. *Res Q*, 1957, 28(3), 223-232.

# Comparative Study of Aerobic and Anaerobic Fitness between Indigenous and Non-indigenous Game Players in Telangana State

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## ABSTRACT

Optimal performance requires a combination of technical and tactical abilities as well as a high degree of physical fitness. Aerobic and anaerobic fitness is the basic to indigenous and non-indigenous games. Hence, it was intended to determine the aerobic and anaerobic fitness of indigenous game like kho-kho and non-indigenous game like volleyball players. Several different games like kho-kho are played in the country with their origin in ancient times. Playing such games may aid in the promotion of physical prowess and multilateral motor development. Indigenous games of India have been largely unstudied and it would appear timely pertinent to pursue research in a systematic manner. For the purpose of this study, 80 male players (indigenous sport – kho-kho,  $n = 40$  and non-indigenous game – volleyball,  $n = 40$ ) were selected randomly from the different levels of competition in Telangana state at the age of 14–16 years. The data were analyzed and compared with the help of standard statistical procedure, in which mean, standard deviation, standard error of mean, and independent  $t$ -test were used. The level of significance was set at 0.05. The result of this study revealed that the significant difference exists in anaerobic fitness and aerobic fitness between two groups. The results also showed that the indigenous sport (kho-kho) players were better than non-indigenous game (volleyball) players.

**Keywords:** Aerobic and anaerobic fitness, Indigenous game (kho-kho), Non-indigenous game (volleyball).

## 1. INTRODUCTION

In the present day, the world games and sports are very much competitive. Every competitor must enhance his technical and tactical abilities along with conditional abilities and psychological abilities. Two individuals having the same technical, tactical, or psychic ability can differ in performances when there are differences in their conditional ability. Physical fitness is important to the human mind because every movement, everybody position, and tension in the muscle tendon and joint help to contribute to the formation of concepts and ideas. Physical fitness contributes to the efficient working of muscles and enables the mind to make quick and correct decision while maintaining control over the emotion. The most common was to refer to fitness currently is “Health-related fitness”

and “Motor performance fitness.” However, in case of competitive sports, aerobic and anaerobic capacity is the fundamental component of fitness. Aerobic capacity describes the functional capacity of the cardiorespiratory system, (the heart, lungs, and blood vessels). Aerobic capacity is defined as the maximum amount of oxygen the body can use during a specified period, usually during intense exercise. It is a function both of cardiorespiratory performance and of the maximum ability to remove and utilize oxygen from circulating blood. Anaerobic capacity is the ability to mobilize energy during activities of intense nature, i.e., executing intensive work with explosive action in short duration of time, such as bursting speed in football, basketball, kabaddi, kho-kho, hockey, smash of volleyball, and take off in jumps. However, the requirement of fitness varies from game to game.



This study intended to analyses the aerobic and anaerobic fitness among indigenous game (kho-kho) players and non-indigenous game (volleyball) players.

### 1.1. Objective of the Study

The objective of this study was to compare the aerobic and anaerobic fitness between indigenous and non-indigenous game players in Telangana state.

## 2. METHODOLOGY

### 2.1. Subjects

For the purpose of this study, 80 male players were selected, 40 from the indigenous sport kho-kho and 40 from the non-indigenous sport volleyball players.

### 2.2. Variables

A. Independent variables.

- Indigenous game (kho-kho) players and non-indigenous game (volleyball) players.

**Table 1:** The analysis of data on selected variables those were aerobic fitness and anaerobic fitness collected on 40 indigenous game (kho-kho) players and 40 non-indigenous game (volleyball) players

Group	Aerobic fitness	Anaerobic fitness
	Mean±S.D	Mean±S.D
Indigenous game (kho-kho) players	149.6±11.58	7.72±1.30
Non-indigenous game (volleyball) players	166.25±24.28	9.27±1.07

SD: Standard deviation

B. Dependent variable.

- Anaerobic Fitness: 50-yard dash (s).
- Aerobic Fitness: 600-yard run/walk (s).

## 3. RESULTS

It appears in Table 1 that mean and standard deviation of indigenous game (kho-kho) players is 149.6 and 11.58 and non-indigenous game (volleyball) players are 166.25 and 24.28 in relation to aerobic fitness. In the case of anaerobic fitness of the groups, the mean and standard deviation is 7.72 and 1.30 and 9.27 and 1.07, respectively. It is evident that indigenous game (kho-kho) players are superior to non-indigenous game (volleyball) players in relation to aerobic and anaerobic fitness.

The analysis of Table 2 shows that the mean difference of aerobic fitness of indigenous game (kho-kho) and non-indigenous game (volleyball) players is 16.65 and SE is 4.26. The calculated “*t*” value was found 3.90, which is the table value. Hence, it can safely be said that the mean difference of aerobic fitness between the indigenous game (kho-kho) and non-indigenous game (volleyball) players is statistically significant.

The analysis of Table 3 shows that the mean difference of anaerobic fitness of indigenous game (kho-kho) and non-indigenous game (volleyball) players is 1.55 and SE is 0.27. The calculated “*t*”-value was found 5.83, which is greater than the table value. Therefore, it may be stated that the mean difference of aerobic fitness between the indigenous game (kho-kho) and non-indigenous game (volleyball) players is statistically significant.

**Table 2:** Comparison of aerobic fitness between indigenous game kho-kho and non- indigenous game volleyball players

Variable	Origin of game	Number	Mean	S.E.M	S.E.	M.D	<i>t</i> -value
Aerobic Fitness	Indigenous game	40	149.6	1.83	4.26	16.65	3.90**
	Non-indigenous game	40	166.25	3.84			

$t_{0.05}(78)=1.99$  \*\* significant at 0.05 level

**Table 3:** Comparison of anaerobic fitness between indigenous game kho-kho and non- indigenous game volleyball players

Variable	Origin of game	Number	Mean	S.E.M	S.E	M.D	<i>t</i> -value
Anaerobic Fitness	Indigenous game	40	7.72	0.20	0.27	1.55	5.83**
	Non-indigenous game	40	9.27	0.17			

$t_{0.05}(78)=1.99$  \*\* significant at 0.05 level

#### 4. DISCUSSION

The result shows that the aerobic fitness of indigenous game (kho-kho) players was better than the non-indigenous game (volleyball) players. Never the less, indigenous game (kho-kho) players and non-indigenous game (volleyball) players are more or less similarly able in relation to anaerobic fitness. Indigenous sports like kho-kho have significant value for enhancing physical fitness capabilities; however, there is a paucity of research completed to date. This was probably one of the first scientific examinations of these sports seeking to profile athletes compared to non-indigenous sports in Telangana. Interestingly, we found that as a group, athletes from indigenous sports exhibited faster aerobic performance than athletes involved in more traditional Western sports. In both the cases, bursting speed, agility, basic endurance, strength, and strength endurance are highly required. As a result, the players of both the team's practiced to improve those qualities in good movement. The result of *t*-value showed the defiantly significant difference in anaerobic fitness and aerobic fitness components between indigenous game (kho-kho) players and non-indigenous game (volleyball) players, as tabulated value at 0.05 levels is 1.99 lower than the obtained value where indigenous game (kho-kho) players found superior than their counterparts.

#### 5. CONCLUSIONS

On the basis of the obtained results from the present analysis, it may be concluded that indigenous game (kho-kho) players and non-indigenous game (volleyball) players, in Telangana, significantly differ on the variables of anaerobic fitness (50-yard dash). In anaerobic fitness, indigenous game (kho-kho) players have better scores in comparison to non-indigenous game (volleyball) players. This result shows that aerobic fitness significantly differs between two groups and indigenous game (kho-kho) players are better than non-indigenous game (volleyball) players.

#### REFERENCES

1. Clarke, H.E. *Application of Measurement to Health and Physical Education*. Englewood Cliffs, NJ: Prentice-Hall; 1959.
2. Mathews, D.K. *Measurements in Physical Education*. Philadelphia, PA: W.B. Saunders; 1973.
3. Burris, B. Measurement of aerobic capacity in college women. *Completed Res Health Phys Educ Recreation*, 1973, 15, 158.
4. Wilgus, W.E. A comparison of efficiency between aerobic and anaerobic work. *Completed Res Health Phys Educ Recreation*, 1963, 5, 63.
5. Rai, V. A differentiation study on university players in relation to general motor ability. *Int J Res Pedagogy Technol Educ Movement Sci*, 2013, 1(3), 23-29.

# Effect of Iyengar Iyengar Yogic Practice on Selected Physiological Variable among College Men Students

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## ABSTRACT

The purpose of the present study was to investigate the effect of Iyengar Iyengar yogic practice on selected physiological variables among college men students. To achieve the purpose of the study, 30 college men students were selected from The American College, Madurai, during the year 2020. The subject's age ranges from 18 to 24 years. The selected players were divided into two equal groups consists of 15 men students, each namely experimental group and control group. The experimental group underwent a Iyengar yogic practice program for 6 weeks. The control group was not taking part in any training during the course of the study. Cardiorespiratory endurance was taken as criterion variable in this study. The selected subjects were tested that on cardiorespiratory endurance was measured through Cooper 12 min run and walk test was conducted on a 400 m standard track. Pre-test was taken before the training period and post-test was measured immediately after the 6 week training period. Statistical technique "t" ratio was used to analyze the means of the pre-test and post-test data of the experimental group and control group. The results revealed that there was a significant difference found on the criterion variable. The difference is found due to Iyengar yogic practice given to the experimental group on cardiorespiratory endurance when compared to the control group.

**Keywords:** Cardiorespiratory endurance and "t" ratio, Iyengar yogic practice.

## 1. INTRODUCTION

Physical activity can improve health, decrease the loss of muscle mass, increase functional strength, and greatly improve the likelihood of achieving successful weight maintenance. Exercises are good for one's health has been the topic of scientific debate for years. Serious scientific research designed to examine the role of exercise on mortality and morbidity was started in the 1950s and data now show that regular amounts of Iyengar yogic practices reduce the risk of heart diseases and extend life expectancy Baumgartner and Jackson (1991).

Yogasanas are the physical practices which tone up the internal organs of the body. The body that is visible from outside is only a skeleton covered by muscle cells which give it a shape. Until and unless our internal organs are healthy, we cannot be healthy. We see that the heart works for all the 24 h and does not take rest even for

a single moment. The heart can get rest only when the nerves carrying the blood to and from the heart are clean. Even a small obstruction in them can cause a major disorder. Our lungs should also function properly and take maximum air full of oxygen for purifying the blood. Similarly of juices for the proper digestion of food. The formation of juices, blood, muscles, fats, bones, and semen should take place according to the need of the body. Our nervous system should get strength so that all body movements can be performed in a proper way. The impurities should not get accumulated in the body and we should be able to enhance our muscle power.

## 2. METHODOLOGY

The purpose of the study was to find out the effect of Iyengar Iyengar yogic practice on selected physiological variables among college men students. To achieve this purpose of the study, 30 college men

**Table 1:** Analysis of *t*-ratio for the pre- and post-tests of the experimental and control group on cardiorespiratory endurance scores in meters

Variables	Group	Mean		SD		Sd. error		df	“ <i>t</i> ” ratio
		Pre	Post	Pre	Post	Pre	Post		
Cardiorespiratory endurance	Control	1787.33	1790.33	62.61	60.84	16.16	15.71	14	0.33
	Experimental	1776.00	1883.33	54.22	72.77	14.00	18.66		

\*Significance at 0.05 level of confidence. SD: Standard deviation

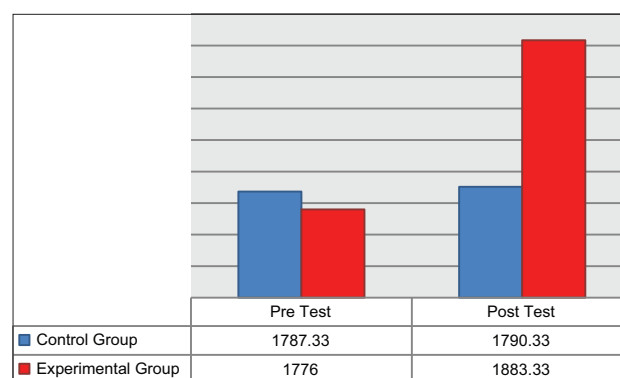
students were selected as subjects at random. The age of the subjects was ranged from 18 to 24 years. The selected subjects were divided into two equal groups of 15 subjects each such as a Iyengar yogic practice group (experimental group) and control group. The experimental group underwent Iyengar yogic practice for 3 days/week for 6 weeks. Control group, which they did not undergo any special training program apart from their regular physical activities as per their curriculum. The following physical variable, namely, cardiorespiratory endurance, was selected as criterion variable. All the subjects of two groups were tested on selected that criterion variable cardiorespiratory endurance was measured through Cooper 12 min run and walk test at prior and immediately after the training program. The “*t*”-test was used to analyze the significant differences, if any, in between the groups, respectively. The 0.05 level of confidence was fixed to test the level of significance which was considered as an appropriate.

## 2.1. Analysis of the Data

The significance of the difference among the means of the experimental group was found out by pre-test. The data were analyzed and dependent “*t*”-test was used with 0.05 levels as confidence.

Table 1 reveals that the mean values of pre-test and post-test of the control group on cardiorespiratory endurance were 1787.33 and 1790.33, respectively. The obtained “*t*” ratio was 0.33 since the obtained “*t*” ratio was less than the required table value of 2.14 for the significant at 0.05 level with 14° of freedom, it was found to be statistically insignificant. The mean values of pre-test and post-test of the experimental group on cardiorespiratory endurance were 1776.00 and 1883.33, respectively. The obtained “*t*” ratio was 8.73\* since the obtained “*t*” ratio was greater than the required table value of 2.14 for significance at 0.05 level with 14° of freedom, it was found to be statistically significant. The result of the study

showed that there was a significant difference between the control group and experimental group in cardiorespiratory endurance. It may be concluded from the result of the study that the experimental group improved in cardiorespiratory endurance due to 6 weeks of Iyengar yogic practice.



**Figure 1:** Bar diagram showing the pre- and post-tests mean values of the experimental and control group on cardiorespiratory endurance. Scores in meters

## 3. DISCUSSION ON FINDINGS

The result of the study indicates that the experimental group, namely, Iyengar yogic practice group, had significantly improved the selected dependent variable, namely, cardiorespiratory endurance when compared to the control group. It is also found that the improvement caused by Iyengar yogic practice when compared to the control group.

## 4. CONCLUSIONS

1. There was a significant difference between experimental and control groups on cardiorespiratory endurance after the training period.
2. There was a significant improvement in cardiorespiratory endurance. However, the improvement was in favor of the experimental group due to 6 weeks of Iyengar yogic practice.

## REFERENCES

1. Baumgartner, T.A., and Jackson, A.S. *Measurement for Evaluation in Physical Education and Exercise Science*. Dubuque: Wm. C. Brown Publisher; 1991. p. 14-17.
2. Doijad, V.P., Kamble, P., and Surdi, A.D. Effect of yogic exercises on aerobic capacity (cardio respiratory endurance). *Int J Physiol*, 2013, 1(2), 47-50.
3. Madame, G. The participation of women in physical activity and sports associations. *FIEP Bull*, 1995, 65, 1-12.
4. Paffenberger, R.S Jr., and Lee, M.I. Physical activity and fitness for health and longevity. *Res Q Exerc Sport*, 1984, 67, 9-11.



# Comparative Study of Physical Fitness among Basketball and Netball Players of Mahabubnagar District

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## ABSTRACT

The study was conducted the players of physical fitness between basketball and netball male players. To carry out this study, 30 subjects, 15 from basketball and 15 from netball, were taken. The age limit of players was ranged between 14 and 16 years. The samples were taken from Mahabubnagar District only. In this study, speed, explosive power of arms, and agility were to measure the physical fitness components. Significance of difference between the means, “t”-test was applied. The level of significance was 0.05.

**Keywords:** Agility, Coordination, Explosive power, Physical fitness, Speed.

## 1. INTRODUCTION

It is the capacity of an individual to do work effectively with joy and pleasure. After the work is over, he still has sufficient capacity to do more work without any exertion. Moreover, his recovery is faster and quicker. Physical fitness is generally achieved through exercise and special training. In addition to the high level of skill required to play basketball and netball, to be successful you need, among other things, good speed, agility, and endurance. Below is a discussion about the fitness requirements for basketball, which can help with developing training program for these sports.

### 1.1. Purpose of the Study

The main purpose of this study was to compare physical fitness among selected basketball and netball players.

- 1) To find out the physical fitness components of basketball players.
- 2) To find out the difference between motor fitness components of basketball and netball players.

## 2. METHODOLOGY

To carry out this study, 30 male players (15 basketball and 15 Netball) were taken. The age limit of players was between 14 and 16 years. The samples were taken from

Mahabubnagar District only. Speed, explosive power of arms, and agility were used to measure the physical fitness components. The mean was computed for the comparison of players of Mahabubnagar District. To assess the significance of the difference between the means in case of significant, “t”-test was applied. The level of significance was 0.05.

### 2.1. Selection of Variables

The following tests were selected for the study.

Explosive power: Medicine ball test.

Agility: Squat thrust (Burpee).

Speed: 50 m dash.

Variables	Group	n	Mean±SD	“t” ratio
Speed ability	Basketball	15	7.47±0.64	5.1575
	Netball	15	8.79±0.70	
Explosive power of arms	Basketball	15	5.813±0.4779	9.0182
	Netball	15	4.393±0.3788	
Agility	Basketball	15	12.20±1.42	8.1335
	Netball	15	7.73±1.58	

\*Significant at 0.05 level of confidence, SD: Standard deviation

## 3. RESULTS

The data collected by adopting the above procedure were statistically analyzed. The results are presented

in the following table. For testing the significance in AAHPER Youth Fitness Test, medicine ball test, and squat thrusts (Burpee) test, the level of significance chosen was 0.5; the comparison between the basketball and netball players for the selected physical fitness variables statistically analyzed using test.

#### 4. DISCUSSION

The above table shows that the mean value of speed ability test of basketball players is 7.47 and netball players is 8.79, so netball players have lintel more speed compare to basketball players. This score is applied on the standard norms of AAHPER Youth Fitness Test.

The above table shows that the mean value of explosive power of arms basketball players is 5.813 and netball players is 4.393, so basketball players have a more explosive power of arms compare to netball players.

The above table shows that the mean value of squat thrusts (Burpee) of basketball players is 12.20 and

netball players is 7.73, so basketball players have good agility (power) compare to netball players.

#### 5. CONCLUSION

The data analysis of selected physical fitness shows that basketball players have a good explosive power, strength, and agility compare to netball players who have a good endurance compare to basketball players.

#### REFERENCES

- 1) Methew, D.K. *Measurement in Physical Education*. Philadelphia, PA: W.B. Saunders Company; 1978.
- 2) Deepla, K., and Rajinder, R.T. A study on the physical fitness among athletes and football players of schools in Hyderabad. *Asian J Phys Educ Comput Sci Sports*, 5, 105.
- 3) Singh, H. *Science of Sports Training*. New Delhi: D.V.S Publication; 1991. p. 85.
- 4) Hunsicker, P., and Reiff, G.G. *AAPHER Youth Fitness Test Manual*. American Alliance for Health, Physical Education, and Recreation; 1976.

# An Analytical Study of Injuries among Athletes of Hyderabad District in Telangana State

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## ABSTRACT

The practice of athletics can lead to an increased risk of injury. Engaging in sports activities has numerous health benefits but also carries the risk of injury. Sports trauma commonly affects joints of the extremities, i.e., knee, ankle, hip, shoulder, elbow, wrist, etc. The objective of the study is to investigate the frequency of injuries among athletes of Hyderabad District. The sample for the study consists of 100 male athletes who include 25 throwers, 25 sprinters, 25 middle- and long-distance runners, and 25 jumpers those who participated in the Hyderabad District Athletics Championships for the year 2019–2020 between the age group of 16 and 20 years. The data are collected through questionnaire. The results of the study show that throwers secured 50% injuries in lower extremities, 30% injuries in vertebral column, and 20% injuries in upper extremities; sprinters secured 80% injuries in lower extremities, 15% injuries in vertebral column, and 5% injuries in upper extremities. Middle- and long-distance runners secured 87% injuries in lower extremities, 10% injuries in vertebral column, and 3% injuries in upper extremities. Jumpers secured 80% injuries in lower extremities, 13% injuries in vertebral column, and 7% injuries in upper extremities. It is concluded that athletes must have good conditioning and prevention to avoid the injuries. This type of study is useful to coaches to give proper coaching for the development of motor qualities for the prevention of injuries among athletes.

**Keywords:** Injuries, Lower extremities, Upper extremities, Vertebral column.

## 1. INTRODUCTION

Engaging in sports activities has numerous health benefits but also carries the risk of injury. At every age, sports persons sustain a wide variety of soft tissue, bone, ligament, tendon, and nerve injuries caused by direct trauma or repetitive stress. Different sports are associated with different patterns and types of injuries, whereas age, gender, and type of activity influence the prevalence of injuries. Sports trauma commonly affects joints of the extremities, i.e., knee, ankle, hip, shoulder, elbow, wrist, and spine. The sports injuries that occur in competition or practice have loss of time for participation in sports.

According to the Translating Research into Injury Prevention Practice model (Finch, 2006), the first step in injury research is to understand the extent of the problem. The prevalence and prevalence proportion of sports injuries have been widely investigated across sports. Unfortunately, such studies have only included groups selected by either one or more criteria, such as specific sports (Jacobsson *et al.*, 2012), level (Hall *et al.*, 2013), age (Scase *et al.*, 2012), or injury type (Maselli *et al.*, 2015).

## 2. POPULATION AND SAMPLE GROUP

The sample for the study consists of 100 male athletes who include 25 throwers, 25 sprinters, 25 middle- and

long-distance runners, and 25 jumpers those who participated in the Hyderabad District Athletics Championships for the year 2019–2020 between the age group of 16 and 20 years.

### 3. RESEARCH INSTRUMENTS

All the players were given a questionnaire regarding the sports injuries occur while playing athletics during the practice and competition. All the sportspersons are doing regular practice for minimum of the past 3 years.

The questionnaire consists of the following injuries: Lower extremities, upper extremities, head, neck, and spine.

### 4. RESULTS

The results of the study show that throwers secured 50% injuries in lower extremities, 30% injuries in vertebral column, and 20% injuries in upper extremities; sprinters secured 80% injuries in lower extremities, 15% injuries in vertebral column, and 5% injuries in upper extremities. Middle- and long-distance runners secured 87% injuries in lower extremities, 10% injuries in vertebral column, and 3% injuries in upper extremities. Jumpers secured 80% injuries in lower extremities, 13% injuries in vertebral column, and 7% injuries in upper extremities. It is concluded that athletes must have good conditioning and prevention to avoid the injuries. This type of study is useful to coaches to give proper coaching for the development of motor qualities for the prevention of injuries among athletes.

**Table 1: Percentage of injuries among throwers**

Lower extremity injuries	Upper extremities	Head	Neck	Vertebral column
50	20	Nil	Nil	30

**Table 2: Percentage of injuries among sprinters**

Lower extremity injuries	Upper extremities	Head	Neck	Vertebral column
80	5	Nil	Nil	15

**Table 3: Percentage of injuries among middle- and long-distance runners**

Lower extremity injuries	Upper extremities	Head	Neck	Vertebral column
87	3	Nil	Nil	10

**Table 4: Percentage of injuries among jumpers**

Lower extremity injuries	Upper extremities	Head	Neck	Vertebral column
80	13	Nil	Nil	7

The majority of sports injuries are soft tissue in nature because many of injuries arise in football, which is due to improper body mechanics and improper sports techniques.

### 5. DISCUSSION

It is concluded in throwers that lower extremity injuries are 50%, upper extremities 20%, and vertebral column 30%. It is concluded in sprinters that lower extremity injuries are 80%, upper extremities 5%, and vertebral column 15%. It is concluded in middle- and long-distance running that lower extremity injuries are 87%, upper extremities 3%, and vertebral column 10%. It is concluded in jumps that lower extremity injuries are 80%, upper extremities 13%, and vertebral column 7%.

### 6. RESEARCH RECOMMENDATIONS

Sufficient warm-up, proper technique, correct biomechanics, proper conditioning, optimizing balance, coordination, optimizing reaction times, optimal diet, adequate rest, and positive attitude will reduce the risk of injuries. Increase your flexibility by performing dynamic warm-up before practice and competition followed by static stretching post-activity.

#### 6.1. Recommendations' for Further Research

Consult a coach or physical trainer to incorporate the conditioning programs during the practice. Have a pre-season physical examination and follow your doctor's recommendations.

### REFERENCES

1. Finch, C. A new framework for research leading to sports injury prevention. *J Sci Med Sport*, 2006, 9(1-2), 3-9.
2. Jacobsson, J., Timpka, T., Kowalski, J., Nilsson, S., Ekberg, J., and Renstrom, P. Prevalence of musculoskeletal injuries in Swedish elite track and field athletes. *Am J Sports Med*, 2012, 40(1), 163-169.
3. Maselli, F., Ciuro, A., Mastro Simone, R., Cannone, M., Nicoli, P., and Signori, A. Low back pain among Italian rowers: A cross-sectional survey. *J Back Musculoskeletal Rehabil*, 2015, 28(2), 365-376.

4. Nielsen, R.O., Ronnow, L., Rasmussen, S., and Lind, M. A prospective study on time to recovery in 254 injured novice runners. *PLoS One*, 2014, 9(6), e99877.
5. Rosenbaum, A.J., Uhl, R.L., Rankin, E.A., and Mulligan, M.T. Social and cultural barriers: Understanding musculoskeletal health literacy: AOA critical issues. *J Bone Joint Surg Am*, 2016, 98(7), 607-615.



# A Study on Locus of Control and Aggressive Behavior of Pencak Silat Women Players

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## ABSTRACT

The study was carried out to assess the influence of locus of control on aggressive behavior of pencak silat women players to meet the objectives of the present study the data were collected at All India Inter-University Pencak Women Championship 2019–2020 held in January 21–January 23 at Gulbarga University, Gulbarga, by administering personal-biodata schedule, aggressive and locus of control were administered, the responses were scored and terminated as per the manual, after collecting data “t”-test was employed to assess the significant impact of locus of control on aggressive behavior on aggressive behavior of pencak silat women players, the calculated “t” value was significant at table value at 0.05 level. The result has found that internal locus of control leads to control emotion and understand the situation in real sense with practical aspect, whereas external locus of control women players would lose their temper and behavior assertively without understanding the consequence; hence, formulated hypotheses were tested and proved positively and drawn the conclusion that aggressive behavior of women players depends on the beliefs system and mind state of the women players.

**Keywords:** Aggressive behavior, Locus of control, Pencak silat women players.

## 1. INTRODUCTION

The development of achievements in sports can be achieved through a planned, organized, and measurable exercise involving various scientific and technological disciplines. Every sport requires physical exercise to achieve maximum performance as it is the foundation of every sport. Some factors can spur the development of achievements in sports, such as quality improvement in training and sports coaching. Attempts to improve achievement in sport should be carried out by exercises conducted through a scientific approach with related sciences. With the support of various related disciplines, the training theory will be well developed so that the sports achievements can be improved well. Pencak silat achievement cannot be speculatively achieved. Achievement must go through intensive training with a proper exercise program. The exercise should certainly be specialized in developing the components required in pencak silat sport.

The participation in modern sports is influenced by various physical, physiological, sociological, and

psychological factors. During training, besides good physique and fitness of the athlete, main emphasis is laid on the development of various types of skills involved in the game as well as on teaching the strategies, techniques, and tactics of the game. Until recently, the coaches have been paying inadequate attention to the social and psychological factors which although have been proved to contribute to performance in events in the higher competitive sports. It is only recently that sports administrators and coaches have realized the importance of the psychological preparation and training of players to enable them to bear the strain and stresses inherent in sports participation. Hence, now the sports trainer and coaches have started giving more importance to the psychological conditioning or the building the mental make-up of the players before their contests in the national and international competitions. Many research studies in the psychology of sports men and women studied that separately not much interest has been focused on the socioeconomic status, which plays a major role in determining the personality factors of the women players, which could play an important

role in their performance. In the face of more and more men and women belonging to different strata of society are entering the sports arena every year and sharing the laurels with their counterparts, it was felt necessary to “find out influence of locus of control on aggressive behavior among pencak silat women players.”

### 1.1. Aggressive Behavior

The reliance aggression in sports has been traditionally cantered round the usefulness of sports in providing an outfit for aggression and controlling violence in society. Adjustment attempts to satisfy needs by overcoming both inner and outer abstracts and by adopting circumstances. The learning about adjustment means analyzing two things interval make-up and internal personal or social behavior. Adjustment is a dynamic process by which organizes mart their needs. Physical education and related activities satisfy many of these needs. The aggressive constructs are a complex one that there are individual differences in the invite, potential to aggress and that the aggression can also be learned or stimulated by specific situations. When aggressive energies are expressed within the rules of a sport and channeled into skill by a mature athlete, then one may witness a peaceful and inspiring performance. Aggression for aggression sake should not be sanctioned. It is self-defeating and -debilitating to others. The outstanding athlete's entries competition with control and not with impose. The aggressive athlete will be more active, eager, strong, highly motivated, and likely to seek to vanquish any opponent. Athlete is who is highly motivated by emotional aggression should not be confused with the athlete who has primary motivation but who aggression because she is placed in an athletic situation that demands it. Pencak silat football, hockey, and boxing would be expected to attract more aggressively motivated individuals than Curbing, Golf, and Badminton: Latter sports require their own form of aggression. Even nonphysical sports have been described as fiercely aggressive.

### 1.2. Locus of Control

Locus of control is considered to be an important aspect of personality. Locus of control (Rotter, 1966) refers to an individual's perception about the underlying main causes of events in his/her life. His conception of locus of control distinguishes two types of individuals and internals, who perceive the likelihood of an event occurring as a product of their own behavior, and externals, who view events as contingent on luck,

chance, or other people. Levenson (1973) believed that an internal orientation will increase one's motivation to continue in an activity, while external orientation decreases one's willingness to persist in an activity she feels she has very little ability to influence. Optimism has been associated with an internal locus of control and pessimism with an external locus of control (Dember *et al.*, 1989). Athletes who develop an external locus of control tend to immediately point the finger at all the reasons why they came up short in a game – the coach did not play me the right way, the officials were terrible, etc. On the other hand, athletes with more of an internal locus of control first look inward when they face adversity, and begin by asking themselves what they could have done different or better so that they would not have failed. Developing an internal locus of control can dramatically help with sports success, as resiliency and mental toughness are dramatically enhanced as a result of rational thinking. Internal and external control beliefs seem to affect individual's perceptions of outcomes. Research related to locus of control and goal setting has yielded a positive relationship between difficulty of the goal and performance for those with an internal orientation (e.g., Locke and Latham, 1990).

### 1.3. The Purpose of the Study

The purpose of the present study is to examine the locus of control and aggressive behavior that reflects whether individuals attribute their success and failure to their own behaviors (internal locus of control) or other women players or luck (external locus of control). This study attempted to locus of control and aggressive behavior among All India Inter-University Pencak Women Championship 2019–2020 held in January 21–January 23 at Gulbarga University, Gulbarga, Karnataka.

## 2. REVIEW OF RELATED LITERATURE

Bandura as well as others had observed the aggressive behavior of children. Rather than have them participate in the complex teacher-learner situation, researchers permit children to play with toy, some of which give an idea of there.

Locus of control is a term introduced by psychologist Julian Rotter that represents the social learning theory's concept of internal versus external control of reinforcement (Kormanik and Rocco, 2009). Locus of control refers to a predisposition in the perception of what causes reinforcement (Kormanik and Rocco, 2009). Essentially, it is the degree to which individuals

feel that they have control over reinforcements or outcomes of behaviors (Rotter, 1990). One would have an internal locus of control if he or she feels as though consequences of his or her actions are contingent on personal behaviors or characteristics (Rotter, 1990). On the other hand, an individual with an external locus of control would expect that the outcome or reinforcement is a function of luck, fate, or chance and that this consequence is generally unpredictable (Rotter, 1990). Locus of control, stress, and performance 129 A multitude of research has been conducted regarding Rotter's aspect of locus of control. Kormanik and Rocco (2009) referenced a study that looked at the relationship between locus of control and life stress, as measured by depression and anxiety. It was found that the less internal locus of control an individual perceives, the greater the likelihood for stress and depression (Kormanik and Rocco, 2009). In addition, Bemardi (2001) explained that when an individual perceives that he or she has control over a situation, he or she will be less likely to perceive the situation as stress-inducing. Furthermore, internal locus of control individuals tends to experience lower anxiety than others; therefore, externality may act as a stress buffer (Bemardi, 2001).

### 2.1. Problem of the Study

A study on influence of locus of control on aggressive behavior of Pencak silat women players.

### 2.2. Hypothesis

1. There is a significant influence of locus of control on aggressive behavior among the Pencak silat women players.
2. The external locus of control leads to produce more aggressive behavior comparing to the internal locus of control.

### 2.3. Objectives

The objectives of the study were to assess the influence of locus of control on aggressive behavior of Pencak silat women players.

## 3. METHODOLOGY

Selection of the subjects in this study, 200 women players those are participated in All India Inter-University Tournament selection of variables. The variables selected for this study were as follows:

1. Aggression behavior.

2. Locus of control tool used to measure the aggression behavior and locus of control.

The following tests were selected and scores were considered as criterion measure for the study was A. Kumar (aggression) and Dr. Romapal (locus of control) and test was administered to the study.

## 4. RESULTS

The result has shown the fact and information about the consequence of locus of control, internal locus of control person has control their emotion and ability to manage situation in real sense, and external locus of control person would lose their temper without understanding real causes for their behavior.

### 4.1. Collection of Data

To meet the objectives of the present study, the data were collected at All India Inter-University Pencak Women Championship 2019–2020 held in January 21–January 23 at Gulbarga University, Gulbarga, by administering personal-biodata schedule, aggressive and locus of control were administered, the responses were scored and terminated as per the manual. Statistical technique to analysis the study *t*-test was used.

## 5. DISCUSSION AND INTERPRETATION OF DATA

The data were applied to “*t*”-test to assess the significant difference and influence of locus of control on aggressive behavior of pencak silat women players.

Table 1 presents the mean, standard deviation, and “*t*” value of aggression and locus of control of pencak silat women players. The pencak silat women players mean scores of locus of control are 40.01 and on aggressive behavior is 11.73. This suggests that the pencak silat women players are having internal locus of control and the moderate level of aggression. The obtained value is

**Table 1:** Showing the mean, SD, and “*t*” values of locus of control and aggression of pencak silat women players

Variables	Aggression	Locus of control
Mean	11.73	40.01
SD	2.72	6.01
<i>t</i> -value	48.13**	

SD: Standard deviation

48.13, which is significant at 0.01 level. The significant value suggests that there is a significant influence of locus of control on the aggressive behavior of women players. In other words, the internal locus of control of the pencak silat women players has a significant influence on moderate aggressive behavior.

This is because the pencak silat women players with the internal locus of control would be rational and optimistic and would gain control over their emotions and aggression. Therefore, the sportsmen with an internal locus of control would definitely control the aggression and help to adopt a moderate level of aggressive behavior and boost his achievement or performance.

## 6. CONCLUSION

The result has found that internal locus of control leads to control emotion and understand the situation in the real sense with practical aspect, whereas an external locus of control sportsperson would lose their temper and behavior assertively without understanding the consequence; hence, formulated hypothesizes were tested.

## REFERENCES

- 1) Chrisger, G., and Sullian, P. Uses a direct observation approach to study aggressive behaviour in hockey: Some preliminary findings. *Athl Insight*, 2008, 8(1), 1-14.
- 2) Donahue, E.G., Rip, B., and Valerian, R.J. When winning are everything: On passion, indentify, and aggression in sport. *Psychol Sport Exerc*, 2009, 10(5), 526-534.
- 3) Kerr, J.H. *Motivation and Emotion in Sport Reversal Theory*. United Kingdom: Psychology Press Ltd. Publishers.
- 4) Singh, J., and Jayadhas, S. Comparison of physical fitness selected physiological variables of sea coast and high altitude living schools society for the nation institutes of physical education and society for the nation institutes of physical education and sports. *Journal*, 1983, 6(1).
- 5) Muhajir, Pendidikan Jasmani dan Olahrag, dan Kesehatan Kelas X. *Physical Education and Sports Health for Junior High School Grade X*. Jakarta: Penerbit Erlangga; 2011.
- 6) Nugroho, A. *Diktat Pedoman Latihan Pencak Silat Guideline for Pencak Silat Training*. Yogyakarta: Fakultas Ilmu Keolahragaan, Universitas Negeri Yogyakarta; 2001.
- 7) Nugroho, A. *Pencak Silat: Komparasi, Implementasi, dan Manajemen (Pencak Silat: Comparison, Implementation, and Management*. Yogyakarta: FIK-UNY; 2008.
- 8) Nugroho, A. *Tes Keterampilan Pencak Silat Untuk Mahasiswa Pencak Silat Skills Tests for Students*. Yogyakarta: FPOK IKIP Yogyakarta, Lemlit IKIP Yogyakarta; 2004.
- 9) Pakaya, F. *Panduan Pembelajaran Pencak Silat Untuk Sekolah Dasar Guideline for Learning on Pencak Silat for Elementary School*. Jakarta, PT: Pustaka Indonesia Press; 2012.
- 10) Pangemanan, D., and Mayulu, N. Analisis faktor resiko penyebab terjadinya diabetes melitus tipe 2 pada wanita usia produktif dipuskesmas Wawonasa. *J e-Biomed (eBM)*, 2014, 2, 404-412.



# The Effect of Plyometric Exercises on Shot Put Performance

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## ABSTRACT

The present study elevates the effect of plyometric training (PT) exercises on shot put performance of schoolboys. In this study, researcher has been taken sixty subjects as high schoolboys from a selected high school, Chimmapudi, Khammam district. Telangana region, at random and their ages, lie in between 14 and 17 years. The subjects were divided into two identical groups which consist of thirty in each group, experimental group (plyometric exercise training [PT] and control group (CG). The dependent variables, namely, shot put performance and abdominal strength, were selected and measured by shot put through test and jackknife test for this swot. The data were analyzed by SPSS 20.0 with descriptive measures and a sampling test for paired mean difference *t*-test at 0.05 level of significance. The data inferred that there was a significant improvement on the two variables, shot put performance and abdominal strength by the relevance of plyometric exercises. This kind of analysis is a useful effect of plyometric exercises on shot put performance at high school levels.

**Keywords:** Abdominal strength, Jackknife test, Plyometric exercise, Shot put performance.

## 1. BACKGROUND

Present days, plyometric exercises can play a significant role in physical education and sports. Plyometric, also known as “jump training” or “plyos,” is exercises in which muscles exert maximum force in short intervals of time, with the goal of increasing power (i.e., speed-strength). This training focuses on learning to move from a muscle extension to a contraction in a rapid or “explosive” manner, such as in specialized repeated jumping. Plyometric is primarily used by athletes, especially martial artists, sprinters, and high jumpers, to improve performance, and are used in the fitness field to a much lesser degree. Plyometric includes explosive powerful training exercises that are trained to activate the quick response and elastic properties of the major muscles in the body. It was initially made famous by Soviet Olympians in the 1970s, providing the core element in the strength programs of elite sporting athletes worldwide. Sports using plyometric include basketball, tennis, badminton, squash, and volleyball, as well as the various codes of football (Wilt and Yessis, 1984).

### 1.1. Motor Fitness

The components of motor fitness refer to the several key components required to facilitate quality overall fitness.

In most traditional circles, there are considered to be five general components of fitness: Cardiorespiratory Endurance, muscular strength, muscular endurance, flexibility, and body composition, although healthy body composition is most often a by-product of the other components and is, therefore, not recognized in some circles as an actual “component” of fitness. Following the five general components of fitness are the components of “motor” fitness, which most affect athletic performance. These include muscular power, speed, balance, coordination, accuracy, and agility. Reaction time is also considered by some to be a component of motor fitness; however, some also contend that it is a type of speed, i.e., “reaction speed.” Improvements in endurance, stamina, strength, and flexibility come about through conditioning/training. Training refers to the activity that improves performance through a measurable organic change in the body. Concurrently, improvements in coordination, agility, balance, and accuracy are developed through practice. Practice refers to the activity that improves performance through changes in the nervous system. Power and speed are adaptations of both training and practice (Brookes, 2004). Jackknife test for nine repetitions measures abdominal strength. Abdominal strength plays an important role in performing various bending and stretching movements in players on



apparatus and floor about 50% of the movements belonging to bending and stretching structure movement. High-performance group has been found to have a significantly higher amount of abdominal strength (Singh, 1979).

## 2. METHODOLOGY

In this study, 60 ( $n = 60$ ) male shot put performance schoolboys who represented for their schools from ZPSS High School, Chimmappudi, Khammam dist., Telangana, were considered as subjects at random by random sampling approach and their ages from 14 to 17 years. The subjects were divided into two equal groups of 30 each. The experimental group was given 12 weeks (duration – 12 weeks, session – 3 days/week, and duration of one session – 1 h) of plyometric exercise training and the control group (CG) was not given any specific training. Experimental Group-I plyometric exercise training plyometric training (PT) was given to the experimental group. The subjects were tested on selected variables, namely, shot put performance and abdominal strength by shot put and Jackknife test, respectively, for this study. Before and after the training period, the data were collected. The collected data were analyzed using some descriptive measures mean, standard deviation (SD), maximum and minimum, and paired  $t$ -test. The level of significance fixed at 0.05 Level. The entire statistical was done using SPSS 20.0 ver. Software tool.

### 2.1. Objectives of the Study

The study has been planned with the following objectives:

1. To study the effect of plyometric exercises on shot put performance on high schoolboys.
2. To study the effect of plyometric exercises on abdominal strength on high schoolboys.

### 2.2. Hypotheses

It has been set up the hypotheses that the plyometric training will improve physical fitness and skills among the high schoolboys of ZPSS, Chimmappudi, Khammam district.

1. There is no significant effect of physical fitness and skills such as shot put performance among the high schoolboys in CG.
2. There is no significant effect of physical fitness and skills such as abdominal strength among the high schoolboys in the experimental group.

### 2.3. Selection of Variables

The research scholar reviewed the available scientific literature pertaining to the problem from books, journals, magazines, websites, and research papers which revealed the importance of plyometric exercise training. Taking into consideration of feasibility criteria and availability of the instruments, the following variables were selected for this study.

### 2.4. Dependent Variables

#### 2.4.1. Motor fitness components

1. Shot put performance.
2. Abdominal Strength.

### 2.5. Independent Variables

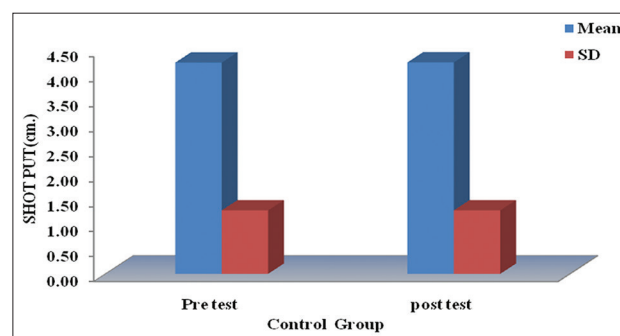
Plyometric exercise training.

## 3. DATA ANALYSIS AND FINDINGS OF THE STUDY

**Table 1:** Descriptive analysis of shot put (cm) performance in pre- and post-test of on high schoolboys in the control group

Control group	Shot put (cm)	
	Pre-test	Post-test
Mean	4.23	4.23
SD	1.27	1.27
Minimum	2.61	2.61
Maximum	7.4	7.4
Mean difference	0.00	

SD: Standard deviation



**Graph 1:** Shot put (cm) performance in pre- and post-test of on high schoolboys in the control group

## 4. RESULTS AND DISCUSSION

Table 1 and Graph 1 show the mean, SD, and mean difference of shot put between pre- and post-test of high

schoolboys in CG by throw (seconds) test. The mean and SDs are  $4.23 \pm 1.27$  and  $4.23 \pm 1.27$ , respectively. In the group, the shot put minimum and maximum values were found to be 2.61, 2.61, and 7.4, 7.4, respectively. It is obvious that the mean difference of shot put between pre- and post-test of on high schoolboys is 0.00 in CG.

Table 2 and Graph 2 show the mean, SD, and mean difference of abdomen strength between pre- and post-test of school subjects in CG by jackknife test (nine repetitions) test. The mean and SDs are  $9.13 \pm 4.07$  and  $9.47 \pm 4.27$ , respectively. In the group, the speed minimum and maximum values were found to be 3, 3 and 18, 19, respectively. It is obvious that the mean difference of abdomen strength between pre- and post-test of on high schoolboys is 0.33 in CG.

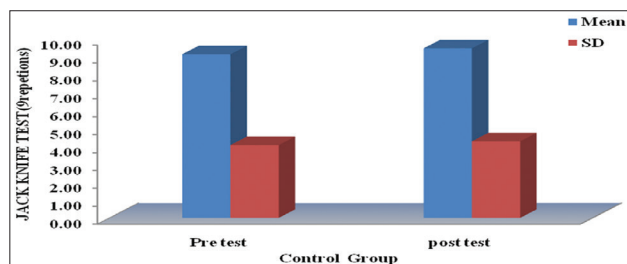
#### 4.1. Discussion

Table 3 and Graph 3 show the mean, SD, and mean difference of jackknife test 9 repetitions) between pre- and post-test of school subjects in the circuit training group by jackknife test nine repetitions) test. The mean and SDs are  $11.33 \pm 4.24$  and  $16.43 \pm 4.33$ , respectively. In the group, the jackknife test nine repetitions) minimum and maximum values were found to be 5, 8 and 19, 23, respectively. It is obvious that the mean difference of jackknife test (nine repetitions)

**Table 2:** Descriptive analysis of abdomen strength in pre- and post-test of on high schoolboys the in plyometric training group

Control group	Jackknife test (nine repetitions)	
	Pre-test	Post-test
Mean	9.13	9.47
SD	4.07	4.27
Minimum	3	3
Maximum	18	19
Mean difference	0.33	

SD: Standard deviation



**Graph 2:** Abdomen strength in pre- and post-test of on high schoolboys in the plyometric training group

between pre- and post-test of on high schoolboys is 5.10 in the circuit training group.

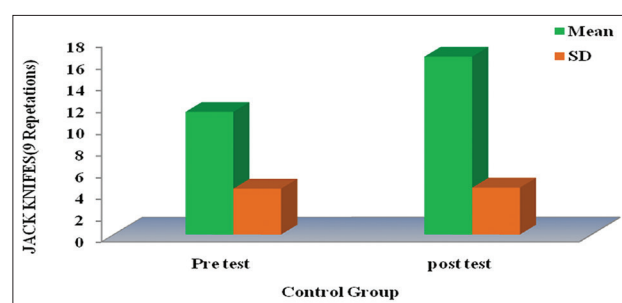
Table 4 and Graph 4 indicate that there was a significant improvement in the shot put performance through the plyometric exercise training. It reveals that the obtained *t*-statistic observed value 10.239 is significant since  $P = 0.001$  lesser than the 0.05, there was a significant improvement between pre- and post-test on the selected motor fitness components. Hence, there was a significant improvement in the speed between the pre- and post-test of the experimental group, whereas CG showed no significant improvement. Hence, the results indicate that the significant improvement in the shot put performance was due to the plyometric exercise (PT) training alone.

Table 5 and Graph 5 indicate that there was a significant improvement in strength through plyometric exercise training. It reveals that the obtained *t*-test statistic value 8.17 is significant because the  $P < 0.05$ , there was a significant improvement between pre- and post-test on strength. Hence, there was a significant improvement in the strength between the pre- and post-test of the experimental group, whereas CG showed no significant improvement. Hence, the results indicate that the significant improvement in the strength was due to the plyometric exercise (PT) training alone.

**Table 3:** Descriptive analysis of strength in pre- and post-test of on high schoolboys in the circuit training group

Plyometric group	Jackknife test (nine repetitions)	
	Pre-test	Post-test
Mean	11.33	16.43
SD	4.24	4.33
Minimum	5	8
Maximum	19	23
Mean difference	5.10	

SD: Standard deviation

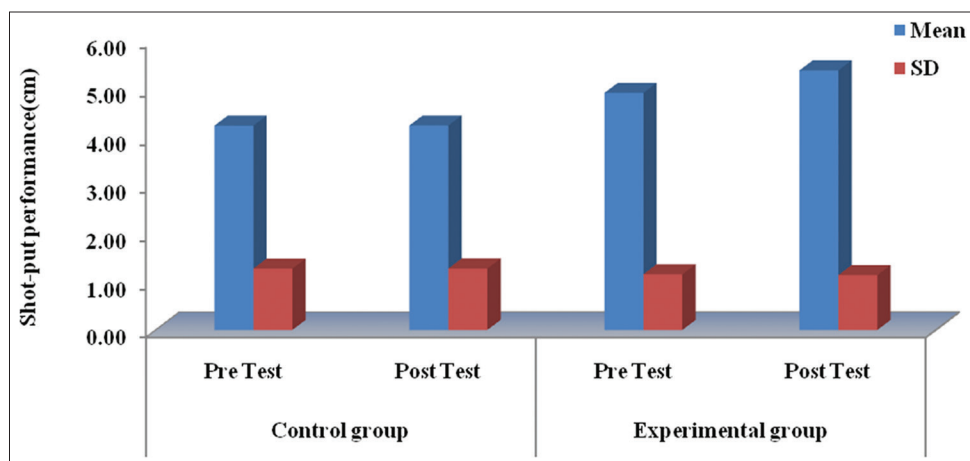


**Graph 3:** Abdomen strength in pre- and post-test of on high schoolboys in the circuit training group

**Table 4:** Hypothesis test on paired mean difference in pre- and post-test on shot put in the experimental and control groups

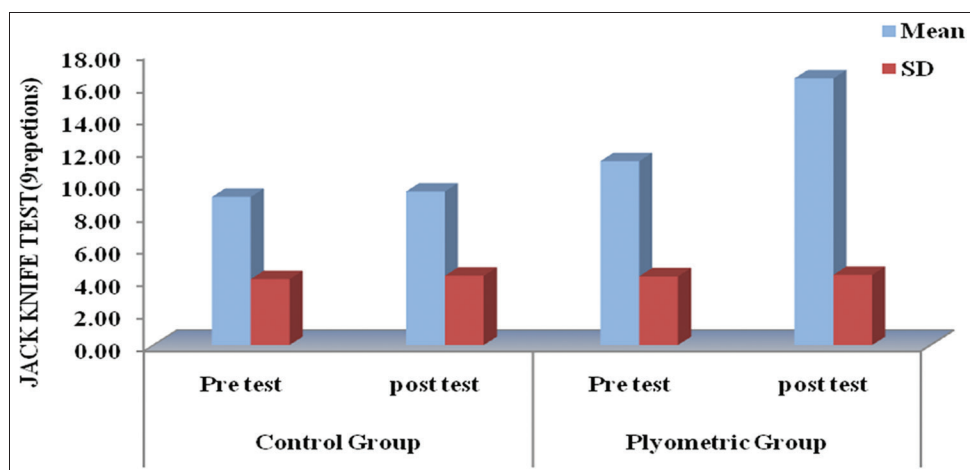
Group	Test	Mean±SD	Df	Mean Diff	t-test value	P value
Experimental	Pre-test	4.91±1.15	29	0.47	10.239	0.001*
	Post-test	5.37±1.17				
Control	Pre-test	4.23±1.26	29	0.01	2.021	0.067
	Post-test	4.24±1.27				

\*Significance at 0.05 levels. df: Degree of freedom, SD: Standard deviation

**Graph 4:** The mean difference of pre- and post-test shot put performance of in the control group and experimental group**Table 5:** Hypothesis test on paired mean difference in pre- and post-test on abdomen strength experimental and control groups

Group	Test	Mean±SD	Mean diff.	df	t-value	P value
Experimental	Pre-test	9.13±4.07	0.34	29	25.54*	0.000
	Post-test	9.47±4.27				
Control	Pre-test	11.33±4.24	5.10	29	1.00	0.34
	Post-test	16.43±4.33				

\*Significance at 0.05 level. df: Degree of freedom, SD: Standard deviation

**Graph 5:** The mean difference of pre- and post-test abdomen strength in the control group and experimental group

## 5. FINDINGS

1. The result of the study reveals that the 12 weeks of plyometric exercise training on the selected dependent variables. There was a significant improvement in shot put performance through plyometric exercise training (PT). Since  $P < 0.05$ , there was a significant improvement between pre- and post-test on shot put performance.
2. The result of the study reveals that the 12 weeks of plyometric exercise training on the selected dependent variable. There was a significant improvement in abdomen strength through plyometric exercise training (PT). Since the  $P < 0.05$ , there was a significant improvement between pre- and post-test on strength.

## 6. CONCLUSIONS

From the result of the study, the conclusions have been drawn as follows:

There was a significant difference in abdominal strength and shot put throw performance on schoolboys. Furthermore, all the figures show the difference in mean of abdominal strength and shot put. It was concluded that there was a significant improvement in the selected dependent variables, namely, shot put performance and strength by plyometric exercise training.

## REFERENCES

1. Stemm, J.D., and Jacobson, B.H. Comparison of land- and aquatic-based plyometric training on vertical jump performance. *J Strength Cond Res*, 2007, 21(2), 568-571.
2. Vescovi, J.D., Canavan, P.K., and Hasson, S. Effects of a plyometric program on vertical landing force and jumping performance in college women. *Phys Ther Sport*, 2008, 9(4), 185-192.
3. Singh, R.S., Bains, J., and Gill, J.S. *Essential of Physical Education*. Ludhiana: Kalyani Publishers; 2008.
4. Wilt, F., and Yessis, M. *Soviet Theory, Technique and Training for Running and Hurdling*. Vol. 1. Championship Books; 1984.
5. Brookes, D.S. *The Complete Book of Personal Training*. Champaign, IL: Human Kinetics; 2004. p. 249.
6. Faigenbaum, A.D., McFarland, J.E., Keiper, F.B., and Tevlin, W. Effects of a short-term plyometric and resistance training program on fitness performance in boys age 12 to 15 years. 2011.
7. Polhemus, and Burkhardt. The effects of the plyometric training drills on the physical strength gains of college football players. *Natl Strength Coach Assoc J*, 1990, 2(5), 13-15.
8. Berryman, N., Maurel, D., and Bosquet, L. Effect of plyometric vs. dynamic weight training on the energy cost of running. *J Strength Cond Res*, 2010, 24(7), 1818-1825.
9. Sankey, S.P., Jones, P.A., and Bampouras, T.M. Effects of two plyometric training programmes of different intensity on vertical jump performance in high school athletes. *Serb J Sports Sci*, 2008, 2(1-4), 123-130.
10. Spurrs, R.W., Murphy, A.J., and Watsford, M.L. The effect of plyometric training on distance running performance. *Eur J Appl Physiol*, 2003, 89(1), 1-7.
11. Alam, S., Pahlavani, H.A., and Mehdipour, M. The Effect Of Plyometric Circuit Exercises On The Physical Preparation Indices Of Elite Handball Player. *Phys Educ Sport*, 2012, 10, 89-98.
12. Singh, C. Assessment of physical abilities and competition performance of female gymnasts. *Int J Phys Educ Sports Sci Phys Educ Health Fitness Sports*, 1979, 13.

# Dyspnea in Athletes

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## 1. INTRODUCTION

Dyspnea during exercise is a common complaint in seemingly otherwise healthy athletes, which may be associated with fatigue and underperformance. Because dyspnea is a general term and may be caused by numerous factors, ranging from poor aerobic fitness to serious, potentially fatal respiratory and non-respiratory pathologies.

Dyspnea is defined as “undue awareness of one's own respiratory pattern.” In normal people, dyspnea is one of the common symptoms of diseases involving cardiovascular, respiratory, and general nutritional causes.

As such it is important for physical education trainers to be familiar with the many factors that can cause dyspnea during exercise in seemingly otherwise healthy individuals and have a general understanding of the problem to deal with the emergency situation while during training seasons.

### 1.1. Aims of this Study

The aims of this study were as follows:

- To identify the common causes of dyspnea encountered in athletes
- To highlight the systemic causes and non-causes effects the athletes.

## 2. MATERIALS AND METHODS

In this present study, we include 100 persons with a background history of athletes who are attending the outpatient counter of medicine, respiratory medicine departments with complaints of dyspnea on exertion.

In this group, we include schoolchildren and college students from various geographical areas such as urban and rural areas. Among these people, we enquire about them with a brief history of their complaints add detailed examination, after that we do investigations for conclusion.

## 3. RESULTS

Among the physiological causes mainly due to is unconditioning/deconditioning of athlete to the level of activity. Mainly due to lack of fitness, lack of regular exercises to maintain the physical fitness strength to keep with physical activity level. Otherwise, healthy athletes with poor fitness may report dyspnea due to being unaccustomed to the ventilator demands of unfamiliar exercises, have a preconceived notion of their fitness level based on previous experience, or may have to exert more effort to keep up with their more fit counterparts in a team environment.

Among the pathological causes, respiratory and nutritional causes are predominately effect the performance of an individual. About 14% of people had exercises induced bronchial asthma, 6% had vocal cord dysfunction, 11% had a childhood, and present respiratory infection 5% is with chronic bronchitis.

Among the nutritional causes anemia, mainly iron deficiency anemia 15% and hypoproteinemia 9% are noticed. Other rare causes are cardiovascular causes such as hypertrophic cardiomyopathy and supraventricular tachycardia chest wall deformities and pollution.

Other surprising causes were smoking mainly in college students 3% effects which suggest lifestyle changes and lack of vigilance and health education about the smoking effects on health.

## 4. DISCUSSION

### 4.1. Physiological Causes – Pathophysiology

Approximately half of the healthy elite endurance athletes may experience exercise-induced arterial hypoxemia due to non-pathological anatomical or physiological shunting of blood within the cardiopulmonary system.



**Table 1: Incidence of various causes grossly involving the study group**

Causes	Persons involved
Physiological	70
Pathological	30

**Table 2: Incidence of various pathological causes lead to dyspnea in athletes**

Pathological causes	Persons involved
Respiratory causes	
Exercise-induced bronchial asthma	14
Vocal cord dysfunction	6
Respiratory infections	11
Chronic bronchitis	5
Nutritional causes	
Anemia	15
Hypoproteinemia	9
Cardiovascular causes	
Hypertrophic obstructive cardiomyopathy	2
Supraventricular tachycardia	3
Other causes	
Air pollution	2
Chest wall and musculoskeletal dysfunction	5
Smoking	3

Highly trained endurance athletes may have such extensive cardiovascular neuromuscular and metabolic adaptations to maintain the physiological demands during the exercise. This physiological limitation is overcome by proper training before engaging the events which require high physiological demands.

#### 4.2. Pathological Causes – Pathophysiology

Among the respiratory causes, exercise-induced asthma causes decreased entry of environmental air reaching the lungs and increasing the work for breathing due to airways constriction. This condition was treated with bronchodilators and inhalers.

Vocal cord closure due to anxiety in person or athletes leads to the early closure of vocal cord, causing limitations of respiration. This phenomenon was treated with counseling and treatment with anxiolytics.

The respiratory infection causes improper ventilation which can be treated with antibiotics.

#### 4.3. Nutritional Causes – Pathophysiology

Iron deficiency anemia and hypoproteinemia are cause decreased hemoglobin production by depletes hemo (due to iron deficiency), globin (due to hypoproteinemia) leads to decreased oxygen-carrying capacity of hemoglobin of RBC lead to dyspnea during exercise.

#### 4.4. Cardiovascular Causes – Pathophysiology

Hypertrophic cardiomyopathy is the common cause of death in athletes on fields due to decreased cardiac output due to obstruction.

Supraventricular tachycardia is also one of the causes of death which is due to hypoxia-induced rhythm abnormality of the heart.

#### 4.5. Others

Smoking and air pollution lead to chronic bronchitis which effects the airways and causes increased work of breathing as in exercise-induced asthma which is treatable by avoiding risk factors such as smoking and pollution and use of bronchodilators.

### 5. CONCLUSION

Dyspnea, fatigue, and underperformance are often interrelated symptoms in athletes and may have various causes, ranging from benign to potentially deadly, while airway conditions, namely, asthma and chronic bronchitis are often at the top of the differential diagnosis list, numerous other conditions such as anemia, and cardiovascular conditions must also be considered. To avoid frustration and catastrophic mistakes, it is essential for physical directors to obtain a thorough athletes history about the health status, including detailed exercise specific questions and them develop and conduct an appropriate plan to improve the condition of the athletes.

Following the implementation of a proper management plan for the identified diagnosis, consult clinicians should regularly follow-up with athletes to ensure that the intervention is working as comorbidities and non-adherence to treatment recommendations can negatively influence outcomes.

### REFERENCES

Dyspnea. Available from: <http://www.wikipedia.org>.

# Comparative Study of Body Composition and Physical Fitness of Government Residential and Non-residential Students of Peddapalli District in Telangana

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## ABSTRACT

The purpose of the study is to compare the body composition and physical fitness of residential and non-residential secondary schoolboys. A total of 100 secondary schoolboys were selected as the subjects of this study. Among them, 50 boys are belonging to residential school and remaining 50 boys are non-residential school from Peddapalli District in Telangana state. Body composition (body mass index [BMI]) and physical fitness components such as arm and shoulder strength, abdominal strength, agility, explosive leg strength, speed, and cardiovascular fitness were taken into consideration for the study. The analysis of obtained data was made by “*t*” ratio at 0.05 level of significance. Residential secondary schoolboys body composition (BMI) efficiency was seen well as compared non-residential schoolboys. On the basis of results, it was concluded that there were significant differences in shuttle run, standing broad jump, 50-yard race, and 600-yard run. There were no significant differences in pull-ups and BMI between residential and non-residential schoolboys.

**Keywords:** Body composition, Physical fitness, Residential and non-residential.

## 1. INTRODUCTION

Physical fitness is very necessary for a healthy and tension-free life. Physical fitness includes diet, exercise, and sleep. These three basic things have their own importance in each individual's life and everyone should be sensible with regard to these for a healthy life. As J.F. Keennedy rightly said, “Physical fitness is not only one of the most important keys to a healthy body, it is the basis of dynamic and creative intellectual activity.” This statement clearly shows us the importance of physical fitness. In its most general meaning, physical fitness is a general state of good health. Optioning and maintaining physical fitness is a result of physical activity, proper diet and nutrition, and, of course, proper rest for physics recovery. Exercise reduces the risk of heart disease, diabetes, colon cancer, and high blood pressure. People how are active outlive those how are inactive. Body composition often considered a component of fitness. It refers to markup of the body in terms of lean mass (muscle, bone, vital tissue, and organs) and fat mass. An optimal ratio of fat to lean mass is an indication of fitness and the right types of exercise will help decrease body fat and increase or maintain muscle

mass. The propose of this study was to compare body composition and physical fitness of residential and non-residential secondary schoolboys of Peddapalli District in Telangana state.

### 1.1. Objective of the Study

1. The main objective of the study is to study the body composition and physical fitness among the residential and non-residential government schoolboys of Peddapalli District in Telangana.

## 2. METHODOLOGY

For the purpose of this study, 50 boy students studying in residential secondary school and 50 boys studying in non-residential secondary school were selected randomly as a subject from Peddapalli District. The age group was between 14 and 17 years. The study was delimited to the male students only. Body mass index (BMI) of subjects was assessed by weight (kg), 8 (m) formula and measured by measure and weight machine. Muscular strength was measured by pull-ups in numbers, strength and endurance were measured by 1 min bent knee sit-ups

in numbers of sit-ups correctly done, speed and agility were measured by shuttle run test in seconds, explosive leg strength was measured by standing broad jump in feet and inches, speed by 50 yards run in seconds, and cardiovascular efficiency by 600 yards run in minutes and seconds. The raw scores obtained from the test given by the subjects were converted in to A.A.H.P.E.R.D. Youth Fitness Test scoring table and this score was taken into consideration for the statistical procedure. To find out the comparison of body composition and physical fitness states of residential and non-residential secondary schoolboys of Peddapalli District. For analysis of data, *t*-test was applied.

### 3. RESULTS

Table 1 states that the mean difference is 4.72. Received "*t*" ratio is 2.221, which is more than significant level. Thus, there was a significant difference between residential and non-residential students.

Table 2 reveals that the mean difference is 14.51. Received "*t*" ratio is 4.321, which is more than significant level. Thus, there was a significant difference between residential and non-residential students in strength endurance.

Table 3 indicates that the mean difference is 8.12. Received "*t*" ratio is 2.952, which is more than significant level. Thus, there was a significant difference between residential and non-residential school students in agility.

Table 4 gives the details of mean difference that is 9.30. Received "*t*" ratio is 2.321, which is more than significant level. Thus, there was a significant difference between residential and non-residential secondary schoolboys in explosive leg strength.

Table 5 states that the mean difference is 11.11. Received "*t*" ratio is 2.577, which is more than significant level. Thus, there was a significant difference between residential and non-residential secondary school students in speed.

Table 6 indicates that the mean difference is 8.69. Received "*t*" ratio is 2.931, which is more than significant level. There was a significant difference between residential and non-residential secondary students in cardiovascular efficiency.

Table 7 shows that the mean difference is 0.63. Received "*t*" ratio is 1.927, which is more than significant level.

**Table 1: The differences of the mean of residential and non-residential**

No.	Group	Mean	Mean difference	<i>t</i>
1	Residential schoolboys	34.48	4.72	2.221
2	Non-residential schoolboys	3878		

Significant at 0.5(98)=1.98

**Table 2: The difference of the mean of residential and non-residential secondary boys in the sit-ups**

No.	Group	Mean	Mean difference	<i>t</i>
1	Residential schoolboys	29.30	14.51	4.321
2	Non-residential schoolboys	1492		

**Table 3: The difference of the mean of residential and non-residential secondary boys in the shuttle run**

No.	Group	Mean	Mean difference	<i>t</i>
1	Residential schoolboys	30.92	8.12	2.952
2	Non-residential schoolboys	24.10		

Significant at 0.5 (98)=1.98

**Table 4: The difference of the mean of the residential and non-residential secondary schoolboys in the standing broad jump**

No.	Group	Mean	Mean difference	<i>t</i>
1	Residential schoolboys	31.82	9.30	2.321
2	Non-residential schoolboys	41.12		

Significant at 0.5 (98)=1.98

**Table 5: The difference of the mean of residential and non-residential secondary schoolboys in the 50-yard race**

No.	Group	Mean	Mean difference	<i>t</i>
1	Residential schoolboys	32.12	11.11	2.577
2	Non-residential schoolboys	21.11		

Significant at 0.5 (98)=1.98

**Table 6: The difference of the mean of residential and non-residential secondary schoolboys in the 600-yard run**

No.	Group	Mean	Mean difference	<i>t</i>
1	Residential schoolboys	25.98	8.69	2.931
2	Non-residential schoolboys	17.69		

Significant at 0.5 (98)=1.98

**Table 7:** The difference of the mean of residential and non-residential secondary schoolboys in the BMI

No.	Group	Mean	Mean difference	t
1	Residential schoolboys	17.42	0.63	1.927
2	Non-residential schoolboys	16.79		

Significant at 0.5 (98)=1.98. BMI: Body mass index

Hence, it is revealed that there was no significant difference between residential and non-residential secondary schoolboys.

#### 4. CONCLUSION

The result of the study shows that there is a significant difference between residential and non-residential secondary schoolboys with reference to strength of arm,

shoulder muscle, abdominal strength, explosive strength of leg muscle, agility, and speed. Whereas, there is no significant difference found between both residential and non-residential secondary schoolboys regarding BMI.

#### REFERENCES

1. Jerome, C. *Fitness and Health, the Definitive Guide to Staying Fit and Healthy*. New York: A Division of Simon and Schuster, Inc.; 2006.
2. Harriso, C.H. *Physical Fitness New Letter*; 1959.
3. Johns, T., and Jonson, E.T.A. *Andover Physical Fitness Testing Program*; 1944.
4. Devender, K.K. *Test and Measurement*. New Delhi: DVS Publications; 1944.
5. Sharma, S.S., and Shukla, B.R.K. *Kinanthropometry Soccer Players with Respect to their Field Position*. Patiyala: Inter Antirational Congress of Sports Science; 1982.

# The Role of Computer Science and Technology for Progression in Sports Science and Analysis

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## ABSTRACT

Computer science in sport is an interdisciplinary area that seeks to incorporate both theoretical and practical elements and approaches in the fields of computer science and sports science. The interdisciplinary plays a major part in the development, use, and progress of sport theorization and practice in the area of computer-based but also mathematical technologies in sports science. The reasons why IT is a key collaborator in sports science are primary linked to the growing need of support for appropriate methods and principles that can be created and accessible in the field of computer science in the use of data and media, the development of models, the study of structures, and so on.

**Keywords:** Computer media, Sport analysis, Sports science, Sports models, Technology.

## 1. INTRODUCTION

The modern computer has changed the planet's face. Nowadays, more computers are fitted with a microchip than humans. The word "computer," which means to calculate, comes from the word compute. Computers from calculators were built because more complicated and mathematical calculations were required. A computer is a tool for numerical and mathematical operations that were programmed by humans.

A computer is technically a programmable computer. This enables a programmed list of instructions to be executed and new instructions to be followed. A computer is a tool for electronic processing of information or records. It is capable of saving, retrieving, and processing data. The physical education machine is an interdisciplinary discipline which combines both theoretical and practical aspects.

A computer-aided teaching allows students to choose an alternative to the classroom and frees them from the computer-managed writing process. Students can observe and listen to movement mechanics slowly and learn efficiently using the computer. The recent

technological advances in sport preparation, regulatory changes, collecting rules from online agencies, conducting work, etc., can be changed using the internet. The current application of computers in primary and secondary physical training is minimal in comparison with other fields. Computers have potential applications. Computers are helpful in the creation of vast activities and projects, including budgeting, monitoring, estimates, and scheduling of services for physical education. The use of computers not only increases the reporting standard but also reduces sporting organizations' time and operational costs.

## 2. METHODS

The system used for classification inquiry.

### 2.1. Application of Computers in Investigate

- Searching the literature
- Research selection
- Data analysis
- Analysis of results
- General help.



## 2.2. Computer Application in Motor Learning and Monitoring

- Reaction and time of movement
- Time-to-goal scores
- Motion distance and location
- Neurophysiological neuromuscular variable
- Application for software.

## 2.3. Exercise Physiology Technology Research in Exercise

- Software helps track lactic acid levels in muscle tissue minute by minute transition
- The analog to the optical converter is used by the computer to assess blood pressure, heart rate, and pulse rate
- Several measurements from participants can be reported at the same time
- The proportion of body fat based on skin fold is also measured.

## 2.4. Determining the Maximum Oxygen Consumption Computers in the Measuring Variables

- The best indicator of cardiovascular fitness is maximum oxygen in intake
- This process is used to read gas analyzers, to estimate and read the volume meters for flow rates for the percentage of the gases involved
- The auxiliary device can waste time, time, and space while using the computer keyboard alone easily performs the same task, including the measurement of the barometric pressure.

## 2.5. Requirement for Fitness

- The exercise specialist may use the commercially available software to administer the fitness program, which will help easily perform the task
- The outcome of a physical exercise test of the subjects could be inserted in the system and compared to the program on implementation of the software program on the device
- The relevant exercise is then fixed by the result of the individual.

## 2.6. Composition of the Body

- The software for body composition is designed for use by programmers for health enhancement provided by clinics

- Enables demographic information to be entered and also provides for the selection of methods for body composition.

## 2.7. Biomechanical Applications Application

- Teaching aids
- Film analyzing
- Strength measurement
- Strength plate
- Using is kinetic dynamiter computers.

## 2.8. Use of Sports Psychology Computers

- Self-assessment
- Self-talks
- The task of concentration
- Organic feedback and relaxation

## 3. CONCLUSION

Ultimately, it is worth mentioning, as well as in television (TV) and TV-sports that computers are part and parcel of the entire physical activity and sports system. Computers are used in science, motor planning, physiologies, exercise therapy, biology, biomechanics, and sports psychology to facilitate instruction and coaching and also boost sports performance. Computers are used for the area of physical education, engineering, and sports coaches. The use of computers in sport results perfectly and saves time as well. The outcomes in sports events are unwarranted because they are measured properly and objectively. Therefore, computers which contribute to sports and physical education are needed to learn and get to know.

## REFERENCES

1. Winn, W. Emerging developments in the field of research in curriculum technology: Learning climate studies. *Study Philos Educ*, 2002, 14(3), 331-350.
2. Wood, S.L., and Lynn, S. Elementary physical education teaching. *Turk Online J Educ Technol*, 2000, 9(5), 42-42.
3. Jorgen, P. Informatics in sports: A historical overview, current areas and future applications (part II). *Int J Comput Sci Secur*, 2006, 2, 36-46.
4. Baca, A. Informatics in sport: A history, current areas and future technologies summary (Part I). *Int J Comput Sci Secur*, 2006, 2, 25-35.
5. Lames, M., and Link, S. Sport informatics past, future and interdisciplinary origins. *Int J Comput Sci Secur*, 2009, 8(2), 1-15.
6. Baca, A. Sports computer review. In: Haake, S., and Moritz,

- E.F. (eds). *Physical Science*. New York: Springer; 2006.
7. Gold, RS. *Health Education Microcomputer Applications*. Dubuque, IA: William C Brown Publishing; 1991.
8. McLean, D.D., and Hill, J.M. Case study in computer-based support, support for internship preparation. *Sch*
- Leis Recreation Stud J*, 1993, 5, 35-49.
9. Muhammad, S.B. *Use of Physical Education Equipment*. Champaign, IL: Kinetics of Human; 2008.
10. Blanc, R. *How Computers Function*. Emeryville, CA: Ziff-Davis Press; 1993.

# The Role of Sports Psychology on Athletic Players and Meritorious Sportspersons

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## ABSTRACT

Psychology of the sportsperson is very important for achieving the heights in sports. It includes various components of physical, mental, spiritual, and good emotional health of the sportsperson. Psychology includes various components such as personality, attitudes, anxiety, aggression, and stress also play an important role in sports. This paper identifies all those factors and their importance for the sportsperson to become a successful sportsperson in their life. The importance of sports psychology has been realized for decades; however, many coaches and updates pay too little attention to how it can help them perform better. Send it still focus on the physical aspect of but sport performance is determined by a combination of psychological factor technical skill ethnical inside and state of mind all four factors are critical to peak performance one could argue however that the last of those is the executive function as it is the mind which determines whether or not what you have train in an over the past 5 years is brought out on the day at that moment when it matters most it is this aspect of sports performance which has traditionally been failed the least attention in preparation for company hence in a world where many thee are physically technically and tactical increasingly similar it is the mind which offers perhaps the greatest scope for a company to advantage the role of mind has become even more bore important with the rapidly increasing commercialization of port which has presented new athletes across many levels and ages to include we can say that sports psychology play with vital role in enhancing the performance of the players.

**Keywords:** Anxiety, Personality, Psychology, Sports, Stress.

## 1. INTRODUCTION

Sports cycle is the understanding of how the mind explains its performance in their shoe sport within the principles of sports psychology for various concepts search has how do athletes prepare to learn what is their personality how can they attend states of relaxation and concentration how does in at learn to visualize success fuel performance do they understand and overcome their limiting people and how does an athletics develop high level of self-awareness. The importance of sports psychologist as an integral member of the caching and health-care learns is widely recognized. In the past, it was assuming that those skills virgin genetically based or acquired early in life now are commonly accepted that athletes and coaches are cup learning board range of psychological skills that can play a critical role in learning and in performance.

## 2. PURPOSE OF THE STUDY

Sports like psychologist skills to help applied enhance their learning process and motor skills cope with competitive pressures fine-tune the level of awareness needed for optimal performance and stay focused amid the many destructions of team travel find in the company to environment psychological training should be an integral part of an athlete's holistic training process carried out in conjunction with other training elements this is best accomplished by a collaborative effort among the coach the sports psychologist and the athletes however and knowledgeable and interested coaching an learn basic psychological skills and import them to do the athletes especially during actually practice there is a powerful force guiding athletes to the super the athletes especially during actual practice there is a powerful force guiding athletes to those super performance it is subconscious mind athletes must follow their subconscious mind to

become the driving force when the perform in the athlete is able to control the sub conscious they become better at tapping their mental power to form more constantly at a high level only when tapping into your mind power will your body be able to you operate on pure distinct and more constantly under stress the result is more opportunities to achieve performances elite athletes are constantly looking to improve the performance to acquire and age on their competitors no matter how physically prepared and athletes is it there mental preparedness that makes the difference when completing against each other conditioning the mind is justice important as conditioning the body think of your mental attitude as the ultimate weapon that gives you an edge.

### **3. RESEARCH METHODOLOGY**

Psychology performance are performance in sports is no longer dependent on psychological well-being of the athletes it is well established by now that there are numerous psychological factors which effectively improve the physical performance the point where psychological response potential reaches the dead in the psychological process sleep to make the click by providing the boost are energy to achieve the goal with psychological sea wood impossible that is why psychological training and conditioning are now a days airport and parcel of total sports training programs atlas is unique to oneself apart from psychological depression such a such as height weight it is they are born to the psychological differences as well some athletes maybe outgoing and extrovert where us others baby introvert and withdrawn and then also different their levels of perception summit larder burn strong psychological while others a week dispositions eclipse with weak dispositions fail to accomplish their task individual difference in sports performance are in invertible phenomenon and the teacher our coach has to modifiers approach according to the nature of each individual athlete.

## **4. RESULTS**

### **4.1. Personality**

The human personality is marvelously interact structure delicately woven up motivation emotions habits and thoughts into a pattern that balance the poolside pushes of the outside world it is the totality property of his being that include is physical mental emotional and temperamental makeup is experience perception memory imagination instincts habits thoughts and sentiment constitute his personality.

### **4.2. Intelligence**

The agency is the aggregate mental capacity energy of an individual to act purposefully to think rationally and to deal effectively with once environment intelligence involves that awareness is goal directed and has value.

### **4.3. Stress**

Stresses defined as a physical mental or emotional demand which friends to disturb the homeostatic of the body it is an everyday part of life if there were no stresses we would probably boredom stresses invertible in life and sports and all performing actors artist and athletes perform their talks with bearing dress levels.

### **4.4. Motivation**

Motivation is a force a drive which promotes compels and energizers and individual to actor behave in a particular manner at a particular time for attending the specific goal or purpose.

### **4.5. Aggression**

Agastya is a part of human behavior and is necessary for an individual to live and struggle for higher achievements for supremacy domains and excellence in sports obviously involves aggression.

### **4.6. Arousal and Activation**

The term arousal reflects the veering degrees of readiness to perform physically intellectually are perceptually activation is a short term change of energy mobilization and implies rising of energy above an individual erosion base land for a brief period.

### **4.7. Attention and Concentration**

Concentration of consciousness on an object it is the process of getting an object r thought clearly before the mind it help in in bringing mental alertness and preparedness and a result one becomes alert and alive and tries to exercise 1 mental and physical power as effectively as possible.

## **5. CONCLUSION**

The importance of sports psychology has been realized for decades; however, many coaches and updates pay to little attention to how it can help them

perform better. Send it still focus on the physical aspect of sporting performance but sport performance is determined by a combination of psychological factor technical skill technical inside and state of mind all four factors are critical to peak performance one could argue however that the last of those is the executive function as it is the mind which determines whether or not what you have train in a over the past 5 years is brought out on the day at that moment when it matters most it is this aspect of sports performance which has traditionally been failed the least attention in preparation for competition hence in a world where many athletes are physically technically and actical increasingly similar it is the mind which offers perhaps the greatest scope for a company to advantage the role of mind has become even more bore important with the rapidly increasing commercialization of sport which has presented new athletes across many levels and ages to include we can say that sports psychology

play with vital role in enhancing the performance of the players.

## REFERENCES

1. Caron, A.V. Group dynamics in sport and physical activity: Social Psychological and Performance consequences. *Int J Sport Psychol*, 1990, 21, 286-304.
2. Colman, A.M. *Oxford Dictionary of Psychology*. New York, USA: Oxford University Press Inc.; 2006.
3. Fisher, A.C. *Tests of Attentional Style for Volleyball, Diving, Soccer, Baseball, and Field Hockey*. Ithaca, New York: Ithaca College.
4. Ikulayo, P.B. *Understanding Sports Psychology*. Marina Lagos, Nigeria: Eaiten Press; 1990.
5. Levitt, E.E. *The Psychology of Anxiety*. Hillsdale, NJ: Earlbaum; 1980.
6. Wuest, D.A., and Bucher, C.A. *Foundation of Physical Education, Exercise Science and Sport*. Maryland Heights, Missouri: Mosby; 2006.



# Relationship of Psychological Variables and Playing Ability among Volleyball Players – As a Function of Gender

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## ABSTRACT

The purpose of the study was to find out the psychological relationship of playing ability among volleyball players as a function of gender. To achieve the purpose of this study, the investigator selected 100 volleyball players consisting of 50 men and women. The subjects were randomly selected from players who competed at intercollegiate level competitions held at Chennai. The selected subject's age group was ranging from 19 to 25 years. Selected psychological variable team cohesion was measured through group environment questionnaire; mental toughness was measured through Sports Mental Toughness Questionnaire, and subjects playing ability in volleyball was assessed subjectively through five experts in volleyball in a playing situation. To examine the relationship between playing ability in volleyball and psychological variables, mental toughness and team cohesion simple correlation using the Pearson coefficient of correlation was used. The results proved that though men and women volleyball players psychological levels in team cohesion and mental toughness were positively related with their playing ability, comparing between men and women volleyball players, it was found that men volleyball players were found to be more accurately related with the selected psychological variables than the volleyball players.

## 1. INTRODUCTION

According to Whitaker (1986), in every tactical move in volleyball, one depends on teamwork and individual skills such as good attacking and defending. Tactics will succeed only through mastery on individual fundamental skills and with players thinking as a team.

Morehouse and Miller (1967) are of the opinion that skill is the element of performance which enables the performer to accomplish a large amount of work with a relatively small amount of effort. Skill is acquired mainly through a refinement of the coordination of different muscle groups. When one has mastered the fundamental skills of the game, the player gains a feeling of well-being. Thus, a high level of performance in volleyball is dependent on the mastery over the fundamental skills. Osweiler *et al.* (1990) quotes that practice can be defined as any activity which a player undertakes to try to modify or consolidate skilled actions. The sample repetition of an action is not enough and all types of practices should stress quality. Quantity alone is not sufficient and indeed the practice of wrong movements may only serve to confirm bad habits and so will be detrimental. Normally, it is accepted that shorter, more frequent practice sessions are most beneficial. However, if the criterion of quality is applied, then it can be seen that the length and

distribution of practice sessions will be determined by how much a player can absorb and how long he or she can sustain the standard of the practice.

A volleyball player must have speed, agility, reaction ability, dexterity, as well as the power and skills. Skill is the ability to use the correct muscle at the correct time with the exact force necessary to perform the desired movements in the proper sequence and timings. In Volleyball, there are many skills such as fingering, underarm, spiking, and diving.

Mental toughness is a contested term, in that many people use the term liberally to refer to any set of positive attributes that helps a person to cope with difficult situations.

Cohesion has been defined in many ways. In the sporting world, one definition is most widely used and accepted, and it is the one we will use. Cohesion is the total field of forces that act on members to remain in a particular group (Festinger *et al.*, 1950).

## 2. METHODOLOGY

The purpose of the study was to find out psychological correlates of playing ability among volleyball players

as a function of gender. To achieve the purpose of this study, the investigator selected 100 volleyball players consisting of 50 men and women. The subjects were randomly selected from players who competed at intercollegiate level competitions held at Chennai. The selected subject's age group was ranging from 19 to 25 years. Selected psychological variable team cohesion was measured through group environment questionnaire; mental toughness was measured through Sports Mental Toughness Questionnaire, and subjects playing ability in volleyball were assessed subjectively through five experts in volleyball in a playing situation. To examine the relationship between playing ability in volleyball and psychological variables, mental toughness and team cohesion simple correlation using Pearson coefficient of correlation was used.

### 3. RESULTS

Table 1 shows that the mean values of the cohesion were 69.52 with standard deviation  $\pm 5.14$ . The mean values of mental toughness were 90.6 with standard deviation  $\pm 12.40$ . The mean values of the playing ability of men volleyball players were 38.10 with standard deviation  $\pm 5.63$ .

Table 1 shows that the mean values of team cohesion of volleyball women players were 66.34 with standard deviation  $\pm 5.94$ . The mean values of mental toughness were 87.74 with standard deviation  $\pm 8.97$ . The mean values of playing ability of women volleyball players were 36.76 with standard deviation  $\pm 5.94$ .

#### 3.1. Results on Coefficient of Correlation Volleyball Players

The obtained Pearson correlation coefficient between criterion variable (playing ability) and independent psychological variables of men volleyball players are presented in Table 2.

The results presented in Table 2 showed that there was a significant relationship between playing ability and team cohesion ( $r: 0.844$ ), playing ability, and mental toughness ( $r: 0.886$ ) among men volleyball players.

The obtained Pearson correlation coefficient between criterion variable (playing ability) and independent psychological variables of women volleyball players are presented in Table 3.

**Table 1:** Descriptive statistics, number of subjects, means and standard deviation on selected psychological variables and playing ability of the volleyball players

Variables	No. of subjects	Mean $\pm$ Standard Deviation
Men volleyball players		
Team cohesion	50	69.52 $\pm$ 5.14
Mental toughness	50	90.62 $\pm$ 12.40
Playing ability	50	38.10 $\pm$ 5.63
Women volleyball players		
Team cohesion	50	66.34 $\pm$ 5.94
Mental toughness	50	87.74 $\pm$ 8.97
Playing ability	50	36.76 $\pm$ 5.94

**Table 2:** Pearson coefficient correlation between criterion and independent variables of men volleyball players

Variables playing ability versus	No. of subjects	Obtained "r"	Required "r"
Team cohesion	50	0.844*	0.273
Mental toughness	50	0.886*	0.273

\*Significant at 0.05 level

**Table 3:** Pearson coefficient correlation between criterion and independent variables of women volleyball players

Variables playing ability versus	No. of subjects	Obtained "r"	Required "r"
Team cohesion	50	0.401*	0.273
Mental toughness	50	0.669*	0.273

\*Significant at 0.05 level

The results presented in Table 3 showed that there was a significant relationship between playing ability and team cohesion ( $r: 0.401$ ), playing ability and mental toughness ( $r: 0.669$ ) among women volleyball players.

### 4. CONCLUSION

The results proved that though men and women volleyball players psychological levels in team cohesion and mental toughness were positively related with their playing ability, comparing between men and women volleyball players, it was found that men volleyball players were found to more accurately related with the selected psychological variables than the women volleyball players.

## REFERENCES

- Festinger, L., Schachter, S., and Back, K. *Social Pressures in Informal Groups; a Study of Human Factors in Housing*. Stanford, California: Stanford University; 1950.
- Gucciardi, D.F. The relationship between developmental experiences and mental toughness in adolescent cricketers. *J Sport Exerc Psychol*, 2011, 33(3), 370-393.
- Hardy, L., Bell, J., and Beattie, S. A neuropsychological model of mentally tough behavior. *J Pers*, 2013, 82, 69-81.
- Miller, L.C. Dimensions of psychopathology in middle childhood. *Psychol Rep*, 1967, 21(3), 897-903.
- Osweiler, G.D., Hopper, D.L., and DeBey, B.M. Taste aversion in swine induced by deoxynivalenol. *J Anim Sci*, 1990, 68(Suppl 1), 403A.
- Whitaker, S. Flow in porous media I: A theoretical derivation of Darcy's law. *Transp Porous Media*, 1986, 1(1), 3-25.

# Effect of Yogic Exercises and Aerobic Exercises on Motor Fitness Variables of Muscular Strength Secondary Schoolchildren

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## ABSTRACT

The major objective of the study was to determine the changes on selected motor hypotheses fitness variables due to the effect of yogic exercises and aerobic exercises training. (1) It was hypothesized that the effect of yogic exercises training may improve the selected motor fitness variables of secondary schoolchildren. (2) It was hypothesized that the effect of aerobic exercises training may improve the selected motor fitness variables of secondary schoolchildren. (3) It was hypothesized that the effect of yogic exercises training may better than aerobic exercises training in the improvement of the selected motor fitness delimitation of the study variables of secondary schoolchildren. (1) The study was confined to 150 girls' students of Morarji limitations of the study Desai Residential School, Vijayapura, Karnataka selected for the study. (2) The age of the subjects ranged from 14 to 16 years. (1) The change in climatic conditions such as temperature, atmospheric pressure, humidity, and act. During the training, as testing period could not be controlled. By the research, their influence on the results of the study was considered as one of the limitations.

## 1. INTRODUCTION

Yoga is a physical, mental, and spiritual practice aimed at attaining permanent peace within. This practice for permanent inner peace originated in ancient India and it also belongs to the six schools of Hindu Philosophy or six "Astika." Yoga is also considered as a form of exercise due to its physical forms and postures that have physical benefits to the body and it is also considered as meditation due to the mental and emotional benefits. It gives as well as it is also considered spiritual because it involves getting in touch with your spirit or beyond physical nature. This is why yoga is known as a combination of physical, mental, and spiritual exercise and development or creating a union with your inner self which can benefit life. Yogasana is very effective in throwing out all our body wastes and bring control over the body and organs are proper functioning of which depend our health and happiness. The asana improves mental power and health in controlling the sense organs. It increases the elasticity of our body and makes the body more active and supple. The blood circulation takes place more smoothly and properly and the body becomes capable of more work. It

improves our resistance power against diseases and does not allow any external matter to accumulate in the body; they keep the body free from diseases. The different asana clean the blood circulation, drain of our body, and circulates blood freely to all parts of our body and helps keep our body free from impurities. Yogasana is the best means to keep organs in proper functioning order. It is not only improving body health but also has sobering effects on the mind. The mind becomes balance and peaceful. The practice of yogasana is very effective activating on various so that they secrete their juices in the required quantity and function properly. Aerobic exercises are the exercises that involve or improve oxygen consumption by the body. Aerobic means "with oxygen" and refers to the use of oxygen in the body metabolic or energy-generating process. They are several kinds of aerobic exercises which are performed at moderate levels of intensity for extended period of time. Aerobic training involves any exercises performed using no added weight and is commonly referred to as body weight training. Aerobic training can be done as a standard outline or programmed into any weight loss, bodybuilding, or fitness workout. It has many benefits and is convenient,

and it can be tailored to suit beginner, intermediate, or advanced trainees. Muscular strength training is a type of physical exercises specializing in the use of resistance to induce muscular strength contraction which builds the strength, anaerobic muscular strength, and size of skeletal muscle strength training is typically associated with the production of lactate, which is a limiting factor of exercises performance. Regular muscular exercises lead to adaptations in skeletal muscle which can prevent lactate levels from rising during strength objectives of the study training.

## 2. METHODOLOGY

The purpose of the study was to find out the “effect of yogic exercises and aerobic exercises on motor fitness variables of muscular strength.” For the present study, the experimental research design was employed wherein training is applied to study the cause and effect of the training. To carry out the study, 150 subjects were selected at random from Morarji Daisy Residence School of Vijayapura city. Having their age in the range of 14–16 years. The subjects are classified into their groups; one is control group which is not exposed to any training and other two is experimental group which is exposed to yoga training. Before carry out the, all the subjects were tested and their initial scores are measured and recorded on the motor fitness variables of the subject. Later yogic exercises and aerobic exercises are given for experimental group. For the 16 weeks and by keeping the control group constant. Finally, all the motor fitness variables such as muscular strength half sit-up test number of half sit-up performed in par minute tested and scores are recorded. Later, collected data were put into the statistical using analysis of covariance (ANCOVA) to find out the significant mean differences. The study reveals that yoga training played a key role in increasing muscular strength. The so, it can be concluded that yogic exercises and aerobic exercises made a significant impact on the control group motor fitness variables of the secondary schoolchildren under study. Table 4.1 ANCOVA of the performance of muscular strength of secondary schoolchildren. Variable test yogic exercises, aerobic exercises, and control group show sum of the square Df mean square ratio muscular strength pre-test mean 17.7800, 18.8400, 17.760, B 38.173 2 19.087 2.921 SD 1.37455 1.29929 4.0028 w 960.42 14 7 6.533 post-test mean 20.8800 23.7600 22.080 B 998.593 2 104.64 0 9.145 \* SD 1.75708 2.69966 4.89414 W 209.28 14 7 adjusted post-test mean 22.681 25.052 21.586 B.683 2 209.68 3 14.29 4\* SD 2.36 1.96 2.25 W 982.856 14 4 982.85 6 \*significance 0.05, Table value = 4.08. Table

4.1 shows that the pre-test mean scores of muscular strengths of yogic exercises, aerobic exercises, and control group of secondary school girls’ students. It is observed that mean scores of pre-tests of yogic exercises, aerobic exercises, and control group of girl secondary school students are 17.7800, 18.8400, and 17.600 and their standard deviation is 1.37455, 1.29929, and 4.00286, respectively. The obtained “F” ratio value ( $F=4.08$ ); hence, the null hypothesis is accepted. It indicates that muscular strength among the yogic exercises, aerobic exercises, and control group of secondary school girls’ students is found almost similar; further, Table 4.1 shows that post-test mean scores of muscular strength of yogic exercises, aerobic exercises, and control group of secondary school girls’ students. It was observed that mean scores of post-tests of yogic exercises, aerobic exercises, and control group of girls secondary schoolchildren are 20.800, 23.7600, and 22.0800 and their standard deviation is 1.75708, 2.69966, and 4.89414, respectively. The obtained “F” ratio value is  $F=9.415$ , 2.147, and 0.05 at 5% level of significance, which is more than the table value ( $F=4.08$ ); hence, the null hypothesis is rejected. This indicates that muscular strength is more among the yoga and aerobic group when compared to the control group. Finally, it can be concluded that yoga and aerobic treatment given to the secondary school girls’ students have made a significant impact on the muscular strength of the secondary schoolchildren. The adjusted post-test mean scores on muscular strength of yogic exercises, aerobic exercises, and control group are 22.681, 25.052, and 21.586, respectively, and their standard deviation is 2.36, 1.96, and 2.25, respectively. The obtained “F” ratio value is ( $F=14.294$ , 1.147, and 0.05) 14.294 at 5% level of significance, which is higher than the table value ( $F=4.08$ ); hence, the null hypothesis is rejected and alternative hypothesis is accepted. It can be concluded that there is the significant difference found between the yogic exercises, Arabic exercises, and control group with respect to muscular strength Figure 4.1a. Gives a clear picture of the adjusted means of two training groups. Thus, it is inferred that yogic exercises and aerobic exercises training is more effective in increasing the muscular strength among the subject’s aerobic exercises were significantly better than yogic exercises in improving muscular strength of the secondary schoolchildren compare to control group.

## 3. CONCLUSION

It is conducted that yogic exercises training and aerobic exercises training made a significant impairment an muscular strength of the seconder schoolchildren; in



comparing that the aerobic training and yoga training, it is clear evident that aerobic training helps to develop muscular strength in comparing an with yogic exercises training.

## REFERENCES

1. Raja, C. Effect of yogic practice and physical exercises on flexibility anxiety and blood pressure. *Phys Educ*, 2014, 7(1), 1-9.
2. Preethi. *Conducted a Study to find out the Effect of Selected Yogasanas and Aerobic Exercises on Selected Physical*. Pondicherry: Physiological and Psychological Variables Among Women Students of Pondicherry University; 2006.
3. Shamsuddin., and Kalidas, A.N. Investigated the Influence of Game Specific Field Training and Yogic Practices on Physical, Physiological, Psychological and Performance Variables Among College Level Cricketers; 2007.
4. Sakthignanavel. Investigated the Effect of Pranayama with Aerobic Exercise with Aerobic Fitness. There are Evidences that the Practice of Pranayama and Aerobic Exercises Improves Physical and Mental Performance; 1998.
5. Saraswathi, S.S., and Hiti, J.K. *Asana Pranayama Mudra Bandha*. Bihar, India: Yoga Publications Trust; 1996.

# The Key to Success in Sports – Stress Management

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## ABSTRACT

It is clear from the finding of this study that girls had higher level of stress than boys as the girls have more challenges to follow Indian orthodox customs, prevailing in the society. When stress affects the brain, with its many nerve connections, the rest of the body feels the impact as well. Hence, it stands to reason that if your body feels better, so does your mind. Exercise and other physical activities produce endorphins – a chemical in the brain that acts as natural painkillers – and also improve the ability to sleep, which, in turn, reduce stress. Meditation, acupuncture, and massages therapy; even breathing deeply can cause your body to produce endorphins. Moreover, conventional wisdom holds that a workout of low to moderate intensity makes you feel energized and healthy. Scientists have found that regular participation in aerobic exercise has been shown to decrease overall levels of tension, elevate, and stabilize mood, improve sleep, and improve self-esteem. Albert and Monika (2001) reported that even 5 min of aerobic exercise can stimulate anti-anxiety effects. Finding of this study also indicates that coping strategy of physical education students is better than students of engineering profession due to more opportunities of performing physical activities. Brown (1991) found that life events were more likely to cause students to seek medical advice if the students were low in physical fitness, as compared to students high in physical fitness. Therefore, college faculty and parents need to attend specific training and conferences regarding stress management to guide the students on how to manage their stresses in an effective way. Students may need guidance and reassurance from a positive role model and someone whom they can trust to talk to about such pressures, otherwise, they may choose negative ways to cope with the stress in their lives. Teachers, parents, and college administration should work together to reduce the level of stress and enhance their coping strategy that promotes a healthy lifestyle.

**Keywords:** Healthy, Society, Sports hamper, Stress management.

## 1. INTRODUCTION

In day to life, stress became a big problem in our society, especially in sports. Although a top-class sportsman is having scientific coaching and proper nutrition, still he is lacking in showing top-class performance because of more stress. Stress always hampers the performance of an individual in sports competitions. Stress is the response of the body to any demand placed on them. It arises when they start to worry that they cannot cope. It is also considered as the “wear and tear” of our mind and body as we adjust to the ever-changing environment. Basically, we can broadly classify symptoms of stress into three main groups. They are (1) physical symptoms, (2) emotional symptoms, and (3) relational symptoms.

## 2. PHYSICAL SYMPTOMS

Sleep disturbances, hypertension, headaches or migraine, irregular heartbeat, palpitation, and chest pain, fatigue, hair loss, upset tummy, constipation, acid reflux, heartburn, shortness of breath, asthma attacks, muscle weak, falling sick frequently, etc.

## 3. EMOTIONAL SYMPTOMS

Worry, anxiety, irritable, nervous, frustration, depression, moody, lethargy, tired, difficulty in sleeping, confusion and difficulty in concentrating, inability to think clearly, and a sense of helplessness.

#### 4. RELATED SYMPTOMS

Increased arguments, aggressive and abusive, tendency to overreact, anti-social, violence, etc.

#### 5. HOW TO REDUCE THE STRESS

Stress is inevitable in life but does not mean that we have to be passive about it and risk being stressed out. The following are the tips to reduce stress:

1. Start a stress diary: Keeping a stress diary is an effective way of finding out both what causes you stress and how to avoid stress
2. Exercise: Taking frequent effective exercise is probably one of the best physical stress-reduction techniques available
3. Relaxation and meditation technique: Relaxation and meditation techniques are very good techniques to overcome the stress
4. Time management: Stress is often cited as a result of poor time management. These are often the people who do not prioritize their jobs or tasks
5. Develop your social network: When under stress, it is very natural to withdraw from the world and concentrate exclusively on solving the problem that causes stress. Since stress is the main hurdle to the performance of sportsmen, it shall be given higher priority to be treated. Hence, physical education and exercises play the main role for reducing the stress in sportspersons or to any other individuals to become a success in the life.

##### 5.1. Clarity of Mind

When you are stressed and running on adrenalin, it is harder to make good strategic decisions. I have had some of my best ideas when I have been out of the office and up in the mountains – a place where stress can be left behind and creativity flourishes. Obviously, skipping town for the mountains cannot happen all the time, but it taught me the importance of identifying some of the negative consequences of not managing stress on a daily basis to gain clarity and avoid making bad decisions.

##### 5.2. Energy

When you are overly stressed your energy levels are drained. If you have a team of people reporting into you, they will be looking to you for energy and guidance – developing skills or outlets that allow you to expend negative energy and focus on your passion will always serve you well. Oprah Winfrey has wisely been quoted

as saying, “Passion is energy. Feel the power that comes from focusing on what excites you.”

##### 5.3. Good Health

Your immune system can be weakened by excessive levels of stress, which can alter your mood and general sense of well-being. Stress has also been linked to varying illnesses from the common cold to heart disease, anxiety, ulcers, and cancer. Without your health, it is very difficult to do anything successfully.

Managing stress is a personal process – some people meditate, others exercise. Either way, stress is a normal part of life, but it is important to strike a balance between productive stress and the kind that leaves you depleted.

Stress can manifest itself in many ways when you are a student, soldier, and a parent. But you must learn to recognize stress.

Stress symptoms include mental, social, and physical manifestations. These include exhaustion, loss of/increased appetite, headaches, depression, sleeplessness, and oversleeping. Increased use of alcohol or drugs and other compulsive behavior are often signs. Feelings of alarm, frustration, or apathy may also accompany stress.

If you feel that stress is affecting your life or your studies, your first option is to seek help through an educational counseling center or a veteran's administration facility.

- Take control: See if there is something you can change or control in the situation
- Learn how to best relax yourself: Meditation and breathing exercises have been proven to be very effective in controlling stress. Practice clearing your mind of disturbing thoughts
- Remove yourself from the stressful situation: Give yourself a break if only for a few moments a day
- Set realistic goals for yourself: Reduce the number of events going on in your life and you may reduce the circuit overload
- Selectively change the way you react: Focus on one troublesome thing and manage your reactions to it/him/her
- Change the way you see things: Learn to recognize stress for what it is. Increase your body's feedback and make stress self-regulating
- Avoid extreme reactions: Why hate when a little dislike will do? Why generate anxiety when you can be nervous? Why rage when anger will do the job? Why be depressed when you can just be sad?

- Do something for others: Helping others can help get your mind off yourself
- Get enough sleep: Lack of rest just aggravates stress
- Work off stress: Whether it is through workouts, jogging, tennis, or gardening, physical activity can relieve stress. As you have experienced, the military places great emphasis on physical fitness and exercise training. Studies show that physical activity enhances psychological well-being
- Develop a thick skin: The bottom line of stress management is “I upset myself.”
- Try to “use” stress: If you cannot fight what is bothering you and you cannot flee from it, flow with it, and try to use it in a productive way
- Be positive: Give yourself messages as to how well you can cope rather than how horrible everything is going to be. “Stress can actually help memory, provided it is short-term and not too severe. Additionally, stress causes more glucose to be delivered to the brain, which makes more energy available to neurons, according to a report titled” All stressed up. This, in turn, enhances memory formation and retrieval. On the other hand, if stress is prolonged, it can impede the glucose delivery and disrupt memory
- Do not sweat the small stuff: Try to prioritize a few truly important things and let the rest slide
- Do not overwhelm yourself: Avoid fretting about your entire workload. Handle each task as it comes or selectively deals with matters in some priority
- Do not self-medicate or escape: Alcohol and drugs can mask stress. They do not help deal with the problems
- Most importantly: If stress is putting you in an unmanageable state or interfering with your education, social and/or work life, seek professional help.

## REFERENCES

- Sanyo, Stress in Public and Private Sector; 2010. Available from: <http://www.articlesbase.com/human-resources-articles/stress-in-public-amp-private-sector-2277883.html>. [Last accessed on 2011 Feb 28].
- Collie, D. Top 10 Causes of Workplace Stress. [Last accessed on 2011 Feb 28].
- National Portal Content Management Team. Stress Management; 2010. Available from: [http://www.india.gov.in/citizen/health/stress\\_management.php](http://www.india.gov.in/citizen/health/stress_management.php). [Last accessed on 2011 Feb 28].

# Combined Effect of Plyometric Training and Skill Training on Leg Explosive Power and Passing Ability of Intercollege Male Football Players

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## ABSTRACT

The purpose of the present study was to determine the combined effect of plyometric training and skill training on leg explosive power and passing ability among intercollege male football players. To achieve the purpose of the study, the subject was selected totally 30 intercollege male football players who were selected from Osmania University, Hyderabad, Telangana, India. The subjects were randomly selected and their age ranged from 18 to 23 years. The selected groups were divided into two groups, experimental and control groups. The experimental group consisted of 15 male football players and they underwent plyometric training and skill training. Fifteen male football players acted as the control group as without any specific training. The duration of the training period was resected 12 weeks and the session for 3 days in a week. The combined plyometric training and skill training is considering as the independent variable. The leg explosive power and passing ability were known as dependent variables. The statistical technique analysis of “t”-test was used to analyze the pre-test and post-test data of the experimental group and control group. The results showed that the combined plyometric training and skill training had significant improvement on the selected variables leg explosive power and passing ability compared to the control group.

**Keywords:** Leg explosive power and passing ability, Plyometric training, Skill training.

## 1. INTRODUCTION

Plyometric training comprises explosive muscle contractions to improve strength, speed, and power. Plyometric training has a wealth of benefits for endurance players – increase speed, improve strength and endurance, improve economy, reduce injury occurrence, and boost agility and coordination. To play football at any level, we need a great measure of a number of attributes, speed, strength, stamina, judgment, courage, agility, and tactical ability but above all, the basic skills are needed. Football is a game, which revolves around the effective utilization of fundamental skills such as shooting, passing, heading, throwing, and tackling and a general aptitude of ball sense and ball control. Among these fundamental skills, the investigator has chosen some of the following skills for the study, namely, passing, dribbling, and shooting (kicking).

## 2. METHODOLOGY

The purpose of the present study was to determine the combined effect of plyometric training and skill training on leg explosive power and passing ability among intercollege male football players. To achieve the purpose of the study, the subject was selected totally 30 intercollege male football players who were selected from Osmania University, Hyderabad, Telangana, India. The subjects were randomly selected and their age ranged from 18 to 23 years. The selected groups were divided into two groups, experimental and control groups. The experimental group consisted of 15 male football players and they underwent plyometric training and skill training. Fifteen male football players acted as the control group as without any specific training. The duration of the training period was resected 12 weeks and the session for 3 days in a week. The combined



plyometric training and skill training is considering as the independent variable. The leg explosive power and passing ability were known as dependent variables. The statistical technique analysis of “t”-test was used to analyze the pre-test and post-test data of the experimental group and control group.

## 2.1. Statistical Analysis

The analysis of using “t” ratio on combined plyometric and skill training groups and control group has analyzed and presented below. The data collected on leg explosive power and passing ability variables were due to the effect of combined plyometric and skill training which was processed and discussed. Selected subjects were totally 30 intercollegiate levels male football players who were divided into two equal groups such as experimental group and control group. The data were statistically analyzed for significant difference if any using “t” ratio.

Table 1 reveals the computation of “t” ratio between the mean of pre- and post-test on leg explosive power of intercollegiate level football players of combined plyometric and skill training groups. The mean value of pre- and post-test of combined plyometric and skill training groups was 43.8667 and 47.5333, respectively. Since the obtained “t” ratio 5.686\* was higher than the required table value 2.14, it was found to be statistically significant for the degree of freedom 1 and 14 at 0.05 level of confidence. The results clearly indicated that the leg explosive power of the experimental group improved due to combined plyometric and skill training.

Table 2 reveals the computation of “t” ratio between the mean of pre- and post-test on leg explosive power of intercollegiate level football players of the control group. The mean value of pre- and post-test of the

control group was 41.4000 and 42.3333, respectively. Since the obtained “t” ratio 2.288 was greater than the required table value 2.14, it was found to be statistically significant for the degree of freedom 1 and 14 at 0.05 level of confidence. The results clearly indicated that the leg explosive power of the control group is improved.

Table 1 reveals the computation of “t” ratio between the mean of pre- and post-test on passing ability of intercollegiate level football players of combined plyometric and skill training groups. The mean value of pre- and post-test of combined plyometric and skill training groups was 6.4000 and 8.5333, respectively. Since the obtained “t” ratio 9.909\* was higher than the required table value 2.14, it was found to be statistically significant for the degree of freedom 1 and 14 at 0.05 level of confidence. The results clearly indicated that the passing ability of the experimental group improved due to combined plyometric and skill training.

Table 2 reveals the computation of “t” ratio between the mean of pre- and post-test on passing ability of intercollegiate level football players of control group. The mean value of pre- and post-test of control group was 6.0000 and 5.2667, respectively. Since the obtained “t” ratio 2.128 was lesser than the required table value 2.14, it was found to be statistically no significant for the degree of freedom 1 and 14 at 0.05 level of confidence. The results clearly indicated that the passing ability of the control group did not improve.

## 3. DISCUSSION ON THE FINDINGS

The results of the study indicate that the combined plyometric training and skill training was significantly improved on selected variables such as leg explosive

**Table 1:** Computation of “t” ratio between pre-test and post-test means of combined plyometric training and skill training groups on leg explosive power

Experimental group	Mean	SD	Mean difference	Standard error mean	t-ratio
Pre-test	43.8667	5.33006	3.66667	0.64488	5.686*
Post-test	47.5333	6.32305			

\*Significant at 0.05 level of confidence

**Table 2:** Computation of “t” ratio between pre-test and post-test means of the control group on leg explosive power

Control group	Mean	SD	Mean difference	Standard error mean	t-ratio
Pre-test	41.4000	6.69541	0.93333	0.40786	2.288*
Post-test	42.3333	6.99603			

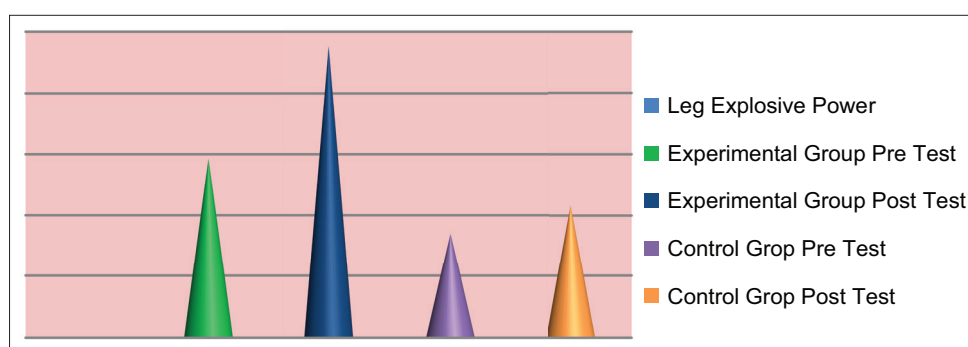
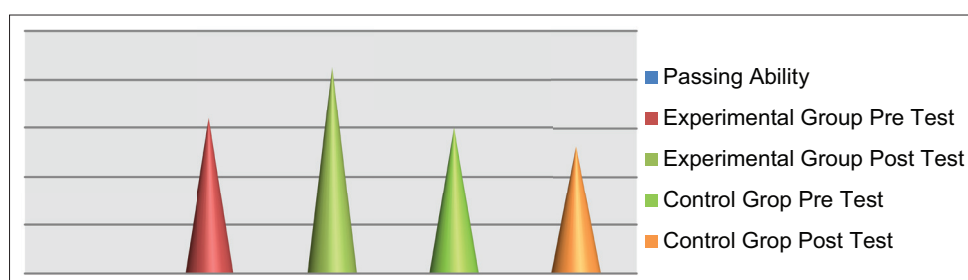
**Table 3:** Computation of “t” ratio between pre-test and post-test means of combined plyometric training and skill training groups on passing ability

Experimental group	Mean	SD	Mean difference	Standard error mean	t-ratio
Pre-test	6.4000	1.40408	2.13333	0.21529	9.909*
Post-test	8.5333	1.24595			

\*Significant at 0.05 level of confidence

**Table 4:** Computation of “t” ratio between pre-test and post-test means of the control group on passing ability

Control group	Mean	SD	Mean difference	Standard error mean	t-ratio
Pre-test	6.0000	1.15470	0.73333	0.32232	2.128
Post-test	5.2667	0.77172			

**Figure 1:** Bar diagram shows the mean values of pre- and post-test on leg explosive power of the experimental and control groups**Figure 2:** Bar diagram shows the mean values of pre- and post-test on passing ability of the experimental and control groups

power and passing ability of intercollege football players. The results of the study indicates that there is a significant improvement on combined plyometric training and skill training on the experimental group when compared to the control group. This study supported by Saez de Villarreal *et al.* who found that changes in combined plyometric and skill training can be linked to sports performance and Patterson and Reid who recommend the appropriate plyometric training will improve soccer player's speed and condition them to manage with the actual pressure of the game.

#### 4. CONCLUSIONS

The results of the study reveal that there is a significant improvement on combined plyometric training and skill training groups when compared to the control group. These changes are due to training. The training inspires changes in combined plyometric and skill training of the football players. The unique profile should take into consideration while administering to the football players.

## REFERENCES

- Patterson, S.D., and Reid, P. *Effect of Weight and Ballistic Training on Speed, Agility, Vertical Jump Height and Skill Performance in Soccer Players*. London: This Research Project is submitted as partial fulfilment of the requirements for the degree of Master of Science, St Mary's University; 2017.
- Saez de Villarreal, E., Suarez-Arrones, L., Requena, B., Haff, G.G., and Ferrete, C. Effects of plyometric and sprint training on physical and technical skill performance in adolescent soccer players. *J Strength Cond Res*, 2015, 29(7), 1894-1903.

# Effect of Moderate Volume Plyometric Training on Leg Explosive Power among Intercollegiate Football Players of Osmania University, Hyderabad

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## ABSTRACT

**Purpose:** The purpose of this study was to find out the effect of moderate volume plyometric training on leg explosive power among intercollegiate male football players. **Methodology:** The research scholar has randomly selected that 40 ( $n = 30$ ) intercollegiate male football players, who were represented for their intercollegiate computation under Osmania University, Hyderabad, were selected as subjects and their age ranged between 18 and 23 years. The subjects were divided into two equal groups, each group consist of 15 total 30. Group 1 acted as experimental group and Group 2 acted as control group. The dependent variable leg explosive power was selected and the leg explosive power was measured by vertical jump test for this study. **Statistical Tool:** The statistical tool paired sample " $t$ "-test was used for analyzing of the data and the obtained " $t$ " ratio was tested for significance at 0.05 level of confidence. **Results:** The analysis of the data revealed that there was a significant improvement on the selected variable vertical jump the application of the effect of moderate volume plyometric training.

**Keywords:** Intercollegiate football players, Moderate volume plyometric training, Vertical jump.

## 1. INTRODUCTION

Ability to produce muscle power output by the lower extremity muscles is a relevant performance issue in many sports activities. Plyometric exercises are commonly used to increase explosive power, by means of the stretch-shortening cycle. Plyometric training is highly effective, with the advantage of requiring reduced physical space, time, and equipment to complete the training sessions. Several previous studies have been inconclusive in establishing an optimized plyometric training design (i.e., frequency, volume, and height of landing) to promote muscle power enhancement.

## 2. METHODOLOGY

The research scholar has randomly selected that 40 ( $n = 30$ ) intercollegiate male football players, who were represented for their intercollegiate computation under Osmania University, Hyderabad, were selected as

subjects and their age ranged between 18 and 23 years. The subjects were divided into two equal groups, each group consist of 15 total 30. Group 1 acted as experimental group (EG) and Group 2 acted as control group (CG). The dependent variable leg explosive power was selected and the leg explosive power was measured by vertical jump test for this study. The statistical tool paired sample " $t$ "-test was used for analyzing of the data and the obtained " $t$ " ratio was tested for significance at 0.05 level of confidence.

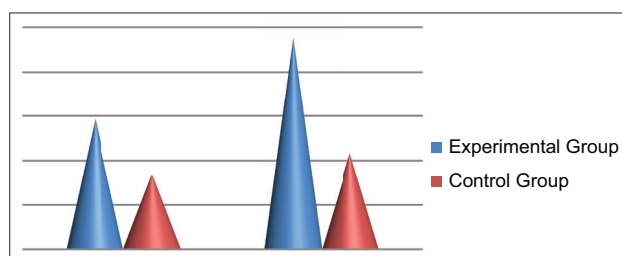
### 2.1. Selection of Variables

The research scholar reviewed the available literature pertaining to the problem from books, journals, magazines, websites, and research papers which revealed the importance of the effect of moderate volume plyometric training taking into consideration of feasibility criteria and availability of the instruments; the following variables were selected for this study.

**Table 1:** Calculation of “*t*”-ratio between the pre- and post-tests on leg explosive power of the experimental and control groups

Group	Test	M	SD	$\sigma$ DM	DM	<i>t</i> -ratio	<i>P</i>
Experimental	Pre-test	43.8667	5.33006	0.64488	3.66667	5.686	0.000
	Post-test	47.5333	6.32305				
Control	Pre-test	41.4000	6.69541	0.40786	0.93333	2.288	0.038
	Post-test	42.3333	5.99603				

\*Significance at 0.05 level

**Figure 1:** The mean difference of pre- and post-tests on leg explosive power of the experimental and control groups

## 2.2. Dependent Variables

- Leg explosive power.

## 2.3. Independent Variables

- Effect of moderate volume plyometric training.

Table 1 indicates that there was a significant improvement on the leg explosive power through the effect of moderate volume plyometric training. It reveals that the obtained *t*-ratio 5.686 is significant because  $P < 0.05$ ; there was a significant improvement between pre- and post-tests on the selected leg explosive power. Hence, there was a significant improvement on the leg explosive power between the pre- and post-tests of the EG, whereas CG showed significant improvement, but when compared to the EG that the EG was more significant. Hence, the results indicate that the significant improvement on the leg explosive power was due to the moderate volume plyometric training.

## 3. DISCUSSION OF FINDINGS

The result of the study reveals the 12 weeks of moderate volume plyometric training on the selected dependent

variable leg explosive power. There was a significant improvement on leg explosive power through the moderate volume plyometric training. It reveals that the obtained *t*-ratio 5.686 is significant because “ $P$ ”  $< 0.05$ ; there was a significant improvement between pre- and post-tests on leg explosive power. Hence, there was a significant improvement on the leg explosive power between pre- and post-tests of EG, whereas CG showed significant improvement, but when compared to the EG that the EG was more significant. Hence, the results indicate that the significant improvement on the leg explosive power was due to the moderate volume plyometric training alone. The results of the study were in consonance with the research done by Raghavan (2019).

## 4. CONCLUSIONS

It was concluded that there was a significant improvement on the selected dependent variable leg explosive power by the application of moderate volume plyometric training.

## REFERENCES

- Ramirez-Campillo, R., Andrade, D.C and Izquierdo, M. Effects of plyometric training volume and training surface on explosive strength. *J Strength Cond Res*, 2012, 27(10), 2714-2722.
- Raghavan, A. *Effect of Two Volume of Plyometric Training on Different Surface Combined with SAQ Drills on Performance Parameters of Junior Volleyball Players*. Karaikudi, Tamil Nadu: Department of Physical Education Alagappa University; 2019.



# Training on Selected Physical Physiological and Psychological Variables of Novice Hockey Players

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## ABSTRACT

Yoga is a way of living with an aim of a healthy mind in a healthy body. In this view, the investigators have made an effort to find out the effect of asana on psychological variables of women college players of hockey. It is a fact that apart from other factors, the performance of an individual in any game and sports is mainly dependent on physical, physiological, and psychological factors. Every sports person should be physically, physiologically, and psychologically fit to carry out daily tasks. Physical fitness is the result of regular physical activity, proper diet and nutrition, and proper rest for physical recovery within the parameters allowed by the genome.

**Keywords:** Physical physiological, Psychological variables.

## 1. INTRODUCTION

The performance of an individual in any game and sports is mainly dependent on physical, physiological, and psychological factors. Every sportsperson should be physically, physiologically, and psychologically fit to carry out daily tasks. Physical fitness is the result of regular physical activity, proper diet and nutrition, and proper rest for physical recovery within the parameters allowed by the genome. Physical fitness is used in two close meanings, general fitness and specific fitness. General fitness is often divided into agility, balance, body composition, cardiovascular endurance, coordination, flexibility, muscular strength, and endurance speed. Many sources also cite that mental and emotional health is an important part of overall fitness. Play is an essential facet in the physical, physiological, and psychological development of child. Play includes sports and games. Sports are generally individualistic where the pattern of movements does not change as in athletics a runner goes on running in a same style with least change in body movements. In games, movements change from one action to another action. They require more elaborate organization and strategies based on intense competition.

fundamentals because an individual achieves a fair level of competency over them, he cannot play the game to one's own satisfaction. There are a number of fundamental skills in hockey, namely, hitting, dribbling, pushing, scooping, stopping, trapping, flicking, tackling, dodging, and passing. The good performance of a hockey player depends on the perfection and proficiency of fundamental skills, positional play, tactics, strategy, general behavior, etc.

### 2.1. Importance of Fundamental Skills

The game, hockey is a very complicated one in terms of skills. In this game of hockey, it is very important; one should have mastery over fundamental skills which are necessary for the players. These fundamental skills are the foundation to the game of hockey. The high level of performance in the game of hockey depends on the proficiency over these fundamental skills. Coaching in hockey starts with these fundamental skills, as these skills are the foundation stones to the game. Once the player gets mastery over these fundamental skills, it will become an art which will draw the attention of spectators. Spectators enjoy the game with the esthetic sense and the player will have the feeling of well-being.

## 2. FUNDAMENTAL SKILLS IN HOCKEY

The skills which are necessary for the players to play the game may be termed fundamental skills. They are called

## 3. SELECTION OF VARIABLES

The research scholar reviewed the available scientific literature pertaining to the problem from books,

journals, magazines, e-resources, and research papers which revealed the importance of Swiss ball training and core board training. Taking into consideration of feasibility, criteria, and availability of the instruments, the following variables were selected for this study.

### **3.1. Dependent Variables**

#### **3.1.1. Physical variables**

- Speed
- Agility
- Balance
- Flexibility
- Muscular endurance.

#### **3.1.2. Performance variables**

- Speed dribbling
- Slap hit
- Shooting from three different spots.

### **3.2. Independent Variables**

- Swiss ball training
- Core board training.

## **4. DRIBBLING**

The player with the ball can progress toward goal through dribbling. It is a basic means to dodge the opponents. As she is not permitted to carry the ball, the only option for her to progress with the ball is dribbling. At the same time, she should also see that the opponents do not interfere in her progress and above all that one must be certain about the rules which govern the skill of dribbling. It is used to break man to man defense in tactical plays. Hence, dribbling is very important in hockey.

## **5. PASSING**

In hockey, the ball is to be taken from one end to another end, to score a goal. This has to be done in accordance with the rules that govern the hockey game. When one team is in possession of the ball, the other teams will always try to take possession of the ball. In such circumstances, the ball has to be passed by the player in possession of the ball to the player of his own team without giving chance for an opponent to get the ball. Hence, an accurate passing is a must for a good player.

## **6. HITTING**

Hit cover maximum distance in a very limited time. It is also used for scoring a goal. It is mostly used while taking penalty corner. A further important advantage is that one will be able to make passes through a wider area and thus one can prevent opponent players from anticipating the pass.

## **7. MOTOR ABILITY AND ITS IMPORTANCE**

Higher level of performance of a hockey player depends on his motor abilities, anthropometric measurements, physiological factors, and psychological variables. Among the variables selected for the study, the immediate capacity of an individual to perform in many varied stunts or athletic events is referred to as general motor ability. In most of the advanced and developed countries, the awareness of motor learning and skill development among children is very much scientific and prolonged which perhaps helped them realize their dreams of high achievement in sports. High level of general fitness with motor abilities such as power, speed, agility, jumping ability, balance, and reaction time is essential qualities of hockey players.

## **8. PHYSIOLOGICAL VARIABLES AND THEIR IMPORTANCE**

For specific physiological systems of the body to be fit, they must function well enough to support the particular game that the player must use playing. Different games make different demands on the organism with respect to neurological, respiratory, circulatory, and temperature regulating functions and physiological fitness specific to the activity. Physiological systems are highly adaptable to exercise. The response of each system is discrete; hard work in the heat is necessary to improve the fitness of the temperature regulation mechanism. Each task has its major physiological components and fitness for the task requires effective functioning of appropriate systems.

## **9. PSYCHOLOGICAL VARIABLES AND THEIR IMPORTANCE**

Competitive anxiety has been recognized as a key to sport psychology issue for some time. Sport competition creates some anxiety in all participants, and for some individuals,

the anxiety is not so intense that successful performance and enjoyment of the activity are impossible. Most athletes must deal with intense anxiety at sometime and most coaches must deal with competitors experiencing varying status of anxiety from near normal and under control to utter panic. Achievement behavior is of special interest in sports psychology because most of sports behavior is achievement behavior. Competition or social achievement predominates, but sport also involves in considerable non-competitive or individual achievement.

## 10. ANTHROPOMETRIC MEASUREMENT AND ITS IMPORTANCE

Performance in games and sports depends not only on physiological, psychological, sociological, and scientific training of the individual, but physique and body composition also affect it considerably. Although the training is equally important, at higher level of competition, where training is given to all the individuals, suitable physique and body composition are of fundamental importance. Genetic imperfections in organs and tissues are responsible for weakness in structure and function. These limit the individual's capacity for strength, endurance, and skill.

## 11. TOTAL PERFORMANCE IN HOCKEY AND ITS IMPORTANCE

The total hockey performance is the general hockey playing ability by hockey players. The general playing ability of any game depends on the proficiency of fundamental skills, motor ability components, physiological variables, and anthropometrical variables besides psychological make-up. Modern performance in any game gives greater emphasis on preparing the players psychologically than physically, though both play sufficient role. Different investigations revealed that performance in games and sports depends not only on physiological, psychological, sociological, and scientific training, but physical composition also influences the total performance considerably.

At higher levels of competition, even though there is variety of players from anatomic standpoint, it is more likely that specific qualities are necessary for players to achieve.

These levels of play the total performance is the true indicator of the player's efficiency and proficiency in the execution of fundamental skills besides all other qualities. The participation in modern sports is influenced by various physical, physiological, sociological, and psychological factors. During the training period, besides the good physique and physical fitness of the athlete, the main emphasis is laid on the development of various types of motor skills involved in the game as well as on teaching the strategies, techniques, and tactics of the game.

## 12. CONCLUSION

They concern physical and mental sides of sport development as well as schools' strategies and environmental aspects of talent development. The second part of the report processes children's psychological and social development phases in different ages it also covers important mental skills, qualities, and techniques for ice hockey player. The hockey players of Swiss ball training group showed significant improvement in flexibility and slap hit when compared to core board training group. At the same time, the core board training group showed significant improvement in speed, agility, and speed dribble when compared to Swiss ball training group.

## REFERENCES

1. Ali, J., and Rahaman, A. A comparative study of Grit between male and female fencers of Manipur. *Shield Res J Phys Educ Sports Sci*, 2012, 7, 32-36.
2. Singh, A., Bains, J., Singh, J., Kaur, N.J., and Singh, R. *Essentials of Physical Education*. New Delhi: Kalyani Publishers; 2005.
3. Kumar, D.A. *Effect of Specific Drills on Selected Skill Related Fitness Variables and Skill Performance Among Hockey Players*. Coimbatore: Unpublished Master's Thesis, Bharathiar University; 2006.
4. Rothstein, A.L. *Research Design and Statistics for Physical Education*. Englewood Cliffs, N.J: Prentice Hall, Inc; 1985.
5. Louis, A.A., and Vallimurugan, V. Effect of fartlek training on vital capacity among hockey players. *Int J Recent Res Appl Stud*, 2014, 1(10), 37-39.
6. Johnson, B.L., and Nelson, J.K. *Practical Measurements for Evaluation in Physical Education*. 3<sup>rd</sup>ed. New Delhi: Surjeet Publications; 1988.

# Effect of 4 Weeks Isometric Practice on Flexibility and Agility of Football Players

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## ABSTRACT

The purpose of this study was to determine the effects of 4 weeks isometric practice on flexibility and agility of football players. **Subjects and Methods:** The method of this study was experimental research and the sample was 20 female football players of Vijayapura (19–22). The result shows that there were significant effects on flexibility and agility of isometric practices.

**Keywords:** Agility, Flexibility, Isometric.

## 1. INTRODUCTION

Isometric training refers to the method of training, in which there is no change in the joint angle. Without movement, great musculotendinous tension can still occur, thus creating a training effect on the body. Although isometric means same distance training, the movement will occur in the form of shortening of the muscle fibers due to the contractile properties of the muscle. Properly performed isometric training is not just holding a position while looking at the clock for a set period of time. In fact, a focused maximal activation of a muscle or group of muscles is required to properly perform an isometric exercise.

SIFF states, in his book super training, “isometric contraction requires a muscle to increase its tension from rest to a maximal or submaximal value over a certain time, to sustain this tension for another period, and to decrease this tension to rest or lower value.” It is this increase in tension and maximal activation of muscle fibers, which gives isometric training a place in any performance, based athletic training system. Isometric exercise is a strange concept that may well go against everything you have been lead to believe about exercise, weight loss, and muscle building. Normally, when you think of going to the gym or doing a workout, you imagine something fairly active with lots of lifting, sweating, and running. Well, isometric exercise is actually the complete opposite of this image (except

for the sweating) and involves working out without moving.

On the other hand, isometric exercise refers to something more precise holding still, often under conditions of substantial or maximum resistance. Holding any weight and keeping it still, neither allowing it to fall nor raising it, is an isometric exercise for the same muscles. Moreover, isometric exercise is also exemplified by any and every hatha yoga posture, which you are holding steadily with muscular effort. Fred Kelley defines “An isometric exercise is one, in which the resistance produces a tremendous amount of tension within the muscle itself. This resistance could consist of any object too heavy to move.” Gene hook defines “A method of strength development which attains overloading of the muscle by matching one part of the body against another. This is a type of muscular contraction, in which the muscle does not decrease in length.” After analyzing the above definitions, the researcher asserts that “isometric exercise is the development of tension within a muscle by the application of resistance. However, if the resistance is greater than the amount of force exerted by the muscle, technically, there will not be any change in its length.” The purpose of this study was to determine the effects of 4 weeks isometric practice on the flexibility and agility of football players between 19 and 22 years old. It was hypothesized those 4 weeks isometric practice will increase flexibility and agility of football players.



## 2. METHODOLOGY

To achieve the purpose of this study, 20 female football players were selected from between 14 and 16 years old. They were administered the training program of isometric practice for 4 weeks, that is, 5 days a week in the morning and evening time for 1 h. The data pertaining to the criterion variable were taken before administering the training program of 4 weeks in relation to flexibility and agility. The standard tests were applied to collect data for the above said variables. After the completion of training, post-test data were taken on all the variables. The following tests were administered for the data collection on selected variables.

### 2.1. Bend and Reach

To measure the flexibility.

### 2.2. Shuttle Run

To measure the speed.

The collected data were analyzed with the help of SPSS computer software. Mean, standard deviation, standard error of mean, and “*t*”-test were used to compare the pre-test and post-test data.

## 3. RESULTS

The following section of the report presents tables given a view of the outcome of the study. The value of the paired statistic of flexibility is given in Table 1 and agility is in Table 2.

Table 1 shows that mean, standard deviation, and standard error of mean with regard to pre-data on flexibility were recorded 2.20, 0.83, and 0.18, respectively, wherein case of post-data the same was recorded as 3.35, 0.74, and

**Table 1:** Descriptive statistics of pre-isometric versus post-isometric groups of football players in relation to flexibility (age groups 14–16)

Group	<i>n</i>	Mean	SD	S.E. Dm	t. trio.	d.f
Pre-test	20	2.20	0.83	0.18	7.667*	19
Post-test	20	3.35	0.74	0.16		

\*Significant “*t*”=0.05

**Table 2:** Descriptive statistics of pre-isometric versus post-isometric groups of football players in relation to agility (age Groups 19–22)

Group	<i>n</i>	Mean	SD	S.E. Dm	t. trio	d.f
Pre-test	20	12.56	0.24	0.05	7.735*	19
Post-test	20	11.51	0.58	0.13		

\*Significant “*t*”=0.05

0.16, respectively, and “*t*”-test ratio 7.667 was found statistically significant at 0.05 level.

Table 2 indicates that mean, standard deviation, and standard error of mean with regard to pre-data on agility were recorded 12.56, 0.24, and 0.05, respectively, wherein case of post-data the same was recorded as 11.51, 0.58, and 0.13, respectively, and “*t*”-test ratio 7.735 was found statistically significant at 0.05 level.

## 4. CONCLUSION

On the basis of the results obtained, the following conclusions are drawn:

- There is a significant improvement in the flexibility of football players after 4 weeks isometric practices. Hence, the hypothesis is accepted.
- There is a significant improvement in the agility of football players after 4 weeks isometric practices. Therefore, the hypothesis is accepted.

## REFERENCES

1. American Association for Health, Physical Education, Recreation. *AAHPER Youth Fitness Test Manual*. Washington, D.C: American Association for Health, Physical Education, Recreation; 1976.
2. Liederman, E. *The Triple Crown King of Handball*. New York: Strength and Health; 2004. p. 28-29.
3. Hoffman B. *Weight Training*. New York: Strength and Health Publishing Co.; 2000.
4. Hook, G. *Weight Training in Athletic and Physical Education*. Englewood Cliff, N.J: Prentice Hall Inc.; 1974.
5. Shea, J. *Isometric Exercises Science and Practice of Strength Training*. 2<sup>nd</sup> ed. Champaign III: Human Kinetics Publishers; 2006. p. 124.
6. Siff M. *Supertraining*. Denver, Co: Supertraining Institute; 2004. p. 222-228.



# Yoga through Physical Fitness for Human Body

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## ABSTRACT

Yoga has been practiced for around 5000 years. Several schools and organizations of yoga have emerged over time to time. It can be overwhelming at first to find a style of yoga that resonates with you. If you are a competitive athlete, it is best to tailor your yoga practice to your training schedule because a particular sport can develop certain muscle groups while ignoring others. Over time, this process causes imbalances in the muscles and joints, leading to overuse injuries. Yoga helps the muscles, tendons, and ligaments move through a full range of motion, thus cultivating balance and core strength, which is a huge benefit to athletes in their chosen sport.

## 1. INTRODUCTION YOGA AND PHYSICAL FITNESS

Yoga' is a Sanskrit term meaning "to join, unite, or yoke together," and the essential purpose of yoga is to bring together body, mind, and spirit into a harmonious whole. The central methods of yoga are physical postures or "asanas" and movement, breathing techniques, or "pranayama" and meditation. Yoga includes guidance on healthy lifestyle, eating habits, mental attitude, and Ayurvedic medicine which is also part of the yogic path to health and balance. Hatha yoga is the path of physical yoga, which is the most popular branch of yoga in the West. "HA" means "SUN," and "THA", "MOON", so hatha yoga is the joining, or the yoking together of these different energies in harmonious equilibrium, positive and negative, and active and receptive.

Yoga is the yoga or the connection between the mental and physical. Anasana is the effort the body makes to reach a pose with controlled inhalations and exhalations and attains the physical benefits of good health through optimum mind control.

Each turn or twist the body makes to replicate an asana is the body's answer to the ask of the mind that calls on the physical self to collect itself through rhythmic breathing and focus on a particular physical entity while observing the going ones of the body flow of blood, sound of a throbbing heartbeat or the aches and pains the body is facing. Physical fitness is the ability to live a full and balanced life. The totally fit person has a healthy and happy outlook towards life. Fitness is the young man's absolute necessity. It breeds self-reliance and keeps man mentally alert. Physical fitness is essential for human

beings to adjust well with his environment as his mind and body are in complete harmony.

## 2. MIND THROUGH BODY

The mind is a subtle entity and the body a more palpable one. To control the body is easier than to harness the dynamic mind. It is the constant flow of water in a gurgling brook or the energetic flapping of a bird's wings; it is unending, ever-expanding, and ever-curious. If mind was the wind that assists the kite, the body is the kite that flutters and flows on the tug of the main thread of which we have the sole control.

Yoga, as is common knowledge, is an ancient science going back centuries and has modeled itself on the natural ecosystem. Hence, asanas replicate the animal and the plant world.

It is the bridge that transcends a worldly experience and translates into a larger surreal experience as one travels through the physical self and releases itself to reach out to a world which is far beyond its physical capacity. It is another word for one's existence realization.

## 3. PHYSICAL PERKS OF YOGA PRACTICE

### 3.1. Benefits of Yoga on Physical Well-being are Manifold

- Benefits the spiritual and mental well-being by opening up clogged emotions and pent up feelings

- Replaces negative (Nakaratmak) with the positive (Sakaratmak) thinking
- Identifies the weaker muscles or organs of the body, through aches and pains and quivering muscle masses
- Effectively deals with stress and mental health issues hence decreased level of anxiety and depression, which are preserves of the modern-day life
- Brings out physical and intellectual sweat to master yogic practices and control the going ones of the mind
- Known to optimize systolic and diastolic pressures
- Helps attain samamkaya – to align each and every part of the body without deviation, retraction, or contraction
- It lets energy flow freely through the chakras while controlling body heat and allowing awareness to travel through each cell and vein
- Helps improve muscle strength and controls common issues such as arthritis, back pain, joint aches, migraine, sinus, and heartburn to name only a few
- Yoga gives posture a pump up and helps align the spine with the rest of the body, this prevents posture related injury
- Yoga assists the joint fluids and protects cartilages and bones from wear and tear
- Yoga helps one lift one's own weight through asanas and uses body weight as a prop to achieve optimum weight loss and muscle strength
- Yoga is a boost to the blood flow and makes the hand and leg muscles more agile. It is known to pump more oxygen into the cells. Advanced yoga poses that demand a greater twist wring poisonous blood out of the body and allows newly oxygenated blood to flow to the primary organs
- Yoga improves oxygen-carrying hemoglobin and red blood cells and cuts the level of clot promoting proteins in the blood. It, therefore, deals with heart attacks and strokes with better effectiveness
- Yoga raises the combative forces of the body to take on the physical hazards of external nature. Pollution, stress, weight gain, fatigue, aching muscles, bad spinal column health, and breathing problems to name a few

- Yoga gives tremendous importance to the anterior spine, and regular practitioners of yoga enjoy optimum flexibility and movement for the upper, thoracic, and anterior spine
- Yoga and pranayama improve nerve health; it ensures the generated energy during the practices reaches the gates or the ends of the nerves.

Mindful breathing techniques of pranayama and asana practices are a boost to the happy hormone serotonin and find its the correlation with elevated levels of happiness and better immune function. Yoga is the body's natural response to attacks on its subtle and larger entities, it is a way of existence when not just the inhalations and exhalations but also the pauses between them (Kumbhaka) are stressed on. Yoga is refreshing and invigorating and opens up clogged pores to facilitate the flow of energy and life.

However, any yoga practice requires the practitioner to be under the tutelage of a seasoned yoga teacher, who is not just a regular practitioner but also a sensible human being who is privy to the vast possibilities of this life force and the orbit shift it can bring to one's day to day existence and also long-term well-being.

#### 4. CONCLUSION

Yoga and other physical exercises are not completely different from each other. Each has its place. As one of the forms of fitness, yoga is excellent at building strength, flexibility, balance, and other functional movement skills.

#### REFERENCES

1. Dune, D. *The Manual of Yoga*. London: Fauloshan and Co., Ltd.; 1956, p. 144.
2. Foiershtain, G. *Encyclopedia of Yoga*. Sofia: LIK; 2001.
3. Central Council of BSFS. *Protocol*, No. 22, Decision No 1/19.VI.1989; 1989.
4. Bersma, D., and Visscher, M. *Yoga Games for Children: Fun and Fitness with Postures, Movements and Breath*. Alameda, CA: Hunter House Inc.; 2003.
5. *Introduction to Yoga: A Beginner's Guide to Health, Fitness and Relaxation*. New York: Three River Press; 2000.

# Anthropometric – Physical Fitness Performance on Volleyball Players

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## ABSTRACT

The purpose of the present investigation was to determine the impact of selected anthropometric and physical fitness variables to skill performance of male volleyball players. To achieve the purpose of the study, 42 male volleyball players ( $n = 42$ ) in the age group of 20–25 years, participated in Gulbarga University, Kalaburagi, were drawn as subjects, only those subjects, who were rated by North Carolina state university volleyball skills test battery to measure the skill performance were considered for the present study. The state collected was statistically analyzed to find out the relationship of selected physical fitness factors to the skill performance of the subjects.

## 1. INTRODUCTION

Sports are as old as human society and it has achieved a universal following in the modern terms; it has now become an integral part of the education process and social activities. Millions of sports fans participate in different events around the year. Many of them participate in sports for the fun, adventure, health, physical fitness, and financial benefits linked with a high degree of popularity.

The anthropometric provides us with the foundations and the private information concerning the characteristics of motor, which contributes about the possibility of evolving to reach high level of performance and achievement, they are measurements on the components of fat, muscles, and bones to give the coaches, during their processes of selection and training, a vision more deep and specialized of the effect of the compound operations, and functional physical contributing to the high levels of athletic achievement. It also considers specifications for anthropometric grounds that must be rationalized through the selection in sports for its close association with the access of emerging and evolving the levels of sporting prowess and due to their impact on the level of the emergence of the physical characteristics and skill and functionality necessary to achieve those high levels of activity sport specialist.

### 1.1. Objective of the Study

The objective of this study was to know the impact of selected anthropometric and physical factors on skill performance.

### 1.2. Hypothesis

- There will be a significant relationship between selected anthropometric measurements and volleyball skill performance
- There will be a significant relationship between selected physical fitness components and volleyball skill performance.

## 2. METHODOLOGY

### 2.1. Variables

- Anthropometric measurements
  - Height
  - Weight
  - Arm length
  - Leg length.
- Physical fitness variables
  - Speed
  - Flexibility
  - Agility
  - Explosive power.

### 2.2. Procedure

Before conducting the test, all the subjects were oriented and the purpose of the test and testing procedures was clearly explained to the volleyball players.

The reliability of data was endured by establishing the instrument reliability, the tester's competency, and subject reliability.

Each variable required different procedures and equipments. Height was measured using studio meter, weight measured using weighing machine, and arm length and leg length was measured using measuring tape; speed was measured on the basis of three electronic stopwatches and through 30 m flying start run, explosive power was calculated on the basis of vertical jump, and agility was calculated by shuttle run.

### 2.3. Analysis of Data

The purpose of the present investigation was to determine the relationship of selected anthropometric and physical fitness variables to the skill performance of male volleyball players. To achieve the purpose of the study, 42 male volleyball players ( $n = 42$ ) in the age group of 20–25 years, participated in Gulbarga University intercollegiate volleyball tournament, were drawn as subjects, only those subjects, who were rated by a North Carolina state university volleyball skills test battery to measure the skill performance were considered for the present study.

All the subjects understudy were tested and measured for their performance in physical fitness variables, such as speed, agility, and explosive power. Four anthropometric measurements test items such as height, weight, arm length, and leg length were administered to the selected/subjects. Their performance in the selected test items was measured and recorded. Their scores of performance in different test items represented the data with respect to the independent variables under consideration in the present study.

The skill performance of the criterion measures was determined by scores of the performance of the subjects to North Carolina state university skills tests battery.

The data were collected and statistically analyzed to find out the relationship of selected physical fitness variables to the skill performance of the subjects. Correlation coefficient values were computed to determine the relationship of each independent variable to skill performance ability (the dependent variable) of male volleyball players. The statistical analysis of data has revealed the following results that are presented in Table 1.

The values of coefficient of correlation  $V$  between performance scores of the volleyball players with leg length were 0.325 with a positive correlation, and the corresponding significance level of 0.036 shows

**Table 1:** Value of coefficient of correlation for independent and dependent variables and their significance

Variables	Correlation coefficient	Significance
Speed versus skill performance	0.119	0.452
Agility versus skill performance	0.117	0.462
Explosive power versus skill performance	0.085	0.594
Height versus skill performance	0.196	0.213
Weight versus skill performance	0.197	0.210
Arm length versus skill performance	0.137	0.387
Leg length versus skill performance	0.325	0.036*

a significant linear relationship of leg length of skill performance of male volleyball players.

The value of the coefficient of correlation  $V$  between performance scores of the volleyball players, in speed, agility, explosive power, height, weight, arm length, and skill performance ability showed a low positive correlation with skill performance of male volleyball players. The correlation coefficients were found to be statistically non-significant.

### 3. CONCLUSION

The performance scores of the selected subjects are that only three test items measuring different physical fitness variables such as speed, agility, and explosive power have shown a non-significant relationship with the skill performance of male volleyball players. Hence, hypothesis 1 is rejected.

The performance scores of the selected subjects in only four test items measuring different anthropometric variables such as height, weight, arm length, and leg length in that only leg length shown a significant relationship with the skill performance of male volleyball players. The relationship was found to be significant at 0.05 level, the hypothesis formulated in the study was partially accepted.

The result of the study may be due to the effect of training, diet, nutrition, food habits, practice, environmental, social background, regular routine, and factors that may be influenced for the performance in the present study.

## REFERENCES

1. American Alliance for Health, Physical Education and Recreation. *Skills Test Manual Volleyball for Boys and Girls*. Washington, DC, USA: American Alliance for Health, Physical Education and Recreation Publication; 1960.
2. Anderson, F.W. *A Study of Personality Traits of Men Varsity Athletes as Compared with those of Women Varsity Players Participating in Intercollegiate Team or Individual Sports*. Vol. 52. Dissertation Abstracts International; 1977.
3. *Physical Activity Policy, Health Improvement Directorate. The General Practice Physical Activity Questionnaire*. Thousand Oaks, California: SAGE Publication; 2009.
4. Berg, J.G. Relationship between selected body measurements and success in standing broad jump. *Completed Res Health Phys Educ Recreation*, 1969, 11, 223.
5. Bhatnagar, D.P., and Singal, P. *A Comparative Study of Athletes and Volleyball Players Modern Perspectives in Physical Education and Sports Sciences*. New Delhi: Harnam Publication; 1980, pp. 117-123.



# Yoga and Mental Health

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## ABSTRACT

The need for effective population mental health promotion approaches is urgent as mental health concerns are escalating globally, and current allopathic treatment regimens are insufficient to bring people toward the state of mental well-being (citation). Successfully alleviating stress has the potential to promote well-being and prevent illness. Worldwide, yoga is gaining popularity as an accessible, acceptable, and cost-effective practice for mind and body. People are turning to yoga for mental health improvement due to preferences for self-treatment as opposed to clinical intervention; perceived greater efficacy than medication; fewer side effects; and lack of response to medication. Yoga has minimal side effects and is cost effective in comparison with pharmacological treatments and psychotherapy. Yoga's added benefit is that it improves physical fitness and encourages self-reliance. In this brief article, we discuss the evidence for yoga as a form of mental health promotion, illness prevention, and treatment for depression.

## 1. INTRODUCTION

By 2020, the World Health Organization predicts that depression will be the second-largest contributor to the global disease burden, after ischemic heart disease (cite). Anxiety is also being diagnosed at a greater rate than it was in the past. Despite these increases in diagnosis, treatment regimens typically include pharmaceutical therapies that are not sufficient to prevent further illness or promote mental well-being. Effectively addressing mental health concerns entail a comprehensive approach that addresses the root of the problems.

In this paper, we provide evidence for yoga as a form of health promotion, illness prevention, and treatment for depression and other mental health imbalances. Like other therapies, yoga is not a complete solution to mental health concerns. In conjunction with other approaches, yoga has great potential to lead people toward greater mental well-being.

The eight-limbed path of yoga includes yama (moral codes), niyama (self-discipline), asana (postures), pranayama (breath practices promoting life force), pratyahara (sensory transcendence), dharana (concentration), dhyana (meditation), and samadhi (state of bliss). The word roots of yoga mean "to join" in Sanskrit. Joining mind and body, and individual and collective selves is the essence of this ancient South Asian practice. Yogic philosophy posits that

every life form is interconnected and united. "Yoga exists in the world because everything is linked."

Yoga's greatest aim is to create compassion within and a deep sense of unity' and oneness with all forms of life. Yoga is an individual activity that has social implications. Those who regularly participate in yoga typically interact with the world in calmer and more reasonable ways. More positive social interactions and relationships are one of the ripple effects of individual yoga practice. Accessible or complementary yoga classes offer low-income people the opportunity to experience the benefits of inner peace and a healthier body. When practices such as yoga are accessible to all, larger effects are possible. Without overstating the impacts, potential consequences of large scale population mental well-being initiatives such as this are less violence in society, less addiction, greater ability to be authentic with one and other.

## 2. YOGA AND MENTAL HEALTH

As the Patanjali Sutras notes, "Yoga is the practice of quieting the mind." Positive mental health is "a state of well-being, in which every individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community. We searched for articles that examined yoga as a form

of promoting mental well-being for healthy people. However, most of the literature in this area focuses on improving the quality of life for people with cancer and other applications. The literature on mental health and yoga is biased toward individualized mental health imbalances in a similar way as literature in physical health is biased toward individualized disease. Yoga has been shown to enhance the quality of life in people who are healthy and ill. A review study found that yoga is as effective or better than exercise at improving a variety of mental and physical health measures such as stress, quality of life, mood states, heart rate variability, pulmonary function, and so on. A meta-analysis concluded that because weight gain and toxicity are side effects of various pharmacotherapies, yoga may be an effective and less toxic auxiliary treatment for severe mental illness. In one study, yoga improved subjective well-being, mental health, and executive functioning within prison populations. Yoga improved the quality of life of pregnant women in various studies and enhanced their interpersonal relationships. Studies over the past 15 years have shown that yoga can improve psychological health during breast cancer treatment, as well as health-related quality of life in antipsychotic-stabilized patients. In the treatment of mild-to-moderate (MDD), promising results indicate that yoga may be applied as a monotherapy. Level II evidence supports the use of yoga as an adjunctive therapy. Multiple studies conclude that (a) yoga is better than no treatment in improving mild-to-moderate depressive symptoms in MDD, (b) yoga is equally as effective as TCAS (tricyclic antidepressants) in severe MDD 1191, and (c) yoga in combination with antidepressants is better than antidepressants alone for depressive symptoms.

### 3. CONCLUSION

The practice of yoga shows promise for promoting better population mental health. It is acceptable, accessible, cost effective, and encourages self-reliance. Yoga is an individual health-promoting practice that can be done

in groups and supported by communities. Like other holistic practices such as tai chi, qigong, meditation, and so forth, it includes a community component. Practicing yoga together, in workplaces, schools, and other group settings have shown to promote population mental health (24), while yoga does not address the social determinants of mental illness; it does promote a greater sense of inner peace for those who partake.

It appears that deep, slow breathing in combination with movement and other aspects of yoga are at the heart of yoga's ability to bring people a greater sense of tranquility. It meets the triple aim of improving health, improving care, and reducing cost. A recent article questions whether sufficient evidence exists for family physicians to recommend yoga to their patients. The evidence-based answer: "Yes, yoga can reduce symptoms of anxiety and depression (strength of recommendation: B, systematic reviews of randomized controlled trials [RCTs] with significant heterogeneity). Across multiple RCTs using varied yoga interventions and diverse study populations, yoga typically improves overall symptom scores for anxiety and depression by about 40%, both by itself and as an adjunctive treatment. It produces no reported harmful side effects." In some cases, yoga is taught for free such as yoga clubs in India and other countries, while it may not be for everyone, through a disciplined approach most people with or without mental health imbalances may feel more mental ease and relaxation through the practice of yoga.

### REFERENCES

1. Antonovsky, A. The salutogenic model as a theory to guide health promotion. *Health Promot Int*, 1996, 11, 11-18.
2. da Silva, T.L., Ravindran, L.N., and Ravindran, A.V. Yoga in the treatment of mood and anxiety disorders: A review. *Asian J Psychiatr*, 2009, 2, 6-16.
3. Desikachar, T.K.V. *The Heart of Yoga: Developing a Personal Practice*. Rochester, Vermont: Inner Traditions; 2011.
4. Patanjali. *The Yoga Sutras of Patanjali*. United States: Dover Publications; 2003.

# A Study of Anxiety and Self-Confidence among School Players and School Non-players – Special Reference to Jalna District

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## ABSTRACT

The aim of the study is to compare the anxiety and self-confidence among school players and school non-players. Hypothesis: (1) There will be no significant difference in anxiety among school players and school non-players. (2) School players will have significantly more self-confidence than school non-players. Sample: In the present study, 40 samples (20 players and 20 non-players) belonging to different schools in Jalna district of Maharashtra state were taken. The age range of the subject was 10–15 years. A purposive non-probability sampling technique was used. Tools: (1) Sports anxiety test (SAT), the scale is constructed and standardized by Dr. Quadri Syed Javeed. It consists of 30 items, each with yes/no type alternative. (2) Sports self-confidence inventory (SSCI), the scale is constructed and standardized by Dr. Quadri Syed Javeed. It consists of 30 items, each with yes/no type alternative. Results: (1) School non-players were significantly more anxious than school players. (2) School players have high self-confidence than school non-players, but the difference is not significant.

**Keywords:** Anxiety, School players, Self-confidence.

## 1. INTRODUCTION

Sports are a competitive activity that involves vigorous physical exertion. Sports by their very nature are enjoyable challenging all absorbing and require a certain amount of skill and physical condition. Sports hold a prominent place in the modern life. Millions of people participate in sports activities, watch and read about them, and spend billions of dollars annually for sport-related activities and equipment. Sports have a very prominent role in the modern society. It is important to individual, a group, a nation, and, indeed, the world. Throughout the world, sports have a popular appeal among people of all ages and both sexes. Sports competitions produce sports personalities, ideal people that we can look up to and achievements that we can marvel at for many youths. The sports stars are better known than the leading politicians of the country. Sports have always reflected development in the society. Sports, indeed, have been mirror of society.

Self-confidence, control. Many athletic psychologists believe that coaches and athletes in recent years came

to this conclusion that to achieve expected goals, mental skills are more.

Optimal performance in sports is dependent on the combination of technical skills (technical and tactical), physical (strength, speed, etc.) and mental (concentration, self-confidence, and control). Many psychologists believe that to achieve expected goals, mental skills are more important than physical skills. An inherent aspect of competitive game is the need for sportsmen to meet the demands of competition and to perform well under pressure. There are many factors such as expectations, perfectionism, fear of failure, and lack of self-confidence which can induce feelings of anxiety in the sportsman and, in turn, can have a devastating impact on the sports performance (Moran, 2004).

Anxiety is a well-studied construct in a range of psychological research areas, including sports, and has over the years undergone considerable refinements with regard to conceptualization and inventories used (Griffith, 1934). Anxiety consists of two subcomponents: Cognitive and somatic anxiety, which influence

performance (Jarvis, 2002; Martens, Vealey and Burton, 1990). The cognitive is the mental component, which is characterized by negative expectations about success or self-evaluation, negative self-talk, worries about performance, images of failure, inability to concentrate, and disrupted attention. Contradictory, the somatic is the physiological element, which is related to autonomic arousals, negative symptoms such as feelings of nervous, high blood pressure, dry throat, muscular tension, rapid heart rate, sweaty palms, and butterflies in your stomach (Jarvis, 2002; Jones, 2000; Martens, Vealey and Burton, 1990).

The level of confidence and that of anxiety are said to be closely related where the word confidence is described as “the inner knowledge that assures, that you can achieve your goal” (Cook, 1992, Orlick, 1990). In its purest form, confidence can be described as the acceptance of your abilities. Bandura (1997) argues that confidence is a non-descript term that refers to the strength of belief but does not necessarily specify what the certainty is about.” Confidence from the various scholars could be seen as possessing an optimistic attitude and the belief that one’s action will have an impact on the outcome of a situation. The modern trends in sports psychology have demonstrated that sportsmen with a high degree of confidence perform better in a variety of sports than those that lack confidence (Sinclair and Vealey, 2001, Mathenson and Mathes, 1991, Martin and Gill, 1991). The higher a sportsmen’s confidence, the less he or she will feel anxious about the competition (and its outcomes) because they know they are ready to take the bull by the horn. Likewise, an over-anxious sportsman exhibits sign of self-doubt. Sportsmen who are made to practice, as also compete, under high anxiety conditions, are better able to manage their anxiety and keep its level optimal, which is conducive to top performance. Several investigations conducted to test the proposed relationships between anxiety, self-confidence, and performance. In one study, Burton (1988) found a positive linear trend between self-confidence and performance. Whereas anxiety, as a negative emotional affects perceptions in sport competitions, where a large majority of sportsmen consider anxiety to be debilitating toward performance, which may result in decreases in performance.

### 1.1. Purpose of the Study

The purpose of the study was as follows:

1. To study the anxiety level among school sports player and school non-sports player.

2. To determine the self-confidence among school sports player and school non-sports player.

## 2. METHODOLOGY

### 2.1. Sample

For the present study, 40 subjects belonging to different schools of Jalna district were selected. Twenty subjects playing various games such as football, archery, and cricket were taken. The age range of the subject was 10–15 years. Purposive non-probability sampling was used.

### 2.2. Hypothesis

1. There will be no significant difference in anxiety among school players and school non-players.
2. School players will have significantly more self-confidence than school non-players.

### 2.3. Tools

#### 2.3.1. SAT

This scale was constructed and standardized by Dr. Quadri Syed Javeed. That test consists of 30 items, each item with “Yes” or “No” alternatives. Reliability of the test was found by test retest method, and it was found to be 0.89 for the anxiety measure. Validity of the test was also validated by correlating the scores obtained on this test with the scores obtained by the subject on Ravikant and Dr. Mishra (2003) Sports Competition Anxiety Inventory. The concurrent validity coefficient obtained is 0.84 which is significant beyond 0.01 levels.

#### 2.3.2. SSCI

This scale was constructed and standardized by Dr. Quadri Syed Javeed. It consists of 30 items, each item with “YES” or “NO” type alternatives. Reliability of the test was found by test retest method, and it was found to be 0.94. Validity of the test was also validated by correlating the scores obtained on this test with the scores obtained by the subject on Dr. Rekha Gupta (Meerut) self-confidence inventory. The concurrent validity coefficient obtained is 0.89 which is significant beyond 0.01 levels.

### 2.4. Procedures of Data Collection

SAT and SSCI administered individuals as well as a small group. While collecting the data for the study, the

latter approach was adopted. The subjects were called in a small group of 5 and their seating arrangement was made in a classroom. Before the administration of test, informed consent was taken. Following the instructions and procedure suggested by the author of the test, the test was administered on all subjects and the whole data were collected.

## 2.5. Variables

### 2.5.1. Independent variable

1. School player
2. School non-player.

### 2.5.2. Dependent variable

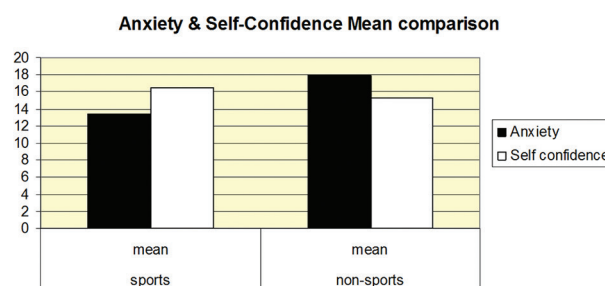
1. Anxiety
2. Self-confidence.

## 3. RESULTS

Mean, SD, and *t*-value of anxiety and self-confidence for school players and non-players are given.

Group	School players		School non-players		DF	T
	Mean	SD	Mean	SD		
Anxiety	13.45	3.95	17.85	3.86	38	3.56**
Self-confidence	16.45	1.99	15.3	3.39	38	1.30

\*\* $P < 0.01$



## 4. CONCLUSION

1. The school non-players are significantly more anxious than school players, thus rejecting the null hypothesis.
2. The self-confidence is higher among school players than non-players. However, the difference is not significant.

## REFERENCES

1. Javeed, Q.S. A study of anxiety and stress among sports persons. *Indian Streams Res J*, 2016, 6(3), 2-11.
2. Mishra, M., Tiwari, S., and Shah, M.M. Comparison of depression, stress and anxiety, between sports person and non-sport persons. *Int J Appl Res*, 2016, 2(6), 210-212.
3. Pradeepkumar, U., and Chandrappa, D. A comparative study on anxiety and aggression among athletes and non-athletes. *Int J Health Phys Educ Comput Sci Sports*, 2(1), 90-7.



# An Analytical Study of Lower Extremity Injuries among Basketball Players of Telangana and Ways of its Prevention

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## ABSTRACT

Basketball is one of the most popular sports in the world. Men and women playing basketball in their everyday life are becoming more prone to injuries. Thus, the objective is to study the characteristics of injuries and its prevention in young basketball players in Telangana. Greater age, height, and weight effect's the most for the occurrence of injuries. The most common injury in basketball occurs mostly in the lower extremities, i.e., knee and ankle injury. Thus, the purpose of this study is to analyze the most common injuries in basketball players and the characteristics associated with that injury and ways of preventing it. Non-contact injuries are more common in basketball as landing injuries, cutting, and stopping injuries, which involve movement with the change of direction and deceleration. The sample for the study consists of 50 male basketball players who played at different national level championships for Telangana between the age group of 18 and 27 years. The data are collected through the questionnaire. The result of the study shows that the most common injuries in the basketball players were in the lower extremities, which are ankle and the knee. About 60% of injuries occurred in the knee, whereas 40% of injuries occurred in the ankle. Thus, it is concluded that proper training and conditioning of the players are very much important to avoid injuries during the practice and competitions. Warming up, stretching is very much important before each session. This study is very much useful for coaches to train the students to develop proper techniques and help players in avoiding injuries.

**Keywords:** Prevention, Risk factors, Sports injuries, Trauma in athletes.

## 1. INTRODUCTION

Basketball is one of the most popular sports in the world. It was first introduced to the world in 1891 by Dr. James Naismith, a physical education teacher using a soccer ball and two peach baskets. Today's high-speed modern basketball fast pace game has opened many opportunities for injuries. Basketball injuries are generally defined as acute/traumatic or overuse injuries. Acute injuries occur due to sudden force, whereas overuse injuries are due to overstraining and more stress on the muscle, soft tissues, and joints. Both types of injuries occur from overuse, lack of proper rest, lack of proper warm-ups or poor conditioning, and poor diet. It is the muscles and joints used while playing basketball is the ones that are most susceptible to injuries.

### 1.1. Common Injuries in Basketball

1. Ankle sprains
2. Knee injuries.

### 1.2. Ankle Sprain

The most common basketball injury is an ankle sprain. This injury often occurs when a player lands on another player's foot or the ankle twists outward. This injury happens when you twist, roll, or turn your ankle in an awkward way. When this happens, the ligaments are stretched or torn and results in pain, swelling and stiffness, and can take days, weeks, or months to heal. The ligaments can tear partially or completely.

### 1.3. Knee Injuries

Knee injuries are the most serious basketball injuries. A knee sprain is a small tear in the ligament. The six most frequently suffered injuries in the knee are patellar tendonitis, knee ligament sprains, anterior cruciate ligament (ACL) tear, posterior cruciate ligament tear, and meniscal tears. If the knee is twisted then the meniscus will tear, which is a tissue that acts as a cushion between femur and the tibia bone. A more severe injury is the complete tear of a ligament. ACL is the most commonly torn ligament in the knee which helps to hold the knee joint together in place. Knee ligament sprains involve stretching and damage to the ligaments of the bones connecting the knee.

### 1.4. Injuries Prevention

The prevention of sports injury is important, as an injury can affect the player both mentally and physically for a shorter or a longer period of time. The need for the study is to find out the prevalence of the sports injury and to create awareness about physiotherapy treatment. Some of the tips to prevent injuries are:

1. Always warm up thoroughly before playing or training.
2. Build core strength.
3. Wear fit ankle length shoes which do not skid.
4. Use a mouth guard, ankle braces, and safety glasses.
5. Warm-up and stretch before each session.
6. Use proper technique and follow the rules.
7. Do not wear jewelry.
8. Play on a clean, dry, and safe surface.
9. If you are injured then take proper rest to heal before you return back to the sport.
10. Hydrate adequately.
11. Maintain proper fitness.
12. After a period of inactivity, start gradually back to full basketball game.
13. Avoid being overstrain and overuse injuries. Listen to your body when you feel the discomfort and pain. Take rest and avoid injuries.
14. Weight training to strengthen your muscles is also important to avoid injury.
15. Cool down after the practice session.
16. Fatigue and overuse of muscles should not be done.
17. Proper conditioning, flexibility, and functional movement training also reduce the risk of injury.
18. Proper nutrition before and during your workout will help you maintain blood sugar levels and keep you adequately hydrated.

### 1.5. Treatment

P.R.I.C.E treatment method:

- P – Protect the injury from further harm using a brace, splint, etc.
- R – Rest the injured area.
- I – Ice the area for 20 min every 2 h.
- C – Compress the swelling using an ACE bandage.
- E – Elevate the injured area above the heart to pull blood flow away from the injured part.

### 1.6. Purpose of the Study

The purpose of the study is to investigate the frequency of lower extremities injuries and the most common injuries among national basketball players of Telangana, activities leading to injury, time and place of injury, and the prevention measures.

### 1.7. Population and Sample Group

The sample of the study consists of 50 male basketball national players of Telangana between the age group of 18 and 27 years who all participated in different national championships.

### 1.8. Research Instrument

All the players were given a questionnaire regarding the injuries that occurred during the practice as well as competitions. All the players do regular practice for at least 3 years. The questionnaire consists of lower extremities injuries.

## 2. RESULTS

The result shows that 60% of injuries occur in the knee whereas 40% of injuries occur in the ankle. The most common injury in the knee is an ACL tear. Moreover, ankle sprains are also common. Thus, it is concluded that athletes must do proper conditioning and exercises to prevent injuries and also if an injury occurs, the PRICE method should be followed to treat the injury. This study helps coaches to train the players to prevent them from injuries.

### 2.1. Injuries in the Lower Extremities

Thus, it is shown that out of 50 players, 30 players had an injury in the knee, and 20 players got the injury in

**Table 1: Injury in the knee and the ankle**

Knee injury	Ankle injury
30 players	20 players

the ankle. Thus, the most common injuries occur in the knee [Table 1].

## 2.2. Recommendations' for Further Research

Consult a Coach or Physical Trainer to incorporate the conditioning program during the practice. Have

a pre-season physical examination and follow your doctor's recommendations.

## REFERENCES

1. Naismith, J. *Inventor of Basketball, History*. United States: Kansas Heritage Group.
2. Miyasaka, K.C., Daniel, D.M., and Stone, M.L. The incidence of knee ligament injuries in the general population. *Am J Knee Surg*, 1991, 4, 3-8.
3. Letha, Y.G. *Prevention of Noncontact ACL Injuries*. Rosemont, Illinois: American Academy of Orthopaedic Surgeons; 2001.

# Players' Feeling about Advancement of Sports Equipment at University Level in Pakistan

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## ABSTRACT

The main purpose behind conducting this research is to find out the players' perception of modern sports equipment. With the help of the literature review, the researchers came to know about the use of modern sports equipment and its importance. A quantitative research was conducted, and the research pattern adopted was survey research. The population of the study was players of different universities. The researcher collected data through a questionnaire based on 20 close-ended questions from 250 players as a sample, out of which 207 were usable in which 132 male and 75 female players were of age above 18 years through simple random sampling technique. For data analysis, Statistical Package for the Social Sciences 22.0 version was used. Individual item analysis (Chi-square test) was used to view the responses against each item of the questionnaire. Demographic factors of student players' regarding age and gender were measured and calculated through ANOVA and *t*-test, respectively, and found no significant difference among male and female (Sig. 0.759) as well as in different age groups (Sig. 0.356). Overall results showed that there are positive results of the use of modern equipment on players' performance. In concern with future recommendations, players should be allowed and facilitated as well as their familiarity with the use of modern sports equipment increased for better outcomes in their sports performance.

**Keywords:** Modernization, Players, Sports equipment, Sports.

## 1. INTRODUCTION

Modernization formerly referred to the disparity and evolution between a "traditional" agricultural culture and the kind of "modern" society that is based on trade and industry (Charlton and Andras, 2005). The modern sport appears to be fundamentally different sports, which is vastly more organized, highly structured, and regulated than in the past and at the highest level become more specialized and modernized (Keys, 2013). Subjective assessment of games hardware ability has been utilized for a long time by makers and players, yet generally few examinations have endeavored to build up a precise way to deal with the estimation of human observations in regard to modernization of games gear (Hocknell *et al.*, 1996), as discernment can be characterized as "our cognizant elucidation of the outside world as made by the mind from an example of nerve driving forces conveyed to it from tactile receptors." Athletic affiliations and organizations contend that they ought to be allowed to guarantee reasonable rivalry and keep up the uprightness of their separate games by managing

hardware (Lazaroff, 1999). On the off chance that hardware turns out to be sophisticated to the point that one cannot sufficiently recognize the relative ability levels of the members in their exhibitions, the very idea of the game is unavoidably modified. Although brandishing experts have an enthusiasm for safeguarding the uprightness of games, not every single mechanical progression has contrarily affected games. Besides, it is hard to observe how to fittingly build up and actualize rules overseeing the utilization of innovation (Floyd, 2002). In this research, researchers tried to get the perception of university student players regarding the use of modern sports equipment at the university level. Hence, the main objective of the study was to take the perception of university sports students regarding the use of modern sports equipment in sports.

## 2. LITERATURE REVIEW

Modernization is a continuous and open-ended process (Hartley and Allison, 2002). Truly, the navigate of time

over which it has happened must be evaluated in many years, regardless of the way that there are instances of revived modernization (Kumar, 1999). In either case, modernization is not for the last time achievement (Kumar, 1999). There is apparently, a dynamic standard consolidated with the very surface of current social requests that does not empower them to settle or to achieve balance. Their headway is continually sporadic and uneven (Giddens, 2013). Whatever the degree of progress, there are continually “in turn around” regions and “periphery” social affairs (Giddens, 2013). This is a vigorous wellspring of strain and hardship in present-day social requests. Such a condition is not restricted to the internal improvement of individual states. It tends to be seen on an overall scale, as modernization expands outward from its novel Western base to take in the whole world. The nearness of unevenly and inconsistent made nations displays a foremost part of feebleness into the world course of action of states (Holton, 2011).

### 2.1. Modernization and Sports

The hierarchical framework of sports was thought to be a hindrance to accomplishing the essential arrangement objectives of first-class achievement and the improvement of chances for youngsters to take an interest in brandish (Houlihan and Green, 2009). There is a requirement for a radical reevaluate of the way we finance and arrange, we offer a modernizing organization with the overseeing assortments of sports (DCMS, 2000). Today, be that as it may, modernization of the area is to a limited extent about the present high political striking nature of sports and physical activity programs and, in that capacity, as Freedon (1999) noted in a related verbal confrontation on the belief system of New Labor, the administration has embraced Etzioni's inclination for guided influence over intimidation (Green and Houlihan, 2006). Modernization of sports therefore fills the double the need of a terrific undertaking of national restoration (a fit, solid, and dynamic populace and the facilitating of the 2012 Olympic Games), and as a purposeful way to deal with enhancing the execution of open administrations through regulatory justification and more prominent coordination and focusing of illuminated targets for conveyance of game projects at grassroots levels (Houlihan and Lindsey, 2012).

### 2.2. Effect of Modernization on Sports

There are no less than two noteworthy and related reasons for modernization. One is the development in science that went along (in Europe) with the Enlightenment (Beck

*et al.*, 2003), the other is the development in accessible innovation. At the point when a nation is pre-present day, its kin for the most part does not have confidence in science. They hold conventional convictions that ordinarily hold that life is influenced by extraordinary powers. They do not trust that life can change in any real ways. In the Enlightenment, individuals came to challenge this thought (Norris and Inglehart, 2011). They came to trust that life is influenced by powers that are justifiable by means of science. When they had this standpoint, they came to trust that life could be progressed. Science could change the way, we live, making us (for instance) less perplexed of infection or other regular catastrophes. Science, obviously, causes individuals to create innovation, innovation drives modernization along, innovation enables ranchers to develop more nourishment, and liberating individuals to go live in urban areas (Landes, 2003). Innovation enables industrial facilities to emerge, therefore giving the new city occupants' employments. Innovation likewise enhances life, giving us activities for stimulation, things that can enhance our well-being, and numerous other helpful advancements (Kranzberg, 1990). These things lead our general public to end up noticeably more modernized. Modernization has its great and terrible focuses. On the incredible side, modernization improves our lives from numerous points of view. It is completely progressively secure to live in a world in which we have masters who can fix defilements and in which women are not obligated to kick the basin in labor. It is increasingly useful to encounter an everyday reality with the end goal that we approach various material products to make our lives progressively pleasant and progressively fun. Modernization also helps people who are abused in customary society. Modernization empowers women to have progressively open entryways (Inglehart, 1997). It liberates abused minority social affairs. In these ways, modernization seems like an uncommonly positive thing. On the other hand, it is possible to battle that modernization has negative effects. One negative effect is on our condition. Modernization brings advancement that eats up essentialness and prompts such things as air sullyng and natural change. Another negative effect is (apparently) on our overall population (Barnett, 2003). Modernization isolates the social ties that bound people together in standard social requests. It makes it with the objective that people never again feel as related with one another. This can provoke such issues as bad behavior and the detachment of family social events. Thusly, modernization has clear causes and it has impacts that can make certain and negative (Palmore, 1999).



### 2.3. Types of Modern Technologies in Sports

Technology is altering the expression of modern sports, sports psychology, and coaching (Johns and Johns, 2000). Condition of heart innovations are used to increase execution in games as multidirectional as cycling, speed-skating, swimming, golf, skiing, surfing, football/soccer ball, tennis racket and ball, running, offices, and some more. Innovation in-game today is found in innumerable structures with every advancement that has conceivably hopeful and profitable results (Cashmore, 2000). Understanding the ramifications of game advancements includes essential typology utilized in arranging; these are done in six sorts of game advances; however, not commonly restricted, sometimes the same advances could fit into various classifications (Chelladurai and Kerwin, 2017). The classes included self-advancements, rehabilitative advances, scene advances, development innovations, execute advances, and database advances (OMOREGIE). While a portion of the advances is yet to establish a connection on the game, comprehension of numerous kinds of game innovations helps to acquire a superior perspective on which mechanical choices of competitors at last approach and effect on game achievements.

#### 2.3.1. Self-technologies

This speaks to the most clear and circulating for some; individuals type of innovation because of the capability of on a very basic level and frequently forever changes a competitor's physical or mental being/makeup. Self-advancements include different sorts of athletic developments, of which are additionally dubious (Tuschling and Engemann, 2006).

Others incorporate surgical techniques, prosthetic/bionic appendages, wear mental mediations, and hereditary building are altogether named self-advancements. The nearness of certain self-advances in sports might be viewed as future, for example, while gear, for example, a prosthesis or a wheelchair are key for a few people with an inability to do their everyday living (Haisma *et al.*, 2006; Pasquina *et al.*, 2006), propels in this innovation, for example, a vitality putting away prosthetic foot, make a lower appendage amputee's walk quicker, and more proficient (Brodtkorb *et al.*, 2008).

#### 2.3.2. Landscape technologies

This type of innovation includes the donning situations which incorporate the manner in which observers watch sports occasions. Noticeable scene innovation is the development of present-day multipurpose game

structures, complete with JumboTron screen retractable curves, taking off cameras, monodot tracks, and phony grass. Bates (1996) fights that innovatively propelled contenders have a comfortable relationship with the mechanical shaking scenes. Olympic style sports contenders use new systems since they can screen their opponents on the JumboTrons sliding the last leg. The cutting edge arena is captivating in routinely attempt to copy nature of other standard style arenas. Sports and exercise science, as most areas of life, has been impacted uncommonly by mechanical advances (Wintler, 1996).

#### 2.3.3. Implement technologies

It joins gear that contenders use or that they kick, toss, or by and large prompt (Butryn, 2003). Various cases fuse football/soccer head defenders outfitted with notice contraptions and radios; shark suits that empower swimmers to move capably slice through the water and imaginative running shoes, golf clubs, and tennis rackets. The intriguing discussion, including these sorts of advancements, is the utilization of fish-discovering PCs in-game angling. This development uses devices (pedometer or alter board), media (video, sound, or both), and social correspondence (playing with another person) to incite individuals to grasp the lead without their truly knowing it (Romero *et al.*, 2010).

#### 2.3.4. Rehabilitative technologies

These are substances and techniques used to get moderate extreme wounds to make up rehabilitative advancements (Heinemann *et al.*, 1991). They likewise incorporate drugs utilized by sound competitors who simply need to counter the generally debilitative impacts of their preparation regimens. Normally, these advances are situated in games centers and preparing offices and are controlled by authorities in athletic preparing or sports medication. Rehabilitative advancements incorporate any sort of mitigating concoction, for example, acetylsalicylic corrosive.

While not innovative in the typical sense, systems, for example, needle therapy and chiroprate alterations are additionally utilized, notwithstanding mechanical and automated treatment (OMOREGIE). Recovery innovations may likewise be seen as execution upgrading on the grounds that they enable competitors to prepare and contend at a level they generally proved unable (Howe, 2011).

#### 2.3.5. Movement technologies

It alludes to those gadgets and methodologies that are intended to survey the structure and proficiency of

a competitor's body. The most widely recognized of such incorporate tape investigation, in spite of the fact that there are significantly more modern instruments that give itemized modernized data on a competitor's biomechanics (Butryn, 2003). On like the other type of innovation, development advancements are frequently not unmistakable inside the aggressive fields.

### 2.3.6. Database technologies

It incorporates PC improvement that empowers contenders and tutors to know everything they need to consider their enemies and themselves (Sève *et al.*, 2006). Database undertakings have tremendously affected the way that various and most master guides and players do their business. Instructive investigation movements (a Nike GPS sports watch; a Polar heartbeat screen) engage solitary contenders to firmly screen their headway on essential physiological and execution parameters (OMOREGIE). Notwithstanding when not preparing for an Olympic gold medal, innovation in technology can play a constructive and supporting part, helping individuals to get spurred in holding fast to a solid exercise schedule, or in restoring after damage. Aggressive level of present-day sports, particularly abnormal state of sports performance has been near the cutoff points of characteristic states of humankind, utilizing the normal favorable circumstances, unique preparing strategies, and to constrain the development of individuals, has for some time been a fantasy (Stambulova *et al.*, 2012).

The substantial number of computer innovation, natural building, new materials and energy utilization technology, data technology, and hypothesis of present-day science and innovation have been generally utilized; as a part of sports fields, making of sports program and sports preparation environment enormously changed and enhanced, training program updated, sites of sports training updated, extraordinarily enhanced the level of focused sports, the extensive variety of capacities, and impacts of sports consequently have been completely displayed (Roco and Bainbridge, 2002).

### 2.4. Sports Equipment Modernization

The game present reality is getting innovative by joining characteristic athletic ability with cutting edge examination and counterfeit wise to create the most ideal results on the playing field of games (Miller *et al.*, 2001). Game energizes individuals as a triumph of human exertion, expressing that off camera is various things that go into that triumph and at the top

is innovation. Mechanical headway has been utilized in wear for quite a while in various structures and expects particularly fundamental parts, especially for the world-class sports. Different undertakings to describe advancement have yielded such an assortment of depictions, to the point that one may give up to the likelihood that development is basically not quantifiable (Kremer and Moran, 2012). From one perspective, it is synonymous with science and practical thought, including every single gadget anytime held in hands. A couple of investigators express that advancement expects an extending part in helping capable contenders, fledgling sprinters, and armchair fans to partake in the games (Shank and Lyberger, 2014). Development is depicted as any significant, connected, or procedural segment of the current game, and exercise science went for development (Miah, 2004). The versatile definition licenses everything from degrees of progress in running shoes and eyewear to different outlooks about the body as imaginative. In the simple age, the utilization of headways in wear was vivaciously centered around contender testing (diagnostics), improved games gear through better building and diagram, and utilized more at contentions. Along these lines, early instances of game advances were neck and neck complete, physiological testing equipment, the minute replay screen, and first usage of electronic arranging contact pads for swimming (OMOREGIE). Without a doubt, advancement has a basic effect in present-day wear, with it being a fundamental bit of a couple of games (e.g., motorsport), and used as a piece of others to improve execution. The topical usages of advancement join, sports garbs; clothing and wearable's; workplaces; contention intervention and courses of action; media broadcasting and exchanges; and execution assessment (Wells, 2014). Subsequently, innovation and game have had something of rough relationship throughout the years (Bass and Eynon, 2009). Turner (2013) opined that to start with games and innovation did not generally appear the most matching. Thinking about the idea of game and hardware used to play and with a late union of advancements, numerous capacities are combined into one little gadget. Innovation progressively is assuming the main job in the advancement of the game and improves execution in all countenances. In this way, uses of innovation take into consideration increasingly powerful preparing, incitements, the executives and following of competitors, exactness of results, improved onlooker seeing, creating execution, and avoiding wounds, among a lot more capacities (Busch, 1998). Innovation in games is a specialized method by which competitors endeavor to improve their preparation and

focused surroundings so as to upgrade their generally athletic presentation (Johns and Johns, 2000). It is thought of as a specialized method or instrument used to seek after picked closes. Henceforth, the paper explores the effect of innovation on game execution.

### 3. RESEARCH METHODOLOGY

The research methodology is the pattern to select population, select sample, collect data, analyze it and develop inference, and in this research, all results obtained through an analysis were in numeric form, and research which has numeric results is said to be quantitative research. As the research population is said to be a large community of homogenous characters and appropriate according to the objectives of the study, the population of this study were the students (male and female) of different government and nongovernment/private universities sited in Lahore. In the language of research, sample is said to be the small portion of the population which is said to be the true representation of the whole population for the generalizability or practical implication of research and the sample for this study were male and female student players of eight nongovernmental/private and governmental/public sector with the isolation of each sector sited in Lahore. The data collection tool used in this research was close-ended questionnaire containing 20 items. Likert type scale was used to rank each item of the questionnaire, which is comprised 5 limit/checks as (Strongly disagree to strongly agree). The total sample size was 207 male and female students of selected eight universities. Statistical Package for the Social Sciences 20.0 was used to analyze data and the statistical test used to analyze data was Chi-square test for individual item analysis and ANOVA for comparison of the mean of three different age groups which were as 18–21 years, 22–25 years, and 26 years and above.

Table 1 shows that there was no statistically difference between the groups as  $P = 0.356$ , which is  $>0.05$ , which means that there is no significant difference regarding different statement/perceptions related to this topic in different age groups.

Table 2 shows the response rate regarding the statement “In my opinion, my performance enhanced with the use of modern sports equipment that 109 students response was strongly agreed (SA), 63 agreed (A), 12 was undecided (UD), 13 disagreed (DA), and 10 students response was strongly disagree (SD) about this statement.” “In my opinion, my performance

enhanced with the use of modern sports equipment.” Table 2 shows that Chi-square value is 185.826 whereas significance, i.e.,  $P = 0.00$ , which is smaller than 0.05, which expresses that there is the notable difference among the sample population concerned to statement “In my opinion, my performance enhanced with the use of modern sports equipment.” The overall result shows that the performance of players enhanced with the use of modern sports equipment.

Table 3 shows the response rate that 72 students response was SA, 75 was A, 27 was UD, 20 was D, and 13 students response was strongly SD about this statement “In my opinion, modern sports equipment is not available to university players.” Table 3 shows that

**Table 1: Results and data analysis**

	Sum of square	DF	Means square	F	Sig.
Mean					
Between Groups	0.739	1	0.387	1.345	0.356
Within groups	64.848	206	0.328		
Total	65.467	207			

Where  $\alpha=0.05$ , DF: Degree of freedom, F: Frequency, Sig.: Significance

**Table 2: Chi-square value of player's perception about the statement “In my opinion, my performance enhanced with the use of modern sports equipment”**

Statement 1	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
In my opinion, my performance enhanced with the use of modern sports equipment	10	13	12	63	109	185.826	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

**Table 3: Chi-square value of player's perception about statement “In my opinion, modern sports equipment is not available to university players”**

Statement 2	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
In my opinion, modern sports equipment is not available to university players	13	20	27	75	72	85.440	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

the Chi-square value is 85.440 whereas significance, i.e.,  $P = 0.00$  which is smaller than 0.05 which express that there is a notable difference among the sample population concerned to statement "In my opinion, modern sports equipment is not available to university players." Overall result shows that modern sports equipment is not available to university players.

Table 4 shows the response rate that 56 students response was SA, 86 was A, 30 was UD, 24 was D, and 11 students response was strongly SD about this statement "In my opinion, university provides modern sports equipment to players for preparation of competition." Table 4 shows that Chi-square value is 85.971 whereas significance, i.e.,  $P = 0.00$  which is smaller than 0.05 which express that there is notable difference among the sample population concerned to statement "In my opinion, university provides modern sports equipment to players for preparation of competition." Overall result shows that the university provides modern sports equipment to players for the preparation of competition.

Table 5 the response rate that 76 students response was SA, 92 was A, 24 was UD, 8 was DA, and 7 students response was strongly SD about this statement "In my opinion, due to modern sports equipment, enjoyment and interest in sports enhanced among university students/players." Table 5 shows that Chi-square value is 153.604 whereas significance, i.e.,  $P = 0.00$  which is smaller than 0.05 which express that there is notable difference among the sample population concerned to statement "In my opinion, due to modern sports equipment, enjoyment and interest in sports enhanced among university students/players." The overall result shows that due to modern sports equipment, enjoyment, and interest in sports enhanced among university students/players.

Table 6 shows the response rate that 76 students response was SA, 85 was A, 25 was UD, 16 was D, and 5 students response was SD about this statement "I feel progressive improvement in my sports performance due to use of modern sports equipment." Table 6 shows that the Chi-square value is 128.918 whereas significance, i.e.,  $P = 0.00$  which is smaller than 0.05 which express that there is the notable difference among the sample population concerned to statement "I feel progressive improvement in my sports performance due to use of modern sports equipment." The overall result shows that there is a progressive improvement in sports performance due to the use of modern sports equipment.

Table 7 shows the response rate that 66 students response was SA, 82 was A, 37 was UD, 14 was D, and 8 students

**Table 4:** Chi-square value of player's perception about the statement "In my opinion, university provides modern sports equipment to players for preparation of competition"

Statement 3	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
In my opinion, university provides modern sports equipment to players for preparation of competition	11	24	30	86	56	85.971	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

**Table 5:** Chi-square value of player's perception about the statement "In my opinion, due to modern sports equipment, enjoyment and interest in sports enhanced among university students/players"

Statement 4	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
In my opinion, due to modern sports equipment, enjoyment and interest in sports enhanced among university students/players	7	8	24	92	76	153.604	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

**Table 6:** Chi-square value of player's perception about the statement "I feel progressive improvement in my sports performance due to use of modern sports equipment"

Statement 5	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
I feel progressive improvement in my sports performance due to use of modern sports equipment	5	16	25	85	76	128.918	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

response was SD about this statement "In my opinion, difficult/complex sports skills can easily learned by the use of modern sports equipment." Table 7 shows that Chi-square value is 99.981 whereas significance, i.e.,  $P = 0.00$  which is smaller than 0.05 which express



that there is a notable difference among the sample population concerned to statement “In my opinion, difficult/complex sports skills can easily learned by the use of modern sports equipment. The overall result shows that difficult/complex sports skills can be easily learned by the use of modern sports equipment.

Table 8 shows the response rate that 57 students response was SA, 63 was A, 51 was UD, 26 was D, and 10 students response was SD about this statement “In my opinion, university coaches know very well about use of modern sports equipment.” Table 8 shows that the Chi-square value is 48.918 whereas significance, i.e.,  $P = 0.00$  which is smaller than 0.05 which express that there is notable difference among the sample population concerned to statement “In my opinion, university coaches know very well about use of modern sports equipment.” The overall result shows that university coaches know very well about the use of modern sports equipment.

Table 9 shows the response rate that 56 students response was SA, 74 was A, 42 was UD, 21 was D,

**Table 7:** Chi-square value of player’s perception about the statement “In my opinion, difficult/complex sports skills can easily learned by the use of modern sports equipment”

Statement 6	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
In my opinion, difficult/complex sports skills can easily learned by the use of modern sports equipment	8	14	37	82	66	99.981	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

**Table 8:** Chi-square value of player’s perception about the statement “In my opinion, university coaches know very well about the use of modern sports equipment”

Statement 7	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
In my opinion, university coaches know very well about the use of modern sports equipment	10	26	51	63	57	48.918	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

and 12 students response was SD about this statement “In my opinion, with the modernization of sports equipment, sports become more expensive for players.” Table 9 shows that Chi-square value is 63.266 whereas significance, i.e.,  $P = 0.00$  which is smaller than 0.05 which express that there is notable difference among the sample population concerned to statement “In my opinion, with the Modernization of sports equipment, sports become more expensive for players.” The overall result shows that with the modernization of sports equipment, sports become more expensive for players.

Table 10 shows the response rate that 49 students response was SA, 91 was A, 41 was UD, 17 was D, and 9 students response was SD about this statement “In my opinion, it is important that the modern sports equipment is used according to given SOP’s for effective and better outcome.” Table 10 shows that the Chi-square value is 100.560 whereas significance, i.e.,  $P = 0.00$  which is smaller than 0.05 which express that there is notable

**Table 9:** Chi-square value of player’s perception about the statement “In my opinion, with the modernization of sports equipment, sports become more expensive for players”

Statement 8	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
In my opinion, with the modernization of sports equipment, sports become more expensive for players	12	21	42	74	56	63.266	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

**Table 10:** Chi-square value of player’s perception about the statement “In my opinion, it is important that the modern sports equipment is used according to given SOP’s for effective and better outcome”

Statement 9	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
In my opinion, it is important that the modern sports equipment is used according to given SOP’s for effective and better outcome	9	17	41	91	49	100.560	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree



difference among the sample population concerned to statement “In my opinion, it is important that the modern sports equipment is used according to given SOP’s for effective and better outcome.” The overall result shows that modern sports equipment is used according to given SOP’s for effective and better outcome.

Table 11 shows the response rate that 72 students response was SA, 63 was A, 38 was UD, 27 was D, and 7 students response was SD about this statement “In my opinion, special players get more help with modernization of equipment for better outcomes.” Table 11 shows that the Chi-square value is 67.758 whereas significance, i.e.,  $P = 0.00$  which is smaller than 0.05 which express that there is notable difference among the sample population concerned to statement “In my opinion, special players get more help with the modernization of equipment for better outcomes.” The overall result shows that special players get more help with modernization of sports equipment for better outcomes.

Table 12 shows the response rate that 63 students response was SA, 75 was A, 36 was UD, 20 was D, and 13 students response was SD about this statement “In my opinion, use of modern sports equipment minimizes the injury rate of players.” Table 12 shows that the Chi-square value is 69.787 whereas significance, i.e.,  $P = 0.00$  which is smaller than 0.05 which express that there is a notable difference among the sample population concerned to statement “In my opinion, use of modern sports equipment minimizes the injury rate of players.” The overall result shows that the use of modern sports equipment minimizes the injury rate of players.

Table 13 shows the response rate that 60 students response was SA, 68 was A, 42 was UD, 27 was D, and 13 students response was SD about this statement “In my opinion, university players get less benefit by the use of modern equipment in comparison to professional players.” Table 13 shows that Chi-square value is 52.251 whereas significance, i.e.,  $P = 0.00$  which is smaller than 0.05 which express that there is notable difference among the sample population concerned to statement “In my opinion, university players get less benefit by the use of modern equipment in comparison to professional players.” The overall result shows that university players get less benefit by the use of modern equipment in comparison to professional players.

Table 14 shows the response rate that 63 students response was SA, 100 was A, 26 was UD, 15 was D, and 3 students response was SD about this statement “I feel

**Table 11:** Chi-square value of player’s perception about the statement “In my opinion, special players get more help with modernization of equipment for better outcomes”

Statement 10	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
In my opinion, special players get more help with modernization of equipment for better outcomes	7	27	38	63	72	67.758	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

**Table 12:** Chi-square value of player’s perception about the statement “In my opinion, use of modern sports equipment minimizes the injury rate of players”

Statement 11	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
In my opinion, use of modern sports equipment minimizes the injury rate of players	13	20	36	75	63	69.787	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

**Table 13:** Chi-square value of player’s perception about the statement “In my opinion, university players get less benefit by the use of modern equipment in comparison to professional players”

Statement 12	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
In my opinion, university players get less benefit by the use of modern equipment in comparison to professional players	13	27	42	68	60	52.251	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

myself psychologically stronger due to use of modern sports equipment.” Table 14 shows that the Chi-square value is 152.396 whereas significance, i.e.,  $P = 0.00$  which is smaller than 0.05 which express that there is a notable difference among the sample population

concerned to statement “I feel myself psychologically stronger due to use of modern sports equipment.” The overall result shows that students/players feel there selves psychologically stronger due to the use of modern sports equipment.

Table 15 shows the response rate that 59 students response was SA, 89 was A, 41 was UD, 16 was D, and 2 students response were SD about this statement “In my opinion, modernization of sports equipment reduced use of human resources in sports activities.” Table 15 shows that the Chi-square value is 115.295 whereas significance, i.e.,  $P = 0.00$  which is smaller than 0.05 which express that there is notable difference among the sample population concerned to statement “In my opinion, modernization of sports equipment reduced use of human resources in sports activities.” The overall result shows that the modernization of sports equipment reduced the use of human resources in sports activities.

Table 16 shows the response rate that 58 students response was SA, 98 was A, 26 was UD, 19 was D, and 6 students response was SD about this statement “In my

**Table 14:** Chi-square value of player’s perception about the statement “I feel myself psychologically stronger due to use of modern sports equipment”

Statement 13	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
I feel myself psychologically stronger due to use of modern sports equipment	3	15	26	100	63	152.396	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

**Table 15:** Chi-square value of player’s perception about the statement “In my opinion, modernization of sports equipment reduced use of human resources in sports activities”

Statement 14	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
In my opinion, modernization of sports equipment reduced the use of human resources in sports activities	2	16	41	89	59	115.295	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

opinion, modern sports equipment help to attain health-related and skill-related fitness in short period of time.” Table 16 shows that Chi-square value is 132.155 whereas significance, i.e.,  $P = 0.00$  which is smaller than 0.05 which express that there is notable difference among the sample population concerned to statement “In my opinion, modern sports equipment help to attain health-related and skill-related fitness in short period of time.” Overall result shows that modern sports equipment help to attain health-related and skill-related fitness in a short period of time.

Table 17 shows the response rate that 60 students response was SA, 80 was A, 37 was UD, 24 was D, and 6 students response was SD about this statement “In my opinion, use of modern prosthetic devices help in rehabilitation of injury.” Table 17 shows that that Chi-square value is 82.396 whereas significance, i.e.,  $P = 0.00$  which is smaller than 0.05 which expresses that there is notable difference among the sample population concerned to statement “In my opinion, use of modern prosthetic devices help in rehabilitation of injury.” The overall

**Table 16:** Chi-square value of player’s perception about the statement “In my opinion, modern sports equipment help to attain health-related and skill-related fitness in short period of time”

Statement 15	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
In my opinion, modern sports equipment help to attain health-related and skill-related fitness in short period of time	6	19	26	98	58	132.155	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

**Table 17:** Chi-square value of player’s perception about the statement “In my opinion, use of modern prosthetic devices help in rehabilitation of injury”

Statement 16	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
In my opinion, use of modern prosthetic devices help in rehabilitation of injury	6	24	37	80	60	82.396	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

result shows that the use of modern prosthetic devices helps in rehabilitation of injury.

Table 18 shows the response rate that 66 students response was SA, 81 was A, 40 was UD, 17 was D, and 3 students response was SD about this statement “In my opinion, results of competitions are more clear and without ambiguity due to use of modern sports equipment.” Table 18 shows that the Chi-square value is 102.541 whereas significance, i.e.,  $P = 0.00$  which is smaller than .05 which express that there is notable difference among the sample population concerned to statement “In my opinion, results of competitions are more clear and without ambiguity due to use of modern sports equipment.” The overall result shows that results of competitions are more clearly and without ambiguity due to the use of modern sports equipment.

Table 19 shows the response rate that 65 students response was SA, 73 was A, 47 was UD, 14 was D, and 8 students response was SD about this statement “In my opinion, technical faults of sports skills can be easily eradicated by the use of modern sports equipment.” Table 19 shows that Chi-square value is 83.411 whereas significance, i.e.,  $P = 0.00$  which is smaller than 0.05 which express that there is notable difference among the sample population concerned to statement “In my opinion, technical faults of sports skills can be easily eradicated by the use of modern sports equipment.” The overall result shows that technical faults of sports skills can be easily eradicated by the use of modern sports equipment.

Table 20 shows the response rate that 48 students response was SA, 83 was A, 47 was UD, 20 was D, and 9 students response were SD about this statement “In my opinion, inappropriate use of modern sports equipment can cause injury.” Table 20 shows that the Chi-square value is 80.029 whereas significance, i.e.,  $P = 0.00$  which is smaller than .05 which express that there is notable difference among the sample population concerned to statement “In my opinion, inappropriate use of modern sports equipment can cause injury.” The overall result shows that inappropriate use of modern sports equipment can cause injury.

Table 21 shows the response rate that 58 students response was SA, 86 was A, 22 was UD, 30 was D, and 11 students response was SD about this statement “In my opinion, use of modern equipment, put the players away from learning of basic skills.” Table 21 shows that Chi-square

**Table 18:** Chi-square value of player’s perception about the statement “In my opinion, results of competitions are more clear and without ambiguity due to use of modern sports equipment”

Statement 17	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
In my opinion, results of competitions are more clear and without ambiguity due to use of modern sports equipment	3	17	40	81	66	102.541	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

**Table 19:** Chi-square value of player’s perception about the statement “In my opinion, technical faults of sports skills can be easily eradicated by the use of modern sports equipment”

Statement 18	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
In my opinion, technical faults of sports skills can be easily eradicated by the use of modern sports equipment	8	14	47	73	65	83.411	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

**Table 20:** Chi-square value of player’s perception about statement “In my opinion, inappropriate use of modern sports equipment can cause injury”

Statement 19	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
In my opinion, inappropriate use of modern sports equipment can cause injury	9	20	47	83	48	80.029	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

value is 89.256 whereas significance, i.e.,  $P = 0.00$  which is smaller than .05 which express that there is notable difference among the sample population concerned to statement “In my opinion, use of modern equipment, put the players away from learning of basic skills.” The overall result shows that the use of modern equipment put the players away from learning of basic skills.

**Table 21:** Chi-square value of player's perception about the statement "In my opinion, use of modern equipment, put the players away from learning of basic skills"

Statement 20	Observed					Chi-square	Sig.
	SD	D	UD	A	SA		
In my opinion, use of modern equipment, put the players away from learning of basic skills	11	30	22	86	58	89.256	0.000

Where  $\alpha=0.05$ , SD: Strongly disagree, D: Disagree, UD: Undecided, A: Agree, SA: Strongly agree

#### 4. CONCLUSION

After going through the whole research, the researchers have reached the following conclusion that the data have empirically proved in support of that there is the positive role of modern sports equipment to enhanced sports performance of players. The fact is players who use modern sports equipment in their sports activities, have higher self-esteem (sig. 0.000), better sports skills (sig. 0.000), better performance (sig. 0.000), motivation (sig. 0.000), confidence (sig. 0.000), and they can easily achieve success and better performance level (sig. 0.000). All modern sports equipment helps to perform well without injuries. Hence, through this research, it is concluded that players perception of sports equipment is positive with reference to their good performance outcome in their sports activities. Modern sports equipment is good in the development of the sports field.

#### 5. RECOMMENDATIONS

This research opened the thought process about the use of modern sports equipment so followings are few future recommendations regarding the use of modern sports equipment;

- The coach must have good working knowledge about the use of modern sports equipment.
- The coach must train athletes as per available technologically modern facilities enabling them to perform well in their sports career.
- Further studies should be undertaken for taking the authentic opinions of sports players regarding the use of modern technologies of their choice to enhance their performance. Applied research is an essential aspect of research in sport. Coaches and athletes are encouraged about the findings of such

research as it gives them a scientific assessment of a real-life situation regarding the use of modern technologies in their sporting career.

#### REFERENCES

- Barnett, J. Security and climate change. *Glob Environ Change*, 2003, 13(1), 7-17.
- Bass, R., and Eynon, B. *Capturing the Visible Evidence of Invisible Learning*. New York: Academic Commons; 2009. p. 1-30.
- Beck, U., Bonss, W., and Lau, C. The theory of reflexive modernization: Problematic, hypotheses and research programme. *Theory Cult Soc*, 2003, 20(2), 1-33.
- Busch, A. *Design for Sports: the Cult of Performance*. United States: Princeton Architectural Press; 1998.
- Butryn, T.M. Posthuman podiums: Cyborg narratives of elite track and field athletes. *Sociol Sport J*, 2003, 20(1), 17-39.
- Cashmore, E. *Making Sense of Sports*. USA: Routledge; 2010.
- Charlton, B.G., and Andras, P. Modernizing UK health services: "Short-sharp-shock" reform, the NHS subsistence economy, and the spectre of health care famine. *J Eval Clin Pract*, 2005, 11(2), 111-119.
- Chelladurai, P., and Kerwin, S. *Human Resource Management in Sport and Recreation*. Champaign, IL: Human Kinetics; 2017.
- Floyd, E.E. The modern athlete: Natural athletic ability or technology at its best. *Villanova Sports Ent LJ*, 2002, 9, 155.
- Giddens, A. *The Consequences of Modernity*. United States: John Wiley and Sons; 2013.
- Green, M., and Houlihan, B. Governmentality, modernization, and the "disciplining" of national sporting organizations: Athletics in Australia and the United Kingdom. *Sociol Sport J*, 2006, 23(1), 47-71.
- Hartley, J., and Allison, M. Good, better, best? Inter-organizational learning in a network of local authorities. *Public Manage Rev*, 2002, 4(1), 101-118.
- Heinemann, A.W., Doll, M.D., Armstrong, K.J., Schnoll, S., and Yarkony, G.M. Substance use and receipt of treatment by persons with long-term spinal cord injuries. *Arch Phys Med Rehabil*, 1991, 72(7), 482-487.
- Hocknell, A., Jones, R., and Rothberg, S.J. Engineering "feel" in the design of golf clubs. *Eng Sport*, 1996, 333-337.
- Holton, R.J. *Globalization and the Nation State*. United Kingdom: Palgrave Macmillan; 2011.
- Houlihan, B., and Green, M. Modernization and sport: The reform of sport England and UK sport. *Public Adm*, 2009, 87(3), 678-698.
- Houlihan, B., and Lindsey, I. *Sport Policy in Britain*. Vol. 18. United Kingdom: Routledge; 2012.
- Howe, P.D. Cyborg and supercrip: The paralympics technology and the (dis) empowerment of disabled athletes. *Sociology*, 2011, 45(5), 868-882.
- Inglehart, R. *Modernization and postmodernization: Cultural, Economic, and Political Change in 43 Societies*. New Jersey: Princeton University Press; 1997.



- Johns, D.P., and Johns, J.S. Surveillance, subjectivism and technologies of power: An analysis of the discursive practice of high-performance sport. *Int Rev Sociol Sport*, 2000, 35(2), 219-234.
- Keys, B.J. *Globalizing Sport*. Vol. 152. United States: Harvard University Press; 2013.
- Kranzberg, M. The uses of history in studies of science, technology and society. *Bull Sci Technol Soc*, 1990, 10(1), 6-11.
- Kumar, K. Modernization and industrialization. In: *Modernity, Critical Concepts*. Vol. 1. London: Routledge; 1999. p. 72-104.
- Landes, D.S. *The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present*. United Kingdom: Cambridge University Press; 2003.
- Lazaroff, D.E. Sports equipment standardization: An antitrust analysis. *Ga L Rev*, 1999, 34, 137.
- Miah, A. *Genetically Modified Athletes: Biomedical Ethics, Gene Doping and Sport*. United Kingdom: Routledge; 2004.
- Norris, P., and Inglehart, R. *Sacred and Secular: Religion and Politics Worldwide*. United Kingdom: Cambridge University Press; 2011.
- Omoriegie, P.O. *The Impact of Technology on Sport Performance*. Accra, Ghana: Proceedings of INCEDI 2016 Conference.
- Palmore, E. *Ageism: Negative and Positive*. Washington, DC: Springer Publishing Company; 1999.
- Roco, M.C., and Bainbridge, W.S. Converging technologies for improving human performance: Integrating from the nanoscale. *J Nanopart Res*, 2002, 4(4), 281-295.
- Romero, N., Sturm, J., Bekker, T., De Valk, L., and Kruitwagen, S. Playful persuasion to support older adults' social and physical activities. *Interact Comput*, 2010, 22(6), 485-495.
- Sève, C., Poizat, G., Saury, J., and Durand, M. A grounded theory of elite male table tennis players' activity during matches. *Sport Psychol*, 2006, 20(1), 58-73.
- Stambulova, N., Stambulov, A., and Johnson, U. Believe in yourself, channel energy, and play your Trumps: Olympic preparation in complex coordination sports. *Psychol Sport Exerc*, 2012, 13(5), 679-686.
- Turner, G.M. The limits to growth model is more than a mathematical exercise. *GAIA-Ecol Perspect Sci Soc*, 2013, 22(1), 18-19.
- Wells, P. Animation, sport and technology. In: *Animation, Sport and Culture*. London: Palgrave Macmillan; 2014. p. 177-201.



# Effects of *Moringa oleifera* with Anuloma Viloma Practice on T4, Thyroid-Stimulating Hormone, Iron, and Testosterone among College Men Athlete

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## ABSTRACT

The purpose of the study was to investigate the “Effects of *Moringa oleifera* with Anuloma Viloma Practice on T4, thyroid-stimulating hormone (TSH), Iron, and Testosterone among College Men Athlete.” *M. oleifera*: Many studies show that *M. oleifera* may lead to modest reductions in blood sugar and cholesterol. It may also have antioxidant and anti-inflammatory effects and protect against arsenic toxicity. Moringa leaves are also highly nutritious and should be beneficial for people who are lacking in essential nutrients. Selection of variables: The following variables were selected for this study. (I) Dependent variables: T4, TSH, iron, and testosterone. (II) Independent variables: (1) *M. oleifera*, (2) *M. oleifera* with Anuloma Viloma Practice, and (3) control group. Experimental design: The subjects were selected for this study through the random group design consisting of pre- and post-test, 45 college men athletes randomly divided into three groups, the group was assigned as an experimental group and control group. The groups are (1) *Moringa* Anuloma Viloma practice, (2) *oleifera* with Anuloma Viloma practice, and (3) control group. Training schedules and supplementation: During the training period, the experimental group underwent their walking program period of 8 weeks for all days with *M. oleifera*. The experimental group underwent walking for 45 min of duration in evening hours between 4:30 pm and 5:30 pm for 7 days per week. Statistical technique: Analysis of covariance statistical technique was used to test the significant difference among the treatment groups. If the adjusted post-test results were significant, the Scheffe’s *post hoc* test was used to determine the paired mean significant difference. thirumalaisamy (2004). After incorporate statistical technique, it was found that a significant decrease T4, TSH, iron, and testosterone in the experimental group I (*M. oleifera* with Anuloma Viloma practice) and also found that high-density lipoprotein and testosterone significantly increase due to 8 weeks of *M. oleifera* with Anuloma Viloma practice than that of *M. oleifera* group.

## 1. INTRODUCTION

### 1.1. *Moringa Oleifera*

Many studies show that *M. oleifera* may lead to modest reductions in blood sugar and cholesterol. It may also have antioxidant and anti-inflammatory effects and protect against arsenic toxicity. Moringa leaves are also highly nutritious and should be beneficial for people who are lacking in essential nutrients. Boost testosterone: One of the biggest marketing claims made by the manufacturers of *Moringa* supplements is its ability to increase testosterone levels, boost erections and enhance sexual performance. Essentially that it is an aphrodisiac.

### 1.2. Statement of the Problem

The purpose of the study was to investigate the “Effects of *M. oleifera* with Anuloma Viloma Practice on

Selected T4, Iron, and Testosterone among College Men Athlete.”

### 1.3. Selection of Variables

The following variables were selected for this study: (I) Dependent variables: (1) T4, (2) thyroid-stimulating hormone (TSH), (3) iron, and (4) testosterone and (II) independent variables: (1) *M. oleifera* with Anuloma Viloma practice, (2) *M. oleifera*, and (3) control group.

## 2. EXPERIMENTAL DESIGN

The subjects were selected for this study through the random group design consisting of pre- and post-test, 45 college men athletes randomly divided into three groups, the group was assigned as an experimental group and control group. The groups are (1) *M. oleifera*

with Anuloma Viloma practice, (2) *M. oleifera*, and (3) control group.

### 3. TRAINING SCHEDULES

During the training period, the experimental group underwent their walking program period of 8 weeks for all days with *M. oleifera*.

#### 3.1. Statistical Technique

Analysis of covariance statistical technique was used to test the significant difference among the treatment groups (thirumalaisamy, 2004).

#### 3.2. Computation of Analysis of Covariance

Tables 1-4 illustrate the statistical results of the EFFECTS of *M. oleifera* with Anuloma Viloma practice on T4 among college men athlete and ordered adjusted means and the difference between the means of the groups under study.

### 4. DISCUSSION AND FINDINGS OF T4

This result indicated that the effect of *M. oleifera* with Anuloma Viloma practice and aerobic training had significantly changed the T4 among college men

athlete when compared with the control group in terms of means. Further findings of the study indicated that *M. oleifera* with Anuloma Viloma had greater reduction in T4 than the *M. oleifera*.

In experimental group had implementing the *M. oleifera* with Anuloma Viloma prescription is influenced the significant in T4 when compare to the control group. It's all because of the supplementing the natural products are influenced and converted the T4 spent as energy for stamina and it avoids to the formation of excess in the body. Hence, it is concluded that the aerobic training with *M. oleifera* had significantly influenced T4.

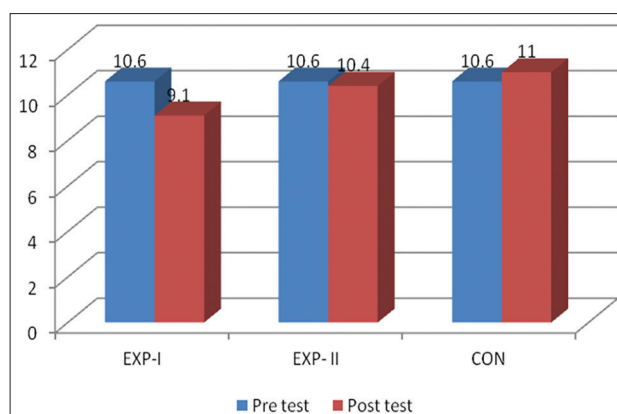
### 5. DISCUSSION AND FINDINGS OF IRON

From these analyses, it is found that the results obtained from the experimental groups had increase in the iron when compared with the one from the control group. This is due to the inclusion of *M. oleifera* with Anuloma Viloma in the analyses on the experimental groups.

In experimental group had implemented the *M. oleifera* with Anuloma Viloma prescription is influenced the significant increase in iron when compare to the control group. It's all because of the supplementing the natural products are influenced to increase the availability

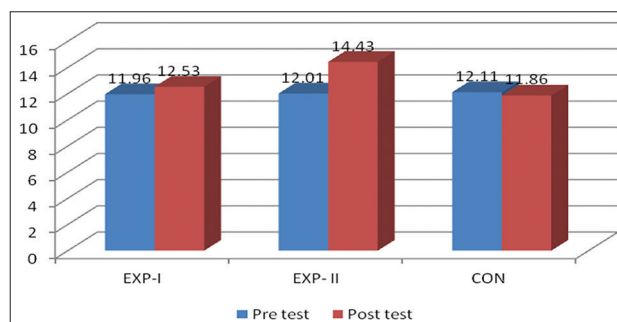
**Table 1:** Computation of the analysis of covariance of T4

Means	EXP-I	EXP-II	Con. group	S.V	S.S	D.F	M.S	O.F
Pre-test	10.6	10.6	10.6	B	0	3	0	0.00
				W	72.8	56	1.30	
Post-test	9.1	10.4	11.0	B	34.0	3	11.34	6.94
				W	91.5	56	1.63	
Adjusted	9.1	10.4	11.0	B	34.0	3	11.34	6.91
				W	90.2	55	1.64	

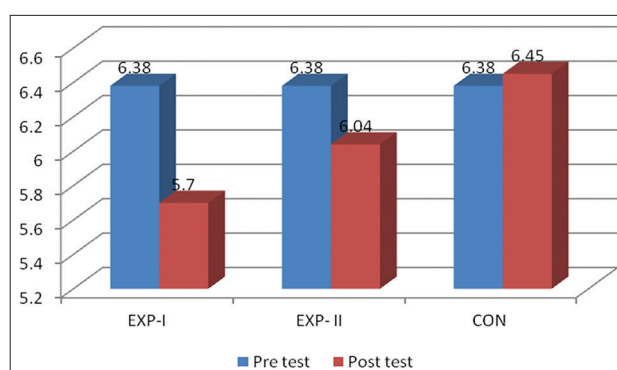


**Table 2:** Computation of the analysis of covariance of iron

Means	EXP-I	EXP-II	Con. group	S.V	S.S	D.F	M.S	O.F
Pre-test	11.96	12.01	12.11	B	0.18	2	0.09	0.41
				W	9.39	42	0.22	
Post-test	12.53	14.43	11.86	B	53.21	2	26.60	48.80
				W	22.9	42	0.54	
Adjusted post-test	12.55	14.43	11.83	B	53.92	2	26.96	50.70
					21.83	41	0.53	21.83

**Table 3:** Computation of the analysis of covariance of TSH

Test	Exp. Group 1	Exp. Group 2	Control group	S.V	S.S	D.F	M.S	F
Pre-test	6.38	6.38	6.38	B	0.032	3	0.01	0.04
				W	14.10	56	0.25	
Post-test	5.7	6.04	6.45	B	10.76	3	3.58	30.61
				W	6.5	56	0.11	
Adjusted	5.69	6.04	6.45	B	10.5	3	3.52	31.69
				W	6.1	55	0.11	



oxygen because if iron is present that will increase oxygen carrying capacity in our body. Hence, it is concluded that *M. oleifera* with Anuloma Viloma had significantly influenced increase availability of iron in our body and supply energy to working muscle.

## 6. DISCUSSION AND FINDINGS OF TSH

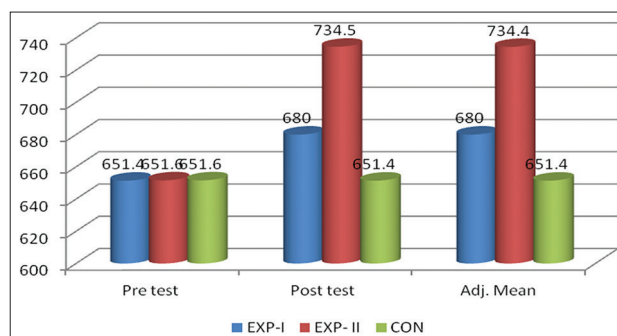
From these analyses, it is found that the results obtained from the experimental groups had significantly reduced

from its excess level to little normal level when compared with the one from the control group. This is due to the inclusion of *M. oleifera* with Anuloma Viloma in the analyses on the experimental groups.

It is interesting to note that the results obtained from experimental Group I had more effect than experimental Group II on the reduction of TSH level. This is due to the implementation of *M. oleifera* with Anuloma Viloma in experimental Group I.

**Table 4:** Computation of the analysis of covariance of testosterone

Means	EXP-I	EXP-II	Con. group	S.V	S.S	D.F	M.S	O.F
Pre-test	651.4	651.6	651.6	B	0.40	2	0.2	0.00
				W	17,924.4	42	426.7	
Post-test	680	734.5	651.4	B	53,440.5	2	26,720.27	38.3
				W	29,289.4	42	697.3	
Adj. post-test	680.0	734.4	651.4	B	53,413.9	2	26,706.9	44.5
				W	24,581.7	41	599.5	



## 7. DISCUSSION AND FINDINGS OF TESTOSTERONE

From these analyses, it is found that the results obtained from the experimental groups had significantly in testosterone level when compared with the one from the control group. This is due to the inclusion of *M. oleifera* with Anuloma Viloma in the analyses on the experimental groups. It is interesting to note that the results obtained the value of testosterone from experimental Group I had greater increase from its lower level to maximal level than experimental Group II on the improvement of testosterone. This is due to *M. oleifera* with Anuloma Viloma supplemented to boost the volume of testosterone in the experimental groups.

## 8. CONCLUSION

Within the limitations of the study, the following conclusions were drawn:

1. Experimental Group I (*M. oleifera* with Anuloma Viloma) showed significantly greater reduction on T4, TSH, and increased iron, testosterone significantly increases due to 8 weeks of natural supplementation with aerobic training than that Anuloma Viloma practice group.

## REFERENCES

1. Domenico, M., Lina, C., and Francesca, B. Sustainable crops for food security: *Moringa* (*Moringa oleifera* Lam.). *Encyclopedia Food Secur Sustain*, 2019, 5, 409-15.
2. Abdel-Rahman Mohamed, A., Mohamed, M.M., Samah, R.K., Gamal, A.S., and Ali, H.A. *Moringa oleifera* extract attenuates the CoCl<sub>2</sub> induced hypoxia of rat's brain: Expression pattern of HIF-1 $\alpha$ , NF-kB, MAO and EPO. *Biomed Pharmacother*, 2019, 109, 1688-97.
3. Valdés-Rodríguez, O.A., Giadrossich, F., Pérez-Vázquez A., and Moreno-Seceña, J.C. Above and below-ground biomass and allometry of *Moringa oleifera* and *Ricinus communis* grown in compacted clayey soils. *Flora*, 2018, 241, 35-45.

# Effects of *Moringa oleifera* with Anuloma Viloma Practice on Resting Heart Rate, Iron, Mean Arterial Pressure, and Testosterone among College Men Athlete

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## ABSTRACT

The purpose of the study was to investigate “Effects of *Moringa oleifera* with Anuloma Viloma Practice on Resting Heart Rate, Iron, Mean Arterial Pressure, and Testosterone among College Men Athlete.” *M. oleifera*: Many studies show that *M. oleifera* may lead to modest reductions in blood sugar and cholesterol. Moringa leaves are also highly nutritious and should be beneficial for people who are lacking in essential nutrients. Selection of variables: The following variables were selected for this study. (I) Dependent variables: (1) Resting heart rate, (2) iron, (3) mean arterial pressure, and (4) testosterone. (II) Independent variables: (1) *M. oleifera* with Anuloma Viloma, (2) *M. oleifera*, and (3) control group experimental design: The subject were selected for this study through the random group design consisting of pre- and post-test, 45 college men athletes randomly divided into three groups, the group was assigned as an experimental group and control group. The groups are (1) *M. oleifera* with Anuloma Viloma, (2) *M. oleifera*, and (3) control group. The experimental group underwent walking for 45 min of duration in evening hours between 4:30 pm and 5:30 pm for 7 days per week. Statistical Technique: Analysis of covariance statistical technique was used, to test the significant difference among the treatment groups. If the adjusted post-test results were significant, the Scheffe’s *post hoc* test was used to determine the paired mean significant difference, thirumalaisamy (2004). After incorporate statistical technique, it was found that a significant decrease in resting heart rate 3. Mean arterial pressure and in experimental Group I (*M. oleifera* with Anuloma Viloma Practice), and also found that iron and testosterone significantly increase due to 8 weeks of *M. oleifera* with Anuloma Viloma Practice.

## 1. INTRODUCTION

### 1.1. *Moringa oleifera*

Many studies show that *M. oleifera* may lead to modest reductions in resting heart rate, mean arterial pressure blood sugar, and cholesterol. It may also have antioxidant and anti-inflammatory effects and protect against arsenic toxicity. Moringa leaves are also highly nutritious and should be beneficial for people who are lacking in essential nutrients.

### 1.2. Statement of the Problem

The purpose of the study was to investigate “Effects of *M. oleifera* with Anuloma Viloma Practice on Resting Heart Rate, Iron, Mean Arterial Pressure, and Testosterone among College Men Athlete.”

### 1.3. Selection of Variables

The following variables were selected for this study. (I) Dependent variables: (1) Resting heart rate, (2) iron, (3) mean arterial pressure, and (4) testosterone. (II) Independent variables: (1) *M. oleifera* with Anuloma Viloma Practice, (2) *M. oleifera*, and (3) control group. Experimental design: The subject was selected for this study through the random group design consisting of pre- and post-test, 45 college men athletes randomly divided into three groups; the group was assigned as an experimental group and control group. The groups are: (1) *M. oleifera* with Anuloma Viloma Practice, (2) *M. oleifera*, and (3) c group.

### 1.4. Computation of Analysis of Covariance

Tables 1-4 illustrate the statistical results of Effects of *M. oleifera* with Anuloma Viloma Practice on Selected



**Table 1: Computation of analysis of covariance of resting heart rate**

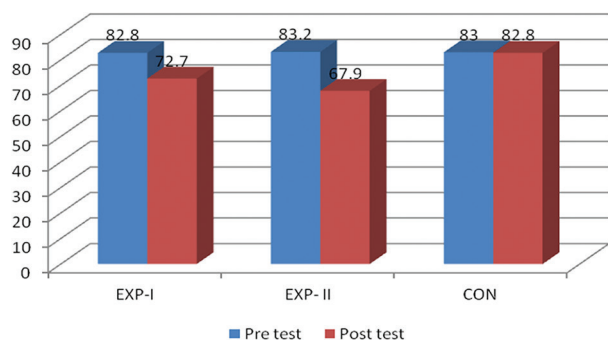
Means	EXP-I	EXP-II	CON	S.V	S.S	D.F	M.S	O.F	T.F
Pre-test	82.8	83.2	83	B	1.2	2	0.6	0.07	3.23
				W	344.8	42	8.2		
Post-test	72.7	67.9	82.8	B	1726.9	2	863.4	102.37	
				W	354.2	42	8.4		
Adjusted	72.8	67.8	82.8	B	1740.8	2	870.4	132.15	
				W	270.0	41	6.5		

**Table 2: Computation of analysis of covariance of iron**

Means	EXP-I	EXP-II	Con. Group	S.V	S.S	D.F	M.S	O.F
Pre-test	11.96	12.01	12.11	B	0.18	2	0.09	0.41
				W	9.39	42	0.22	
Post-test	12.53	14.43	11.86	B	53.21	2	26.60	48.80
				W	22.9	42	0.54	
Adjusted post test	12.55	14.43	11.83	B	53.92	2	26.96	50.70
				W	21.83	41	0.53	21.83

Lipid Profile Status and Testosterone among College Men Athlete and ordered adjusted means and the difference between the means of the groups under study.

## 2. DISCUSSION AND FINDINGS OF RESTING HEART RATE

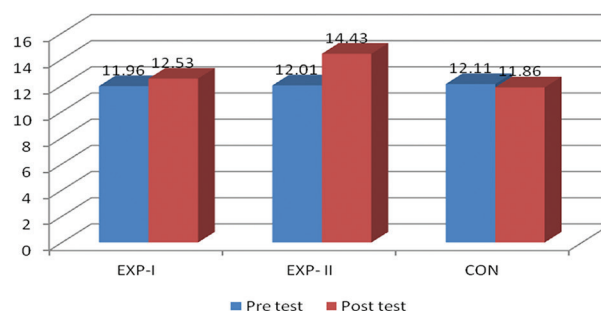


This result indicated that the effect of *M. oleifera* with Anuloma Viloma Practice had significantly reduced the resting heart rate Among College Men Athlete when compared with the control group in terms of means. Further findings of the study indicated that *M. oleifera* with Anuloma Viloma Practice had a greater reduction in resting heart rate.

In the experimental group had implementing the *M. oleifera* with Anuloma Viloma Practice is influenced by the significant resting heart rate, when compared to the control group. It is all because of the supplementing the

natural products is influenced and its help to increase the flexibility of the blood tubes and heart. Hence, it concluded that the *M. oleifera* with Anuloma Viloma had significantly influenced to reduce the resting heart rate in college men athletes.

## 3. DISCUSSION ON FINDINGS OF IRON



From these analyses, it is found that the results obtained from the experimental groups had increase in the iron when compared with the one from the control group. This is due to the inclusion of *M. oleifera* with Anuloma Viloma in the analyses on experimental groups.

In the experimental group had implemented that the *M. oleifera* with Anuloma Viloma prescription is influenced the significant increase in iron when compared to the control group. It is all because of the supplementing, the natural products are influenced to increase the available oxygen because if the iron is present that will

**Table 3: Computation of analysis of covariance of mean arterial pressure**

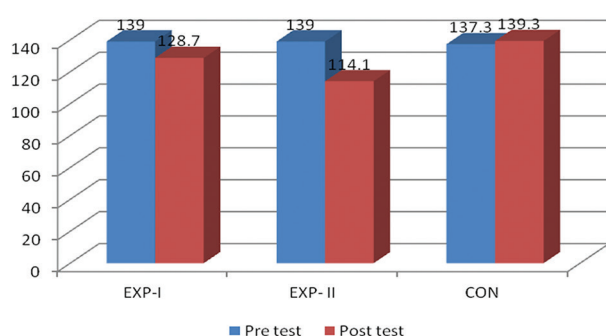
Means	EXP-I	EXP-II	Con. Group	S.V	S.S	D.F	M.S	O.F
Pre-test	139	139	137.3	B	27.7	2	13.8	0.34
				W	1691.3	42	40.2	
Post-test	128.7	114.1	139.3	B	4802.8	2	2401.4	71.94
				W	1402	42	33.3	
Adjusted Post test	128.6	114.0	139.4	B	4808.6	2	2404.3	71.13
				W	1385.8	41	33.8	

**Table 4: Computation of analysis of covariance of testosterone**

Means	EXP-I	EXP-II	Con. Group	S.V	S.S	D.F	M.S	O.F
Pre-test	651.4	651.6	651.6	B	0.40	2	0.2	0.00
				W	17,924.4	42	426.7	
Post-test	680	734.5	651.4	B	53,440.5	2	26,720.27	38.3
				W	29,289.4	42	697.3	
Adjusted Post test	680.0	734.4	651.4	B	53,413.9	2	26,706.9	44.5
				W	24,581.7	41	599.5	

increase oxygen-carrying capacity in our body. Hence, it concluded that the *M. oleifera* with Anuloma Viloma had significantly influenced the increase availability of iron in our body and supply energy to working muscle.

#### 4. DISCUSSION ON FINDINGS OF MEAN ARTERIAL PRESSURE

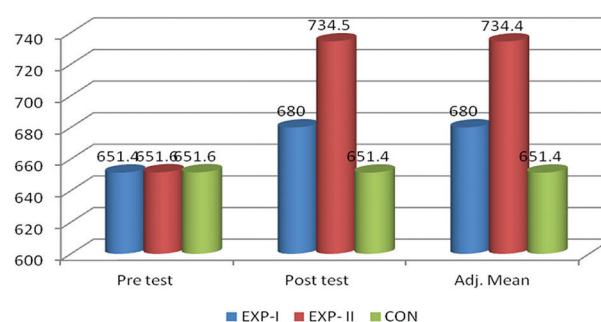


From these analyses, it is found that the results obtained from the experimental groups had a significant reduction in the mean arterial pressure when compared with the one from the control group. This is due to the inclusion of *M. oleifera* with Anuloma Viloma in the analyses on the experimental groups.

It is interesting to note that the results obtained from experimental Group I had more effect than experimental Group II on the reduction of mean arterial pressure

level. This is due to the implementation of *M. oleifera* with Anuloma Viloma in the experimental Group I.

#### 5. DISCUSSION ON FINDINGS OF TESTOSTERONE



From these analyses, it is found that the results obtained from the experimental groups had significantly in testosterone levels when compared with the one from the control group. This is due to the inclusion of *M. oleifera* with Anuloma Viloma in the analyses on experimental groups. It is interesting to note that the results obtained the value of testosterone from experimental Group I had a greater increase from its lower level to maximal level than experimental Group II on the improvement of testosterone. This is due to prescription of the natural supplemented to boost the volume of testosterone in the experimental

Groups I. It is concluded that the experimental groups had greater improvement in the volume of testosterone in the men athletes.

## 6. CONCLUSION

Within the limitations of the study, the following conclusions were drawn:

1. Experimental Group I (*M. oleifera* with Anuloma Viloma) showed significantly greater reduction resting heart rate, mean arterial pressure, and increase testosterone, iron, than that of experimental Group II of training at the end of 8 weeks of training period of time.

## REFERENCES

1. Domenico, M., Lina, C., and Francesca, B. Sustainable crops for food security: *Moringa* (*Moringa oleifera* Lam.). *Encyclopedia Food Secur Sustain*, 2019, 5, 409-15.
2. Abdel-Rahman Mohamed, A., Mohamed, M.M., Samah, R.K., Gamal, A.S., and Ali, H.A. *Moringa oleifera* extract attenuates the CoCl<sub>2</sub> induced hypoxia of rat's brain: Expression pattern of HIF-1 $\alpha$ , NF-kB, MAO and EPO. *Biomed Pharmacother*, 2019, 109, 1688-97.
3. Valdés-Rodríguez, O.A., Giadrossich, F., Pérez-Vázquez A., and Moreno-Seceña, J.C. Above and below-ground biomass and allometry of *Moringa oleifera* and *Ricinus communis* grown in compacted clayey soils. *Flora*, 2018, 241, 35-45. Flora, (2018).

# A Comparative Study on Cardiovascular Endurance and Explosive Strength among Inter-University Men Handball Players and Hockey Players

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## ABSTRACT

The purpose of the present study is to compare the cardiovascular endurance and explosive strength among inter-university men handball and hockey players. For the purpose of study was conducted on 100 men Handball and Hockey players of different universities of western India representing in West zone inter university Handball and Hockey championships. The subjects were divided into two age groups, 18–22 years (50 samples) and 23–28 years (50 samples). For measuring cardiovascular endurance, Queen's College step test was used and for measuring explosive strength, standing broad jump test was used. The statistical mean, standard deviation, and *t*-test were used to measure the cardiovascular endurance and explosive strength among inter-university men handball and hockey players. The result of the study revealed that handball men player and hockey men player age of 18–22 years found no significant difference in cardiovascular endurance and a significant difference was found in explosive strength. The result also revealed that handball men player and hockey men player age group of 23–28 years found no significant difference in cardiovascular endurance and explosive strength.

**Keywords:** Cardiovascular endurance, Explosive strength, Physical fitness.

## 1. INTRODUCTION

Modern sports are a competitive to the hilt, it requires on incredibly exceptional level of fitness, I fact, there can be no sport without fitness. Thus, player should be engaging in serious fitness training programs to a sport of once choice. R. Lamb, "Physical fitness is the capacity to meet the present and potential challenges of life with success." Clarke (1978) has thus exhorted that physical fitness is a vital biological need, the neglect of which handicaps the total effectiveness of the individual. Carolyn Gillespie (2015) fitness in the game of field hockey is just as important as passing and receiving, scoring, tackling, making saves, and playing well. Fitness is a key to success both in short and long term in playing this sport, and importantly, it helps you maintain a healthy and active lifestyle, helping to minimize and prevent injuries.

### 1.1. Cardiovascular Endurance

It is the ability of the heart to deliver blood to working muscles and their ability to use it. This is the quality that enables one to continue engaging in reasonably

vigorous physical activities for prolonged period of time where the required cardiorespiratory adjustments to the activity are built up.

### 1.2. Strength

Strength is the ability to overcome resistance or to act against resistance. Strength plays a paramount role in the physical fitness status. Powerful throw in handball and hits in hockey, the legs at the time of jumping and running involved muscles had to generate the force, which is definitely the net result of power.

## 2. PURPOSE OF THE STUDY

The purpose of the present study is to compare the cardiovascular endurance and explosive strength among inter-university men handball and hockey players.

## 3. METHODOLOGY

The study was conducted on 100 men handball and hockey players of different universities of Western

India representing in West zone inter-university handball and hockey championships. The subjects were divided into two age groups, 18–22 years, 50 samples (25 samples handball and 25 hockey) and 23–28 years, 50 samples (25 samples handball and 25 samples hockey).

### 3.1. Dependent Variables

1. Cardiovascular endurance
2. Explosive strength.

### 3.2. Independent Variables

1. Queen's College step test
2. Standing broad jump test.

### 3.3. Statistical Methods used

Mean, standard deviation (SD), and *t*-test.

## 4. RESULTS

S. No. 1: In Queen's College step test, the result showed that the calculated mean 54.82 and SD 5.80 of handball men player and also reveals that the mean 59.42 and SD 6.98 of hockey men player. It is observed that  $t = 0.181$ . It means that there is no significant difference in cardiovascular endurance between handball and hockey men player age group of 18–22 years.

S. No. 2: In standing broad jump test, the result showed that the calculated mean 2.13 and SD 0.12 of handball men player and also reveals that the mean 1.93 and SD 0.16 of hockey men player. It is observed that  $t = 2.19^*$ . It means that there is a significant difference in explosive strength between handball and hockey men player age group of 18–22 years.

S. No. 1: In Queen's College step test, the result showed that the calculated mean 58.16 and SD 4.29 of handball men player and also reveals that the mean 59.70 and SD 5.23 of hockey men player. It is observed that  $t = 0.26$ . It means that there is no significant difference in

cardiovascular endurance between handball and hockey men player age group of 23–28 years.

S. No. 2: In standing broad jump test, the result showed that the calculated mean 2.18 and SD 0.20 of handball men player and also reveals that the mean 1.93 and SD 0.17 of hockey men player. It is observed that  $t = 1.99$ . It means that there is no significant difference in explosive strength between handball and hockey men player age group of 23–28 years.

## 5. DISCUSSION

It is observed in Table 1, S. No.1 that group handball men player and hockey men player age of 18–22 years found no significant difference in cardiovascular endurance, but the mean value of hockey men player found greater. The results show that hockey players were better in cardiovascular endurance than handball players. This is due to the fact that hockey field is 100 yards  $\times$  60 yards, continuously running in such a big field ultimately helps in develop cardiovascular endurance in hockey players.

It is observed in Table 1, S. No. 2 that handball men player and hockey men player age group of 18–22 years found a significant difference in explosive strength, but the mean value of handball men player found greater. Findings of the researcher are well supported by Sanjeev Kumar (2013), Imtiyaz (2013), and Harmeet Singh (2015). The result shows that handball players were better in explosive strength than hockey players. In the game of handball, explosive strength is needed to do a lot of movements such as pivot jump, three-step jump shot, and many other activities, which requires great amount of strength.

It is observed in Table 2, S. No. 1 that handball men player and hockey men player age group of 23–28 years found no significant difference in cardiovascular endurance but the mean value of hockey men player found greater. The results show that hockey players were better in cardiovascular endurance than handball

**Table 1:** Comparison of cardiovascular endurance and explosive strength among handball and hockey men age group of 18–22 years

S. No.	Name of the variable	Name of test	Handball men ( $n=25$ )		Hockey men ( $n=25$ )		Calculated ( $t$ -value)
			Mean	SD	Mean	SD	
1	Cardiovascular endurance	Queen's College step test	54.82	5.80	59.42	6.98	0.18
2	Explosive strength	Standing broad jump	2.13	0.12	1.93	0.16	2.19*



**Table 2:** Comparison of cardiovascular endurance and explosive strength among handball and hockey men age group of 23–28 years

S. No.	Name of the variable	Name of test	Handball men (n=25)		Hockey men (n=25)		Calculated (t-value)
			Mean	SD	Mean	SD	
1	Cardiovascular endurance	Queen's College step test	58.16	4.29	59.70	5.23	0.26
2	Explosive strength	Standing broad jump	2.18	0.20	1.93	0.17	1.99

players. This is due to the fact that hockey game being aerobic activity. The duration of the match and extra time in hockey requires high class of cardiovascular endurance.

It is observed in Table 2, S. No. 2 that handball men player and hockey men player age group of 23–28 years found no significant difference in explosive strength but the mean value of handball men player found greater. The result shows that handball players were better in explosive strength than hockey players. Findings of the researcher are well supported by Trikhas and Kumar (2013). In the game of handball, explosive strength is developed by doing continuous movements such as running, pivot jump, three-step jump shot, and many other skills, which requires great amount of explosive strength.

## 6. CONCLUSION

To analysis the data, mean, SD, and *t*-test were calculated. The significance level was set up at 0.05 levels. The 50 samples degree of freedom is 48 and the table value is 2.00 to determine the significant difference.

Statistically no significant differences were found in cardiovascular endurance among inter-university level men handball and hockey players both 18–22 and 23–28 years age groups. Hockey men player found more in cardiovascular endurance as compared to

handball men player as per their mean difference in both the above age groups.

Statistically significant differences were found in explosive strength among inter-university level men handball and hockey players 18–22 years age group while as no significant difference was found in explosive strength among inter-university level men handball and hockey players 23–28 years age group. Handball men player found more in explosive strength as compared to hockey men player as per their mean difference in both the above age groups.

## REFERENCES

1. Ahmad Mir, B. *Comparative Study of Selected Fitness Components among Inter University Men and Women Handball and Hockey Players*. Aurangabad, Maharashtra: Unpublished Master PhD Thesis of Dr. Babasaheb Ambedkar Marathwada University; 2020.
2. Singh, H. Comparative study on s elected physical fitness and physiological variables between volleyball and handball players. *Eur J Phys Educ Sport*, 2015, 10(4), 206-211.
3. Imtiyaz, I. *Comparative Study of Selected Fitness Components of Basketball and Handball Players of Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. Aurangabad. Maharashtra: Unpublished Master Dissertation of Dr. Babasaheb Ambedkar Marathwada University; 2013.*
4. Trikha, S., and Kumar, A. Comparative study of motor abilities variables of different games. *Int J Sci Res* 2013, 2(11), 464-465.

# Comparative Study of Reaction Time among Ball Badminton Players and Badminton Players of Osmania University, Hyderabad

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## ABSTRACT

The purpose of the study was to assess the difference on reaction time between the intercollegiate men ball badminton and badminton players. To achieve the purpose of the study, the researcher randomly selected 50 players (i.e., 25 players in ball badminton and 25 players in badminton) from Osmania University intercollegiate men ball badminton and badminton tournament. The criterion variable selected for this study was visual reaction time. The collected data were analyzed using the independent “*t*”-test, to interpret the results. The level of confidence was fixed at 0.05 levels. It was concluded that there was no significant difference found on reaction time between intercollegiate men ball badminton and badminton players of Osmania University.

**Keywords:** Badminton, Ball badminton, Reaction time.

## 1. INTRODUCTION

Ball badminton is a sport native to India. It is a racquet game, played with a yellow ball made of wool, on a court of fixed dimensions divided by a net. The game was played as early as 1856 by the royal family in Thanjavur, the capital of Thanjavur district in Tamil Nadu, India. It enjoys the greatest popularity in India. Ball badminton is a fast-paced game; it demands skill, quick reflexes, good judgment, agility, and the ability to control the ball with one's wrist. Particularly, the high speed of the shuttlecock leaves too little a time to react; thus, badminton player should quickly and accurately decide during the game. In brief, the fast return of the shuttlecock in <1 s necessitates quick thinking and reacting to the stimulus during the game.

## 2. METHODOLOGY

The purpose of the study was to analyze the reaction time between the intercollegiate men ball badminton and badminton players of Osmania University. To achieve the purpose of the study, 50 intercollegiate players were selected as subject randomly from ball badminton and badminton game. The subject was

selected from the intercollegiate men ball badminton and badminton players who participated in the intercollegiate tournament of Osmania University. The age of the subjects was ranged from 18 to 23 years. The researcher selected the reaction time as variable for the study. The investigator conducted visual reaction time test through reaction timer for all the subjects for both ball badminton and badminton players and the obtained data were analyzed statistically using independent “*t*”-test to find out the significant difference between the ball badminton and badminton players. The result was tested at 0.05 level of confidence.

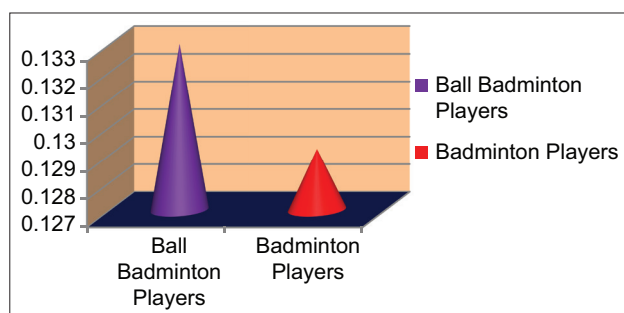
## 3. RESULTS

Table 1 reveals that the mean of reaction time for intercollegiate men ball badminton players was 0.1330 with the standard deviation of 0.02654 and badminton players was 0.1292 with the standard deviation of 0.03101. The obtained “*t*” ratio 0.814 was found to be lesser than the required table value of 1.98 at 0.05 level of confidence for 98 degrees of freedom. This indicates that there was no significant difference on reaction time between the intercollegiate men ball badminton and badminton players.

**Table 1:** Computation of “t” ratio on reaction time between the intercollegiate men ball badminton and badminton players

Reaction time level	M	SD	$\sigma$ DM	DM	t-ratio
Ball badminton players	0.1330	0.02654	0.00577	0.00384	0.814
Badminton players	0.1292	0.03101			

\*Significant at 0.05 levels

**Figure 1:** Bar diagram showing the mean difference between intercollegiate men ball badminton and badminton players on reaction time

#### 4. DISCUSSION AND CONCLUSIONS

The results of the study reveal that there was no significant difference found on reaction time between the intercollegiate ball badminton and badminton players and also when comparing the mean values of reaction time for the intercollegiate ball badminton and badminton players, the intercollegiate badminton players were slightly better than ball badminton players.

Based on the results of the study, it was concluded that there was no significant difference found on reaction time between the intercollegiate ball badminton and badminton players of Osmania University.

#### REFERENCES

- Hülsdünker, T., Strüder, H.K., and Mierau, A. Visual motion processing subserves faster visuomotor reaction in badminton players. *Med Sci Sports Exerc*, 2017, 49(6), 1097-1110.
- Mahesh, B., Kalpesh, V., Gitesh, D., Maulik P., and Hitesh, J. A comparative study of visual reaction time in badminton players and healthy controls. *Indian J Appl Basic Med Sci*, 2013, 15a(20), 76-82.

# Balance Diet and Best Sports Workouts for the Best Performance in Athletics

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## ABSTRACT

Food is another necessary thing for the body. We all should know how when and what to eat. A balanced diet is important because our bodies, organs, and tissues need proper nutrition to work effectively without good nutrition our body which is more prone to disease infection fatigue and poor performance. Children with a poor diet run the risk of growth and developmental problems. Bad eating habits can continue for the rest of their lives. Athletic performance improves with nutrition and crumbles with nutritive deficiency. Carbohydrates, fats, proteins, vitamins, minerals, and water are essential to the diet. Carbohydrates, fats, and proteins are referred to as energy nutrients because they are used as food fuels for metabolism. A sound balance high energy plan to help to get stronger make consistent progress in sport and beat the competition. Carbohydrates intake for the athletes 70% for the day and proteins 10–20% and fats 20–30% are recommended for high energy performance. Pre-exercise fuel eats a small snack 1–2 h/game and small meals 2–3 h and large meal 3–4 h for game. Post-exercise fueling your body within 15–30 min after workout can help your muscles re-energize for your next workout or competition. A sound balanced high energy plan to help athletes stronger make consistent progress in sports and beat the competitions. You need fruits, vegetables, milk, meat and poultry, fish, beans, peace, and nuts and seeds have a consumption in daily routine mails. And also, optimal nutrition is essential in that physical activity, athletic performance, and recovery from exercise are enhanced due to good nutrition. It is the position of the American Dietetic Association, Dietitians of Canada, and the American College of Sports Medicine that appropriate selection of food and fluids, timing of intake, and supplement choice are necessary for optimal health and exercise performance. Energy and macronutrient needs, especially carbohydrates and protein, must be met during times of high physical activity to maintain body weight, replenish glycogen stores, and provide adequate protein to build and repair. Fat intake should be good enough to provide the essential fatty acids and fat-soluble vitamins and to contribute energy for weight maintenance.

## 1. INTRODUCTION

A balanced diet is a light which has basic five food groups carbohydrates, proteins, fats, minerals, and vitamins. Balanced diet is very important in sports and games nutrition is the science that interprets the interaction of nutrients and other substance in food. In relation to maintenance, growth, reproduction, health, and disease of an organism. Sports, exercise, and nutrition were always there from the very beginning of the history of mankind. Nowadays sports medicine is also an important developed area in sports science that deals with the health aspect of sportsman. Growth and development, clinical medicine, drugs and dope sports

nutrition and diet, and many areas are playing a key role in the increase of sports science. Moreover, food is needed to build the body make good wear and tear and to act as fuel for the production of heat and energy. Food is there for the prime necessity of life. And also, optimal nutrition is essential in that physical activity, athletic performance, and recovery from exercise are cancelled due to good nutrition. Although exercise performance can be e affected by body weight and composition, these physical measures should not be criterion for sports performance and daily weigh-ins are discouraged. Sportspersons need to consume adequate energy during periods of high intensity and/or long-duration training to maintain body weight and health and maximize

training effects. Deficient or less energy intakes can result in loss of muscle mass. It should be relatively high in carbohydrates to maximize maintenance of blood glucose, be moderate in protein, be composed of familiar foods, and be well tolerated by the athlete.

### 1.1. Purpose of the Study

The objective of the present study and analyze on above area for know about reasons, effects, factors, causes and also identifications of presentations, and some other examinations. This study also creates a path to conduct several further researches and observation in the same direction. Athletic performances improve with neutrino and gender with nature deficiency. In this observation will also examine. We analyzed what is the use of vitamins, minerals, iron, and calcium for athletes.

## 2. METHODOLOGY

Every athlete person should follow some healthy rules and regulations along with strong nutrition. They are health and nutrition professionals recommended that 55–60% of the calories in our diet come from carbohydrates no more than 30% from fat and the remaining 10–15% from protein. The best way to determine if you are getting too few are too many calories is to monitor your weight. Keeping within your ideal competitive weight range means that you are getting the right amount of calories. Depending on how muscular you are, 55–70% of your body weight is water. Being hydrated means maintaining your body's fluid level. Electrolytes are nutrients that affect fluid balance in the body and are necessary for your nerves and muscles to function.

## 3. RESULTS

Most activities use a combination of fat and carbohydrate as energy sources. Carbohydrates are sugar and starches found in foods such as breads, cereals, fruits, vegetables, pasta, milk, honey syrups, and table sugar. Carbohydrates are the preferred source of energy for your body. When you are training or competing, your muscles need energy to perform.

One source of energy for working muscles is glycogen which is made from carbohydrates and stored in your muscles. In the past, athletes were warned that eating sugary food before exercise could hurt performance by causing a drop in blood glucose levels. Recent studies,

however, have shown that consuming sugar up to 30 min before an event does not diminish performance. In fact, evidence suggests that a sugar-containing pre-competition beverage or snack may improve performance during endurance workouts and events. Athletes need to eat about 1800 calories a day to get the vitamins and minerals; they need for good health and optimal performance. Many athletes, especially those on strength training programs or who participate in power sports, are told that eating a ton of protein or taking protein supplements will help them gain muscle weight. Hemoglobin, which contains iron, is the part of red blood cells that carries oxygen from the lungs to all parts of the body, including muscles. Since your muscles need oxygen to produce energy, if you have low iron levels in your blood, you may tire quickly. Symptoms of iron deficiency include fatigue, irritability, dizziness, headaches, and lack of appetite. The recommended dietary allowance from iron is 15 mg a day from women and 10 mg for men. Red meat is the richest source of iron, but fish and poultry also for good sources. Fortified breakfast cereals, beans, and green leafy vegetables also contain iron. Our bodies absorb the iron found in animal products best. Calcium is needed for strong bones and proper muscle function. Dairy foods are the best source of calcium.

## 4. DISCUSSION

Optimum nutrition is essential in that physical activity, athletic performance, and recovery from exercise are enhanced due to good nutrition, it is the position of the American Dietetic Association, Dietitians of Canada, and the American College of sports medicine that appropriate selection of foods and fluids, timing of intake, and supplement choices are necessary for optimal health and exercise performance. Energy and macronutrient needs, especially carbohydrates and protein, must be met during times of high physical activity to maintain body weight, replenish glycogen stores, and provide adequate protein to build and repair tissue.

Fat intake should be good enough to provide the essential fatty acids and fat-soluble vitamins and to contribute energy for weight maintenance. Although exercise performance can be affected by body weight and composition, these physical measures should not be a criterion for sports performance and daily weigh-ins are discouraged.

Sportspersons need to consume adequate energy during periods of eye intensity and/or long-duration training to



maintain body weight and health and maximize training effects. Deficient or less energy intakes can result in loss of muscles, mass, menstrual dysfunction, loss of or failure to gain bone density, and increased risk of fatigue. All this is the case of injury and illness and a prolonged recovery process.

Before exercise, a sportsperson can take a meal or snack. They should provide sufficient fluid to maintain hydration and low in fat and more fiber intake to facilitate gastric emptying; this minimizes gastrointestinal distress. It should be relatively high in carbohydrates to maximize the maintenance of blood glucose, be moderate in protein, be composed of familiar foods, and be well tolerated by the athlete.

## 5. CONCLUSIONS

Several scientific studies in the field of performance to athletes have conclusive evidence that the regular involvement in physical activity, nutrition like taking good food. Maintain certain food habits can improve the strength to sports personalities. Moreover, some of the other recommendations suggest hearing for better

performance to athletes. These are distribute the daily consumption of food over three regularly spaced meals. If weight gain is desirable, evening snacks can be added. Eliminate those foods from diet which furnish only calories without contributing their share of vitamins and minerals. Eliminate tea, coffee, and alcohol avoid fatty food. They slow peristalsis movement of intestine, causing a delay in emptying stomach. Eat to serving daily of fresh fruits. Food should contain more vegetables, including leafy green vegetables, and eat enough butter. Drink at least three glasses of low-fat milk daily to take adequate water.

## REFERENCES

1. American Health and Nutrition. Status and you Estimate Necessary City for Growth and Development of Children. Mountain View, CA: American Health and Nutrition; 2019.
2. Centre for Disease Control and Prevention. Physical Education and Nutritional Values of Physical Students Risk Behaviour Survey. New Delhi: Centre for Disease Control and Prevention; 1988.
3. Gulati, R., and Irani, A. *Sports Medicine*. New Delhi: Medical Publisher; 2011.

# Benefit of Fasting One Day a Week

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## ABSTRACT

Is fasting 1 day a week good for your health? To answer this question, let's take a look at what happens in your body when you begin to eat and drink nothing but water. After your cells use up the sugar that is in your bloodstream from your last meal or beverage, your body has to find another source of energy for your cells. And the first places that it turns to are your liver and your muscles. Both your liver and your muscles store sugar in the form of glycogen, and when needed, glycogen can be broken down to glucose, which all of your cells can use to produce energy for their ongoing activities.

## 1. INTRODUCTION

During a water-only fast, your glycogen stores are depleted within about 24 h, give or take a few hours. After your glycogen stores are used up, most of your cells begin burning fatty acids for energy – these fatty acids come from your fat reserves, including fatty tissue that surrounds your organs. Two groups of cells – your red blood cells and your brain cells – cannot use fatty acids to fuel their energy needs. Your red blood cells and brain require glucose, and once glycogen/glucose from your muscles and liver are used up, your brain and your red blood cells get their glucose from two sources: (1) From glycerol, which is a component of your fat tissues and (2) from your muscles – some of your muscle tissues get broken down, and the amino acids from your muscle tissues are used to produce glucose for your brain and red blood cells.

## 2. METHODOLOGY

Clearly, it is not in your best interest to rapidly eat up your muscles to meet the energy requirements of your brain and red blood cells during a water-only fast. Your body knows this, and somewhere between the 2<sup>nd</sup> and 3<sup>rd</sup> days of water-only fasting, your liver begins churning out ketones, which during a water-only fast, come primarily from the breakdown of fatty acids from your fat reserves. Once your liver generates large numbers of ketones, your brain is able to use ketones to fuel itself. At this point, only your red blood cells require glucose that must still be derived from the

breakdown of your muscles, but with your brain no longer dependent on breakdown of your muscles for energy, the rate at which your muscles are catabolized will be such that your muscles are spared as much as possible – this state is called “protein sparing” – it is a survival mechanism that is built into human physiology to deal with times of famine. Getting back to the big picture, it should be clear that from about the 2<sup>nd</sup> or 3<sup>rd</sup> day of a water-only fast, your body meets its energy requirements through your fat reserves. *Since the bulk of the toxins in your body are stored in your fat reserves, the longer you fast on water only, the more fat you'll burn and the more toxins you'll eliminate from your system.* This is why we see elimination of lipomas, atheromas (accumulated waste in your blood vessels), and other conditions related to toxin accumulation during a prolonged water fast.

*Put another way, your body does not experience significant detoxification during the first 12-24 h of a water-only fast.* Your body begins to eliminate large quantities of toxins only after it begins to burn your fat reserves at a rapid rate. And this does not happen until you've used up the glycogen stores in your liver and muscles. So when you fast 1 day a week, you deplete the stores of sugar in your liver and muscles, and you begin to break down your muscles – these are the main things you accomplish during the 1<sup>st</sup> day of water fasting. Significant detoxification only begins to occur if you continue past day 1 of fasting. This is not to say that there are no benefits to fasting 1 day a week or that you do not eliminate any toxins during a 1-day fast.

### 3. RESULTS

You are eliminating toxins with every breath that you take. And your body will always increase its rate of ongoing detoxification whenever you get more rest and/or eat less food because less digestive burden and more physical rest always mean more available resources for detoxification.

Rather than fast 1 day a week on water only, for most people, it makes more sense to do a juice fast 1 day a week or even once a month. With a juice fast, you can supply your body with enough nutrients that you do not have to deplete the sugar stores in your liver and muscles or break down a lot of your muscle tissue. At the same time, because the nutrients in freshly pressed juices are so easily digested, a 1-day juice fast can ease digestive burden and enhance ongoing detoxification to some degree. But let's be clear: The main benefit of a 1-day juice fast is not significant detoxification; it is a concentrated period of rest for your digestive organs and

an opportunity for the organs that are responsible for ongoing detoxification (liver, kidneys, skin, and lungs) to do a little extra health-promoting work.

### 4. CONCLUSION

This study says that it is not good for long-term health to fast 1 day a week on water only. If you want to give your body a period of rest and intense cleansing once in a while, it makes more sense to spend a day eating all raw fruits and vegetables, or drinking nothing but freshly pressed juices.

### REFERENCE

- The World Community Service Centre. *Vethathiri Maharishi Institute for Spiritual and Intuition Education. Temple of Consciousness, Arutperumjothi Nagar, Aliyar, Pollchi*. Erode: The World Community Service Centre; 2016.

# A Study on Importance of Yoga in Daily Life in Telangana State

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## ABSTRACT

Yoga is not a religion it is a way of living that aims toward a healthy mind in a healthy body. The word "YOGA" originates from Sanskrit and means "TO JOIN, TO UNITE." Yoga exercises have a holistic effect and bring out the inner peace and healthy body, mind, heart, and soul. Man is a physical, mental, and spiritual being; yoga helps promote a balanced development of all the three. Other forms of physical exercises like aerobics assure only physical well-being. They have a little to do with the development of the spiritual or astral body. The aspirant feels rejuvenated and energized. Thus, yoga teaches every aspirant how to control mind, body, heart, and soul. Yoga in daily life is a system of practice consisting of eight levels of development in the areas of physical, mental, social, and spiritual health. When the body is physically healthy, the mind is clear, focused and stress is under control. This gives the space to connect with loved ones and maintain socially healthy relationships. When you are healthy, you are in touch with your inner self, with others, and your surroundings on a much deeper level, which adds to your spiritual health. The main goals of "Yoga in Daily Life" are physical health, mental health, social health, and spiritual health, and self-realization or realization of the divine within us. These goals are attained by love and help for all living beings, respect for life, protection of nature and the environment, a peaceful state of mind, full vegetarian diet, good thoughts and positive lifestyle, physical, mental, and spiritual practices, and tolerance for all nations, cultures, and religions. Yogic techniques are known to improve one's overall performance. Pranayama is an important, yet little known part of yoga. Until recently, this art and science of yogic breathing was almost completely unknown to the common man like many other ancient Indian arts. Pranayama techniques act to purify the Nadis, including these three main energy channels.

## 1. INTRODUCTION

Yoga is essentially a spiritual discipline based on an extremely subtle science, which focuses on bringing harmony between mind and body. It is an art and science of healthy living practice. The word "YOGA" is derived from the Sanskrit root "YUJ," meaning to the universal consciousness, indicating a perfect harmony between the mind and body, man and nature. According to the modern scientist, everything in the universe is just a manifestation of the same quantum firmament. One who experiences this oneness of existence is said to be in yoga and is termed as a yogi, having attained to a state of freedom referred to as mukti, nirvana, or moksha. Thus, the aim of yoga is self-realization, to overcome all kinds of suffering, leading to "the state of liberation" (Moksha) or "Freedom" (Kaivalya). Living with freedom in all

walks of life, health and harmony shall be the main objectives of yoga practice. "Yoga" also refers to an inner science comprising a variety of methods through which human beings can realize this union and achieve mastery over their destiny, yoga, being widely considered an immortal cultural outcome of Indus-Saraswati Valley Civilization. Dating back to 2700 BC has proved itself catering to both material and spiritual upliftment of humanity. Basic human values are the identity of Yoga Sadhana.

Om Saha Navavatu  
Saha Nau Bhunaktu  
Saha Virya Karvav-Hai  
Te-Jasvi Nava dhitam-Astu  
Ma Vidvi Şav-Hai  
Om SantiH santiH santiH  
OM Paramatma, protect and bless us.

Give us strength to come to the end of the path, To  
eternal knowledge,  
Help us so that we do not turn against one another, and  
eternally united continue on the path together.  
OM Peace Peace Peace

## 2. PEACE OF MIND, CONSCIOUSNESS, AND SOUL

To live in harmony with oneself and the environment is the wish of every human. However, in modern times, greater physical and emotional demands are constantly placed on many areas of life. The result more and more people suffer from physical and mental tension such as stress, anxiety, and insomnia, and there is an imbalance in physical activity and proper exercise. The pranayama, meditation, and Basthirika some of practices which give peace of mind and consciousness and happy soul in humans life. In this way, yoga assists us in coping with everyday demands, problems, and worries. Yoga helps to develop a greater understanding of our self, the purpose of life, and the union of the individual self with universal self. Yoga is that supreme, cosmic principle. It is the light of life, the universal creative consciousness that is always awake and never sleeps; that always was, always is, and always will be.

## 3. PHYSICAL HEALTH

The health of the body is of fundamental importance in life. As the Swiss-born physician, Paracelsus, very correctly said, "Health isn't everything, but without health everything is nothing." To preserve and restore health, there are physical exercises (asanas), breath exercises (pranayama), and relaxation techniques. An even greater factor in the maintenance of good health is the food we eat. What we eat influences both our body and psyche – our habits and qualities. In short, the food we eat has an effect on our whole being.

## 4. MENTAL HEALTH

In general, we are let through life by the mind and senses, rather than having these under our control. However, to gain control of the mind, we must first place it under inner analysis and purify it. Negative thoughts and fears create an imbalance in our nervous system and through this our physical function. This is the cause of many illnesses and sorrows. Clarity of thought, inner freedom, contentment, and a healthy self-confidence are the basis for mental well-being. That is why we

strive to gradually overcome our negative qualities and thoughts and "AIM" to develop positive thoughts and behavior.

## 5. SOCIAL HEALTH

Social health is the ability to be happy within oneself and to be able to make others happy. It means to nurture genuine contact and communication with other people, to assume responsibility within society, and to work for the community. Social health is also the ability to relax and experience life in all its beauty.

## 6. SPIRITUAL HEALTH

The main principle of spiritual life and highest precept of humankind are AHIMSA – PARAMO – DHARMA. This precept embraces the principle of non-violence, in thought, word, feeling, and action. Prayer, meditation, mantra, positive thinking, and tolerance lead to spiritual health. Humans should be protectors, not destroyers. Those qualities that really make us human are the ability to give, understand, and forgive. To protect life and respect the individuality and independence of all forms of life is the primary practice of the yoga teachings. By following this precept greater tolerance, understanding, mutual love, help, and compassion develop not only between individuals but also between all humans, nations, races, and religious faiths.

### 6.1. Self-realization or Realization of the Divine within us (Healthy Life)

Cultivate indomitable will practice self-control and self-mastery. Have self-confidence. Develop independent judgment. Do not argue after the self-realization, you know the natural process of life, that takes place through you, and that goes for the life on existence. Life in the universe and life within you follows a certain process, out of which you experience life on the existence. Give up the idea of "I-ness," "Mine-ness." Look within for the happiness which you have sought in vain in the sensual objects. Moksha is the *Summum bonum* of life. It is freedom from births and deaths. It is not annihilation. You will be gradually molded in the spiritual path. You will draw inspiration from them. There will be an inner urge in you to attempt for God-realization. Pray to the Lord that you may become a saint.



## 7. YOGA IN DAILY LIFE

- Physical health
- Mental health
- Social health
- Spiritual health
- Self-realization or realization of the divine within us.

## 8. GOALS ARE ATTAINED BY DOING “YOGA IN DAILY LIFE”

- Love and help for all living beings
- Respect for life, protection of nature, and the environment
- A peaceful state of mind
- Full vegetarian diet
- Pure thoughts and positive lifestyle
- Physical, mental, and spiritual practices
- Tolerance for all nations, cultures, and religions.

### 8.1. The Techniques of Pranayama

Yogic techniques are known to improve one's overall performance. Pranayama is an important, yet little known part of yoga. Until recently, this art and science of yogic breathing was almost completely unknown to the common man like many other ancient Indian arts. Those who knew it used to be very reluctant to share their knowledge and experience with anyone unless a student proved by tests that he was ready to receive it. By balancing the functioning of both Nadis that is both aspects of the autonomic nervous system. We can stimulate the main energy channel called SHUSHUMNA NADI and harmonize the activity of the nervous system as a whole.

## 9. CONCLUSION

The fundamental principle of “Yoga in Daily Life” is religious freedom. Yoga is not a religion – it is the source of spirituality and wisdom, the root of all religions. Yoga transcends religious boundaries and reveals the way to unity. “Yoga in Daily Life” offers the spiritual aspirant guidance on life's path through the practices of Mantra Yoga and Kriya Yoga. As the most highly developed beings on earth, humans are capable of realizing their real nature and inner self, God.

The spiritual goal of yoga is God-realization, the union of the individual soul with God. The realization that we are all one in our common root and connection to God is the first step. Decisions regarding your health and well-being and a free, happy life, are in your hands. Practice regularly with firm determination and success will be certain. I wish all yoga practitioners and those still to become practitioners much happiness, success, health, harmony, joy in life, and God's blessing.

## REFERENCES

1. Maheshwarananda, P.S. *Yoga in Daily Life the System*. Vienna: IberoVerlag European University Press; 2000.
2. Wood, C. Mood change and perceptions of vitality: A comparison of the effects of relaxation, visualisation and yoga. *J R Soc Med*, 1993, 86(5), 254-258.
3. Sivananda, S. *The Divine Life Society*, Tehri Garhwal, Uttar Pradesh, India; 1999.
4. Maheshwarananda, P.S. *Yoga in Daily Life: The System*; 2005.

# Innovative Teaching Methods in Physical Education for Better Learning

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## ABSTRACT

**Introduction:** Physical educators have been trying to instill values of fitness for life in the mind of the children. The National Association of Sport and Physical Education (2003) and Institute of Medicine's (2013) recommend that children should obtain a minimum of 60 min of moderate to vigorous physical activity in a day. **Aim:** This article will highlight the latest teaching strategies, age-appropriate equipments, and health optimizing physical education (PE) curriculum used in the field of PE program for better teaching and learning process. **Methods:** New PE activities, equipments, PE curriculum in the field of PE obtained through Google search, with the keywords PE curriculum, PE equipments, age appropriate PE program, assessment in PE, strategies in PE, and curriculum guidelines for PE; as well the experience by researchers were expressed in this article. **Discussion:** A physical educator has a great role to play at the grassroot level to groom a child into making a potential and highly skilled professional. Olympians are not born, but they are made through their lifetime participation in research-based PE program from school. **Conclusions:** A physical educator has a great role to play in the grassroot level to groom a child into making a potential and highly skilled professional. New curriculum, age-appropriate equipments, teaching techniques, etc., should be introduced in all the schools to make the child engage in physical activity for at least 60 min/day. However, the use of innovative equipments, strategies, and curriculum in PE classes must be research-based and need for the children.

**Keywords:** Curriculum, Equipments, Physical education, Schoolchildren.

## 1. INTRODUCTION

Physical education (PE) program has been creating, implementing, and evaluating in promoting lifelong wellness among the school children. Students learn how to make healthy food choices, reduce time playing video games, and watching television [1]. Previously, the PE program has been removed from the school curriculum as schools everywhere strive to improve the academic performance of their students, many have cut PE and recess periods to leave more time for sedentary classroom instruction [2]. Over the years, researchers and educators have revised their PE curricula, equipments, and training programs to meet the six National Association of Sport and Physical Education (NASPE) guidelines. In India, Central Board of School Education has made PE an elective subject in school curriculum. The idea of including PE class in school is to make the students healthy and teach them

a healthy lifestyle. The aim of the study is to highlight the latest strategies, age-appropriate equipments, new curriculum, used in the field of PE program for better learning and developing health among young children through physical activity. For this purpose, new PE activities, equipments, PE curriculum in the field of PE obtained through Google search, with the keywords PE curriculum, PE equipments, age appropriate PE program, assessment in PE, strategies in PE, and curriculum guidelines for PE; as well the experience by researchers were expressed in this article.

### 1.1. Innovative Program in PE

Until date, the PE program in some schools in India has not really changed its methodology, wherein children play a particular sport by sharing one ball in a huge group. Moreover, the drawback is that not every child gets the opportunity to play. With the introduction

of new curriculum, age-appropriate equipments, teaching techniques, etc., the PE class has become more interesting, attractive, and more valuable for the students. Researchers and educators are trying to revise their PE curricula and training programs to meet the six NASPE (National Association of Spore standing of movement concepts, principles, strategies, and tactics as they apply to the learning and performance of physical activities, (3) participates regularly in physical activity, (4) at and PE) standard guidelines: (1) demonstrates competency in motor skills and movement patterns needed to perform a variety of physical activities, (2) demonstrates unachieved and maintains a health-enhancing level of physical fitness, (5) exhibits responsible personal and social behavior that respects self and others in physical activity settings, and (6) values physical activity for health, enjoyment, challenge, self-expression, and/or social interaction. Sports, Play, and Active Recreation for Kids (SPARK), a pioneer organization in the United States, has been contributing in the systemic reform of PE since 1989. In addition to the six guidelines of NASPE, SPARK supports Healthy People Goals 2010: (a) PE classes make every effort to engage students in moderate to vigorous physical activity (MVPA) at least 50% of their class time without sacrificing academic achievement or student enjoyment of PE,

(b) SPARK focus on positive health outcomes of students. These include physical fitness and sports skills, (c) SPARK programs include strategies that promote behavior and environmental change techniques, and (d) SPARK also follows As soon as possible (ASAP) activity to avoid the lengthy instruction in physical education class (SPARK) [3].

In India, many organizations such as LEAPSTART (FIT-KIDS), EDUSPORTS, KOOH SPORTS, SPORTS MENTOR, Physical Education Foundation of India, Youth Affairs and Sports, National Association of Physical Education and Sports Science, and all the physical educators and health educators are also taking initiatives to develop PE program to meet the standard guidelines. Recently, Sports Authority of India in collaboration Global Trust has launched a new scheme in India called the School Sports Promotion Foundation in five sports discipline, namely, athletics, football, volleyball, basketball, and cricket for talent identification in school children. Its main objective is to provide sports education in children from the grassroot level. Sports education includes basics movement skills, locomotion, basic skills of the games, rules and

regulations of the games, nutritional knowledge, and team cohesion [4].

## 1.2. Teaching Strategies

New teaching strategies like ASAP active games were introduced in PE class to keep the students active ASAP, which is one of the physical educator's objectives. In many traditional PE classes, students arrive at the activity area only to stand or sit and listen to lengthy instructions (SPARK) [5]. This wastes valuable activity time and should, therefore, be done sparingly. This section includes a variety of enjoyable activities to begin activity immediately. ASAP activities use little or no equipment, are fun and challenging and promote health-related fitness. They quickly involve all students in MVPA with few instructions or rules to slow them down. It reduces wasting of time in giving lengthy instruction in the class. Playground expectation cards, skills cards, task cards, etc., were also used on the play field to reduced lengthy instructions.

Another strategy used in PE class is 80/20 rules, which means that the PE teacher tries to keep the students active 80% of class duration. Music is also used in PE classes to make more fun activities which interest the students and are also used as start and stop signals.

Limited space activities like BINGO GAMES are introduced which allowed the PE class to run in limited space since space constraint is one of the most common issues in today's school environment. Whether it be inclement weather (rainy day, smog warnings, extreme heat, etc.) or the usual activity area is unavailable (assembly in the gym, a book fair in the multipurpose room, the blacktop is getting re-paved, etc.), every so often, the only choice of space for PE is a classroom or other small area. To involve the parents in PE activities, HOME-PLAY games were introduced in PE class which keep the child active at home and during vacation. It is a take-home page with interesting facts on 1 side, and fun challenges on the other.

MVPA is also introduced during the PE classes to keep the students ready for the next challenges. For example, chasing and fleeing skills are used in many of the most popular games played by children. By changing the locomotor skill, the method of tagging, the task students perform to reenter the game after being tagged, and/or the ways in which they may seek safety, you can create enough tag games to last a lifetime. Chasing and

fleeing games are usually short in duration (5–10 min), and use little or no equipment. The games in this unit provide opportunities for students to develop chasing, fleeing, and spatial awareness skills while promoting health-related fitness in enjoyable ways. The activities are designed to include and challenge all students' physical skills, while maintaining enjoyable, health-promoting, moderate-to-vigorous physical activity during class.

### 1.3. Latest Equipments

The equipment is one of the backbones of PE classes. In PE classes, it should be age-appropriate and safe to use for the child. Bevans *et al.* [5] suggested that age-appropriate equipment increases pain free practice, increases students' chances for active participation in the class, and maximize the amount of time devoted to PE during which children are physically active. Children get maximum activity when every child has a piece of equipment and does not have to wait a turn [6].

For early childhood, equipments such as scarf and balloon are used in learning catching and throwing lessons. In K-2 grade students, bean bags and fluff ball are used which falls quickly to gravity and the movement becomes fast. A foam ball is another equipment introduced to teach kicking and trapping in K-2 and 3-6 children. Fun activities such as parachute and manipulative games which teach them team work and develop their upper body strength were introduced to them. All the objects are safe to play and does not hurt the child.

### 1.4. Latest Curriculum

The NASPE is now endorsing the concept of Comprehensive School Physical Activity Programs (CSPAP) that are designed to increase daily levels of physical activity for all school-age children and youth. This new CSPAP curriculum model called Health Optimizing Physical Education (HOPE) that can be used to help Primary to High School (P-12) students to acquire knowledge and skills for lifelong participation in physical activity that contributes to optimal health benefits [7]. A CSPAP intends to provide expanded opportunities for physical activity beyond regularly scheduled PE time – including before, during, and after school, as well as opportunities outside of school (e.g., at home and in the community).

HOPE aims at developing the public health goal for students to accrue adequate amounts of current physical

activity and be prepared for an active lifestyle in adulthood. It involves all the socioecological factors that affect the child so as to achieve the optimal health benefits. They are individual, interpersonal, organizational, community, and public policy [7].

Another teaching curriculum called Teaching Games for Understanding (TGFU) is developed in America to elicit the players'/students' tactical awareness and skill development from situated learning experience enabled by the Teacher/Coach/Physical Educationist. Naomi Hart (2010) [8] discussed the model of TGFU as (a) game participation:

The learning in PE starts with games participation in a modified game or real games. At this stage the formative assessment takes place, (b) Game appreciation: Through gameplay students are given the chance to enjoy and experience of learning, (c) tactical awareness: Through gameplay students are encourage to identify attacking and defending strategies and implements successful tactical action, (d) making appropriate decision: In dynamic situation, students make real time decisions. These could be with or without the ball, (e) skill execution: Do the students have the ability to convert their decisions into actions? Can they execute the correct skill to enable their team to succeed? (f) Performance: Students take part in full or modified game applying all new knowledge and skills. This is the time for summative assessments. A detail on TGFU was described by Stolz and Pill [9] and Griffin *et al.* (2005) in the Physical Education Review journals.

## 2. DISCUSSION

According to the U.S. Olympic Committee, the university's athletes are dominating the U.S. Olympic Team in which the U.S. has competed since 1912. This Olympians are not born, but they are made through their lifetime participation in research-based PE program from school. In the west, children are taught the importance of PE from the grassroot level. A progressive structure is being followed so as to inculcate the basic techniques of movements, skills, and a sense of fitness right from early childhood.

PE program has its unique benefits and its program fits into each other. An example of how a progressive structure PE curriculum intertwine and integrate one into other from early childhood, kindergarten, and grade 3–6 program can be explained by teaching the skills of throwing and catching. In early childhood, a



child would be exposed to the throwing and catching of a balloon. The weight of descent is slower and gives time to the child to reflex while trying to catch the balloon. As the child gets more comfortable with the balloon, the object is replaced with a scarf. Since the scarf falls quicker to gravity, the personal space of the child is maintained and safely guarded. In the program for the age group ranging from kindergarten to Grade 2, a slightly heavier object (e.g., a fluff ball) is used. Since the fluff ball is heavier, it will fall faster, which is again age-specific and is safer for the child. Therefore, instead of using a big ball to teach children of this age group, a fluff ball is safer and will save their finger from getting hurt. The primary focus is to inculcate gross motor skills in this age group. This activity is a progression of the movement techniques learned by the children in their early childhood. In this level, the movement is more precise and prepares them to learn higher techniques as the basic techniques of movements will help them in formulating to a better motor program.

In the curriculum for the age group of grade 3–6, the action is more defined into a more appropriate throwing action. At this stage, tennis ball is used. As they get more comfortable with the tennis ball, the children can be introduced to partners so that the skills of the children are groomed and developed to improve their potential, similar to that of playing cricket wherein the ball is actually thrown back and forth to learn catching and throwing skills. By the time, the child goes to the entire progression through the PE program and the child skills are hold at the highest level to be implemented in the future.

### 3. CONCLUSIONS

New curriculum, age appropriate equipments, teaching techniques, etc., should be introduced in all the schools to make the child engage in physical activity for at least 60 min/day. However, the use of innovative equipments, strategies, and curriculum in PE classes must be

research-based and need for the children. Physical education program should be one of the major subjects in schools curriculum since the physical educator has a great role to play in the grassroot level to groom a child into making a potential and highly skilled professional.

### REFERENCES

1. Sallis, J.F., and McKenzie, T.L. Physical education's role in public health. *Res Q Exerc Sport*, 1991, 62, 124-137.
2. Trost, S.G., and Mars, H.V. Why we should not cut PE. *Health Learn*, 2009, 67, 60-65.
3. SPARK. *How SPARK Aligns with NASPE's National Standards for Physical Education*. Available from: <http://www.sparkpe.org/standardsNASPE.pdf>. [Last accessed on 2017 Feb 15].
4. India Today (PTI). *Grukul Trust Launches School Sports Promotion Foundation*. <http://www.indiatoday.intoday.in/story/grukul-trust-launches-school-sports-promotion-foundation/1/469116.html>. [Last accessed on 2017 Feb 15].
5. Bevans, K.B., Fitzpatrick, L.A., Sanchez, B.M., Riley, A.W., and Forrest, C. Physical education resources, class management, and student physical activity levels: A structure process-outcome approach to evaluating physical education effectiveness. *J Sch Health*, 2010, 80(12), 573-580.
6. Rink, J.E., Hall, T., and Williams, L. *School Wide Physical Activity: A Comprehensive Guide to Designing and Conduction Programs*. Champaign, Illinois: Human Kinetics News and Excerpts; 2010. Available from: <http://www.humankinetics.com/excerpts/excerpts/the-role-and-responsibilities-of-the-physical-education-teacher-in-the-school-physical-activity-program>.
7. Metzler, M., McKenzie, T., Ellis, R., Mars, H., and Barrett-Williams, S.L. Health optimizing physical education (HOPE): A new curriculum model. *J Phys Educ Recreation Dance*, 2013, 84(4), 41-47.
8. Naomi Hart. *Teaching Games for Understanding*; 2010. Available from: <http://www.naomihartl.weebly.com/blog/archives>. [Last accessed on 2017 Apr 20].
9. Stolz, S., and Pill, S. Teaching games and sport for understanding. *Eur Phys Educ Rev*, 2014, 20(1), 36-71.



# Occupational Health Problems Related to Computer Users (Information Technology: IT): A Review of the Past Three Decades

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## ABSTRACT

**Background:** The computerization of the workplace has increased tremendously past three decades. This information technology (IT) revolution has not only created more jobs but also led to increased incidence of repetitive strain injuries (RSI), cumulative trauma disorder, and other musculoskeletal disorders (MSD's). **Methods:** An investigation of various factors responsible for developing these problems and reviewing current research on emerging newer diseases was carried out to develop a strategic model. Lack of clear diagnostic criteria delays timely management. **Results:** Review of studies on Indian IT professionals has revealed the prevalence of straight spine syndrome, sacroiliac joint pain, and early isolated diastolic hypertension in addition to RSI and MSD's. Attitude and lifestyle factors are important in modifying the intensity of the problem. **Conclusion:** It is evident that these occupation related painful problems likely to increase unless serious long-term preventive approach is followed. An integrated approach aimed at improving the working posture, reduction in static load, and positive interventions to reduce the influence of job-stress resulting in poor work performance.

**Keywords:** Computers, Job stress, Occupational health, Posture, Repetitive strain injuries.

## 1. INTRODUCTION

Revolution in information technology (IT) is happening worldwide with a greater pace. About 30% of the workforce in developed and much more in the developing countries report with work-related problems. Each year, 8% of working Dutch citizens take time off from work due to repetitive strain injuries (RSI) symptoms [1]. According to the Canadian report, 10% of Canadian young adults report with RSI [2]. Health problems in computer users appear to be interrelated, and they are musculoskeletal "or" musculotendinous, visual, and stress-related. India has become a hub of IT industry with a large number of young people in it. One of the early studies on 200 subjects [3] revealed 40–50% of them suffer from fatigue, more than 40% musculoskeletal disorders (MSD's) predominantly from neck and upper limbs. Recent studies have also revealed peculiar incidence of sacroiliac joint pain and systemic disease like early isolated diastolic hypertension

among Indian professionals. We have been following IT professionals ( $n = 14,300$ ) past three decades on occupational health status and it is felt that Indians (probably Asians) perceive differently to these work-related problems. These problems are discussed with an Indian perspective under the following headings.

### 1.1. RSI and Related Problems

These are attributable to (a) static loading or isometric contraction of muscles of neck, shoulder, and arm to maintain position of function, (b) dynamic loading "or" repetitive movement of forearm and fingers to execute a task, and (c) force used to perform a task [4,5]. Great historians such as Leonardo da Vinci, Ramazzini, and many occupations such as tea pluckers, battery wrapping jobs, and telegraphers complained of RSI symptoms. The WHO classified RSI under the group of International Classification of Diseases-9 [6]. However, Indian IT professionals do not seem to suffer much from

RSI of wrist and hand; on the contrary, the incidence of carpal tunnel syndrome (CTS) is quite high in the west.

## 1.2. Neck and Back

The relationship between the performance of work and the occurrence of neck pain is evident [7]. The normal curvatures of the cervical and lumbar spines are essential for healthy function. During normal postural alignment, the external auditory meatus lines up directly over the acromioclavicular joint. The average relative rotation angle found for C2-C3 was  $7.59^\circ$  and was explained as being larger vertebrae and would naturally make up a larger portion of a circular lordosis in the cervical spine. Maintenance of cervical lordosis of  $31^\circ$ – $40^\circ$  could be a clinical goal as a functional treatment [8]. Neutral position, which is repeatable, is also known as self-balance position of spine which is less stressful [9]. Wrong and acquired postures, in addition to habitual postures of professionals, are responsible for neck pain. Forward head posture (FHP), which is observed in many Indian IT professionals, found to be responsible for developing painful straight spine syndrome [10]. Sitting for long hours disturbs spinal mobility and increases the risk of FHP. FHP is a new clinical entity and has been identified as an important factor for a variety of musculoskeletal syndromes [11]. The lordotic cervical and lumbar spine are the basis of the spine's ability to resist axial stressors; thus, any reduction in cervical curve can result in a 50% reduction in the strength of the spine. Indian IT professionals face major painful situations during job as a result of FHP.

## 1.3. Ergonomics and Back Pain

Indian professionals vary tremendously in their anthropometric data; hence, it is difficult to achieve sound ergonomics in the workplace. Backache in young subjects is frequently due to lack of back support; tall and short subjects do not understand the ergonomic adjustments needed. In the absence of footrest for short people (stature < 160 cm) always suffered low back pain during our observations [12]. FHP places greater stress on thoracic and lumbar cervical spine creating paraspinal muscle spasm.

## 1.4. Visual Impairment

Work-related visual complaints (asthenopia) in IT professionals were reported all over the world. Commonest being red-eye syndrome/dry-eye syndrome in young professionals and they usually overcome.

Visual display terminals (VDT's) cause disturbances in accommodation, more with small-sized font but better than conventional hard copy work [13]. Heavy computer users, predominantly young population, were shown to be significantly associated with frequency doubling technology (FDT-VFA), visual field abnormalities and computer users with myopia pose increased risk of VFA, possibly related to glaucoma [14]. The luminance can greatly influence the visual fatigue of VDT users.

A general tendency toward visual complaints for liquid crystal display with thin-film transistor than for cathode ray tube and surrounding luminance decreased the accommodation amplitude [15]. Visual symptoms can be grouped as:

- a. Simple eye strain which recovers with little awareness and care.
- b. Asthenopia; severe visual fatigue resulting from ocular muscles and the neck posture.
- c. Accommodation disturbances and with pre-existing myopia if present, can increase the risk of glaucoma.

Subjects complaining of eyestrain varied from one organization to the other. In one organization, 38% complained of eye strain, but in another, 21.2%. These problems depend up on many factors.

## 1.5. Stress Related to Work

IT professionals face continuous stress due to job deadlines supplemented by environmental and domestic stressors. Stress results from an imbalance between resources and demands including self-imposed ones. During stressful situations, concentration, awareness on posture, dexterity during work, and many neurophysiological changes occur in the body leading to drop in work performance. Many young subjects lack positive lifestyle factors leading to early obesity (41%), poor physical fitness (66%), and poor dietary habits increase the risk of stress-related problems in them [16]. Stress-induced shoulder and neck pain are not necessarily associated with elevated trapezius muscle activity in one study [17]. Computer work-related stress is influenced by complex factors such as the purpose of computer use, the environment, the equipment, and the continuous duration of users [18].

## 1.6. Early Hypertension

Early hypertension in young individuals is not uncommon in India. Recent study has indicated that young IT professionals face early hypertension; 16%

had moderately raised isolated diastolic rise in blood pressure, 48% had HDL <30 mg/dl, 26% had total cholesterol >240 mg/dl, and 80% had LDL >180 mg/dl. About 26% of them were overweight and 14% had Grade I obesity with abnormal waist to hip ratios. Eighty percent do not exercise, 38% skip breakfast, and 17% consume >5 cups of coffee/day [19]. This unique rise in isolated diastolic blood pressure indicates clearly early cardiovascular reactivity a serious risk due to stress and lifestyle factors.

### 1.7. Sacroiliac Joint Pain

Backache occurs as a result of many factors, but recently many senior professionals suffered from back pain emerging from sacroiliac joint. About 165 (11% of 1500 employees) had SIJ pain. Ninety percent of them had job experience of more than 7 years [20].

## 2. DISCUSSION

Apart from IT occupations, even in private life, an increasingly long duration of computer use is observed among many professionals. Current review of studies and our experience of working with IT professionals and other occupations involving prolonged computer use since 1997 until date, have revealed many observations. RSI and related MDS's are highly prevalent in Indian computer professionals and comparable with the west. Pain, discomfort, and partial dysfunction reported when they are engaged in repetitive and forceful jobs "or" when they assume prolonged static "or" awkward postures. According to Browne *et al.*, the important aspect of RSI depends on the degree of severity; stage three of RSI where weakness, pain, and fatigue even at rest results in serious loss of work performance. The two important risk factors are:

### 2.1. Physical Risk Factors

Substantial amount of working time at a computer in a poor arrangement, i.e., lack of footrest, unsupported back, incorrect chair, and wrongly arranged desktop heights with awkward posture, can increase the risk of developing RSI.

### 2.2. Workplace Organizational Risk Factors

Working without breaks, tight deadlines, unclear job roles, and poor workplace social support increase the risk for them. However, CTS and other wrist and hand-related RSI do not occur frequently in Asian

IT professionals when compared to the west. Neck is a major crush for an Indian professional. There is essentially minimal or no muscular activity needed to support the head; a FHP incurs from increased dorsal spinal kyphosis places this head, ahead of the center of the gravity increasing the static loading of the neck as well as shoulder muscles. Abnormal stress occurs in the facets, disc, and supporting tissues when normal motion of the spine is impaired. Spinal biomechanical stability requires an optimal lordotic structure.

Potential stress to the anterior longitudinal ligament in the upper cervical spine and posterior longitudinal ligament in the lower cervical spine develops to FHP, thus decrease in the relative rotation angle in the upper cervical spine. Many painful conditions result during FHP, i.e., muscle tension and fatigue, narrowing of intervertebral foramina in upper cervical spine and thus leading to impingement in blood vessels and nerve roots; tight levator muscles lead to impingement in cervical plexus, tight upper trapezius will cause impingement in greater occipital nerve and hence cause headache, TM joint pain from faulty head, neck, and mandible alignment and facial muscle tension. In a study of 277 lateral cervical X-rays, patients have shown lordosis of 20° or less were more likely to have carcinogenic symptoms significantly ( $P < 0.0001$ ) [21]. Visual symptoms do not depend on radiation from CRT, but increase with working time on systems in the majority of cases. In a large study of 4000 school children, visual discomfort was noted if viewing time is more than 60 min a day [22]. The stress of convergence and accommodation contributes to visual discomfort [23]. Eye monitor ergonomics plays a greater role in preventing these symptoms. Red-eye results from drying due to reduced blinking and can be prevented by awareness. Emotional stress during workloads can increase muscular tension in neck and shoulder muscles resulting in pain. Having frequent breaks during work has never been a priority for senior computer professionals (>7 years of experience); this has led to serious back pain due to sacroiliitis as a cause of persistent pain observed in our studies. Long sitting hours had a high correlation with SIJ pain. The use of computers might influence physical and mental health problems such as blood pressure and mood disturbance [24,25].

We have also observed that raised early isolated diastolic blood pressure is due to many factors and the hypothesis based on poor physiological adjustment in sedentary IT professionals. The study by Huang GD and Fenerstein on 248 marines clearly suggests that job redesign and

interventions which address a workers work style during increased work demands may help reduce the likelihood of musculoskeletal symptoms and/or their intensity [26]. Devereux *et al.* have suggested the importance of focusing on psychosocial work factors, along with physical work factors when undertaking ergonomic intervention strategies [27]. Another study investigated 721 workers to indicate that psychological factors at work may predict musculoskeletal pain [28].

### 3. CONCLUSION

Emerging research suggests that IT industry has many occupational hazards, which can be prevented effectively. Despite development in office-automation with modern gadgets such as voice software, flicker reduction, radiation reduction, glare-free monitors, and air-conditioned environments, man-machine-environment relationship need to be balanced. Many modern equipment do provide adequate feedback which is outside the range of conditions in which human perceptual system evolved. On one side, common man facing cardiovascular diseases, diabetes, and cancer; but we have to face the challenges of IT-related MSD's and stress-related medical problems. In Indian context, problems have been perceived differently. Individuals and organizations should develop occupational wellness programs with a multidisciplinary approach and more controlled studies are needed by occupational physicians.

### 4. RECOMMENDATIONS

As number of young aspirants perceiving IT job should develop complete awareness of problems related to job, competitive nature of IT industry may leave adequate time to regulate exercise and other lifestyle factors. Colleges should incorporate ergonomic awareness, postural awareness, and the most important regular physical exercise and stress coping skills in the education curriculum. Organizations staffed with computer users should encourage frequent breaks during work and compulsory vacations to improve their work performance. Effective time management will help the professionals to develop these healthy occupational habits. Special attention should be paid toward neck pain and related problems and emerging early hypertension. Occupational physicians should initiate more close controlled studies as Indian professionals face peculiar problems and preventive approach is the best for IT-related medical problems.

### REFERENCES

1. Bongers, P.M., de Vet, H.C., and Blatter, B.M. Repetitive Strain Injury (RSI): Occurrence, aetiology, therapy and prevention. *Ned Tijdschr Geneeskde*, 2002, 146(42), 1969-1970.
2. Statistics Canada. *Canadian Community Health Survey*. Vol. 14. Health Reports; 2003.
3. Bakhtiar, C.S., and Suneetha, S. Can we prevent occupational stress in computer professional? *Indian J Occup Environ Med*, 2000, 4(1), 4-6.
4. Browne, C.D., Nolan, B.M., and Faithfull, D.K. Occupational repetition strain injuries. *Med J Aust*, 1984, 140, 329-332.
5. Ferguson, D. The "new" industrial epidemic. *Med J Aust*, 1984, 140, 318-319.
6. National Occupational Health and Safety Commission. *RSI Committee Report and Model Code of Practice*. Vol. 7. Canberra: Australian Government Publishing Service; 1986.
7. Buckle, P.W., and Devereux, J.J. The nature of work-related neck and upper limb musculoskeletal disorders. *Appl Ergon*, 2002, 33(3), 207-217.
8. Harrison, D.D., Janik, T.J., Troyanovich, S.J., and Holland, B. Comparisons of lordotic cervical spine curvatures to theoretical model of the static sagittal cervical spine. *Spine*, 1996, 21, 667-675.
9. Saudham, A. Repeatability of head positive recordings from lateral cephalometric radiographs. *Br J Orthod*, 1988, 15, 157-162.
10. Bakhtiar, C.S., Sapur, S., and Deb, P.S. Forward head posture is the cause of straight spine syndrome in many professionals. *Indian J Occup Environ Med*, 2000, 4(3), 122-124.
11. Memell, J.M. *The Musculoskeletal System: Differential Diagnosis from Symptoms and Physical Signs*. Gaithersburg, Maryland: Aspen Publishers Inc.; 1992, pp. 126-133.
12. Bakhtiar, C.S., Suneetha, S., and Vijay, R. Conservative approaches benefit occupation-related backaches in milk-vendors and goldsmiths. *Indian J Occup Environ Med*, 2000, 6(4), 186-188.
13. Kurimoto, S., Iwasaki, T., Nomura, T., Noro, K., and Yamamoto, S. Influence of VDT work on eye accommodation. *J UOEH*, 1983, 5(1), 101-110.
14. Tatemichi, M., Nakano, T., Tanaka, K., Hayashi, T., Nawa, T., Miyamoto, T., Hiro, H., and Sugita, M. Possible association between heavy computer users and glaucomatous visual field abnormalities. A cross sectional study in Japanese workers. *J Epidemiol Community Health*, 2004, 58, 1021-1027.
15. Wolska, A., and Switupa, M. Luminance of the surround and visual fatigue of VDT operators. *Int J Occup Saf Ergon*, 1999, 5(4), 553-581.
16. Choudhary, S.B., Rao, V., and Suneetha, S. Attitude alters the risk for development of RSI in software professionals. *Indian J Occup Environ Med*, 2003, 7(1), 32-33.



17. Holte, K.A., and Westgaard, R.H. Daytime trapezius muscle activity and shoulder-neck pain of service workers with work stress and low biomechanical exposure. *Am J Ind Med.*, 2002, 41(5), 393-405.
18. Sheedy, J.E. Vision problems at video display terminals: a survey of optometrists. *J Am Optom Assoc*, 1992, 63, 687-692.
19. Choudhary, S.B., Rao, V., and Shetty, U.A. *Early Hypertension in IT Professionals; Seniors Cardiovascular Risk*. Unpublished Data; 2006.
20. Choudhary, S.B., and Rao, V. *Sacroiliac Joint Pain, a Common Cause of Backache in Experiences IT Professionals*. Unpublished Data; 2007.
21. McAvinarey, J., Schulz, D., Bock, R., Deed, E., Harrison, D.C., and Holland, B. Determining the relationship between cervical lordosis and neck complaints. *J Manipulative Physiol Ther*, 2005, 28(3), 187-193.
22. Misawa, T., Shigeta, S., and Nojima, S. Effects of video games on visual function in children. *Nihon Eiseigaku Zasshi*, 1991, 45(6), 1029-1034.
23. Collins, C., O'Meara, D., and Scott, A.B. Muscle strain during unrestrained human eye movements. *J Physiol*, 1975, 245, 351-369.
24. Tanaka, T., Tamamoto, S., Naro, K., Fukumoto, T., and Kuroiwa, A. The effects of VDT work on the regulation of hemodynamics compared with aging. *Ergonomics*, 1989, 32, 1595-1605.
25. Smith, M.J., Conway, F.T., and Karsh, B.T. Occupational stress in human computer interaction. *Ind Health*, 1999, 37, 157-173.
26. Huang, G.D., and Fenerstein, M. Identifying work organisation targets for a work related musculoskeletal symptoms prevention programme. *J Occup Rehabil*, 2004, 14(1), 13-30.
27. Deverux, J.J., Viachonikolis, I.G., and Buckle, P.W. Epidemiological study to investigate potential interaction between physical and psychological factors at work that may increase the risk of symptoms of musculoskeletal disorder of the neck and upper limb. *Occup Environ Med*, 2002, 59, 269-277.
28. Torp, S., Riise, T., and Moen, B.E. The impact of Psychological work factors on musculoskeletal pain: A prospective study. *J Occup Environ Med*, 2001, 43(2), 120-126.



# A Comparative Study of Physical Skills among Intercollegiate Players and Interuniversity Players in Telangana State

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## ABSTRACT

In the present study, an attempt has been made to compare physical component namely physical skills between intercollegiate players and interuniversity players belonging to Osmania University. The study was carried out on 50 players (50 intercollegiate players and 50 interuniversity players who participated in different team games) for assessment of physical skills. The data were collected by the use of questionnaire of past 3 years players. The data were analyzed and compared with the help of statistical procedures in which arithmetic mean, standard deviation (SD), and *t*-test were employed. The mean and SD values of intercollegiate sports players and the interuniversity sports players were found to be  $5.1488 \pm 4.058$  and  $1.306725 \pm 0.744278$ . The intercollegiate player and interuniversity players' physical skills *t*-values were found to be 2.46. There is a significant difference between interuniversity sports players and intercollegiate sports players in Telangana state.

**Keywords:** Intercollegiate players, Interuniversity players, Physical skills.

## 1. INTRODUCTION

I have been interested in physical skills for a long time, dating all the way back to at least the 3 years. This interest is rooted in a powerful intuition that there are many educationally-relevant aspects of human abilities that are not accounted for by physical skills.

Physical skills are healthy growth and development, including being a healthy weight and reducing the risk of disease such as diabetes or cancer later in life.

Building strong hearts, muscles, and bones, it is also a learning fundamental movement skills, it can improve movement, balance, coordination, and reaction time.

It can be developed from sport goes beyond learning new physical skills. Sport helps students develop better ways to cope with the highs and lows of life. When they are playing sport, students learn to lose. Being a good loser takes maturity and practice. Losing teaches children to bounce back from disappointment, cope with unpleasant experiences and is an important part of becoming resilient.

Playing sport helps students learn to control their emotions and channel negative feelings in a positive way. It also helps children to develop patience and understand that it can take a lot of practice to improve both their physical skills and what they do in school.

### 1.1. Objectives of the Study

The objectives of the study were to assess the difference in physical skills between the players of intercollege and interuniversity level. Physical skills can make us mental alertness and ethical qualities.

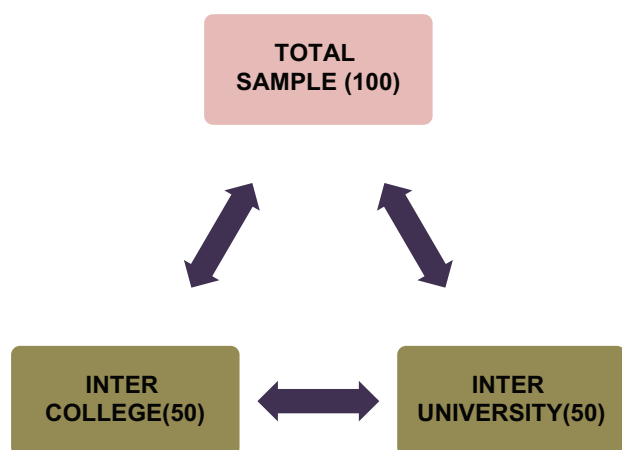
Constructive social abilities, emotional maturity.

### 1.2. Benefits of the Study

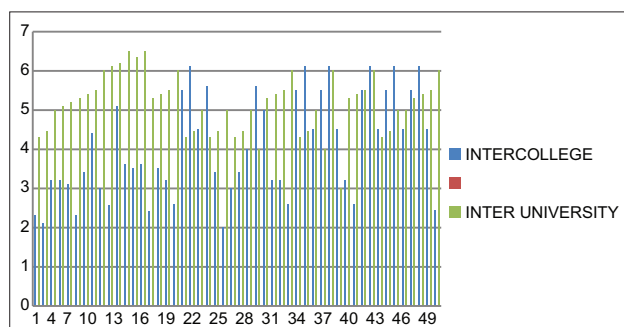
The sample would be subjected to the systematic purposive sampling technique. All the physiological variables would be considered.

Tools to be used: Standardized test selected to measure physical skills of the sample are as follows:

Physiological benefits	Emotional benefits	Social benefits
<ul style="list-style-type: none"> <li>• It benefits every aspect of your body, from your bones to your muscles to your organs.</li> <li>• Regular exercise strengthens your muscles and bones which aids relief from common aches and pains, such as lower back pain and arthritis, as well as fighting osteoporosis and muscle loss.</li> <li>• It also improves your balance and flexibility, making everyday activities easier and supporting your physical independence as you age. It even helps with things you might not think about, such as boosting sexual stamina and relieving menstruation cramp pains.</li> </ul>	<ul style="list-style-type: none"> <li>• Physical activity has been shown to stimulate chemicals in the brain that make you feel better.</li> <li>• Hence, playing sport regularly improves children's overall emotional well-being.</li> <li>• Research shows there's a link between playing sport and self-esteem in children.</li> <li>• The support of the team, a kind word from a coach, or achieving their personal best will all help children to feel better about themselves.</li> <li>• It can control a players emotional imbalance.</li> </ul>	<ul style="list-style-type: none"> <li>• Playing in a team helps children to develop many of the social skills they will need for life.</li> <li>• It teaches them to cooperate, to be less selfish, and to listen to other children.</li> <li>• It also gives children a sense of belonging. It helps them make new friends and builds their social circle outside school and colleges.</li> </ul>



**Figure 1:** A total sample of 100 subjects would be selected randomly



**Figure 2:** Graphical representation of interuniversity players and intercollegiate players physical skills

Table 1 indicates the values of descriptive statistics of the groups (intercollegiate sports player and interuniversity sports player) for physical skills variable, which shows that the mean and standard deviation values of intercollegiate sports player and the interuniversity sports player were found to be  $5.1488 \pm 4.058$  and  $1.306725 \pm 0.744278$ . Table 1 also indicates the SED values of intercollegiate sports player and the interuniversity sports player were found to be 1.29 and 0.73, respectively.

**Table 1:** Physical skills (muscular endurance test, muscular power, cardiovascular endurance, flexibility test, and balance test)

Variable	Group	n	Mean	SD	SEM
Physical skills	Intercollege	50	4.058	0.744278	0.736798
	Interuniversity	50	5.1488	1.306725	1.293592

SD: Standard deviation, SEM: Standard error of the mean

**Table 2:** The intercollegiate player and interuniversity players physical skills

Group	n	t-value	Sig. (2-tailed)
Intercollege	50	2.46	1
Interuniversity	50		

Table 2 indicates the physical skills *t*-test values of intercollegiate sports player and the interuniversity sports player separately. The intercollegiate player and interuniversity players physical skills *t*-values were found to be 2.46. As shown in Table 2 ( $P < 5$ ), there is a significant difference between interuniversity sports players and intercollegiate sports players.

## 2. CONCLUSION

It was also concluded that there is a significant difference exists on physical skills, i.e. intercollege tournament practice, university camp awareness, more experience, and game knowledge are more per the interuniversity players then the intercollege players. The intercollege players score level had less score than interuniversity level players.

## REFERENCES

Arvey, R.D., Maxwell, S.E., and Salas, E. Development of physical ability tests for police officers: A construct validation approach. *J Appl Psychol*, 1992, 77, 996-1009.

Arvey, R.D., Nutting, S.M., and Landon, T.E. Validation strategies for physical ability testing in police and fire settings. *Public Pers Manage*, 1992, 21, 301-312.

Campbell, W.J., and Fox, H.R. Testing individuals with disabilities in the employment context: An overview of issues and practices. In: Ekstrom, R.B., and Smith, D.K., (eds). *Assessing Individuals with Disabilities in Educational,*

*Employment, and Counseling Settings*. 1<sup>st</sup> ed. Washington, DC: American Psychological Association; 2002, p. 198.

Campion, M.A. Personnel selection for physically demanding jobs: Review and recommendations. *Pers Psychol*, 1983, 36, 527-550.

Hogan, J. The structure of physical performance in occupational tasks. *J Appl Psychol*, 1991, 76, 495-507.

# Implementation of Fitness Certificate in Professional Colleges

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## ABSTRACT

Regular physical activity can help to improve the absorption of nutrients in the body. It also helps to improve cardiovascular health and develop muscular strength. The heart plays an important role in pumping blood to the entire body. New “challenges,” such as physical activity, social opportunities, and increased learning, can stimulate the production of new cells in the brain. A combination of all of those things can improve concentration, help keep the mind focused, and, ultimately, boost work productivity and academic success in students. Although hours of studying burn mental energy, both your body and mind need physical exercise to function at their peak. Not only can exercise help with concentration and focus but also with mental health. Indirectly, exercise improves mood and sleep and reduces stress and anxiety. The purpose of this study was to determine the physical activity performed by students, its frequency and intensity and how this physical activity may relate to their physical fitness and academic success. Students get a lot of benefits from physical education classes. Physical education classes can help students to become more aware of the importance of a healthy lifestyle. The students can also retain a higher level of knowledge as a result of the overall health. This knowledge can help them to make wise decisions concerning their safety, health, and wellbeing. Here are ways in which physical education can help to improve the life of the students. Physical fitness of the student, improvement of academic performance, social assimilation, reduce the levels of stress, helps student focus, daily fitness activities, learn the importance of working out, health and nutrition, in still positive behaviors, final thoughts.

**Keywords:** Student P.E. records, Fitness level tests, BMI chart, Classification of students, P.E classes in academic year, Fitness certificate.

## 1. INTRODUCTION

Students get a lot of benefits from physical education classes. P.E. classes can help students to become more aware of the importance of a healthy lifestyle. The students can also retain a higher level of knowledge as a result of the overall health. This knowledge can help them to make wise decisions concerning their safety, health, and wellbeing. Here are ways in which physical education can help to improve the life of the students.

### 1.1. Physical Fitness of the Student

Physical fitness can be a key component of a healthy lifestyle. This is why P.E. is a key subject in all the leading universities in the world. When regular fitness activities are included in the lifestyle of student, it is possible for them to maintain fit. Regular physical activity can help to improve the absorption of nutrients in the body. It also helps to improve cardiovascular health and develop muscular strength. The heart plays an important role in pumping blood to the entire body.

When students remain inactive throughout the day, they can be at risk of various cardiovascular issues. Unlike adults, children do not have to spend a lot of their time in the gym to get the adequate amount of workout. All they need is ample playtime and running around the field.

### 1.2. Reduces the Levels of Stress

Many University curriculums lay emphasis on core subjects. Students are pressurized to perform better in these subjects. Even after spending hours in the classroom, they get a lot of homework to tackle away from the student. This means that they have no or little time to play at home as they have to do their homework. This causes a lot of stress to the children as they are supposed to spend so many hours studying. This is despite the fact that playtime is one of the ways of releasing stress. Therefore, physical activity can be an outlet for getting rid of stress and anxiety. It can also facilitate emotional resilience and stability.

### 1.3. Health and Nutrition

Nutrition is one of the elements of P.E. one of the key benefits of P.E. is that it helps students to understand the importance of proper nutrition. This is particularly important in college as this is where eating disorders and obesity prevails. With physical education and health, students understand the importance of eating well and key nutrition guidelines.

## 2. METHODOLOGY

### 2.1. Participants

Participants were volunteers enrolled in for-credit physical activity (fitness program) and nutrition classes that required a fitness assessment as a part of their course requirements. Courses drew from all colleges across the universities and were a part of a student general education requirement.

The following fitness tests are used for the fitness program:

Body composition: Height, weight, age, waist girth, body mass index (BMI), and body fat percentage through bioelectrical impedance were used to assess subject's body composition and weight status.

Muscular endurance: Assessments included two tests: A 1-min maximum repetition push-up test and modified curl-up test. Modified curl-ups are performed as per schedule (max number possible to perform is 75 repetitions).

Flexibility: Trunk flexion was assessed with a standard sit and reach box, with total distance recorded in centimeters.

Following the objective fitness measurements, subjects were asked to complete the form.

Demographics: Students self-reported their current academic year, age, sex, height, and weight.

### 2.2. Need for Physical Fitness Programme

There is no dispute or argument on having a Physical Fitness Programme for people of the country covering all sections of the society, starting from school going children to housewives and old people. Physical fitness initially was needed for survival purposes as "Survival of the fittest" was the dictum. Today physical fitness is the underlying paradigm for social as well as economic well-being of the country. Physical fitness is all the more important now come well-being of the country. Physical fitness is all the more important now in view of the technological advancements which have reduced physical activities being performed by individuals to a bare minimum. A stage has now come when adults as well as children are facing diseases which were unheard of by human beings a few years ago. Blood pressure, diabetes, hypertension, heart disease, etc., are prevalent in children of the country.

### 2.3. Components of Physical Fitness

The six basic components of physical fitness important for good health are:

1. Cardiorespiratory endurance,
2. Muscular strength,
3. Muscular endurance,
4. Flexibility,
5. Explosive strength,
6. Body composition.

Physical fitness tests and their dimensions as proposed by this scheme are detailed hereunder:



Test item	Fitness dimension measures
Sit-ups (number in a minute)	Abdominal strength/endurance
Sit and reach (cm)	Flexibility and low-back musculoskeletal function
Modified pull-up (completed)	Upper body strength and endurance
Mile run (min: sec)	Cardiorespiratory endurance
04×10 m shuttle run test	Test of speed, body control, and ability to change direction (agility)
Standing vertical jump	Explosive strength and power of legs
Standing broad jump	Explosive strength and power of legs and extensibility of hip muscles
Height (meters) and weight (Kg)	Body mass index (body composition)

### 3. RESULTS

#### 3.1. Improvement of Academic Performance

There are studies that show that P.E. can help to improve the academic performance of a student. Many of the regular physical activities that students engage in are associated with higher levels of concentration and well-composed behaviors. Sports activities help to reinforce the knowledge learned in other subjects. For instance, one of the benefits of P.E. includes helping students to do better in social studies.

#### 3.2. Helps Students Focus

If you do not take time off from your job, you will realize that it can be hard to focus. This can also happen to students. They require more than one break in a day if they focus their attention on books. This is why physical education is necessary. When students engage in P.E., they are able to burn the excess pent up energy. Pent up energy is often what leaves them fidgeting and without paying attention in the classroom.

#### 3.3. Final Thoughts

It is clear that physical education plays a key role in the development of a student life. There are various factors that should be considered in the development of sports activities. One of these is the age of the student. It is important for a physical educator to help learners make the right choice of physical activities either now or in the future. Therefore, there are some good reasons for

why physical education should be incorporated into the college's curriculum.

## 4. DISCUSSION

#### 4.1. Sit-ups in 60 s (Knees Flexed)

**Purpose:** The purpose of the sit-up is to evaluate the abdominal muscular strength and endurance.

**Equipment:** Mats or other comfortable surfaces are recommended. Stopwatch or sweep second hand from an electronic wristwatch may be used for timing.

**Scoring:** Record the number of correctly executed sit-ups that are completed in sixty seconds.

#### 4.2. Sit and Reach Test (Sitting Position)

**Purpose:** The purpose of the sit and reach is to evaluate the flexibility (extensibility) of the low back and posterior thighs.

**Equipment:** The test apparatus consists of a specially constructed box with a measuring scale where 23 cm is at the level of the feet.

**Scoring:** The score is the farthest distance point reached on the fourth trial measured to the nearest centimeter. The test administrator should remain close to the scale and note the farthest distant point touched the fingertips of both hands. If the fingertips reach unevenly, the test should be readministered. The tester should place one hand on the subjects knees to ensure that they remain extended.

#### 4.3. Modified Pull-ups

**Purpose:** The purpose of the modified pull-ups test is to test the shoulder strength and endurance.

**Equipment:** The test apparatus consists of a specially constructed horizontal bar that can be positioned at a height that allows the student to clasp the bar with over grasp when lying on the back on a flat surface.

**Scoring:** The student's score is the number of correctly executed pull-ups.

#### 4.4. One Mile Run (1600 m)

**Purpose:** The purpose of the 1-mile run is to measure maximal functional capacity and endurance of the cardiorespiratory system.

**Equipment:** One-mile run can be administered on a 400 m or 200 m or on any other flat, measured area.

**Scoring:** The one-mile run is scored to the nearest of a second and the performance should be recorded on the individual soccer card.

#### 4.5. 04 × 10 m Shuttle Run Test

**Purpose:** This purpose is to test of speed, body control, and the ability to change direction (agility)

**Equipment:** Equipment required is two wooden blocks for each runner (each block should measure 10 × 5 × 5 cm), marker cones or marking tape, measurement tape, stopwatch, and flat non-slip surface, with two lines 10 m apart.

**Scoring:** Record the time to complete the test in seconds to the nearest one decimal place. The score is the better of the 2 times recorded.

#### 4.6. Standing Vertical Jump

**Purpose:** The purpose of standing vertical jump is to measure the explosive power of the legs muscles and extensibility of hip muscles.

**Equipment:** Test equipment required is measuring tape, several pieces of chalk, and a smooth wall surface of at least 12 ft. from the floor.

**Scoring:** The distance between the reach and the jump marks is the score. Three attempts are allowed and the best attempt is recorded as the score.

#### 4.7. Standing Broad Jump

**Purpose:** The purpose of standing broad jump is to measure the explosive power of the legs muscles.

**Equipment:** Test equipment consists of tape measure to measure distance jumped, nonslip floor for takeoff, and soft landing area preferred. The take offline should be clearly marked.

**Scoring:** The score is the maximum distance covered in any one of the three attempts.

### 5. CONCLUSION

**Body composition:** Height measured to the nearest cm (recorded in meters) and weight will be recorded to the nearest 0.5 kg

**Scoring:** BMI can be calculated by formula  
BMI = weight/height\*height)

#### BMI chart for boys

BOYS	Age 10	Age 11	Age 12	Age 13	Age 14	Age 15	Age 16	Age 17+
BMI	14-18	14.5-18.5	15-19	15.5-21	16-21.5	16.5-21.5	17-22	17.5-22.5

#### BMI chart for girls

GIRLS	Age 10	Age 11	Age 12	Age 13	Age 14	Age 15	Age 16	Age 17+
BMI	13-23	13.5-23.5	14-24	14.5-24.5	15-25	15.5-25.5	16-26	16.5-26.5

#### 5.1. Periodicity of Testing

The fitness tests need to be executed at least 2 times in a year, i.e., in the month of June and January of academic session, which will provide an idea regarding present status as well as improvement of physical fitness during academic session of the student.

The students shall undergo these eight tests on two pre-determined dates in the months of January and June every year. While the conduct of these tests and their evaluation could be done by suitably trained internal personnel/staff during the students' non-board year, the same shall be entrusted to external observers/examiners in the years in which the student is taking his/her class university exams and maintain records and issue the fitness certificate end of the course.

PHYSICAL FITNESS CERTIFICATE

Date:

Student name	Course	Age	Height	Weight	Gender	BMI	Year
	UG/PG		C.M.	k g	M/F		

Roll. No .....

Date of Birth:-.....(D/M/Y)

Student signature.....

I, P.E.Department.....after careful personal examination(as per records) of the case do hereby certify that Sri./Mr/Kum..... whose signature is given above is found physically fit to undergo professional education.

His/Her height....., weight....., chest..... and BMI Below/Average / Above

PHYSICAL DIRECTOR

PRINCIPAL

Place:

Date:

(S E A L)

## REFERENCES

1. Fitness Program in India. Available from: <http://www.fitindia.gov.in/events/khelo-india-fitness-test>.
2. Available from: <https://www.schoolfitness.kheloindia.gov.in/staticpage/landingpage.aspx>.
3. National Fitness Programme for Students. Available from: <https://www.kheloindia.gov.in>.
4. Available from: [https://www.researchgate.net/publication/281297534\\_2008\\_kerala\\_total\\_physical\\_fitness\\_programme\\_test\\_resultsreport\\_to\\_the\\_government](https://www.researchgate.net/publication/281297534_2008_kerala_total_physical_fitness_programme_test_resultsreport_to_the_government).
5. Available from: <https://www.ajaymakenblog.wordpress.com/2016/08/20/national-physical-fitness-programme-for-school-children-draft-introduced-by-me-4-weeks-before-being-shifted-from-sports-ministry>.
6. Available from: [https://www.researchgate.net/publication/282332617\\_health\\_related\\_physical\\_fitness\\_status\\_of\\_school\\_children\\_in\\_kerala\\_india\\_findings\\_from\\_2008\\_tfp\\_survey](https://www.researchgate.net/publication/282332617_health_related_physical_fitness_status_of_school_children_in_kerala_india_findings_from_2008_tfp_survey).
7. Available from: [https://www.academia.edu/10759873/total\\_physical\\_fitness\\_programme\\_health\\_empowerment\\_programme\\_for\\_school\\_children\\_in\\_kerala](https://www.academia.edu/10759873/total_physical_fitness_programme_health_empowerment_programme_for_school_children_in_kerala).

# Effectiveness of Specific Strength Training Profile on Physical Performance in Trained Athletes

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## ABSTRACT

A general strengthening program should address all major muscle groups and exercise through the complete range of motion. Any sign of injury or illness from strength training should be evaluated before continuing the exercise in question. Previous studies have reported that warm-up and cool-down protocols were effective to prevent injury and increase performance for athletic population. If specific strength training profile can further improve the outcome in the athlete's population? This study was conducted in order to compare the specific strength training profile combined with general warm-up and cool-down can improve physical performance in trained athletes. It is randomized experimental study with a total of 30 athletes were selected by a convenient sampling method with the age group range from 18 to 25 years. Study was conducted for duration of 8 weeks. The parameters used in this study are physical performance, which are measured using 6-min walk test, respectively. This study concluded that specific strength training profile combined with general warm-up and cool-down can improve physical performance in trained athletes.

**Keywords:** 6-min walk test, Specific strength training.

## 1. INTRODUCTION

Strength training (also known as resistance training) is a common component of sports and physical fitness programs for young people. Some adolescents and preadolescents may use strength training as a means to enhance muscle size and definition or to simply improve appearance. Strength training programs may include the use of free weights, weight machines, elastic tubing, or body weight. The amount and form of resistance used as well as the frequency of resistance exercises is determined by specific program goals. Since 1988, the National Collegiate Athletic Association injury surveillance system (ISS) has collected injury and exposure data. For resistance training, these alterations usually contribute to significant increases in muscle strength and size (McDonagh and Davies, 1984; Tesch, 1988; Abernethy *et al.*, 1994). A reportable injury in the ISS had to meet all of the following criteria: Injury occurred as a result of participation in an organized intercollegiate practice or contest; injury required medical attention by a team certified athletic trainer or physician; and injury resulted in restriction of the student-athletes participation or performance for 1 or more days beyond the day of injury.

In addition to the obvious goal of getting stronger, strength training programs may be undertaken to improve sports performance, rehabilitate injuries, prevent injuries, and/or enhance long-term health. Studies have shown that strength training, when properly structured with regard to frequency, mode (type of lifting), intensity, and duration of program, can increase strength in preadolescents and adolescents. Gains in strength, muscle size, or power are lost after 6 weeks if resistance training is discontinued.

Maintenance exercises may offset these losses, but specific recommendations for maintaining strength gains have not been defined for preadolescents and adolescents. Strength training can improve an adolescent athlete's performance in weight lifting and powerlifting. Strength training is a common practice in sports like football in which size and strength are desirable.

Despite theoretical benefits, scientific studies have failed to consistently show that improved strength enhances running speed, jumping ability, or overall sports performance. Evidence that strength training programs help prevent sports-related musculoskeletal injuries in preadolescents and adolescents is inconclusive. Furthermore, there is no evidence that strength training

will reduce the incidence of catastrophic sports-related injuries.

Research in this area has often focused on various combinations of sets and repetitions to optimize these specific adaptations (Tan, 1999). For example, an early study by Berger 1962 suggested that three sets of 4–8 repetitions produced optimal gains in strength compared to various other sets/repetition combinations.

Anderson and Kearney, 1982 tested DeLorme's hypothesis by investigating the effects of three very different resistance programs on strength adaptations. Forty-five college-aged men were randomly assigned to one of three groups: High resistance/low repetition (three sets of 6–8 repetitions maximum [RM]), medium resistance/medium repetition (two sets of 30–40 RM), and low resistance/high repetition (one set of 100–150 RM).

## 2. MATERIALS AND METHODS

The aim of the study is to assess the effect of specific strength training profile on physical performance in trained athletes.

To achieve the purpose of the study, thirty ( $n = 30$ ) athletes were selected 18–25 age groups and they were divided into two groups of twenty ( $n = 15$ ) each. General warm-up and cool-down were given to the control group and general warm-up, specific strength training, and cool-down were given to the experimental group for 8 weeks (3 days/week).

Thirty athletes were selected in the age group between 18 and 25 years alter due to consideration of inclusion and exclusion criteria. The subjects were allotted into two groups at YMCA College of Physical Education, Chennai.

- Group A received general warm-up and cool-down only;
- Group B received general warm-up, specific strength training followed by cool-down protocol.

The pre-test and post-test were taken before and at the end of the treatment. Physical performance was measured before and after the training section for both groups.

For performance by 6 min' walk/run test, independent "t" test was used to find out the results.

- Absences of true control/sham or placebo group
- These study only short-term effects and further recommendation is to maintain at a long-term follow-up

- In addition, we did not successfully collect enough data on home exercise compliance to allow for analysis
- Strengths of this study include an adequate sample size to detect between-group differences and a very low dropout rate.

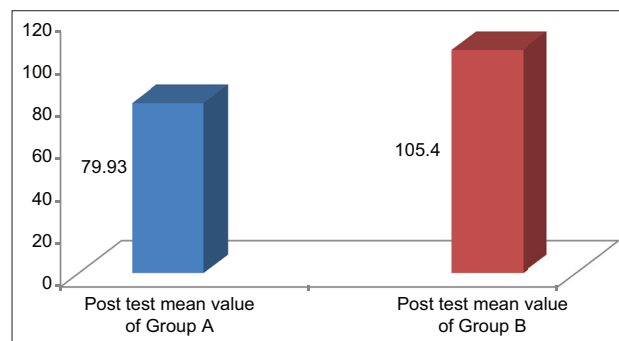
## 3. RESULTS OF THE STUDY

Table 1 shows the results of comparative mean values, mean difference, standard deviation, and unpaired "t" test value of Group A and Group B (post-test) performance – 6-min walk test.

**Table 1: Performance – 6-min walk test**

Groups	n	Mean	SD	SEM	Calculated "t" test
Group A	15	79.93	3.53	1.239	20.5492
Group B	15	105.40	3.25		

The calculated  $t$  value (20.5492) is significant as it is greater than the tabulates  $t$  value (1.7011) for  $df=28$  at 0.05% level of significance



**Graph 1:** Graphical representation of post-test values of Group A and Group B (6-min walk test)

## 4. CONCLUSION AND SUMMARY

The study concluded that specific strength training profile combined with general warm-up and cool-down can improve physical performance and prevent injury for trained athletes.

This study states that there would be a significant improvement on performance and prevents injury variables of trained athletes.

## REFERENCES

- Magee, D.J. *Orthopedic Physical Assessment*. 4<sup>th</sup> ed. Philadelphia, PA: Saunders; 2002.
- Domholdt, E. *Physical Therapy Research, Principles and Applications*. West Bengal: Saunders Company; 1993.
- Ebnezar, J. *Essentials of Orthopedics for Physiotherapists*.



- 1<sup>st</sup> ed. New Delhi: Jaypee; 2003.
- Kotwala, P.P., and Natarajan, M. *Textbook of Orthopedics*. 1<sup>st</sup> ed. New Delhi: Elsevier; 2005.
- Pillai, R.S.N., and Bagavathi, V. *Statistics Theory and Practice*. New Delhi: S. Chand & Company Ltd.; 1997.
- Pandey, S., and Pandey, A.K. *Clinical Orthopedic Diagnosis*. 2<sup>nd</sup> ed. New Delhi: Jaypee Brothers; 2000.
- Molole, T.R., Thomas, G., and Arthur, M. *Orthopedic and Sports Physiotherapy*. 2<sup>nd</sup> ed. St Louis: Mosby.
- Young, B., Walker, M., Sttuencc, J., and Boyles, R. A combined treatment approach emphasizing impairment-based in physical therapy for plantar heel pain: A case series. *J Orthop Sports Phys Ther* 2004;34:725-33.
- Zohan, D.A., Mennell, J.M. Musculoskeletal pain. Diagnosis and physical therapy treatment. *Phys Ther*, 1976, 57, 129-9, 190-3.

# Screening Variant Levels of Mood Disorders Symptoms among Inter-University Football Players

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## ABSTRACT

Hypomania disorder is the name used to describe a set of “mood swings” conditions, the most severe form of which used to be called “manic depression.” The term describes the exaggerated swings of mood, cognition, and energy from one extreme to the other that are characteristic of the illness. This study was designed to investigate and identify different levels of mood disorder. A survey study was performed on South Zone Inter-University Football players ( $n = 150$ ) aged 19–24 years. These data were analyzed with a percentile statistical application. The analysis of the data from the hypomania checklist which was collected from the convenience samples, the results shows that inter-university football players 4% of the respondents were having hypomania disorder. Finally, concluding that hypomania disorder is affecting the players.

**Keywords:** Cognition, Hypomania, Mood swings, Stress.

## 1. INTRODUCTION

Mood disorder, formerly called manic depression, is a mental illness that brings severe high and low moods and changes in sleep, energy, thinking, and behavior. People who have hypomania disorder can have periods in which they feel overly happy and energized and other periods of feeling very sad, hopeless, and sluggish. In between those periods, they usually feel normal. You can think of the highs and the lows as two “poles” of mood, which is why it is called “hypomania” disorder. The word “manic” describes the times when someone with hypomania disorder feels overly excited and confident. These feelings can also involve irritability and impulsive or reckless decision-making. About half of people during mania can also have delusions (believing things that are not true and that they cannot be talked out of) or hallucinations (seeing or hearing things that are not there). “Hypomania” describes milder symptoms of mania, in which someone does not have delusions or hallucinations, and their high symptoms do not interfere with their everyday life.

## 2. METHODOLOGY

A total of 150 convenience sample groups were taken from various football players who took part in South

Zone Inter-University Football Tournament. Their age ranges between 19 and 24 years. The study used a questionnaire method hypomania checklist (HCL)-32, tool by Angst *et al.* to collect data from the samples, and the period executed in December 2018. Hypomania (hypomania disorder) is the main dependent variable and the sub-variables from the HCL are potentially hypomania (major depressed), active hypomania (active hypomania), risk-taking hypomania, and non-hypomania (normal) were selected for the purpose of the study. The percentile was acclimated to determine the hypomania disorder symptoms among the football players. The descriptive statistics were acclimated to find mean difference in the various symptoms of hypomania disorder for the football players.

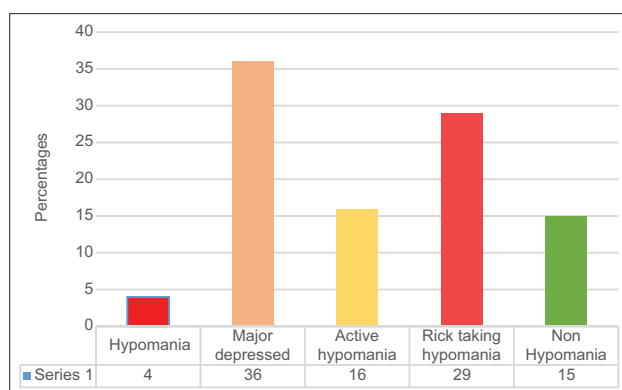
## 3. RESULTS

The statistical analysis and interpretation of data have been prescribed in Table 1. The test was administered to 150 football players of various teams in the South Zone Inter-University Football Tournament.

The total number of samples was 150 and of 150 most of the respondents (97) have potential hypomania and 77 respondents been suffering from risk-taking hypomania. Forty-three respondents were having active hypomania

**Table 1: Percentages of mood disorder symptoms of football players**

Items	Values	n	Percentages
Hypomania	10	150	4
Major depressed	97		36
Active hypomania	43		16
Rick taking hypomania	77		29
Non-hypomania	42		15

**Figure 1:** Bar diagram showing percentages of mood disorder symptoms of football players

and 42 respondents have nonpolar disorder. Only 10 respondents were having the hypomania disorder. This finding depicts the fact that the football players possess the symptoms of hypomania disorder, which is typically a mood disorder.

#### 4. DISCUSSION

Hypomania disorder is very common and the lifetime prevalence of hypomania disorder spectrum is 4% in the general population. Moreover, hypomania disorder is associated with substantial impairments in productive and social roles. The HCL-32 is a convenient instrument for screening hypomania disorders, and psychiatrists in several countries use it in practice. India is the second most populated country in the world. Therefore, a study concerning the use of the HCL-32 in the South Zone Inter-University Football Tournament.

#### 5. CONCLUSIONS

This study concludes that the football players of various universities are having affected with more depression status; it may be due to the body contact game, speed play, injury status, match intensity, aggression, and anxiety. Sometimes it might be because

of low confidence levels, inferiority complex, fear of match, and at times due to more pressure situations in life. They are also significantly more likely to develop an addiction to drugs or alcohol. This affects the performance levels of the player, where a player may not exhibit his full potential. Therefore, hypomania disorder possesses a risk to the individual's physical and emotional well-being.

#### REFERENCES

1. Angst, J., Adolfsson, R., Bennazzi, F., Gamma, A., Hantouche, E., Meyer, T.D., Skeppar, P., Vieta, E., and Scott, J. The HCL-32: Towards a self-assessment tool for hypomanic symptoms in outpatients. *J Affect Disord*, 2005, 88, 217-233.
2. Chun, B.J.D., and Dunner, D.L. A review of antidepressant-induced hypomania in major depression. *Eur Arch Psychiatry Clin Neurosci*, 2004, 6, 32-42.
3. Das Gupta, R., and Guest, J.F. Annual cost of hypomania disorder to UK society. *Br J Psychiatry*, 2002, 180, 227-233.
4. Kessler, R.C., Akiskal, H.S., Angst, J., Guyer, M., Hirschfeld, R.M., Merikangas, K.R., Kessler, R.C.S., Berglund, P., Demler, O., Jin, R., Merikangas, K.R., and Walters, E.E. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the national comorbidity survey replication. *Arch Gen Psychiatry*, 2005, 62, 593-602.
5. Kleinman, L., Lowin, A., Flood, E., Gandhi, G., Edgell, E., and Revicki, D. Costs of hypomania disorder. *Pharmacoeconomics*, 2003, 21, 601-622.
6. Krishnan, K.R. Psychiatric and medical comorbidities of hypomania disorder. *Psychosomatic Medicine*, 2005, 67(1), 1-8.
7. Lahuerta, J., and Angst, J. Cross validation with the mood disorder questionnaire (MDQ) of an instrument for the detection of hypomania in Spanish: The 32-item hypomania symptom checklist (HCL-32). *J Affect Disorder*, 2007, 101, 43-55.
8. Murphy, F.C., and Sahakian, B.J. Neuropsychology of hypomania disorder. *Br J Psychiatry*, 2001, 178, s120-s127.
9. Stang PE. Validity of the assessment of Hypomania spectrum disorders in the WHO CIDI 3.0. *J Affect Disorder*, 2006, 69, 259-269.
10. Seema, Q., and Frangou, S. Neuropsychology of hypomania disorder: A review. *J Affect Disord*, 2002, 72(3), 209-226.
11. Twiss, J., Jones, S., and Anderson, I. Validation of the mood disorder questionnaire for screening for hypomania disorder in a UK sample. *J Affect Disord*, 2008, 110(1), 180-184.
12. Kim, B., Wang, R.H., Son, J.I., Kim, C.Y., and Joo, Y.H. Hypomania in depressive patients without histories of

diagnosis of hypomania disorder and the use of the mood disorder questionnaire for the detecting hypomaniaity. *Compr Psychiatry*, 2008, 49, 469-475.

13. Forty, L., Smith, D., Jones, J., Jones, I., Caesar, S.,

Fraser, C., Gordon-Smith, K., and Craddock, N. Identifying hypomanic features in major depressive disorder using the hypomania checklist (HCL-32). *J Affect Disord*, 2009, 114, 68-73.

# Fit India Movement – An Initiative Program by Government of India to Attain Fitness, Wellness, and Health for People of India

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## ABSTRACT

The purpose of this article is to understand the fit India movement program and create awareness among Indians about the importance of fitness in our daily lives by the events present in this fit India movement such as fit India quiz, fit India women's day 2020, fit India active Sunday, fit India monthly plog event, and fit India school and also understanding of the events in the fit India movement. The benefits of fit India movement and challenges to overcome have been identified. It has been conclusive evidence that by this fit India movement, it is making all kinds of people from school children to old age and men to women making sedentary and unhealthy people to fit, active and healthy people thereby fit India.

**Keywords:** Active Sunday, Plog event, Sedentary

## 1. INTRODUCTION

Fit India movement is a nation-wide movement in India to encourage people to remain healthy and fit by including physical activities and sports in their daily lives. It was launched by Prime Minister of India Narendra Modi at Indira Gandhi Stadium in New Delhi on 29 August 2019, on the occasion of National Sports Day.

The campaign has a "Fitness Pledge"

I promise to myself that I will devote time for physical activity and sports every day and I will encourage my family members and neighbors to be physically fit and make India a fit nation.

The focus of the movement is to create awareness among Indians about the importance of fitness in our daily lives and showcasing the ease and simplicity of doing things, which make us fit.

### 1.1. Aim

Fit India Movement aims at behavioral changes – from sedentary lifestyle to physically active way of day-to-day living.

### 1.2. What is Fit India Movement?

The Fit India Movement is a movement to take the nation on a path of fitness and wellness. It provides a unique and exciting opportunity to work toward a healthier India. As part of the movement, individuals and organizations can undertake various efforts for their own health and well-being as well as for the health and well-being of fellow Indians.

### 1.3. What are the events of fit India?

- Fit India quiz
- Fit India women's day 2020
- Fit India active Sunday
- Fit India monthly plog event.

Fit India Quiz' is an initiative by the Fit India Movement to create awareness among people across the country regarding fitness, health, and nutrition. This activity aims to engage, excite, and enable citizens to motivate them toward fitness and raise awareness about fitness through an interactive learning process.

The Fit India Quiz contains multiple-choice questions based on the fitness, health, indigenous games, and nutrition. These questions are designed to motivate



citizens to get fit by learning about various matters related to health such as what kind of activities help in gaining fitness, what kind of diets help in remaining fit, and what kind of indigenous sports are played in our country. Through this fun and interactive quiz, participants would have the opportunity to not only test their knowledge about fitness and win attractive prizes but also get motivated in getting fit.

The overall objective of the Fit India Quiz is to bring about physical and mental change among citizens to adopt a healthy lifestyle through the MyGov platform.

For participation in Fit India Quiz, please visit: <https://quiz.mygov.in/quiz/fit-india-quiz>

#### **1.4. Why Fit India Women's Day 2020?**

Women are the strongest pillar that holds a family together. She acts as a catalyst in making her family healthy, wealthy, and fit. But with regular chores of life, she seldom overlooks her own health. Regular activities in the form of exercise are vital for the overall well-being of women's mental and physical health. Physical activity for 30 min a day can not only improve her daily life but also make her more efficient and mindful in making the right decisions.

Fit India active Sunday, powered by GOQii is a unique community-driven initiative that encourages people to get together and exercise for one hour. One can choose any GOQii center such as a ground, park, and beach. for their Fit India Active Sunday. This initiative has grown over the past 5 years throughout the country across 23 cities in over 40+ venues. These programs will be conducted by self-motivated "Champions" who inspire others to get fit and active.

You too can be a part of this community by joining a Fit India Active Sunday group or choose to lead by example by hosting a Fit India Active Sunday session in your city.

Fit India monthly plog jogging is good for your health. Swachhata is good for India's health. Why not combine the two? Plog is the new running craze that is saving the world from plastic pollution, by combining jogging with picking up litter. Won't it be satisfying to take your gloves and a bag and start picking up garbage/litter along the way while you are jogging, instead of just passing by and silently cursing the individual who dumped it?

## **2. FIT INDIA SCHOOLS**

Join the Fit India School movement. Increase physical education and physical activity for your students and in your school and make a fitter, healthier, and happier India.

### **2.1. Fit India Schools**

"How to Live" ought to be the first pillar of formal education?

This involves teaching and practicing the art of taking care of one's body and health daily. Schools have to be the first formal institution after home, where physical fitness is taught and practiced.

In the above background, the Fit India Mission encourages Schools to Organize a Fit India School. It has also prepared a set of Fit India School Certification with simple and easy parameters.

## **3. FIT INDIA SCHOOL CERTIFICATION**

The following parameters would apply:

1. Having one teacher trained in PE, and such teacher is physically fit and active
2. Having a playground where two or more outdoor games are played
3. Having one PE period each day for every section and physical activities (sports, dance, games, yogan, and PT) take place in the PE period
4. Having all students spending 60 min or more on physical activities daily.

### **3.1. Fit India Three Star School**

The following additional parameters would apply for claiming a three star certification:

1. All teachers to be physically fit and spending 60 min or more every day for physical activities
2. School has at least two trained teachers (including one PET), each well versed with any two sports
3. Sports facilities for four sports including the two outdoor sports
4. Every student learns and plays two sports – one of which could be a traditional/indigenous/local game.

### **3.2. Fit India Five Star School**

The following additional parameters (over and above three star certification) would apply for claiming the highest certification:

1. School conducts monthly intraschool sports competitions, participates in interschool sports competition, and celebrates Annual Sports Day
2. All teachers are trained in PE
3. School has two or more sports coaches. These may be PE teachers
4. School follows structured PE curriculum prescribed by NCERT/School Board
5. School conducts annual fitness assessments of all children
6. School opens its playground(s) after school hours for neighboring communities, and the same is actively used. A reasonable fee can be levied for maintenance and security.

### **3.3. Procedure for Schools to Get Fit India Star Certification**

1. Basic Fit India School would be self certified and registered online at [www.fitindia.gov.in](http://www.fitindia.gov.in) by the School. On registration, a certificate would be issued online to the school, and on receipt of such certificate, the school would be entitled to use Fit India Logo and Fit India Flag
2. For Fit India Three Star or Five Star certification, the school would have to file its claim online at [www.fitindia.gov.in](http://www.fitindia.gov.in). The Fit India Mission would get the claim verified and thereafter issue an online certificate and commendation letter. The same would be followed in print and dispatched through postal mail
3. Fit India is going to be included in the Prime Minister's Award.

### **3.4. Honor Fit India Three Star and Five Star**

1. Organize Fit India events at schools from time to time. You may encourage schools to use their creativity in designing and organizing Fit India events
2. A senior officer as a State Nodal Officer for Fit India for monitoring
3. To honor Fit India Three Star and Five Star Schools by organizing appropriate function in the State Headquarters. Fit India Five Star Schools could be felicitated at State level Republic Day and Independence Day functions.

### **3.5. Fit India School Week**

The challenges of the modern-day life have brought along with it the need to be more physically proactive

and fit to face its challenges with optimum energy and positivity. Fit children are able to handle day-to-day physical and emotional challenges better. However, for a holistic and intrinsically healthy lifestyle, awareness and support for fitness movement are more essential than ever.

A total of 6 working days will be celebrated as "Fitness Week" in all its affiliated schools. This movement therefore endeavor's to alter this behavior from "Passive Screen time" to "Active Field time" and the aim of the objective is to develop Sports Quotient among all the students to achieve a healthy lifestyle. Such movement will also instill in students the understanding of regular physical activity and higher levels of fitness-enhancing in them self-esteem and confidence.

## **4. BEST PRACTICES WORLDWIDE**

- In 2007, a report by the "International Association for the study of Obesity" stated that Germans are the most overweight people when compared with the people of other European countries. This was like a wake-up call for the Germany. Hence, they immediately launched "Fit instead of Fat" program to promote an active lifestyle and also to stop increasing obesity rates among children by 2020
- In 2016, The government of China introduced a program called "Healthy China 2030" to encourage people to be healthy.

## **5. BENEFITS OF FIT INDIA MOVEMENT**

- The growth of technology made our lives much easier and much better, but at the same time, it made many people turn to a sedentary lifestyle. Earlier people used to walk to schools or offices. But now, technological innovations decreased the necessity of physical activities. Technologies such as food ordering apps, cab booking services, washing machines, and online shopping enabled us to get things done without much physical activity. Hence, there is a need to take effective steps to turn to an active lifestyle to protect our health. Hence, "Fit India Movement" was launched at the right time and encourages people to maintain a healthy lifestyle
- Hypokinetic diseases such as diabetes and hypertension are prevailing throughout the world. Due to the inactive lifestyle and stressful lives,

Fit India Movement motivates people to maintain physical and mental fitness

- With high-quality advertisements and marketing practices, junk food manufacturers are manipulating children to buy their foods. This Fit India Movement will make children think about the negative consequences of junk food. As a result, this movement will encourage children to consume healthy food
- Fit school has the power to change the mindset of their parents whose parents put too much stress on children to study. They send their children to tuition after school or just make them sit to do homework, forgetting the importance of free time to play. This movement has the potential to change their minds, and as a result, they may encourage their children to go out and play
- Some people are already focusing on fitness. We can observe this with the increasing number of fitness startups. But that is a small proportion of people. In general, many people want to maintain an active lifestyle, but all they need is some encouragement. Hence, this movement constantly reminds people to focus on fitness goals
- This movement has the potential to make more people embrace traditional Indian martial art forms such as malkhambas, dunds, Kathi Samu, and Musti Yudha and traditional dance forms.

## 6. FEW CHALLENGES TO OVERCOME

- The motivation to maintain fitness should start from childhood. But in India, many schools lack playgrounds. Lack of playgrounds may push children to turn into an inactive lifestyle

- “Fit India Movement” may not reach the people below the poverty line. To maintain a healthy lifestyle, both physical activity and nutritious food are necessary. But in India, still many people are malnourished, and some people do not have access to safe drinking water. Hence, without solving the issue of poverty and lack of access to affordable nutritious food, a section of people in India will not be able to take advantage of this movement.

## 7. CONCLUSION

Fit India movement is a necessary initiative considering the increasing number of people turning to a sedentary lifestyle. It has all sorts of events from fit quiz which imparts basic knowledge of fitness, wellness, and health.

Realizing the fact of fit children tomorrow is a fit nation. Hence, it has launched fit school events in all schools for active and fit children. Fitness Sunday for the people to cut lazy Sundays and making the people of the community come and inspire on various drills at different community venues.

There is a need to take steps to make healthy food affordable and accessible.

## REFERENCES

1. Available from: <https://www.groupdiscussionideas.com/fit-india-movement>.
2. Available from: [https://www.en.wikipedia.org/wiki/fit\\_india\\_movement](https://www.en.wikipedia.org/wiki/fit_india_movement).
3. Available from: <http://www.fitindia.gov.in>.
4. Available from: <https://www.seshagun.gov.in/fit-india>.

# Teaching Meta-Skills in Physical Education and Sports Science: The Missing Link in our Programs

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## 1. INTRODUCTION

In this paper, I will introduce the concept of meta-skills in physical education and sports science. The three essential questions that I will address are:

- What is Meta skill?
- Why should we include meta-skills into our physical education and sports programs?
- How can we teach meta-skills in our programs?

## 2. METHODS, RESULTS, AND DISCUSSION

### 2.1. Question #1: What is a Meta skill?

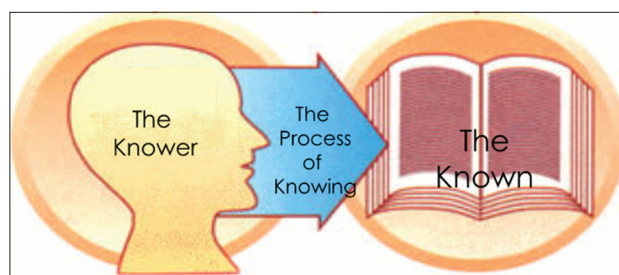
The word “Meta” has several definitions so let me explain the way I will use it in this paper. I will use “Meta” to mean “going beyond” or “something that is of a higher order.” Thus, when I refer to Meta skills in physical education and sport science I am eluding to skills/knowledge that go beyond what we typically teach our students and/or skills/knowledge that is of a higher order. Also, I will use skills and knowledge interchangeably, as noted above.

Let me begin, then, by giving a brief overview of what we typically see happening in our physical education and sports science programs. In physical education and sports science, we do a good job of teaching our students knowledge about the different disciplines that make up physical education and sports science domains. Here are a few of the major disciplines that make up physical education and sports science: Anatomy, exercise physiology, kinesiology, biomechanics, motor development, pedagogy, history of sports, sports regulations, competitive sports, sport psychology, theory of sports, and others. These disciplines can be referred to as book knowledge, that is, knowledge of specific theories, facts, and figures as they relate to physical education and sport science. Although we teach our students important and valuable knowledge, we rarely teach our students one essential element, one

important Meta skill/knowledge. That missing element, or meta-skill/knowledge, is teaching the student how to know themselves, teaching students about their inner self, teaching students about who is doing the learning. And equally important, teaching students how to come to know their inner self and their true nature.

To elaborate on this point, I will introduce a three-part learning model. I will call it the acquisition of the knowledge model. This model has three components, which are fundamental to enhancing skills/knowledge gained by our students. Figure 1 illustrates the three components (1) the knower/self the person who is gaining knowledge, (2) the process of knowing the dynamics and flow of knowledge, and (3) the known the information, theories, and facts that are acquired through the process of knowing.

As mentioned above, in our current physical education and sports science programs, most of what our students learn and how the student learns falls into the second component, the process of knowing, and the third component, the known. Little, if any, time or focus is given to the first component, the knower. The first component (the Knower) is the component where we allow our students to come to know about their inner self, their true nature. In other words, we have neglected to teach our students about the first and critical component of the learning model, that is, the Knower/Self, the person who is doing the learning. Hence, the meta-skill we need to teach and include in our programs



**Figure 1:** Three-part learning model the acquisition of the knowledge model



is the knowledge and experience of the Knower/Self. This skill goes beyond our traditional curriculum; this skill is of a higher order because it helps to expand the awareness of the student and provides a foundation, a reference point to complete and integrate the cycle of the three-part learning model.

## 2.2. Question #2: Why Should we Include Meta Skills Into our Physical Education and Sports Programs?

To answer this question, I would like to introduce the concept of neuroplasticity. Neuroplasticity refers to the ability of the brain to form and reorganize synaptic connections, especially in response to learning or experience or following injury. In other words, when we learn something new or when we have experience (which can be positive or negative), actual changes occur in the brain as a result of that experience. The brain changes in structure will also impact function. This has profound implications because it points to the fact that what our students learn and experience in our programs has a direct impact on the structure and function of their brains.

Now let's go back and connect this point to our previous point of meta-skills. I pointed out earlier that in most physical education and sports science programs, we lack knowledge and experience of the Knower/Self, which is an essential component of the learning model. We have not included this vital component in our physical education and sports science programs. We can say that our physical education and sports science programs are incomplete, and more importantly, we limit the opportunity for our students to have richer learning experiences, which can change the structure and function of the student's brain in a positive and meaningful way.

Hence, if we want to improve our programs, we must consider incorporating the meta-skill of knowledge and experience of the Knower/Self. By doing so, we can expand the awareness of the student and enrich their overall learning experience. Providing this type of experience can benefit our students. The student will have a greater understanding of who and what they are, a better understanding of their true inner nature. This kind of positive learning experience will have a positive effect on the structure and function of the student's brain and make the learning experiences they have in physical education and sports science programs much more meaningful and relevant.

Evidence from Vedic Science to support the three-Part Learning Model.

ऋचो अक्षरे परमे व्योमन्  
यस्मिन्देवा अधि विश्वे निषेदुः  
यस्तन्न वेद किमुचा करिष्यति  
य इत्तद्विदुस्त इमे समासते

*Richo Akshare param vyoman  
yasmin Devā adhi vishve nisheduh  
yastanna veda kim richā karishyati  
ya ittadvidus ta ime samāsate*

The verses of the Veda exist in the collapse of fullness (the *kshara* of 'A')  
in the transcendental field, the Self,  
In which reside all the Devas, the impulses of creative intelligence,  
the Laws of Nature responsible for the whole manifest universe.  
He whose awareness is not open to this field,  
what can the verses accomplish for him?  
Those who know this level of reality  
are established in evenness, wholeness of life.

*Rk Veda 1.164.39*

Interestingly enough, there is knowledge contained in the Rig Veda, an ancient Vedic text, that refers to a level of awareness in human consciousness that supports the inclusion of the meta-skill mentioned above. The following verse from the Rig Veda talks about a universal level of awareness that must be known to gain maximum benefit from education (Fergus, 2017).

The essence of this verse is that there exists a universal level of existence, the transcendental field, and when the transcendental field, the self, is known/experienced then that person will be established in evenness and wholeness of life. This is why we should include knowledge and experience of the Knower/Self into our physical education and sports science programs. It not only completes the cycle of learning but also provides the student a way to take full advantage of what education has to offer a deep and rich appreciation of who the student is, of his/her true nature. This will not only enhance their studies but will also affect all the areas of their life.

Evidence from western science to support the three-Part Learning Model.

We also see evidence from Western Science supporting the inclusion of the meta-skill mentioned above. Recently, a new theory of performance was proposed by Harung and Travis (Harung and Travis, 2015). This



new theory, the “Unified Theory of Performance” discusses specific differences between world-class and non-world-class performers. They discuss their findings in the area of neuroscience and explain that development in the integration of the mind-brain connection was able to explain why world-class performers (athletes, musicians, business executives, and managers) were able to perform at much higher levels than normal-class performers. In short, the new theory explains that the secret to world-class performance was having higher levels of mind-brain integration, more frequent peak experiences, and higher levels of personal positive psychology. These characteristics are associated with athletes, musicians, business executives, and managers that have greater levels of awareness and higher levels of self-actualization. In other words, these individuals are more in tune with their inner nature, more stable, and demonstrate greater evenness and wholeness in life. This new theory lends support to the three-part learning model by showing that the Knower/Self in world-class performers is highly developed and integrated into what they do in their professions. Thus, to help our students achieve higher levels of awareness and performance, we should consider putting more attention into helping our students develop higher mind-brain integration, positive personal psychology, and develop the ability to have more peak experiences.

### 2.3. Question #3: How Can We Teach Meta-Skills In Our Programs?

One powerful meta-skill that has been promoted for several decades now is the inclusion of meditation into our educational programs. Meditation has been researched and found to provide physiological, psychological, and sociological benefits (Horowitz, 2010). There is much information from an eastern and western perspective on the importance of teaching our students techniques to reduce stress, expand awareness, and contact deeper (silent) levels of the mind. Due to space limitations, I will not go deeply into this area but will direct the reader to one good reference, which explains in greater detail the points made in this

paper. The book is the *Science of Being and the Art of Living* (Yogi, 2001). This reference and others like it support in a theoretical and practical manner the three-part learning model. That is to say, when we provide an effective meditation technique for exploring and experiencing the inner life of the Knower, we complete and integrate the three-part learning model. This, in turn, enhances the learning experiences of the students. Moreover, there are various programs/institutions around the world that have incorporated meditation as part of the curriculum, one such program is the David Lynch Foundation: <https://www.davidlynchfoundation.org/schools.html>. These programs acknowledge the importance of teaching meta-skills to increase the awareness of the Knower/Self and are documenting the physiological, psychological, and sociological benefits experienced by students.

### 3. CONCLUSION

The meta-skill of meditation is the missing link in our physical education and sports science programs. It is time to include this important skill to help our students fulfill the 3-part learning model. Teaching this meta-skill to our students will give them the ability to learn more about themselves, to learn about their true nature, and to improve all aspects of their life.

### REFERENCES

- Fergus, J.W. In: Fergus, J.W., Griffith, R.T.H., and Keith, A.B., (eds). *The Vedas: The Samhitas of the Rig, Yajur, Sama, and Atharva*. South Carolina: Create Space Independent Publishing Platform; 2017.
- Harung, H.S., and Travis, F. *Excellence through Mind-Brain Development: The Secrets of World-Class Performers*. Abingdon, United Kingdom: Routledge; 2015.
- Horowitz, S. Health benefits of meditation: What the newest research shows. *Altern Complement Ther*, 2010, 16(4), 223-228.
- Yogi, M.M. *Science of Being and Art of Living: Transcendental Meditation*. New York: Penguin Random House LLC; 2001.

# Application of Technology in Physical Education Class

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## 1. INTRODUCTION

For some time now, using technology to facilitate learning in K-12 classrooms has been a growing focus in many schools. From art classes to science projects, the technology tools have been increasingly instrumental to enhance the learning process. This article takes a look at how can technology be applied in physical education classes and some way in which physical education classes may be improved using technology.

## 2. BENEFITS OF INCORPORATING TECHNOLOGY INTO PHYSICAL EDUCATION CLASSES

One of the benefits of incorporating technology into physical education classes is that learning can be enhanced beyond strategies, skills, and rules between the individual and team sports. It becomes possible to align physical education with other areas such as mathematics or geography, and physical activities can be individualized to create optimal challenges for students. There are some technology tools normally utilized to make the physical education programs to be more efficient in terms of learning sports skills, techniques, foreign activities such as aerobics, and our folk and indigenous rhythmic.

### 2.1. Physical Education Apps

The boom in mobile technology has provided physical educators with a wealth of tools. There are numerous apps that can be taken advantage of, with some allowing for movement tracking and nutritional help, while others assist in enhancing athletic activities like basketball. Apps involving video and picture analysis can be used to examine athletic movements and ultimately help to improve physical skills. Physical educators should not shy away from trial and error while thinking of new ways to use apps in and beyond the classroom. Apps such as My Fitness Pal, Coach's Eye, and Team Shake show the breadth of offerings available and can get the physical education teachers to thinking about many different possibilities.

### 2.2. Wearable Tech

Wearable technology has changed the way we collect and evaluate personal data. With increasing awareness in physical education departments about the importance of feedback from daily activities, technological tools such as pedometers, smartwatches, and heart rate monitors are increasingly being used. With wearable technology, students will be able to track and analyze their heart rates, activity levels, or the number of steps to take within a time frame.

With a pedometer, for instance, during a 3 versus 3 basketball game, students may be asked to make predictions on how many steps they think they can take during the game. Once the game is over, they can then chart the steps and do some problem-solving into ways to add to their steps for the next game. The open-mindedness and enthusiasm that many students have can be leveraged not only to improve their physical well-being at this stage but also to impart lifelong lessons about taking responsibility for their own health.

### 2.3. Virtual Connections

Effective learning involves two-way communication where students are able to engage in discussion and challenge the teacher's ideas to achieve a deeper understanding. Many classrooms have already started taking advantage of the online world by creating classroom blogs or websites. A classroom website is valuable for encouraging discussion after class or enabling communication for students applying PE techniques or working on sports practices or exercise outside of classroom. Another awesome way to leverage virtual connectivity is to invite guests into your classroom through video chat programs such as Skype and Hangouts. Students can also be encouraged to get involved with online courses about nutrition, exercising, and fitness principles or web quests geared toward purposeful inquiry.

### 2.4. Video Resources

As a result of advancements in technology and faster internet becoming available today, it is now possible to

stream videos on YouTube. Physical education teachers can take advantage of this and recommend workout videos to students, as well as other types of content which provide useful demonstrations for skill development, dance, and yoga videos, students may become so entranced with some YouTube channels that follow them, encouraging them to do even more than the teacher asks. No matter the level of the class, teachers will be able to find age-appropriate videos to share. Last, but most certainly not least, PE teachers can consider flipping their classes with the help of videos they make demonstrating technique, freeing up time for more application, and review in class.

### **3. HOW TECHNOLOGY CAN BENEFIT PHYSICAL EDUCATION CLASSES**

It is plain that incorporating technology throughout K-12 classrooms is a big focus for schools. From reading to science projects, tapping cutting-edge technology can improve the learning process. Here is how applying modern technology can benefit students and enhance cross-curricular engagement.

#### **3.1. Utilize Student-owned Devices**

Many high school and junior high students, and in some cases younger students, have a smartphone with them at all times. Students often view mobile devices as extensions of themselves. Tech tools and physical education can go hand in hand. Take the use of Google, for instance. An activity such as this lends itself to student collaboration and allows the instructor to interact with small groups for a personalized experience. A scavenger hunt, or similar type of activity, could easily include any number of mobile apps to increase student engagement.

#### **3.2. Physical Education Apps**

There are multiple education apps that can be integrated into physical education curriculum. Most notable are apps that involve picture or video analysis. These can be used to examine athletic movements in an attempt to critique and improve upon physical skills. An app called Coach's Eye allows for in-depth observations by way of slow-motion video. A few other apps to consider integrating into any physical education program are as follows:

- **Remind** – Submits instantaneous communication through real-time or scheduled messaging. Reminders, emails, or hangouts as a group or individually are sent straight to the student's phone.
- **Team shake** – Allows users to quickly and fairly create groups or teams.

- **Swokitr** – Offers pre-built or customizable fitness blasts/circuits.
- **FIT Radio** – Excellent resource for age-appropriate music.

When it comes to using apps, the only way to know if it will be successful is by trial and error. If an app does not effectively deliver what you had intended, there is a teachable moment in that, as well. Getting your students involved and actively invested is the ultimate goal.

#### **3.3. Wearable Tech**

Wearable tech includes new technology and has completely altered the way we acquire and evaluate personal data. Many physical education departments recognize that feedback from daily activities is important and thus, have begun including the use of heart rate monitors and pedometers into their programs. Fitness tracker can really improve the awareness that students have about their perceived activity levels versus what they are truly accomplishing. They can also help students set and achieve fitness goals.

As with the inclusion of technology in any classroom, select a variety of teaching strategies and be open to non-traditional methods. Today's students are incredibly open-minded and using technology helps deliver impactful, engaging lessons.

### **4. CONCLUSION**

Technology, in general, has positively reshaped physical education classes. With apps, online videos, monitors, and trackers, physical education teachers are able to create customized and reasonable goals for their students. In the process, students felt more engaged and committed to being physically active which is essential in developing healthy habits. For most students, working out or being physically active is a chore. This is one good reason why physical education teachers are turning to a plethora of electronic devices to energize their students and motivate them. The list includes wearable tech, physical education apps, gaming systems, virtual classes, and monitors and trackers.

Since not all students have the same physical capabilities, it is essential for teachers to be aware of what their students can and cannot do. It is important to adapt a program to a particular student's body, thus heart rate monitors have become critical for assessing students physical stamina and in setting realistic and reasonable

goals for them. Apart from heart rate monitors, pedometers have also become an indispensable tool in physical education. They are excellent and reliable when it comes to tracking steps. Smartwatches make a great alternative to the traditional pedometer as a step counter. They may be more expensive, but they offer more functions. Some smartwatches can log students' running distance as well as their speed.

## REFERENCES

- Available from: <https://www.thetechadvocate.org/how-technology-can-benefit-physical-education-classes>.
- Available from: <https://www.emergingedtech.com/2017/07/applying-technology-in-physical-education-class>.
- Harris, F. Visual technology in physical education. *Phys Health Educ J*, 2009, 74(4), 24-27. Available from: <http://www.search.proquest.com.ezproxy.library.ubc.ca/docview/214319009/abstract?accountid=14656>.
- Heyward V. Using technology to promote physical activity. In: *Advanced Fitness Assessment and Exercise Prescription*. 6<sup>th</sup> ed. Champaign, Illinois: Human Kinetics; Available from: <http://www.humankinetics.com/excerpts/excerpts/using-technology-to-promote-physical-activity>. [Last accessed on 2014 Mar 01].
- Available from: [https://www.en.wikipedia.org/wiki/Physical\\_education](https://www.en.wikipedia.org/wiki/Physical_education).

# Combined Effect of Yoga and Endurance Exercise on Lipid Profiles and Body Composition among Intercollegiate Football Players

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## ABSTRACT

The study was to find out the combined effect of yoga and endurance exercise on lipid profiles and body composition among intercollegiate football players. For this purpose, forty-five men football players were selected from Aditya Engineering College, Surampalem, Andhra Pradesh. The subject's age ranged from 18 to 21 years and was selected. The subjects were divided into three equal groups of fifteen each. Group-I underwent yoga training ( $n = 15$ ), Group II underwent endurance exercise ( $n = 15$ ), and Group III undergone combined yoga and endurance exercise. The duration of the training period was restricted to 12 weeks and the number of sessions per week was confined to six. The data obtained from all the groups before and after the experimental period were statistically analyzed by analysis of covariance. Whenever "F" ratio for adjusted post-test means was found to be significant, the Scheffe's test was applied as *post hoc* test to determine the paired mean's differences to find out the significant differences between the pre-test and post-test scores. After 12 weeks of specific training, the experimental group showed significant improvement on the selected body composition and lipid profiles.

**Keywords:** Total cholesterol and thigh girth, Yoga and endurance exercise.

## 1. INTRODUCTION

Yoga means "to unite." Primarily an exercise in moral and mental cultivation of poses and practices aims towards harmonizing your mind, body, and soul to achieve a state of oneness with the universe. It is a spiritual practice that does not subscribe nor promote any particular faith; hence, it can be practiced by all. A lifestyle choice by many, the universally timeless philosophies of yoga, can be incorporated into any belief system. Stress, anxiety, ill-health, unhappiness, and anger can be transformed into peaceful good health, service, and love toward all creations. The techniques are important in this process but the goal should be kept firmly in mind (Iyengar, 1981).

The word "Yoga" is derived from the Sanskrit root "Yuj" (to Join, to use, and to concentrate one's attention on) also means to bind, join, attach and yoke to direct and concentrate one's attention on to strengthen, to use, and apply. Yoga is one of the six orthodox systems of Indian philosophy. It was collated, coordinated, and systematized by Patanjali (the propounder of Yoga

philosophy) in his classical work, "The Yoga Sutras," which consists of 185 terse aphorisms. The system of Yoga is called so because it teaches the means by which the individual soul can be united to or be in communion with God, and so secures liberation/salvation. One who follows the path of Yoga is a Yogi.

### 1.1. Endurance Exercise

Endurance exercise is the act of exercising to increase stamina and endurance. The term "endurance exercise" generally refers to training the aerobic system as opposed to anaerobic. The need for endurance in sports is often predicated as the need for cardiovascular and simple muscular endurance, but the issue of endurance is far more complex. Endurance can be divided into two categories: General endurance and specific endurance. It can be shown that endurance in sport is closely tied to the execution of skill and technique. A well-conditioned athlete can be defined as the athlete who executes his or her technique consistently and effectively with the least effort (Yessis, 2008).



## 2. STATEMENT OF THE PROBLEM

The present study was to find out the combined effect of yoga and endurance exercise on lipid profiles and body composition among intercollegiate football players.

## 3. METHODOLOGY

### 3.1. Independent Variables

- Yoga and endurance exercise.

### 3.2. Dependent Variables

- Lipid profiles
  - Total cholesterol.
- Body composition
  - Thigh girth.

## 4. VARIABLES AND TEST ITEM

S. No	Variables	Test item
1.	Total cholesterol	Blood samples test (Colorimetric method)
2.	Thigh girth	Measuring tapes

## 5. TRAINING PROGRAMME

Experimental group	Yoga and endurance exercise
Duration	12 weeks
Session	6 days a week
Duration of one session	60 min

## 6. STATISTICAL TECHNIQUE

The present study was treated by analysis of covariance (ANCOVA). Whenever “F” ratio for adjusted post-test means was found to be significant, the Scheffe’s test was applied as *post hoc* test to determine the paired mean’s differences to find out the significant differences between the pre-test and post-test scores.

## 7. RESULTS ON TOTAL CHOLESTEROL

An examination of Table 4.1 indicates that ANCOVA. Whenever “F” ratio for adjusted post-test means was found to be significant, the Scheffe’s test for weight of the experimental group is 42.81. The Scheffe’s test ratio on total cholesterol is found to be greater than the

**Table 4.1:** Analysis of covariance of the data on total cholesterol of pre, post, and adjusted scores of experimental groups (in mg/dL)

Test	Yoga training group (Group I) Expt. Group “A”	Endurance exercise group (Group II) Expt. Group “B”	Combined yoga and endurance exercise group (Group III) Expt. Group “C”	Source of variance	Sum of squares	df	Mean squares	F-ratio
Pre-test Mean±SD	196.93±19.28	199.27±21.05	193.93±22.83	Between groups	214.44	2	107.22	0.24
				Within groups	18704.80	42	445.35	
Post-test Mean±SD	184.07±20.05	179.80±19.67	165.27±18.75	Between groups	2914.33	2	1457.16	3.83*
				Within groups	15966.27	42	380.15	
Adjusted post-test mean	183.86	177.42	167.76	Between sets	1965.95	2	982.98	42.81*
				Within sets	941.45	41	22.96	

\*Significant at 0.05 level

**Table 4.2:** Scheffe’s test for the difference between paired means on total cholesterol

Yoga training (Group I) Expt. Group “A”	Endurance exercise (Group II) Expt. Group “B”	Combined yoga and endurance exercise group (Group III) Expt. Group “C”	Mean difference	Confident interval value
183.86	177.42	---	6.44*	4.45
183.86	---	167.76	16.10*	
---	177.42	167.76	9.66*	

\*Significant at 0.05 level of confidence

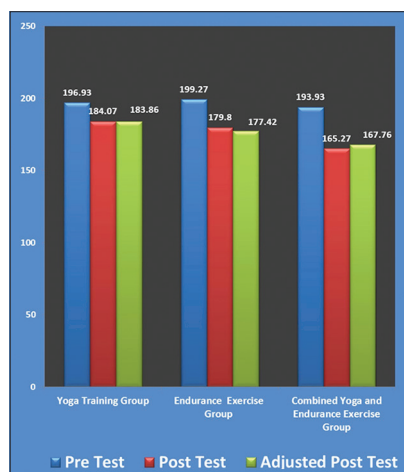
**Table 4.3:** Analysis of covariance of the data on thigh girth of pre, post, and adjusted scores of experimental groups (in cm)

Test	Yoga training group (Group I) Expt. Group "A"	Endurance exercise group (Group II) Expt. Group "B"	Combined yoga and endurance exercise group (Group III) Expt. Group "C"	Source of variance	Sum of squares	df	Mean squares	F-ratio
Pre-test Mean±SD	58.00±2.83	58.13±2.75	57.80±2.24	Between groups	0.84	2	0.42	0.06
				Within groups	288.13	42	6.86	
Post-test Mean±SD	60.13±2.64	61.93±2.55	63.33±2.06	Between groups	77.20	2	38.60	6.54*
				Within groups	248.00	42	5.90	
Adjusted post-test mean	60.11	61.80	63.49	Between sets	85.48	2	42.74	86.27*
				Within sets	20.31	41	0.50	

**Table 4.4:** Scheffe's test for the difference between paired means on thigh girth

Yoga training group (Group I) Expt. Group "A"	Endurance exercise (Group II) Expt. Group "B"	Combined yoga and endurance exercise group (Group III) Expt. Group "C"	Mean difference	Confident interval value
60.11	61.80	---	1.69*	0.65
60.11	---	63.49	3.38*	
---	61.80	63.49	1.69*	

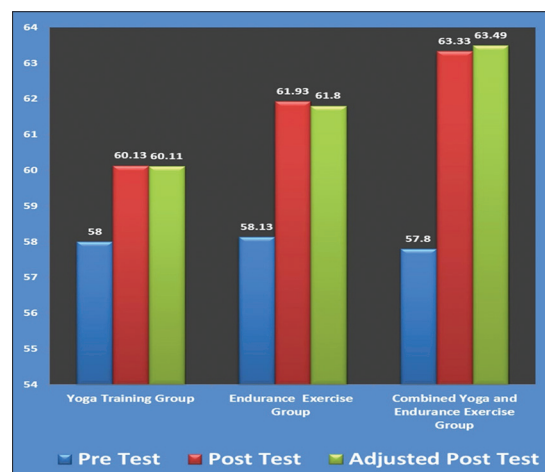
\*Significant at 0.05 level of confidence

**Figure 1:** The pre, post, and adjusted mean values of yoga training, endurance exercise, and combined yoga and endurance exercise group on total cholesterol

required table value of 2.09 at 0.05 level of significance for 19° of freedom. Hence, it is found to be significant.

## 8. RESULTS ON THIGH GIRTH

An examination of Table 4.3 indicates that ANCOVA. Whenever "F" ratio for adjusted post-test means was found to be significant, the Scheffe's test for weight of the experimental group is 86.27. The Scheffe's ratio on thigh girth is found to be greater than the required table

**Figure 2:** The pre, post, and adjusted mean values of yoga training, endurance exercise, and combined yoga and endurance exercise group on thigh girth

value of 2.09 at 0.05 level of significance for 19° of freedom. Hence, it is found to be significant.

## 9. CONCLUSIONS

Based on the statistical analysis and the limitation of the study, the following conclusions are drawn.

- There was a significant difference among yoga training, endurance exercise, and combined yoga and endurance exercise on selected lipid profiles

parameters such as total cholesterol, among intercollegiate football players.

- There was a significant difference among yoga training, endurance exercise, and combined yoga and endurance exercise on selected body composition parameters such as thigh girth, among intercollegiate football players.

## 10. RECOMMENDATIONS

- In the present study, it was concluded that combined yoga and endurance exercise group had much influence on all the criterion variables. Hence, it is recommended to the coaches, trainers, and the physical educators to adopt this practice to improve selected body composition, lipid profiles, and performance-related parameters among intercollegiate Football players.
- The same study may be done by knowing detraining and retraining effects.
- The duration of the training period may be increased up to 15–18 weeks to examine the training effect.
- A similar study may be carried out by selecting national or state level players as subjects.
- A similar study may be conducted by selecting women students as subjects.
- A similar study may be conducted with a large number of samples.

## REFERENCES

- Bera, T.K., and Rajapurkar, M.V. Body composition, cardiovascular endurance and anaerobic power of yogic practitioner. *Indian J Physiol Pharmacol*, 1993, 37, 225-228.
- Bijlani, R.L., Vempati, R.P., Yadav, R.K., Ray, R.B., Gupta, V., Sharma, R., Mehta, N., and Mahapatra, S.C. A brief but comprehensive lifestyle education program based on yoga reduces risk factors for cardiovascular disease and diabetes mellitus. *J Altern Complement Med*, 2005, 11(2), 267-274.
- Booth, F.W., and Baldwin, K.M. Muscle plasticity energy demand and supply processes. In: Browell, L., and Shepherd, J.T., (eds). *Handbook of Physiology: Regulation and Integration of Multiple Systems*. Bethesda, MD: American Physiological Society, 1996, pp. 1075-1123.
- Burstein, M., and Mortin, R. Estimation of HDL-cholesterol by applying enzymatic, colorimetric method. *J Lipid Res*, 1970, 11, 583.
- Clark, J.E. The use of an 8-week mixed-intensity interval endurance-training program improves the aerobic fitness of female soccer players. *J Strength Cond Res*, 2010, 24(7), 1773-1781.
- Clarke, H., and Clarke, D.H. *Application of Measurement in Physical Education*. 6<sup>th</sup> ed. Englewood Cliffs, NJ: Prentice Hall Inc.; 1987, p. 21.
- Costill, D.L., Thomas, R., Robergs, R.A., Pascoe, D., Lambert, C., Barr, S., and Fink, W.J. Adaptations to swimming training: Influence of training volume. *Med Sci Sports Exerc*, 1991, 23(3), 371-377.

# Effect of High-Intensity Plyometric Training with and without Mental Practices on Selected Biomotor Variable (Endurance) of Long Jumpers

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## ABSTRACT

The purpose of this study was to find out “the effect of high-intensity plyometric training with and without mental practices on selected biomotor variable (endurance) of long jumpers.” The study was formulated as a true random group design consisting of a pre-test and post-test. The subjects ( $n = 60$ ) were randomly assigned to three equal groups of 12 male students. Each group consists of 20 college level long jumpers. Pre-test was conducted for all the 60 subjects on selected biomotor, variable such as cardiovascular endurance. The post-test was conducted on the dependent variables after the experimental period for all the three groups. The difference between initial and final mean scores of the groups was the effect of respective experimental treatment on the subjects. The differences in the mean scores were subjected to statistical treatment using analysis of covariance. In all cases, 0.05 level was fixed to test the hypothesis of the study.

**Keywords:** High-intensity plyometric training, Long jumpers, Mental training.

## 1. INTRODUCTION

Sport plays a very prominent role in modern society. It is important to individuals, a group, a nation, and indeed the world. Throughout the world, the sport has a popular appeal among people of all ages and both sexes. Much of the attraction of sport comes from the wide variety of experiences and feeling that result from participation such as success, failure, exhaustion pain, relief, and feeling of belonging. Sport can bring money, glory, status, and goodwill. However, sport can also bring tragedy, grief, and even death (Coakley, 1998).

### 1.1. Need of the Study

The plyometric training is to produce greater power by training the muscles to contract more quickly and forcefully from an actively pre-stretched position. The effectiveness of the exercise relies on the conditioning of the plyometric, or stretch-reflex, mechanism, and the natural elastic properties of the muscle. A concentric contraction is much stronger when it is preceded by an eccentric contraction. In an eccentric contraction, the muscle reacts very powerfully against

the rapid stretching. This reaction is the stretch-reflex. A fundamental principle of plyometric training is that the muscle needs to be pre-stretched quickly. The rate of stretch of the muscle is much more important than the degree of stretch.

### 1.2. Objectives of the Study

The objectives are as follows:

1. To formulate suitable high-intensity plyometric training that would help to improve selected biomotor levels of long jumpers.
2. To formulated suitable mental training that would help to improve selected biomotor levels of long jumpers.
3. To experiment with selected high-intensity plyometric training with mental training and high-intensity plyometric training without mental training on selected biomotor variable among long jumpers.
4. To determine whether high-intensity plyometric training with mental training or high-intensity plyometric training without mental training could contribute better on selected biomotor variables of long jumpers compared with the control group (CG).

### 1.3. Statement of the Problem

The purpose of this study was to find out “the effect of high-intensity plyometric training with and without mental practices on selected biomotor variable (Endurance) of long jumpers.”

## 2. METHODOLOGY

### 2.1. Selection of Subjects

The purpose of the study was to find out the effect of high-intensity plyometric training with and without mental training among long jumpers. To facilitate the study, 60 male students from the different college level of Andhra University Visakhapatnam, Andhra Pradesh, who had represented their college level in intercollegiate competitions, were selected. The selected subjects were in the age ranged between 19 and 25 years. They were further divided into three groups, namely, high-intensity plyometric training with mental training (HPMTG), high-intensity plyometric training without mental training (HPTG) and CG, on a random basis. Each group consists of 20 subjects.

### 2.2. Selection of Variables

The researcher reviewed the various scientific literatures pertaining to varied intensities of plyometric training and mental training on selected biomotor variable from books, journals, and research papers. Taking into consideration the feasibility and availability of instruments, the following variables were selected.

### 2.3. Dependent Variables

Biomotor Variable: Cardiovascular endurance.

### 2.4. Independent Variables

1. High-intensity plyometric training with mental training (HPMG) for 12 weeks.
2. High-intensity plyometric training without mental training (HPTG) for 12 weeks.

### 2.5. Experimental Design

The study was formulated as a true random group design consisting of a pre-test and post-test. The subjects ( $n = 60$ ) were randomly assigned to three equal groups of twenty male students. The groups were designed as the experimental Group I high-intensity plyometric training with mental training group (HPMG), experimental

Group II high-intensity plyometric training without mental training group (HPTG) and CG, respectively. Each group consists of 20 college level long jumpers. Pre-test was conducted for all the 60 subjects on selected biomotor, variables such as cardiovascular endurance. The experimental groups (high-intensity plyometric training with mental training and without mental training) participated in respective training for 12 weeks. The CG did not participate in any of the training program. The post-test was conducted on the above said dependent variables after the experimental period for all the three groups. The difference between initial and final mean scores of the groups was the effect of respective experimental treatment on the subjects. The differences in the mean scores were subjected to statistical treatment using analysis of covariance (ANCOVA). In all cases, 0.05 level was fixed to test the hypothesis of the study.

### 2.6. Collection of Data

The purpose of the study was to estimate the effects of high-intensity plyometric training with mental training and without mental training on selected biomotor variables among college level long jumpers. For this purpose, the research scholar followed the following procedures.

The subjects of the study were selected at random and divided into three equal groups. Among the three groups, the CG was strictly under control, without undergoing any special activity. The experimental groups were undergone with respected experimental treatments. The initial scores were collected before the experimental treatment from all the three groups on the selected variable, cardiovascular endurance. After the completion of an experimental treatment for 12 weeks, the subjects were again tested on the selected variable through standard tests and this forms the post-test scores. The collected data were tabulated for further statistical analysis.

### 2.7. Test Administration – Endurance

#### 2.7.1. Purpose

The purpose of the study was to measure the cardiorespiratory endurance through physical efficiency index (PEI).

#### 2.7.2. Equipment

A stable bench 20 inches high and a stopwatch.



### 2.7.3. Procedure

The subject step up and down 30 times a min on a bench 20 inches high. Each time the subject should step all the way on the bench with the body erect. The stepping process is performed in four counts, as follows: (1) One foot is placed on bench, (2) other foot is placed on the bench; (3) one foot is placed on the floor; and (4) the other foot is placed on floor. The tester may lead off with the same foot each time or any change feet as he desires, so long as the four count step is maintained. The steps were counted the cadence as “up, up, down, down.”

1. The stepping exercise continues for exactly 5 min, unless the subject is forced to stop sooner due to exhaustion. In either case, the duration of the exercise in seconds is recorded; the maximum number of seconds is 30 for the full 5 min period.
2. Immediately after completing the exercise, the subject sits on a chair. The pulse is counted 1–1½, 2–2½, and 3–3½ min after the stepping ceases.

### 2.7.4. Scoring

A PEI is computed utilizing the following formula:

$$\text{PEI} = \text{Duration of exercise in second} \times 100^2 \times \text{sum of pulse counts in recovery.}$$

### 2.8. Statistical Procedure

The following statistical procedures were followed to estimate the effect of high intensity of plyometric training with mental training and without mental training on selected biomotor variable among college level long jumpers.

The pre-test scores were analyzed using ANCOVA statistical technique. When the F-ratio was found to be significant, Scheffe's *post hoc* test was to find out the paired mean significant difference (Thirumalaisamy, 1998).

## 3. RESULTS AND DISCUSSION

### 3.1. Results on Cardiorespiratory Endurance

The statistical analysis comparing the initial and final means of cardiorespiratory endurance due to high-intensity plyometric training with mental training and high-intensity plyometric training without mental training among long jumpers is presented in Table 1.

As shown in Table 1, the obtained pre-test means on cardiorespiratory endurance on high-intensity plyometric training with mental training group was 82.22, high-intensity plyometric training without mental training group was 81.57, and CG was 82.13. The obtained pre-test F-value was 0.30, and the required table F-value was 3.16, which proved that there was no significant difference among the initial scores of the subjects.

The obtained post-test means on cardiorespiratory endurance on high-intensity plyometric training with mental training group was 83.90, high-intensity plyometric training without mental training group was 83.22, and CG was 82.02. The obtained post-test F-value was 2.50 and the required table F-value was 3.16, which proved that there was no significant difference among post-test scores of the subjects.

Taking into consideration of the pre-test means and post-test means adjusted post-test means were determined, and ANCOVA was done and the obtained F-value 20.24 was greater than the required value of 3.16 and, hence it was accepted that there were significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to *post hoc* analysis using Scheffe's Confidence Interval test. The results were presented in Table 2.

**Table 1:** Computation of analysis of covariance of cardiorespiratory endurance

	HPMT group	HPT group	Control group	Source of variance	Sum of squares	Df	Mean squares	Obtai.-Ned F
Pre-test mean	82.22	81.57	82.13	Between	5.03	2	2.51	0.30
				Within	485.33	57	8.51	
Post-test mean	83.90	83.22	82.02	Between	35.93	2	17.97	2.50
				Within	410.38	57	7.20	
Adjusted post-test mean	83.68	83.57	81.89	Between	40.22	2	20.11	20.24*
				Within	55.64	56	0.99	
Mean diff.	1.68	1.66	-0.10					

\*Significant at 0.05 level. HPMT: High-intensity plyometric with mental training, HPT: High-intensity plyometric without mental training. Table F-ratio at 0.05 level of confidence for 2 and 57 (df)=3.16, 2 and 56 (df)=3.16

**Table 2:** Scheffe's confidence interval test scores on cardiorespiratory endurance

Means				Required confidence interval
HPMT group	HPT group0	Control group	Mean difference	
83.68	83.57		0.12	0.79
83.68		81.89	1.79*	0.79
	83.57	81.89	1.68*	0.79

\*Significant at 0.05 level. HPMT: High-intensity plyometric with mental training, HPT: High-intensity plyometric without mental training

The *post hoc* analysis of obtained ordered adjusted means proved that there were significant differences existed between high-intensity plyometric training with mental training group and CG (MD: 1.79). There was a significant difference between high-intensity plyometric training without mental training group and CG (MD: 1.68). There was no significant difference between treatment groups, namely, high-intensity plyometric training with mental training group and high-intensity plyometric training without mental training group (MD: 0.12).

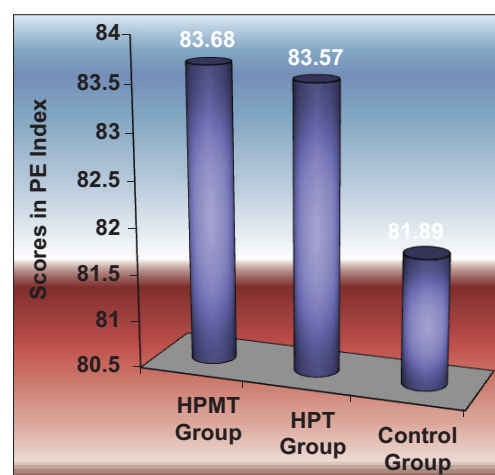
The ordered adjusted means were presented through bar diagram for better understanding of the results of this study, as shown in Figure 1.

#### 4. DISCUSSION ON FINDINGS ON CARDIORESPIRATORY ENDURANCE

The effect of high-intensity plyometric training with mental training and high-intensity plyometric training without mental training on cardiorespiratory endurance is presented in Table 1. The ANCOVA proved that there was a significant difference between the experimental group and CG as the obtained F-value 20.24 was greater than the required table F-value to be significant at 0.05 level.

Since significant F-value was obtained, the results were further subjected to *post hoc* analysis and the results presented in Table 2 proved that there was significant difference between high-intensity plyometric training with mental training group and CG (MD: 1.79) and high-intensity plyometric training without mental training group and CG (MD: 1.68). Comparing between the treatment groups, it was found that there was no significant difference between high-intensity plyometric training with mental training and high-intensity plyometric training without mental training group among long jumpers (MD: 0.12).

Thus, it was found that high-intensity plyometric training with mental training was significantly better



**Figure 1:** Bar diagram on ordered adjusted means on cardiorespiratory endurance. HPMT: High-intensity plyometrics with mental training, HPT: High-intensity plyometrics without mental training, PE index: Physical efficiency index

than high-intensity plyometric training without mental training and CG in improving cardiorespiratory endurance of the long jumpers.

##### 4.1. Discussions on Hypothesis

The result presented in Table 1 on biomotor variable cardiorespiratory endurance due to 12 weeks high-intensity plyometric with mental training (HPMTG) and without mental training (HPTG) proved to be significant at 0.05 level as the obtained F-value of 20.24 was  $>3.16$  to be significant. The *post hoc* analysis results presented in Table 2 proved that paired mean comparisons between HPMTG and CG and HPTG and CG were significant, and the formulated hypothesis No. 1 was accepted for biomotor variable cardiorespiratory endurance.

The *post hoc* analysis results in Table 2 also proved that the paired mean comparisons between experimental groups HPMTG and HPTG were not significant, and the formulated hypothesis No. 2 was accepted for biomotor variable cardiorespiratory endurance.

## 5. FINDINGS

The results of the study proved that high-intensity plyometric training with mental training and without mental training was significantly improved selected bio motor variables, cardiorespiratory endurance, compared to the control group. It was further proved that there was no significant difference between experimental groups high-intensity plyometric training with and without mental training.

The purpose of the study was to find out the effect of high-intensity plyometric exercises with mental training and high-intensity plyometric exercises without mental training on selected biomotor variables of long jumpers. To facilitate the study, 60 male students from the different colleges of Andhra University Visakhapatnam, who had represented their colleges in intercollegiate competitions, were selected. The selected subjects were in the age ranged between 19 and 25 years. They were further divided into three groups, namely, high-intensity plyometric training with mental training (HPMTG), high-intensity plyometric training without mental training (HPTG) and CG, on random basis. Each group consists of 20 subjects. Before the commencement of the training, the purpose of the study and method of performing high-intensity plyometric training and mental training exercises were explained to the subjects for their cooperation and to avoid injuries. Taking into consideration the feasibility and availability of instruments, the following variables were selected.

### 5.1. Biomotor Variables

#### 5.1.1. Cardiovascular endurance

The study was formulated as a true random group design consisting of a pre-test and post-test. The subjects ( $n = 60$ ) were randomly assigned to three equal groups of twenty male students. The groups were designed as the experimental Group I high-intensity plyometric training with mental training group (HPMTG), experimental Group II high-intensity plyometric training without mental training group (HPTG), and CG, respectively. Each group consists of 20 college level long jumpers. A pilot study was conducted to assess the initial capacity of the subjects to fix the exercise load. The intensity of the plyometric training, high-intensity plyometric training and mental training was decided by the maximum heart rate method. Based on the response of the subjects in the pilot study, the training schedules for the experimental groups were modified and finalized. The number of repetitions assigned to each subject was tested, and it was found that they were within the reach of the individuals' capacity. Pre-test was conducted for

all the 60 subjects on selected biomotor variables such as cardiovascular endurance. The experimental groups (high-intensity plyometric training with mental training and without mental training) participated in respective training for 12 weeks. The CG did not participate in any of the training programs. The post-test was conducted on the above said dependent variables after the experimental period for all the three groups. The difference between initial and final mean scores of the groups was the effect of respective experimental treatment on the subjects.

#### 5.1.2. Test of significance

This is the vital portion of thesis achieving the conclusion by examining the hypotheses. The procedure of testing the hypotheses was either by accepting the hypotheses or rejecting the same in accordance with the results obtained in relation to the level of confidence. The test was usually called the test of significance since the scholar tested whether the differences within many groups' scores were significant or not. In this study, if the obtained F-value was greater than the table value, the hypotheses were accepted to the effect that there existed significant difference among the means of the groups compared and if the obtained values were lesser than the required values, then the null hypotheses were accepted to the effect that there existed no significant differences among the means of the groups under study.

#### 5.1.3. Level of significance

The subjects were compared on the effect of high-intensity plyometric training with mental practices and high-intensity plyometric training without mental practices on selected biomotor fitness and physiological variables among college level long jumpers of Andhra Pradesh. The differences between means of initial and final scores on selected criterion variables, speed, explosive power, flexibility, cardiorespiratory endurance, breath-holding time, resting pulse rate, anaerobic power, and  $VO_2$  max were subjected to statistical treatment using ANCOVA. In all the cases, the 0.05 level of confidence was fixed to test the significance, which was considered as appropriate.

## 6. CONCLUSIONS

It was concluded that high-intensity plyometric training with mental training (HPMTG) and high-intensity plyometric training without mental training (HPTG) were significantly improved biomotor variable cardiorespiratory endurance of long jumpers compared to CG. It was further proved that there was no significant difference between treatment groups HPMTG and HPTG.

## REFERENCES

- Barnett, A.L. Adaptation and extension of the European recommendations (EACD) on developmental coordination disorder (DCD) for the UK context. *Phys. Occup. Ther. Pediatr*, 2015, 35(2), 103-115.
- Barr, S.I. Effect of increased training volume on blood lipids and lipoproteins in male collegiate swimmers. *Med Sci Sports Exerc*, 1991, 23(7), 795-800.
- Canter, P.H., and Ernst, E. The cumulative effects of transcendental meditation on cognitive function a systematic review of randomised controlled trials. *Wien Klin Wochenschr*, 2003, 115(21-22), 758-766.
- Carr, C.M. Sports psychology: Psychologic issues and applications. *Phys Med Rehabil Clin North Am*, 2006, 17(3), 519-535.
- Coakley, J.J. Sport in Society: Issues and Controversies. 6<sup>th</sup> ed. Boston: McGraw Hill; 1998.
- Davis, B. Physical Education and the Study of Sport. United Kingdom: Harcourt Publishers Ltd.; 2000.
- Hardayal, S. *Sports Training: General Theory and Method*. Patiala: Netaji Subas National Institute of Sports; 1984, p. 148.
- Hardayal, S. *Science of Sports Training*. New Delhi: DVS Publications; 1991, p. 65.
- Schantz, P.G., and Kalman, M. Strength training is ineffective for oxidative metabolism. *Swim Tech*, 1989, 5, 61-65.
- Will, W., and Freeman, W. *Plyometrics*. Iowa: Championship Books; 1984, p.1
- Yobu, A. *Test measurement and evaluation*. Chennai: Grace Pathipagam; 2004, pp. 422-425.
- Available from: <http://www.gii.in>.
- Available from: <http://www.badmnton>.
- Available from: <http://www.iloveindia.com>.
- Available from: <http://www.livestrong.com/article/453479-vitamins-that-aid-muscle-flexibility>.

# A Study on Scope, Growth, and Perception of E-sports in India

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## ABSTRACT

Electronic sports (e-sports) are gaining importance in terms of popularity and also in terms of its recognition. It has now been recognized by Olympic Council of Asia. This study covers three dimensions in terms of scope, growth, and perception. Scope includes the number of games included in formal setup, types of e-games played across the country, and its impact on sports industry and economy. Growth is measured in several terms, namely, number of games, players, tournaments, spectators, and sponsors. Perception is measured by collecting primary data from the respondent and using descriptive analysis. The study delivers that how e-sports can be one of the major segments in sports industry.

**Keywords:** E-games, E-sports, Growth, Video games.

## 1. INTRODUCTION

### 1.1. E-sports

Electronic sports (e-sports) multiplayer video games played competitively for spectators, typically by professional gamers. "Millions of people enjoy watching e-sports." E-sports are a form of sport competition using video games. E-sports often take the form of organized, multiplayer video game competitions, particularly between professional players, individually or as teams.

The very first video game competition took place on October 19, 1972, at Stanford University for the game of Spacewar with grand prize being a year's subscription of rolling stone with Bruce Baumgart winning the five-man-free-for-all tournament and Tovar and Robert E. Maas winning the Team Competition. The Space invaders Championship held by Atari in 1980 was the earliest large scale video game competition, attracting more than 10,000 participants across the United States, establishing competitive gaming as a mainstream hobby. During the 1970s and 1980s, video game players and tournaments began being featured in popular websites and magazines, including life and time.

After the internet took over many games started to be benefitted, especially PC games. As E-sports started to pick up, many companies started to have e-sports

competitions and tournaments. Nintendo World Championship toured around the United States in 1990 and held its Finale at Universal Studios Hollywood in California. Nintendo held its 2<sup>nd</sup> World Championships 4 years later in 1994 for the Super Nintendo Entertainment System called Nintendo PowerFest '94. There was a whopping 132 finalist that played the finals in San Diego, California. Mike Larossi took away the 1<sup>st</sup> Prize.

Looking at the popularity, Blockbuster Video also conducted own World Game Championships in the early 1990s which was co-hosted by GamePro Magazine. Players from around the United States, Canada, Australia, Chile, and the United Kingdom were eligible to participate and compete. Tournaments started to establish in the late 1990s include Cyberathlete Professional League (CPL) QuakeCon and Professional Gamers League. Games played at CPL include Counter-Strike series, Quake series, and Warcraft. As e-sports started to gain importance, many countries started to use it to their benefit. In 2000, Korean e-Sports Association was formed to promote and regulate e-sports in the country.

During the 2010s, e-sports saw a great jump in viewership as well as the prize money associated with it. From 10 tournaments in 2000, it went to 260 in 2010. South Korea also established and made sure



the competitions and tournaments are covered on televisions in the 2000s. Warcraft III and Starcraft were regularly aired on television on a dedicated 24 h channel for e-sports MBC Game and Ongamenet. German-based GIGA television tried to air but eventually was shut down in 2009. Many players tried to air the e-sports but were eventually shut down at some point of time. Twitch launched in 2011 for streaming online, the games played at e-sports reached 12 billion min of video on the service, with Dota 2 and League of Legends being the most popular. Twitch recorded 4.5 million unique users with each user watching 2 h on average on one of the days of international.

E-sports League, the largest e-sports league in 2014, partnered with local brand Japan Competitive Gaming to try to grow the sport in the country. Physical viewership of e-sports competitions and the scope of events have increased in tandem with the growth of online viewership. In 2013, the Season 3 League of Legends World Championship was held in a sold out Staples Center. The 2014 League of Legends World Championship in Seoul, South Korea, had over 40,000 fans in attendance and featured the band Imagine Dragons, and opening and closing ceremonies in addition to the competition. In 2015, the first e-sports Arena was launched in Santa Ana, California, as the United States' first dedicated e-sports facility. In 2018, the Luxor Las Vegas will open the first e-sports Arena on the Las Vegas Strip and additional locations are planned to open in the coming decade.

## 1.2. Classification as a Sport

It is still a debate in labeling video games as sports. While some point to the growth and popularity of e-sports as the justification others say, it can never achieve an image of true sport. There are reasons other than just the popularity, which state proper planning, precise timing, and skillful execution is need. Video games are often said to be mind sports.

In 2013, Canadian League of Legends player Danny "Shiphtur" Le became the first pro gamer to receive an American P-1A visa, a category designated for "Internationally Recognized Athletes."

In 2014, Turkey's Ministry of Youth and Sports started issuing e-sports player licenses to players certified as professionals.

In 2016, French government started to work on a project to recognize and promote e-sports.

Esports Federation of India (ESFI) is trying to promote the sport in India. ESFI is a full member of International e-Sports Federation, Korea and Asian e-sports Federation, Dubai.

The main objectives of ESFI are to promote, encourage, organize, educate, train, and control e-sports in India. It also looks at making sure, there is a proper place to train. It is trying to build a sustainable ecosystem for e-sports in India.

E-sports have been recognized by the Olympic Council of Asia (OCA). E-sports will be first added as a demonstration sport at next year's Asian Games. OCA says e-sports will be added to official program at Hangzhou 2022.

## 1.3. E-sports Types of Games

Video games which are played in professional competitions usually fall into a few major genres. The majority of e-sports titles are fighting games, first-person shooters (FPS), real-time strategy (RTS), or multiplayer online battle arena (MOBA) games, with the MOBA genre being the most popular in terms of participation and viewership.

### 1.3.1. Fighting games

Competitions in the genre are generally individual competitions with both players providing input to the same machine. The genre originally focused on arcade play but has gradually moved to console play as arcades have declined.

### 1.3.2. FPS

FPS focuses on simulating a firefight from a first-person perspective and may be either individual or team based.

### 1.3.3. RTS

Competitions involving traditional RTS games generally feature individual competitors competing on personal computers over a local area network or the internet.

### 1.3.4. Sports games

Games related to sports are involved in this genre. Games such as FIFA, NBA, and real cricket fall under this genre.

### 1.3.5. MOBA

MOBA games are historically a spin-off of real-time strategy games, but are different enough that they are

**Table 1: Analysis revenue (in \$ millions)**

Year	2012	2014	2015	2016	2017	2018*	2019*	2020*	2021*
Revenue	130	194	325	493	655	906	1187.4	1488.1	1650

**Table 2: Growth of audience (in millions)**

Year	2015	2016	2017	2020*
Enthusiast	120	162	191	286
Occasional	115	161	194	303
Growth	-	36.6%	19.6%	20.1%

now generally considered a separate genre. While traditional RTS games feature many units controlled by a single player, MOBAs are typically team focused, the model being five players on a team, each controlling a single “hero” unit. MOBAs are generally played on personal computers.

#### 1.4. E-sports at Global Level

The e-sports market is experiencing rapid growth, despite being in its formative stage. In 2016, worldwide revenues generated in the e-sports market amounted to 492.7 million U.S. dollars. By 2020, the market is expected to generate over 1.48 billion U.S. dollars in revenues, which indicates a compound annual growth rate of 32%. These revenues came from betting, prize pools, and tournaments, but overwhelmingly from sponsorship and advertising, which brought in almost 661 million U.S. dollars in 2016. In terms of revenue, Asia was the biggest e-sports market overall followed by North America and Europe.

#### 1.5. E-sports in India

ESFI handles the e-sports in India. Its main objectives, as mentioned earlier, are to encourage, organize, train, educate, and control e-sports in India. It looks forward to provide training facilities and to build a sustainable ecosystem for e-sports in India and not to restricting themselves just to organize events and tournaments.

The ESFI looks into official organization in complete and sole in charge of all e-sports matters in India and to guard and enforce rules in co-operation with the States e-sports Associations/Federations of the country and in full and complete collaboration with the Indian Olympic Association, to select and control the Indian e-sports Contingent to the Olympics, Asian Games, Common Wealth and SAF Games and various other International competitions under the patronage of the IESF, OCA,

IOA other Federations Associations and to stimulate the interest of the people of the country in promotion of e-sport. Its mission is to lead, grow, and support e-sports in India.

Another player in India is NODWIN Gaming which is the premier and most recognized e-sports company in the country. It NODWIN Gaming has played a key role in developing the sport in the last decade. It has partnered with ESL and ESWC to popularize competitive gaming in the country.

NODWIN Gaming also produces additional online content on gaming and e-sports such as e-sports centers and the Games and Gadget show. NODWIN Gaming came up with a study “How Indian e-sports works with medicine” where they showed, need of professional dedicated doctors to look after e-sports athletes and their problems.

Flipkart VP Adarsh Menon of Electronics and Auto Department said there are 10 million serious online PC gamers and 30% of today’s youth engage in online gaming at least once a day. The average age of these gamers is from 16 to 27 years. About 40% of men and 35% of women play at least 5 days a week.

#### 1.6. Objective

##### 1.6.1. To study the scope of e-sports in India

The areas covered under scope are players, tournaments, companies, etc. Scope helps to understand the total coverage of the sport played in the country. It also helps to understand about the various companies that have put money in e-sports and the various industries and economies affected by it.

##### 1.6.2. To measure the growth of e-sports in India

Measurement of growth is done by analyzing the market and taking the current scenario and comparing it with the scenario years ago. It is been seen that there is tremendous growth in terms of players taking the sport and tournaments that have taken place.

##### 1.6.3. To assess the perception of e-sports

By assessing the market size in India and comparing it with other e-sports playing nations, companies such

<b>Year</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
Amt.	4.4	6.1	6.4	3.5	5.2	9.7	13.1	19.8	36	61	93.3

2100% growth as compared to 2006 which shows that in 10 years time, prize money has grown phenomenally.

### 3. FINDINGS AND CONCLUSION

It was found out that e-sports will be a medal event at 2022 Asian Games. The research paper shows the acceptance of competitive gaming (e-sports) in today's world. Research speaks about the increasing number of players taking e-sports as a carrier option. Furthermore, many companies have shown keen interest by organizing different e-sports tournaments throughout the year.

The study also speaks about the growing trend of competitive gaming. Many new players have started playing e-sports on a professional level. These players are scouted by companies and are offered contracts to represent them at different tournaments.

The growth can be seen by the number of spectators and gamers that has kept increasing on and off the field. Many occasional viewers have turned into hardcore e-sports enthusiast.

There were positive feedbacks when asked people about the future of e-sports as well as what they think about making money by playing video games. People are now accepting competitive gaming as a global sport.

Secondary data were collected through reports, articles, official websites, and newspapers.

Sampling is done by convenience method.

Descriptive statistics were used to analyze the research.

The study covers important areas such as gaming styles, gaming patterns, average age, and psychology toward the sport which will be beneficial for the related areas.

Table 1 shows that by 2021 e-sports industry is expected to be of 1650 million US dollars which is more than 12 and  $\frac{1}{2}$  times that of 2012 which shows exponential growth in terms of revenue.

Table 2 shows the growth of audience to reach 286 Million of enthusiast audience and 303 millions of occasional viewers. The growth of occasional viewers is faster as compared to enthusiast from which it can be interpreted that the awareness for e-sports has increased. Furthermore, occasional viewers can be shifted to enthusiast once they find a game of their interest.

Table 3 shows that the total prize money involved in e-sports is 93.3 million US dollars which is more than

## REFERENCES

- [1] Khaitan, A. Online Gaming in India: Reaching a New Pinnacle; 2017. Available from: <https://www.assets.kpmg.com/content/dam/kpmg/in/pdf/2017/05/online-gaming.pdf>.
- [2] Sachitanand, R. Gaming Industry is Seeing a Boom as Firm's Cash in on Everything. The Economic Times; 2018. Available from: <https://www.goo.gl/Ds8xDS>.
- [3] Mallya, H. Companies Looking to Make E-sports Mainstream in India; 2018. Available from: <https://www.yourstory.com/2018/01/esports-india>.
- [4] Gambit. U Cypher Announces Details for Season 1 of its Indian Esports League. AFK Gaming; 2017 Available from: <http://www.afkgaming.com/articles/u-cypher-announces-details-for-season-1-of-its-indian-esports-league>.

# Yoga Philosophy for Everyone: Bending Mind and Body

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## ABSTRACT

This paper discusses yoga and philosophy, yoga has been practiced for around 5000 years. There is evidence that the practice of yoga improves physical and mental performance. Although most poses are not aerobic in nature, they do in fact send oxygen to the cells in the body by way of conscious deep breathing and sustained stretching and contraction of different muscle groups. Whatever sport you choose to practice, yoga can enhance and complement your ability. Most sports build muscular strength and stamina, often in specific areas of the body. Yoga can benefit professional sportspersons, it is necessary to explore what is required to play a sport and play it well. It is well acknowledged that to play any sport; we must develop the basic skills and continually train the body so that we can apply the skill in a refined and polished way. This of course requires considerable time, energy, and commitment to practice the skill at hand. Having a body that is flexible, strong, and control is also another important consideration, if one is not able to move the body with the grace, velocity, and speed required, then performance will be lackluster. Hence, we can say that yoga is very beneficial to everyone, especially for sportsmen.

**Keywords:** Mind and Body, Philosophy, Physical and Mental health, Yoga.

**“Yoga is the Way or Method through Which Internal and External Facilities of Man Meets in Totality and Changes Occur and by Which May Achieve God or Feel his Existence and may Become the Part of Him.” -Sri Aurobindo**

## 1. INTRODUCTION

Yoga and sports are the essential aspects of everyone's life. To overcome the health and physical challenges posed by sedentary and postmodern life, the adaptation of such techniques is become inevitable. The curriculum, education department, parents, and other concern stakeholders are largely neglected the need and importance of sports and yoga in education at all levels.

Yoga is one such most enjoyable activity everyone can participate. Yoga is the art and science of maintaining physical and mental well-being that has its origin in India, is among the most ancient yet vibrant living traditions that I getting increasingly popular today. A potent stress buster, yoga is an instrument of self-evolverment and enlightens, through physical and mental well-being. Math-dimension it enhances the quality of our lives at so many levels. One

aspect of yoga's benefits is to explore the bond between health and beauty. Yoga makes children strong; yoga is an art, science, and philosophy. It provides techniques to promote health at physical, mental, emotional, and intellectual levels. In India, yoga is considered one of the six branches of classical philosophy and is referred to throughout the Vedas-ancient Indian scriptures and among the oldest texts in existence. The Upanishads are also broadly philosophical treatises which postdate the Vedas and deal with the nature of the “soul” and universe. However, the origins of yoga are believed to be much older than that, stemming from the oral traditions of yogis, where knowledge of yoga was handed down from Guru (spiritual teacher) to Sisya (spiritual student) all the way back to the originators of yoga, the “Rishis,” who first began investigation into the nature of reality and man's inner world.

## 2. DEFINITION OF THE TERMS

### 2.1. Yoga

The word yoga is derived from the Sanskrit root “YUJ,” meaning to blend, join, attach and yoke, to direct and



concentrate one's attention to use and apply. It also means union or communication. Yogic brings oxygen and energy to every cell changes the organism by burning up waste products expels the toxins while relaxation guards against be rastrenia and insomnia.

## 2.2. Asana

Asanas –(Postures) – asana means holding the body in a particular posture to bring stability to the body and poises to the mind. The practice of asana brings firmness to the body and vitality to the body and mind. The people of ancient Greece believed in the principle. “A sound mind in a sound body.” By practicing asana one frees himself from physical disabilities and mental distractions. It is a state of complete equilibrium of body and mind, and spirit asanas may be of the following types.

- Meditative asanas
- Relaxation asanas
- Cultural asanas
- Asana is the third step of Ashtanga yoga
- Asanas are the physical postures
- Patanjali Rishi defines asana as “Sthira Sukham Asanam” meaning stable and comfortable body posture
- Yoga training in the techniques of harmony and also a preparation for the total integration of human personality.

## 3. OBJECTIVES OF THE STUDY

The objectives are as follows:

- To assess the significant effect of yoga and physical exercises training in anxiety, aggression behavior, emotional intelligence, and social maturity of the sample group
- To find out the influence of physical exercises and yogic practices on health-related physical and motor fitness components such as speed, agility, and cardiorespiratory endurance
- To find out the influence of physical exercises and yogic exercises on body fat, resting pulse rate, vital capacity, and blood pressure
- The main objectives of the yogic practices are to make one free from diseases, ignorance, egoism, miseries the affiliations of old age, fear of death, etc.

## 4. SIGNIFICANCE OF THE STUDY

In the field of physical education and sports, there are several means of training methods, which are plays an

important role and determinant factors to the change of health-related fitness, physiological, and psychological variables.

- The study will throw light on selected yogic training that is having more effect on blood pressure, resting pulse rate, vital capacity, and body fat
- The study would help to the practitioners to realize the importance of yoga practice in developing their personality. The study has thrown light on selected yogic training that is having more effect on personality traits and emotional intelligence of practitioners
- The findings of the study may help the individuals to compare and contrast the changes that occur in health-related physical fitness and physiological variables before and after the physical exercise and yogic practices.

## 5. SIX BRANCHES OF YOGA

### 5.1. Hatha Yoga or Yoga of Postures

Hatha yoga is perhaps the path of yoga one most familiar with since this is the most popular branch of yoga. This branch of yoga uses physical poses or asanas, breathing techniques, or pranayama, and meditation to achieve better health, as well as spirituality. There are many styles within this path-iyengar, integral, ashtanga, kripalu, and jivamukti to name a few. If one wants a peaceful mind and a healthy body to go along with it, Hatha yoga may be the path.

### 5.2. Bhakti Yoga or Yoga of Devotion

Bhakti yoga is the path most followed in India. This is the path of the heart and devotion. Yogis who practice this branch see the “one” or the divine in everyone and everything. Bhakti yoga teaches a person to have devotion to the “one” or to Brahma by developing a person's love and acceptance for all things.

### 5.3. Raja Yoga or Yoga of Self-control

Raja means “royal.” This path is considered to be the king of yoga and this may be due to the fact that most of its practitioners are members of religious and spiritual orders. Raja yoga is based on the teachings of the eight limbs of yoga found in the raja yoga sutras. A raja yogi sees the self as central, and as such, respect to oneself and for all creations are vital to this path. They achieve self-respect by first learning to be masters of themselves. If one wishes to learn discipline, then raja yoga would perfectly suit that need.



## 5.4. Jnana Yoga or Yoga of the Mind

Yoga is the path of yoga that basically deals with the mind, and as such, it focuses on man's intelligence. Jnana yogis consider wisdom and intellect as important, and they aim to unify the two to surpass limitations. Since they wish to gain knowledge, they are open to other philosophies and religion, for they believe that an open and rational mind is crucial in knowing the spirit 5. Karma yoga or yoga of service. Karma yoga is the path of service. For in this path, it is believed that one's present situation is based on his past actions. So by doing selfless service now, one is choosing a future that is free from negatively and selfishness. Karma yogis change their attitude toward the good and in the process, change their souls, which leads to a change in their destiny 6. Tantra yoga or yoga of rituals. Perhaps the most misunderstood of all the paths, Tantra yoga is about using rituals to experience what is scared.

## 6. YOGA SUTRAS OF PATANJALI

The varied philosophies and methodologies of yoga itself were clearly and methodically brought together and presented by the sage Patanjali in his set of 196 aphorisms called "The Yoga Sutras," written some 2200 years ago. The Sutras bring together all the various strands of theory and practice from all sources of yoga and present them in one concise, integrated and comprehensive text. How all the aspects inter-relate and form part of the whole body of yoga is clearly elucidated.

## 7. BENEFITS OF YOGA

### 7.1. Flexibility

Stretching tight body in new ways will help it to become more flexible, bringing greater range of motion to muscles and joints. Over time, one can expect to gain flexibility in hamstrings, back, shoulders and hips.

### 7.2. Strength

Many yoga poses require us to support the weight of our own body in new ways, including balancing on one leg (such as in tree pose) or supporting with our arms. Some exercises require us to move slowly in and out of poses, which also increases strength.

### 7.3. Muscle Tone

As a byproduct of getting stronger, one can expect to see increased muscle tone. Yoga helps shape long, lean muscles.

## 7.4. Pain Prevention

Increased flexibility and strength can help prevent the causes of some types of back pain. Many people who suffer from back pain spend a lot of time sitting at a computer or driving a car. That can cause tightness and spinal compression, which one can begin to address with yoga. Yoga also improves alignment, which helps prevent many other types of pain.

## 7.5. Better Breathing

Most of us breathe very shallowly into the lungs and do not give much thought to how we breathe. Yoga breathing exercises, called Pranayama, focus the attention on the breath and teach us how to better use of our lungs, which benefits the entire body. Certain types of breath can help clear the nasal passages and even calm the central nervous system, which has both physical and mental benefits.

## 7.6. Mental Benefits

### 7.6.1. Mental calmness

Yoga asana practice is intensely physical. Concentrating so intently on what the body is doing has the effect of bringing calmness to the mind. Yoga also introduces one to meditation techniques, such as watching how one breathes and disengagement from thoughts, which help calm the mind.

### 7.6.2. Stress reduction

Physical activity is good for relieving stress, and this is particularly true of yoga. Because of the concentration required, daily troubles, both large and small, seem to melt away during the time of doing yoga. This provides a much-needed break from stressors, as well as helping put things into perspective. The emphasis yoga places on being in the moment can help relieve stress, as we learn not to dwell on past events or anticipate the future. One will leave a yoga class feeling less stressed than when started.

### 7.6.3. Body awareness

Doing yoga will give an increased awareness of our bodies. One is often called on to make small, subtle movements to improve alignment. Over time, this will increase the level of comfort in our body. This can lead to improved posture and greater self-confidence. Yogic exercise develops the muscular fitness, endurance, strength, flexibility. Yoga asana can cure and help in preventing various diseases. Yogic practices help in

regulating the breathing mechanism and increasing vital capacity.

## 8. CONCLUSION

The holistic philosophy of yoga practice provides a theoretical and experiential basis for injury prevention in sport. The Bhagavad Gita throws a lot of light on this important dimension of your life. All the different Yoga's, though apparently different in their structure, in their composition, in their outer form, are fundamentally one in the ultimate analysis. How? Because, all these Yoga's ultimately raise the Jiva or the individual being who has fallen into a very gross state into the net of desires, selfishness, bondage, and ignorance. Basically, all the Yoga's have this common motive or intention to take the individual out of his present predicament and gradually help him to ascend higher into a different state of experience and consciousness. If the attempt to discover the self is done through feeling, through spiritual emotions and divine sentiments, and the love of the heart is directed toward the Divine, then it takes the form of a distinct yoga. This apparent identity is

not stable and unchanging; it keeps ever-changing. Moreover, this apparent identity is subject to inevitable stages of being birth, growth, old age, decay, and death. This is inevitable, this pattern through which every born body has to pass through. This is what Buddha discovered when he first went out of his secluded, carefree, guarded, and protected palace environs, and it was an eye-opener to him.

## REFERENCES

1. Brena, S.F. *Yoga and Medicine: The Reunion of Mind-body Health and the Merging of Yoga Concepts with Modern Medical Knowledge*. New York: Julian Press; 1972.
2. Desikachar, T.K. *The Heart of Yoga*. Rochester, Vt: Inner Traditions International; 1995.
3. Coward, H. *Yoga and Psychology: Language, Memory, and Mysticism*. New York: State University of New York Press; 2002. p. 42-6, 88-9, 109-10.
4. Potter, K. *Meaning and Truth, in Encyclopedia of Indian Philosophies*. Vol. 2. Princeton, NJ: Princeton University Press, Motilal Banarsidass; 1977. p. 160-8.
5. Jacobsen, K. *Theory and Practice of Yoga*. New Delhi: Motilal Banarsidass; 2008. p. 100-1, 333-40.

# A Study on the Effect of Yoga Asanas Body Composition of Fat and High Blood Pressure

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## ABSTRACT

**Background:** Yoga is an ancient Indian exercise and therapy method, which is an art of good living. Regular yoga practice increases consciousness of the body, soothes stress, decreases muscle tension, strain and inflammation, attention to sharpness, and focus. **Aim:** The objective of this study is to determine the impact of 45-day yoga practice on weight (body mass index [BMI]) and high blood pressure (HBP). **Methods:** Fifty male participants were regularly selected on the basis of exclusion criteria during the 35–55 years of age group. Before any discovery, HBP and BMI were approximate. We learned asana's yoga for 45 days. All HBP (systolic) and fat (BMI) were analyzed before and after an estimated 45 days of yoga practice. **Results:** BMI ( $29.27 \pm 0.328$ – $28.48.22 \pm 0.701$ ) and systolic BP ( $127.18 \pm 8.356$  mmHg– $134.86 \pm 7.01$  mmHg) are downgraded in action. On the other hand, no major changes were observed in BMI and BP controls. **Outcome group:** A significant reduction in systolic BP and BMI in subjects who have completed 45 days of yoga, asanas techniques, and asanas.

**Keywords:** Asana, High blood pressure, Index of body mass.

## 1. INTRODUCTION

Yoga, a fusion of one's consciousness with the divine, is a spiritual way of life that many have practiced for centuries. Research and practitioners identified other benefits of yoga concerning physical and mental health [1]. Yoga also improves musculoskeletal function, cardiovascular health, diabetes, respiratory disorders, high blood pressure (HBP), hypotension, depression, and many more. Essentially, yoga is a process of creating a body and mind that moves into an exuberant and fulfilling life that does not hamper a traditional yoga program usually consisting of asana, pranayama, kriya, deep relaxation, and meditation; it has a combined effect of relaxing the body, slowing down movement, and calming the mind yoga practice often starts with a sequence of slow motion to increase blood flow and relax muscles accompanied by attention to posture, deep breathing, and chanting. This is followed by poses involving flexion, extension, adduction, abduction, and rotation [2]. By engaging muscles in an isometric contraction, sustaining poses create strength. Moving joints across their full range of motion increase flexibility [3], while standing poses

promote balance by enhancing muscle stability and enhancing proprioception to minimize falls. Yoga, thus, integrates several elements of exercise which benefit human health. Yoga leads to a reduction in the use of oxygen and metabolism, thereby increasing homeostasis. The effects of meditation on yoga and diabetes, hyperthyroidism, obesity, respiratory problems, mental stress, and oxidative stress have been confirmed in several other studies. Body mass index (BMI) is one of the indicators of adult physical well-being. Hypertension and increased mortality are associated with overweight (BMI 25.0–29.9 kg/m<sup>2</sup>) and obesity (BMI 30.0 kg/m<sup>2</sup>) [4]. Hypertension is one of the most common conditions affecting adults at 26.4% overall. It ranks as the leading chronic mortality risk factor, representing 13.5% of all deaths. Furthermore, it is now projected to grow to affect >1.5 billion people by 2025 [5]. The physical and clinical problem appears unregulated in the current scenario, and there is still a chance of avoiding them by yoga practices.

### 1.1. Subject Selection

All participants included in this study were chosen from 1-month free yoga camps organized by Andhra

University at different locations in the Visakhapatnam district of the total participants, 50 participants per day were considered within the experimental group. Such participants took part in 1 h yoga each day and followed the Indian government's prescribed yoga protocol. Popular yoga practices of participants performing sukshma vyayamalu (rotation of the arms, back bending, rotation of the hands, trunk, and knee movement), yoga asana (standing position: Samasthiti, tadasana, tiryaka tadasana, vrikshasana, pranamasana, kati chakrasana, ardha chakrasana, and trikonasana; sitting position: Padmasana, siddhasana, vajrasana, gomukasana, ustrasana, sasankasana, and vakrasana); prone posture: Pawanamuktasana, sarpasana, shavasana, bhujangasana, salabhasana, and matsyasana; and supine postures: Makarasana, advasana, setubandhasana, and dhanurasana). All participants were granted informed consent, and the study conformed to the Code of Ethics of the World Medical Association (the Declaration of Helsinki). In addition, good clinical practice guidelines of the Ministry of Ayush and Government of India (March 2013) [6] were strictly followed. Participants also received a questionnaire to fill in the information participants with severe illness, spondylitis and rheumatoid arthritis recently underwent surgery, and regular practice sessions were excluded from the study, while participants other than these were excluded from the study irrespective of their problems and the present sample was 35–55 male age group.

Assessment of BMI basic anthropometry procedures used by well-trained examiners for conducting anthropometric measurements is followed. We use an electronic weight scale (EQ-BR 9201 personal weighing scale Equinox Overseas Pvt. Ltd., New Delhi, India). Height was measured on non-elastic tape to the nearest 0.1 cm without shoes [7]. BMI was calculated as a metric unit weight (kg) divided by height (m<sup>2</sup>) international measurement system [SI]) [8].

## 1.2. Measurement of BP

BP was assessed on the right arm in the sitting positions by Omron-automatic BP monitor (Omron HEM-8712 BP Monitor Omron Healthcare India Pvt. Ltd., New Delhi). All participants would have to rest for at least 15 min before the readings were done.

## 1.3. Statistical Analysis

Data were presented as mean  $\pm$  standard deviation and evaluated by a paired *t*-test (the *t*-test of students).  $P < 0.05$  has been recognized as statistically significant.

Data were analyzed using the system SPSS 17.0 (SPSS Inc., India).

## 2. RESULTS

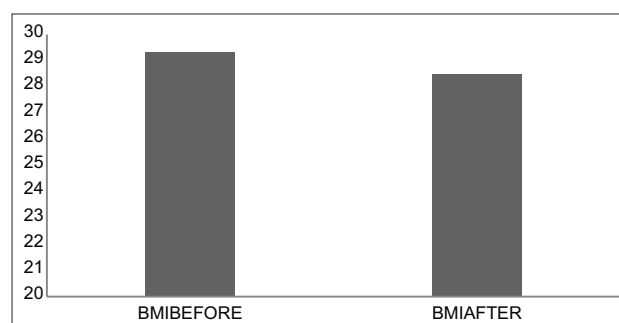
The patient characteristics included in the sample were all 50 males regularly practiced yoga for 45 days the age of the experimental group participants ranged from 35 to 55 years.

BMI following yoga practice, the BMI of all participants was found to decrease statistically significantly from  $29.27 \pm 0.328$  to  $28.48 \pm 0.701$  ( $P = 0.001$ ) [Figure 1].

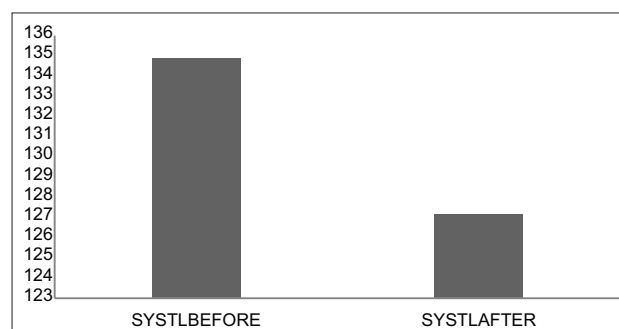
Systolic BP following yoga practice, the systolic BP of the study group reported a significant decrease. The initial systolic BP was registered at  $134.86 \pm 7.01$  mmHg, whereas after 45 days of yoga practice, the BP reduced to  $127.18 \pm 8.356$  mmHg ( $P = 0.001$ ). Describe these major changes were observed in Figure 2.

## 3. DISCUSSION

The practice of yoga consists of several asanas (posture) and meditation, such as prayer, lessening (neck bending, hip movement, and knee movement), and yoga asana



**Figure 1:** Body mass index comparison before and after 45 days of experimental group yoga practice \*\* $P < 0.001$



**Figure 2:** Systolic blood pressure comparison before and after 45 days of experimental group yoga \*\* $P < 0.005$



(standing pose, setting position, prone position, and supine position). We had 35–55 years of age in our sample of participants irrespective of their genders who did yoga practice. In our study, we found that the experimental group's BMI decreased significantly in 45 days, i.e., mainly due to asana that could minimize the accumulated fat on adipose tissue, we found better results in lowering BMI as compared to the previous research by Telles *et al.* [9] Our findings clearly showed that yoga therapy would minimize the risks of obesity. Likewise, the systolic and diastolic BP in people, who did yoga for 45 days were significantly reduced. The asanas relax the mind and the nervous system, the nucleus that regulates tension, regularize, and balance. Furthermore, the sympathetic and parasympathetic nervous system in the practice of asanas regulated, resulting in BP regulation. The asanas belong to the group that governs the BP forward bends, supine, sitting, and inversions. Nonetheless, forward bends are the main asanas that can be of help to people with high BP. Adho mukha svanasana is among them the most effective asana for BP. The horizontal location of the spine in these asanas allows the heart to slow down as there is no tension in pumping the blood into the brain against gravity. Furthermore, the heart rate and cardiac output are slow down simultaneously, and BP is controlled. Our results support the findings that yoga practice decreases systolic and diastolic BP [10]. However, after practicing yoga, all participants were found to achieve good health, positivity, and vitality.

#### 4. CONCLUSION

The propensity to raise weight or obesity in all aged persons is prevalent every day. Research has shown that both BMI and BP reflect morbidity and mortality at low and high rates. Yoga therapy helps to maintain good health by control of BMI and BP. It is, therefore, inferred from our research that the effectiveness of yoga therapy on body weight and BP can have a direct impact on its use as a healthy therapeutic modality in the fight against obesity and irregular BP borne diseases. In the future, these studies are highly needed for researching and validating the impact of yoga practice on health on a larger group of participants. Such studies can aware

people adopt yoga in their daily routine for better physical and mental health.

#### REFERENCES

1. Gangadhar, B.N., and Varambally, S. Integrating yoga in mental health services. *Indian J Med Res*, 2015, 141, 747-8.
2. Garfinkel, M., and Schumacher, H.R Jr. Yoga. *Rheum Dis Clin North Am*, 2000, 26, 125-32.
3. Tekur, P., Singphow, C., Nagendra, H.R., and Raghuram, N. Effect of short-term intensive yoga program on pain, functional disability and spinal flexibility in chronic low back pain: A randomized control study. *J Altern Complement Med*, 2008, 14, 637-44.
4. de Gonzalez, A.B., Hartge, P., Cerhan, J.R., Flint, A.J., Hannan, L., MacInnis, R.J., Moore, S.C., Tobias, G.S., Anton-Culver, H., Freeman, L.B., Beeson, W.L., Clipp, S.L., English, D.R., Folsom, A.R., Freedman, D.M., Giles, G., Hakansson, N., Henderson, K.D., Hoffman-Bolton, J., Hoppin, J.A., Koenig, K.L., Lee, I.M., Linet, M.S., Park, Y., Pocobelli, G., Schatzkin, A., Sesso, H.D., Weiderpass, E., Willcox, B.J., Wolk, A., Zeleniuch-Jacquotte, A., Willett, W.C., and Thun, M.J. Body-mass index and mortality among 1.46 million white adults. *N Engl J Med*, 2010, 363, 2211-9.
5. Kearney, P.M., Whelton, M., Reynolds, K., Muntner, P., Whelton, P.K., and He, J. Global burden of hypertension: Analysis of worldwide data. *Lancet*, 2005, 365, 217-23.
6. Ministry of AYUSH, Government of India. *Good Clinical Practice Guidelines for Clinical Trials in Ayurveda, Sidha and Unani Medicine*. New Delhi: Ministry of AYUSH, Government of India; 2013.
7. Jaacks, L.M., Gordon-Larsen, P., Mayer-Davis, E.J., Adair, L.S., and Popkin, B. Age, period and cohort effects on adult body mass index and overweight from 1991 to 2009 in China: The China health and nutrition survey. *Int J Epidemiol*, 2013, 42, 828-37.
8. Tudor-Locke, C., Ainsworth, B.E., Adair, L.S., Du, S., and Popkin, B.M. Physical activity and inactivity in Chinese school-aged youth: The China health and nutrition survey. *Int J Obes Relat Metab Disord*, 2003, 27, 1093-9.
9. Telles, S., Naveen, V.K., Balkrishna, A., and Kumar, S. Short term health impact of a yoga and diet change program on obesity. *Med Sci Monit*, 2010, 16, CR35-40.
10. Satyanarayana, P., Benerji, G.V., Kumari, D.R., Meka, F.B., and Kummari, N.R. Effect of yoga on heart rate, blood pressure, body mass index. *J Dent Med Sci*, 2013, 8, 36-9.



# Addiction of Exercise

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## 1. INTRODUCTION

My paper is based on two sources (1) observation of Mike Tarff from Anglia Ruskin University in Cambridge and (2) my personal observation of citizen of Parbhani, Maharashtra, India.

On the basis of the above two observations. I am going to prove that improper or unscientific or excess use of physical exercise or yoga proves dangerous for health.

We always think or study about how physical exercises are necessary very few people about misuse of physical exercise.

## 2. NATURE OF THE STUDY

While going for physical exercise of yoga for enhancement of health necessary training is compulsory, as well as some basic rules may be followed for better results.

Mike Troff of Anglia Ruskin University Cambridge 1<sup>st</sup> time shows negative impact on health due to exercises.

Troff research eating and weight disorder published in Springer journal. In general, persons use to exercise for better health after exerciser use to eat nutritious food; sometimes it is change in eating disorder as well as in excess exercise.

## 3. PROBLEM

Mike Troff uses the word exercise addiction. He described that though regular exercise is truthful for health, but excess or improper or exercise addiction proves dangerous for health.

## 4. RESEARCH METHOD

Tarff's study based on nine studies covering a total of 2140 people with a mean age of 25. Exercise addiction was defined on having an obsessive approach to fitness that could have a negative impact on someone's health and social life.

Second, a person of 52 years who practices excess yoga, with any proper training as well as guidance caused for the damage of his health instead of good health.

## 5. RESULTS OF THE STUDY

Tarff reached to the decision that one of 2140 cases 3.7% of people's are having half of the excess exercise for good health and for maintaining good health they having habit of food disorder caused for the negative consequences of mind as well as heart.

Health professionals working with people with eating and exercise disorders should consider monitoring exercise levels on a priority, on this group have been shown to suffer from serious medical conditions as a result of excessive exercise, such as fractious in younger patients, and increased overall mortality.

Observation and case study in my town shows that yoga and physical exercises should be done under trained guidance. If not, it may prove dangerous to the health.

Finally, I want to explain that generally we use to take food just of relief from hunger, sometimes use to take excess food which caused some problem then somebody suggest exercises for avoidance this circle, we should be careful in day-to-day life.

# Yoga, Philosophy, and Physical Education

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## ABSTRACT

The science of yoga is a psychology of a philosophical nature. The very introduction of the system of yoga by Patanjali is by way of an instruction that the mind has to be controlled – Yogahs-chitta-vritti-nirodhah. Patanjali does not go into the details of the philosophical background of the necessity to control the mind, the background that comes in Samkhya and Vedanta. He very simply explains that yoga is control of the mind, restraint of the mind-stuff. Yoga is an experiential science. The most important benefit of yoga is it balances our physical and mental conditions. The aging process, which is largely an artificial condition, caused mainly by auto-intoxication or self-poisoning, can be slowed down by practicing yoga (Alleger, 2007). By keeping the body clean, flexible, and well lubricated, we can significantly reduce the catabolic process of cell deterioration. To get the maximum benefits of yoga, we need to combine the practices of yogasanas, pranayama, and meditation. Yoga in Daily Life is a system of practice consisting of eight levels of development in the areas of physical, mental, social, and spiritual health. When the body is physically healthy, the mind is clear, focused, and stress is under control. The main goals of “Yoga in Daily Life” are Physical Health, Mental Health, Social Health, Spiritual Health, Self-Realization, or realization of the Divine within us. These goals are attained by love and help for all living beings, respect for life, protection of nature and the environment, a peaceful state of mind, full vegetarian diet, pure thoughts and positive lifestyle, physical, mental and spiritual practices, tolerance for all nations, cultures, and religions. Yogic techniques are known to improve one's overall performance. Pranayama is an important, yet little known part of Yoga.

**Keywords:** Meditation, Patanjali, Philosophy, Physical, Psychological conditions, Yoga.

## 1. INTRODUCTION

“The Mind is Everything What You Think You Become”

BUDDHA

Yogic practice usually involves asanas, which are postures or sequences of postures; pranayama, or breathing modification and exercises; and meditation (and sometimes chanting). Although in this column, I focus on the physical aspect of yoga, it is important to keep in mind that yoga emphasizes the integration of body, mind, and spirit and focuses on the person as a whole being. I will also address reasons athletic trainers might want to consider yoga as a supplement to conventional treatment and rehabilitation methods. Asana practice increases core stability, which is essential to both sport performance and injury prevention. Because yoga practice requires the movement of many major and minor muscle groups simultaneously and focuses on proper muscular

and skeletal alignment, it tends to differ from other conditioning methods that emphasize active engagement of only certain areas of the body. A typical outcome of systematic asana practice is an increased overall sense of balance and strength for whole-body movements.

Hatha is one of six main types of yoga (the others are Raja, Karma, Bhakti, Jnana, and Tantra) and the most widely practiced form of yoga in the west. Hatha yoga aims at purifying the body and eventually the mind through physical transformation. Hatha's focus, therefore, is mainly on the physical body and breathing to achieve self-awareness, concentration, endurance, flexibility, and balance.

## 2. YOGA DEFINED

There are different interpretations of the Sanskrit word yoga. The most common one is “to unite” or “to come

together,” which gives us a physical interpretation of the word. Another meaning of yoga is “to tie the strands of the mind together,” which points to intentionality and the importance of directing our thoughts toward the yoga practice. The deeper meaning of yoga, therefore, is “acting in such a way that all of our attention is directed toward the activity in which we are currently engaged.”

### 3. BUILDING UP THE WHOLE MIND

The second point is that the brain is only the medium through which we educate our minds. The mind is a composition of four different faculties, which in yogic terminology is defined as manas, buddhi, chitta, and ahamkara. The word manas means to rationalize, to think about something. Buddhi means intellect. Chitta is an area of consciousness where impressions are stored. Ahamkara is the concept of ego.

In the modern education system, we are feeding only one aspect of the mind buddhi. We are not dealing with the manas as an aspect, which deals with the faculty to know what is right and what is wrong. We are not dealing with chitta, where impressions of knowledge are stored in the form of memory and experience. Nor are we dealing with ahamkara, the ego. Rather we are cramming buddhi with information without boosting up the other aspects of our mind. Therefore, despite all our education, we are not able to apply it constructively and creatively in our lives.

### 4. AN ENERGIZED BODY

Many forms of exercise deplete the body of its energy stores. Yet a yoga practice oxygenates the blood and creates more energy, leaving the body and mind feeling restored and energized. Yoga provides a vehicle through which the body can actively recover from the physical demands of running.

### 5. IMPROVED BREATHING

Lung capacity is of prime importance for players, because it creates the ability to maintain an even breathing pattern through all phases of running. The better the lung capacity is, the more oxygen is circulated through the system, which is most helpful for running long and strong. However, the breathing pattern used in running and other forms of aerobic exercise involves quick and shallow inhalations and exhalations. This uses only the top portion of the lungs, leaving the

middle, and lower portions untouched. Yogic breathing involves slow, deep inhalations and long exhalations, making use of the upper, middle, and lower portions of the lungs. Yogic breathing has been shown to increase lung capacity, and greater lung capacity increases endurance and improves overall athletic performance. In Sanskrit, prana means “energy,” and yogic breathing is called pranayama. Through the breath, you bring in oxygen, feeding your cells, and creating vital life force, and remove carbon dioxide, eliminating toxins. The use of the breath in yoga is vital. Whereas holding the breath creates internal tightness, tension, and anxiety, deep breathing releases tension, reduces stress and anxiety, and physically helps the body ease into poses, particularly those that are challenging. Through this conscious breathing, the body is energized as a result of increased oxygen circulation throughout all of its systems.

### 6. CONCLUSION

The holistic philosophy of yoga practice provides a theoretical and experiential basis for injury prevention in sport. Specifically, yoga poses can be used to augment athletes’ core stability, flexibility, and relaxation. It appears, moreover, that yoga’s focus on corporeal awareness and living in the present moment offers a particularly conducive context for its inclusion in an injury prevention program. Yoga can play a key role in cultivating mind control and concentration, which helps a sportsperson to perform at their game. It offers children and adults an opportunity to experience success in physical activity, which can help build a foundation of strong life. However, curriculum specialists, teachers, trainers, and students should know and analyze seriously the real challenges of yoga education in classroom settings and real-life as well.

### REFERENCES

1. Brena, S.F. *Yoga and Medicine: The Reunion of Mind-body Health and the Merging of Yoga Concepts with Modern Medical Knowledge*. New York: Julian Press; 1972.
2. Farnham, C.W. An Introduction of tests of Agility. In: *Completed Research in Health, Physical Education and Recreation*. Vol. 2. United Kingdom: Babcock C.F; 1966. p. 44.
3. Gokal, R., and Shillito, L. Positive impact of yoga and pranayama on obesity, hypertension, blood sugar, and cholesterol: A pilot assessment. *J Altern Complement Med*, 2007, 13, 1056-7.

4. Gupta, N., Shveta, K., Vempati, R., Sharma, R., and Bijlani, R.L. Effect of yoga based lifestyle intervention on state and trait anxiety. *Indian J Physiol Pharmacol*, 2006, 50, 41-7.
5. Finger, A. *Introduction to Yoga: A Beginner's Guide to Health, Fitness and Relaxation*. New York: Three River Press.
6. Page, S.E., and Ryba, T.V. Yoga. In: Levinson D., and Christensen, K., (eds). *Berkshire Encyclopedia of World Sport*. United States: Berkshire Publishing Group; 2005.

# Protein Essence and Comparison of Dietary Nutrition Index of Players from Sports Authority of India and Khel Parisar Kanker in Chhattisgarh

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## 1. INTRODUCTION

“Let Food be your medicine” – Hippocrates. Dietary nutrition index (DNI) is an uncommon method to access nutrition quality globally which assesses the effect of total nutrients together in a diet. Nowadays, the practice of fast food and “hefty” items is so much in fashion due to their cost and convenience, for example, one may bypass a salad or fruits in favor of fries or a soda drink. According to the State of Food Security and Nutrition report 2017, the number of undernourished people in the world increased to 815 million in 2016 and 777 million in 2017. According to the Food and Agriculture Organization report, 2018 in the State of Food Security and Nutrition, 195.9 million people are undernourished in India, which accounts for 14.8% of population in India. Undernutrition is a crucial and critical problem in tribal areas. India Human Development Index (HDI) for nutrition ranked 131 reflecting as the main problem for the vast majority of the population. Sports are the essence of good health. Protein, vitamins, and minerals are important for growth, maintenance, and repair of body tissues which are crucial for good performance. In case of tribal sports, children appropriate intake of nutrients is useful when sportsperson need to maintain the better performance, so the main focus should be on consuming appropriate diet, therefore, calculating DNI helps in comparing the nutrition adequacy of different population and to know the loophole of the undernutrition.

### 1.1. Purpose of the Study

The purpose of the study was as follows:

1. To examine the DNI and to improve the dietary pattern among the sportsperson residing in hostels.
2. To educate about the necessity of the protein in the diet of the players.

## 2. METHODOLOGY

### 2.1. Selection of the Subjects

The sample consisted of 98 players of Khel Parisar Kanker (KPK) and 148 players of Sports Authority of India (SAI) hostels which include boys and girls of 14–18 years of age. Twenty-four hours recall method was used to assess nutrient intake of both the groups. The data of hostel diet were collected by filling information sheet, in which they self-record the food consumed in the hostel for 3 consecutive days which included a holiday. Consumption of cooked food equal to raw food is measured and their values were calculated from the values developed by Gopalan and Balasubramanian (2016) and Longvah *et al.* (2017) for all the 12 nutrients such as protein, fat, carbohydrate, calorie, calcium, iron, Vitamin A, Vitamin D (retinol), Vitamin D (carotene), Vitamin B<sub>1</sub>, Vitamin B<sub>2</sub>, and Vitamin C. Recommended Dietary Allowances by Srilakshmi (2018) and <https://www.ncbi.nlm.nih.gov> were used for calculating index of nutrient (IN) for each player using the following formula:

$$\text{Index of the nutrient} = \frac{\text{Nutrient Intake by the subject} - \text{RDA for the age and sex}}{\text{Standard Deviation of nutrient of the groups}}$$

Standard deviation (SD) of the nutrient is derived by combining all the dietary nutrient values, according to age and sex, thus, common SD was used for the calculation of IN. The DNI was derived by totaling the IN values of all 12 nutrients for each player. A 2 × 2 factorial design was used. Analysis of variance (ANOVA) was used for the analysis of nutrient intake of the subjects. Descriptive and comparative analysis of the data was done using the SPSS package.



### 3. RESULTS

Table 1 reveals that mean DNI between KPK and SAI centers have a distinct difference. The positive DNI of SAI players as compare to KPK players shows far better nutritional status. The negative DNI (−93.47) of KPK girls shows deprived nutritional status which means more attention is needed to improve the DNI.

Table 2 presents the mean dietary index of different nutrients. As protein is important to build the lean muscle mass for the players it should be taken in appropriate amounts, but it is observed in the study that protein is highly deficient in all the groups. In spite of protein, carbohydrate and Vitamin D retinol are also deficient, whereas consumption of fat is adequate in all the groups. It is also observed that except Vitamin C, all nutrients are deficient in KPK girls.

To examine the effect of institution and sex on DNI, one-way ANOVA was performed with 246 players (165 girls

and 81 boys). The results are presented in Tables 3 and 4. It is observed from the table that there is a significant F ratio concerning institution ( $F = 1, 244 = 6333.52, P < 0.01$ ) shows that players of KPK have lower DNI as compare to SAI players. Partial eta squared of 0.963 shows that 96.3% of variance in DNI depends on the institution. It is also observed that there is a significant F ratio with respect to sex ( $F = 1, 244 = 162.13, P = 0.01$ ). It means that girls and boys differ significantly in their DNI. Partial eta squared of 0.399 shows that 39.9% of the variance in DNI depends on sex. There is a difference in DNI level of boys and girls, the negative mean value of girls indicates that they are deficit in various nutrients measured as compared to boys whose DNI mean value is positive.

### 4. DISCUSSION

Most of the studies, Rao *et al.* (2006), reported of British Nutrition Foundation, and many other researchers reported that mean intake of foodstuffs such as pulses, milk, and milk products was lower than recommended levels of the Indian Council of Medical Research. Munson (2016) and other researchers stated that 20–25 g of protein every 3–4 h is needed to maintain muscle protein synthesis. Soy, whey protein provided throughout the day which improves muscle mass and maintains body weight fat mass.

**Table 1: Mean score of DNI of KPK and SAI**

Institution	Sex	Mean score DNI	n
KPK	Girls	−93.47	98
SAI	Boys	+19.61	81
	Girls	+7.37	67

DNI: Dietary nutrition index, KPK: Khel Parisar Kanker, SAI: Sports Authority of India

**Table 2: Mean DNI according to all nutrients of KPK and SAI**

Nutrient	KPK		SAI			
	Girls		Boys		Girls	
	Mean±SD	DNI	Mean±SD	DNI	Mean±SD	DNI
Protein (g)	−39.6±3.9	−9.84	−22.2±9.0	−2.4	−18.4±10.5	−1.72
Fat (g)	6.1±1.7	3.51	43.6±9.5	4.4	55.6±11	4.9
Carbohydrate (g)	−47.1±66	−0.7	−32.6±38	−0.8	−54.2±44	−1.2
Calorie (Kcal)	−1003±188.9	−5.2	−5.9±3191.4	−0.0	16.1±187.6	0.08
Calcium (mg)	−468.2±33.9	−13.5	8.8±120.0	0.07	18.1±133.3	0.13
Iron (mg)	−3.1±0.5	−6.1	14±6.3	2.1	7.3±14.9	0.47
Vitamin A (µg)	−196.1±24.5	−7.8	155.7±175.7	0.8	137.6±186	0.71
Vitamin D retinol (µg)	−508.7±15.7	−31.5	−99.9±81.8	−1.2	−132±79.1	−1.6
Vitamin D carotene (µg)	−6.7±0.9	−7.3	34.1±14.3	2.3	42.6±21.5	1.9
Vitamin B1 (mg)	−0.33±0.05	−6.4	0.61±0.22	7.3	0.27±0.14	1.8
Vitamin B2 (mg)	−0.63±0.07	−8.9	−0.16±0.24	6.4	0.12±0.23	0.52
Vitamin C (mg)	15.8±6.1	2.54	4.1±16.0	0.26	16.7±16.2	1.01

DNI: Dietary nutrition index, KPK: Khel Parisar Kanker, SD: Standard deviation, SAI: Sports Authority of India

**Table 3: ANOVA analysis for comparison of DNI (indicate significant difference)**

I sex	J sex	Mean difference I-J	Std. error	Sig.	95% confidence interval	
					Lower bound	Upper bound
Kanker girls	SAI girls	-99.7578	1.47216	0.00	-102.6577	-96.8579
SAI girls	SAI boys	-12.2875	1.53619	0.00	-15.3138	-9.2614
SAI boys	Kanker girls	112.0453	1.53619	0.00	9.2614	15.3135

\*The mean difference is significant at the 0.05 level. ANOVA: Analysis of variance, DNI: Dietary nutrition index, SAI: Sports Authority of India

**Table 4: Analysis of variance of players of KPK and SAI**

Source	Type III sum of squares	Df	Mean square	F	Sig.	Partial eta squared
Institution	682,000.76	1	682,000.76	6333.52	0.000	0.963
Error	26,274.1	244	107.68			
Sex	282,756.24	1	282,756.24	162.13	0.000	0.399
Error	425,518.69	244	1743.92			
Total	911,923.9	246				
Corrected total	708,274.9	245				

(a) R squared=0.963 Adjusted R squared=0.963, (b) R squared=0.399 Adjusted R squared=0.397, SAI: Sports Authority of India

## 5. CONCLUSION

In the present study, the lower DNI is definitely barrier in performance of KPK players. Forming of appropriate dietary habits through effective nutritional education program should be implemented. The qualitative and quantitative diet must be focused to prevent low DNI. Calculating DNI is an effective method for the assessment of nutritional status. Intervention program and policy-making are the need of the players. It can be helpful to improve food security and HDI of the country and also guide to access nutrition global index worldwide.

## REFERENCES

- Access to Nutrition Index: Global Index; 2018, pp. 26-33.
- Barigidad, P.M., Adwani, M.R., and Naik, K.R. Dietary nutrition index a new approach to the quality assessment of the diet. *Indian J Nutr Dietetics*, 1996, 33, 29.
- NCBI Book Shelf, Institute of Medicine. *DRI Dietary Reference Intakes: Applications in dietary Assessment*. United States: NCBI Book Shelf, Institute of Medicine; 2000, pp. 45-70.
- Gopalan, C., and Balasubramanian, S.C. *Food Composition tables, Nutritive value of Indian Foods*. Hyderabad: National Institute of Nutrition; 2016, p. 47. Available from: <http://www.nutrition.org.uk/nutrition-science/life/teenagers>.
- Longvah, T., Ananthan, R., Bhaskarachary, K., and Venkalah, K. *Indian Food Composition Tables*. Hyderabad: National Institute of Nutrition; 2017.
- Rao, M.K., Balakrishna, N., Laxmaiah, A., Venkaiah, K., and Brahmam, G.N. Diet and nutritional status of adolescent tribal population in nine states of India. *Asia Pac J Clin Nutr*, 2006, 15(1), 64-71.
- Report Community Nutrition. *The Gale of Encyclopedia of Senior Health*. Report Community Nutrition; 2009, pp. 1-7.
- Srilakshmi, B. *Evaluation of Food Quality: Food Science*. 7<sup>th</sup> ed. New Delhi: New Age International (P) Limited Publishers; 2018, p. 309.
- Food and Agriculture Organization. *State Food Security and Nutrition Report*. United Nations: Food and Agriculture Organization; 2017.
- Department for International Development. *The Neglected Crisis of Undernutrition: Evidence for Action*. London, United Kingdom: Department for International Development; 2009, p. 3.
- Venugopal, R., Varoda, A., and Shrivastava, P. Growth pattern and nutritional status of adolescent girls of Chhattisgarh. *Int J Curr Res*, 2016, 8(8), 36643-36647.
- Munson, T. *The Importance of Protein to Support Football Performance*; 2016, pp. 1-5.

# Role of Yoga in Maintaining the Physical Health

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## ABSTRACT

This paper researched to find out that yoga in sports as important as others think it helps us in different ways and different levels in a sportsmen life. We have improved our performance by daily yoga practice to perform a sporting action efficiently and effectively, a person needs to have a high degree of concentration and focus with a mind that is calm and controlled, yoga can help a sportsperson to have evenness of mind and control of their thoughts even during stress and/or adversity. Yoga can play a key role in cultivating mind control and concentration, which helps a sportsperson to perform at their peak leaves and yoga helps us a lot. With yoga, not only the muscles of the body but also the softer tissues of your body are worked out, resulting in less buildup of the lactic acid, which is responsible for stiffness in various parts of the body. Yoga increases a range of motions of the less used inner muscles and helps in the lubrication of joints. The result is a more flexible body, able to perform tasks easily! The ultimate aim and goal of yogic sciences are not only to attend optimum physical and mental health but also to elevate the level of unconsciousness of an individual practicing it. The pathway of mechanism for attaining such goals may be vivid, but one thing is very much clear that for attaining such goals, one has to understand follow and nourish the body and mind simultaneously. In that way, the psychology of yoga has its own importance. Its basic principles need to be documented in terms of modern physiology and psychology. In fact, it is the need of today.

**Keywords:** Health, Mind and Body, Sports, Yoga.

## 1. INTRODUCTION

“Today’s children are tomorrow’s citizens.”

Yoga is a traditional method of meditation developed by the saints of ancient India. They practiced yoga as an effective method of controlling their mind and bodily activities. Yoga in Daily Life is a system of practice consisting of eight levels of development in the areas of physical, mental, social, and spiritual health (Swami Sivananda, 1999).

Yoga teaches you to focus on breathing while you hold the poses. This attention to the breath is calming it dissolves stress and anxiety. Yoga can help cure insomnia, as regular yoga practice leads to better and deeper sleep. Yoga can help fight fatigue and maintain your energy throughout the day. Yoga is an effective treatment for a variety of autoimmune diseases because it can reduce the symptoms these diseases often cause, such as stiffness, malaise, fatigue, and weakness. Even children can benefit from yoga. Those with attention deficit disorder and hyperactivity can learn to relax and get control using yoga

breathing and yoga asanas. Yoga has been used to help heal victims of torture or other trauma. Because yoga is a form of meditation, it results in the sense of inner peace and purpose, which has far-reaching health benefits.

When the body is physically healthy, the mind is clear and focused, and stress is under control. This gives the space to connect with loved ones and maintain socially healthy relationships. When you are healthy, you are in touch with your inner self, with others and your surroundings on a much deeper level, which adds to your spiritual health. Yoga increases the flexibility of the spine, improves body’s physical condition, and heightened awareness of the importance of relaxation. It has been emphasized that each exercise be practiced slowly, coordinating movement with the breath, pausing motionless in each position, and always with full concentration.

## 2. METHODOLOGY

In this paper, the research was based on secondary data taken from different books, research reports, journals, and research papers.

## 2.1. Objective of the Study

The objectives are as follows:

1. To explain the yoga's effects and benefits of physical health
2. To understand the essential for the mental and physical health of the people
3. To be able to clarify what the effects of yoga are on mental health in physical, and chronic conditions.

## 2.2. Physical Health

The health of the body is of fundamental importance in life. As the Swiss-born physician, Paracelsus, very correctly said, "health is not everything, but without health, everything is nothing." To preserve and restore health, there are physical exercises (Asanas), breath exercises (Pranayama), and relaxation techniques. Within "Yoga in Daily Life," the classic Asanas and Pranayamas are divided into an eight-level system, beginning with "Sarva Hita Asanas" (meaning, "Exercises that are good for Everyone"). Seven other parts follow this preparatory level and lead progressively through the practice of Asanas and Pranayamas. Several special programs have been developed from the basic exercises: "Yoga for Back Pain," "Yoga for Joints," "Yoga for Seniors," "Yoga for Managers," and "Yoga for Children." To maintain good health, other valuable exercises within "Yoga in Daily Life" are the purification techniques of Hatha Yoga. These involve deep relaxation (Yoga Nidra), concentration exercises (e.g., Trataka), as well as Mudras and Bandhas (special Yoga techniques).

An even greater factor in the maintenance of good health is the food we eat. What we eat influences both our body and psyche – our habits and qualities. In short, the food, we eat has an effect on our whole being. Food is the source of our physical energy and vitality. Balanced and healthy foods include grains, vegetables, pulses, fruit, nuts, milk, and milk products, as well as honey, sprouts, salads, seeds, herbs, and spices – either raw or freshly cooked. Foods to be avoided are old, reheated or denatured foods, meat (including all meat products and fish), and eggs. It is also best to avoid alcohol, nicotine, and drugs as these rapidly destroy our health.

## 2.3. Improved Strength

Routine and consistent practice of the various yoga asanas has helped me build strength and improve lean muscle mass. Most notably, with respect to several

muscle groups under-utilized in my chosen athletic disciplines of swimming, cycling, and running. These gains have enhanced core body stability and significantly impeded overuse injury by strengthening the supportive but otherwise under-developed muscles surrounding the more utilized muscles, creating a more balanced, and optimally functional overall strength.

## 2.4. Purpose of the Study

The main purpose of the study was to explain the effects of yoga on mental and physical health. How Yoga is important of an individual's daily life?

## 2.5. Yoga and Physical Fitness

It is quite likely that yoga may help to improve patient self-efficacy, self-competence, physical fitness, and group support, and may well be effective as a supportive adjunct to mitigate medical conditions, but not yet as a proven stand-alone, curative treatment. Confirmatory studies with higher methodological quality and adequate control interventions are needed. Despite a growing body of clinical research studies and some systematic reviews on the therapeutic effects of yoga, there is still a lack of solid evidence regarding its clinical relevance for many symptoms and medical conditions. For many specific indications and conditions, there is inconsistent evidence with several studies reporting positive effects of the yoga interventions, but other studies are less conclusive. In some instances, these discrepancies may result from differences between the study populations (e.g., age, gender, and health status), the details of the yoga interventions, and follow-up rates.

## 2.6. Meditation is a Mental Practice Proven to

- Reduce anxiety and stress
- Reduce cortisol levels and increase calming hormones
- Improve cognitive function
- Reduce blood pressure and heart rate
- Increase immune function
- These benefits combine to allow for better rest, sleep, and recovery, as well as provide the ability to think more clearly under pressure.

## 3. CONCLUSION

As highlighted above, the researcher finds out that "Yoga in daily life" important as others think it helps us in different ways and different levels in our daily life.

We have improved our posture, strength and resiliency, skin smoothness, and immunity by daily yoga practice to perform efficiently and effectively; we daily need to have a high degree of concentration and focus with a mind that is calm and controlled. I wish all yoga practitioners and those still to become practitioners much happiness, success, health, and harmony; joy in life and God's blessing. All these facets justify why we need an International Yoga Day celebration to prepare mankind to face the modern-day challenges and stress in a healthy way. The day is chosen for the celebrations, i.e., June 21, 2015, also holds special significance in many parts of the world. This is the longest day of the

year in the Northern Hemisphere. Hence, timewise, the day gives people across the world a perfect chance to practice yoga in their space comfortably.

## REFERENCES

1. Hariharananda, A.S. *Yoga Philosophy of Patanjali with Bhasvati*. Calcutta, India: University of Calcutta; 2000. p. 1.
2. Powers, J. In: Keown, D., (ed). *Encyclopedia of Buddhism*. London: Routledge; 2004. p. 775-85.
3. Active Interest Media. *Magazine*. United States: Active Interest Media; 2006. p. 121.
4. Mahapragya, A. *Foreword*. Jain Yog: Aadarsh Saahitya Sangh; 2004.



# Effect of Swimming Training on Selected Physiological Parameters of Cerebral Palsy Children

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## ABSTRACT

For the study on the effect of 6 weeks swimming training on selected physiological variables of cerebral palsy children. Seven subjects between 9 and 18 years of age were selected from Amar Jyoti School and Roshni Rehabilitation Centre, Gwalior, for the study. The training program was scheduled for 5 days a week with each session of 1 h duration. The instruments, i.e., dry spirometer, peak flow meter, and sphygmomanometer, were used to measure the vital capacity, peak flow rate, resting heart rate, and resting respiratory rate. The subjects were pre- and post-tested on selected variables. The paired “t”-test was used to compute the effectiveness of the program. The level of significance was set at 0.0.5.

## 1. INTRODUCTION

The swimming games are a competitive sports as well as rehabilitation in physical and physiological areas of humankind. Therefore, the intense of the researcher is used as a means for the rehabilitation of the cerebral palsy of schoolchildren.

By means of a specific swimming training to the selected subjects for the benefits of their cerebral palsy by evaluating of some selected physiological parameters such as vital capacity, peak flow rate, resting heart rate, resting respiratory rate, and blood pressure because the swimming is a one of the popular and the desert game for the development of physique and the physiological of differently able people and normal people.

According to the source of the literature, Kelly and Darrah have studied aquatic exercise for children with cerebral palsy, 2005, Hutzler *et al.* effect of a movement and swimming program on water orientation skills and self-concept of kindergarten children with cerebral palsy, 1998. The purpose of the development of the physique. Ralph, “sports as a means of rehabilitation,” 1970. For the purpose of the present study, the researcher is used for fulfillment as a selected swimming game is training for the development of children mentally disorder and weaker muscles of cerebral palsy schoolchildren.

### 1.1. Purpose of the Study

The purpose of the study was to find out the effect of 6-week swimming training (program) on selected

physiological parameters of children suffering from cerebral palsy.

## 2. METHODOLOGY

### 2.1. Selection of Subjects

For the purpose of this study, seven cerebral palsy children certify by the concern doctor of Amar Jyoti School were selected as experimental group during a regular swimming teaching and training program for the cerebral children who are conducted every year at the Lakshmibai National University of Physical Education swimming pool. Seven children with cerebral palsy reported for learning swimming. All these children belonged to Gwalior city and were studying at Roshni and Amar Jyoti School, integrated schools for handicapped children. A formal written request was made to the principal of these schools and a positive reply was obtained in that respect. Expert advice was obtained from neurology experts of these schools to ensure that the experimental group was medically fit for a swimming program. The age of children ranged from 9 to 18 years.

### 2.2. Experimental Design

Due to the availability of limited subjects, only one group was used as experimental group and no control group was used. The seven subjects were used as experimental group considering as purposive sampling for this study. Since only experimental group was used, their participation in other physical activity programs

**Table 1: Significance of differences between the mean of initial and final scores in selected physiological variables**

Variables (Unit)	n (Number of subjects)	Initial mean	Final mean	Mean difference	"t"-value
Vital capacity (liters)	7	0.98	1.09	0.11	4.61*
Peak flow rate (liters/min)		262.86	300.72	37.86	2.87*
Resting heart rate		68.29	65.72	2.57	4.94*
Resting respiratory rate		21.72	19.43	2.29	7.88*
Resting blood pressure systolic		98.86	97.93	0.93	0.53
Resting blood pressure diastolic		64.58	67.93	3.35	1.84

\*Significant at 0.05 level of confidence

is completely controlled joining the 6-week training program.

### 2.3. Selection of Variables

The variables selected were as following: vital capacity, peak flow rate, resting heart rate, resting respiratory rate, and resting blood pressure – systolic blood pressure and diastolic blood pressure.

### 2.4. Administration of Test and Collection of Data

All the measurements were taken by the scholar with the help of her classmates who were also well acquainted with the tests and their testing procedures.

### 2.5. Statistical Analysis

To determine the effect of swimming training on selected physiological parameters of cerebral palsy children, the data were statistically analyzed by applying the paired "t"-test, and the level of significance was set at 0.05 and is shown in Table 1.

## 3. RESULTS

In the present study, the analysis of data revealed that the four variables which selected, i.e., a significant improvement in vital capacity ( $t = 4.61$ ), peak flow rate ( $t = 2.87$ ), resting heart rate ( $t = 4.94$ ), resting respiratory rate ( $t = 7.88$ ), and other the resting blood pressures both systolic and diastolic were not found a significant improvement ( $t = 0.53$  and  $1.84$ ). Hence, it revealed that 6-week swimming training program consisting of various teaching and recreation drills associated with encouragement and support results in a significant improvement in vital capacity, peak flow meter, resting heart rate, and resting respiratory rate.

## 4. DISCUSSION

The findings of the study on cerebral palsy children are interesting to note. They reveal that regular participation in a swimming training program leads to a significant improvement in their physiological parameters as the same similar study was also concluded by Ralph in his study regarding the improvement of cardiovascular fitness, neuromuscular fitness as a result of swimming practice once or twice a week. In the case of cerebral palsy children, it indicates that their disability is no hindrance to the improvement of these parameters. Irrespective of their disability, they can pick up swimming skills through gradually, and they take a keen interest in water activities.

## 5. CONCLUSION

The following conclusions may be drawn within the limitations of the study:

Swimming training was effective in bringing about significant improvements in vital capacity, peak flow rate, resting heart rate, and resting respiratory rate of the cerebral palsy children.

The 6 weeks swimming training program no significant effect in resting blood pressure of the same subjects.

## REFERENCES

- Caspi, O., Wu, Y., Jin, Z., Li, K., Lu, Z.L., Wong, V., Han, T.L., Zheng, H., Liu, G., Zeng, Y.W., and Zou, L.P. Effect of acupuncture on the brain in children with cerebral palsy using functional neuroimaging (fMRI). *J Child Neurol* 2008;23:1267-74.
- Kelly, M., and Darrah, J. Aquatic exercise for children with cerebral palsy. *Dev Med Child Neurol* 2005;47.
- Hutzler, Y., Chacham, A., Bergman, U., and Reches, I.

Effects of a movement and swimming program on water orientation skills and self concept of kindergarten children with cerebral palsy. *Percept Motor Skills* 1998;86:111-8.  
Hutzler, Y., Chacham, A., Bergman, U., and Szeinberg, A.  
Effects of a movement and swimming program on vital

capacity and water orientation skills of children with cerebral palsy. *Dev Med Child Neurol* 1998;40:176-81.  
Ralph, S. *Sports as a Means of Rehabilitation Proceeding of an International Seminar*. Israel: Physical Education at Wintage Institute; 1970.

# Effects of 4-week Yoga Training on Muscular Strength, Muscular Endurance, Flexibility, and Agility of Female Hockey Players

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## ABSTRACT

The aim of the present study was to investigate the effect of yoga training on muscular strength, muscular endurance, flexibility, and agility of hockey players. For the purpose, a sample of 40 female hockey players of age ranging from 16 to 18 years was selected from The Hyderabad Public School, Begumpet. Further, the subjects were purposively divided into two groups. The first group designated as experimental group ( $n_1 = 20$ ) and the second one as control group ( $n_2 = 20$ ). All the participants were informed about the objectives and methodology of this study and they volunteered to participate in this experimental study. The study was restricted to the variables: Muscular strength, muscular endurance, flexibility, and agility. The same was measured using flexed-arm hang test, sit-ups test, sit and reach test, and shuttle run test, respectively. The experimental group has undergone yoga for 4 weeks by following a sequence of selected yogic asanas, i.e., Parivrtta Trikonasana, Utthita Pasvakonasana, Gomukhasana, Ardha Matsyendrasana, Paschimotanasana, Ustrasana, Dhanurasana, Chakra-asana, Bhujangasana, Sarvangasana, Halasana, and Hanumanasana. Paired sample *t*-test was applied to study the effects of yoga training on hockey players. The level of significance was set at 0.05. Results revealed significant differences between pre- and post-tests of the experimental group in respect to muscular strength ( $t = 6.946^*$ ), muscular endurance ( $t = 9.863^*$ ), flexibility ( $t = 11.052^*$ ), and agility ( $t = 14.068^*$ ). However, insignificant differences were observed between pre- and post-tests of the control group.

**Keywords:** Flexibility and agility, Hockey players, Muscular endurance, Muscular strength, Yoga.

## 1. INTRODUCTION

In the present scenario, global recognition of yoga virtually attracts the attention of intellectuals of varied fields including sports. Worldwide, there seems a considerable rise in scientific research in the field of yoga. Yoga is a science as well as an art of healthy living physically, mentally, morally, and spiritually. It is not limited by race, age, sex, religion, cast, or creed and can be practiced by those who want to have a more meaningful life. Yoga is about developing harmony between mind and body. Yoga – is a “science of sciences” – is too comprehensive in its nature and too profound in its scope of teachings to be fitted into the framework of any particular philosophy, religion or belief, and ancient or modern (Taimini, 2005). Yoga is a psychosomatic spiritual discipline for achieving union and harmony between our mind, body, and soul and the ultimate union of our individual consciousness with the universal consciousness (Mohan, 2008). Some simple

yoga postures that may be used by beginners with time improve flexibility, strength, and endurance (Sequiera, 1999). The purposes of the asanas are to condition the body, which ultimately increase strength, flexibility, and endurance. Mobility is defined as the ability to move body structures or parts of the body through the existing range of motion for a functional activity (Kisner and Colby, 2007). Improved flexibility is one of the most obvious and quickly achieved effects of regular yoga practice since this is based on gradual stretching of muscle and connective tissue around bones and joint (Woodyard, 2011), static retention of yoga poses, and movements of joints throughout the entire existing range of motion (McCall, 2007). More so, these yoga postures are argued to stimulate body organs, promoting digestion, improving circulation, and nervous system functioning (Iyengar, 2005). Asanas are performed standing, sitting, reclining, or inverted and may involve forward bending, backward bending, and twisting of the trunk. It has been argued that

holding these poses for a prolonged period of time (about 30 s or more for each pose) one of the most important aspects of yoga exercise. Several proposed mechanisms have been offered to explain the neuromuscular benefits of yoga. One idea is that the repetitive stretching and force resistance movements of yoga postures increase the contraction ability and size of muscles as well as the range of motion of various joints. This has been supported through evidence of increased muscle size, strength, and endurance (Brochu et al., 2002). The present research was conducted to fetch out the effects of 4-week yoga training on muscular strength, muscular endurance, flexibility, and agility on female hockey players.

## 2. MATERIALS AND METHODS

### 2.1. Subjects

The study was conducted on a sample of 40 female hockey players of age ranging from 16 to 18 years, selected from The Hyderabad Public School, Begumpet. Further, the subjects were purposively divided into two groups. The first group designated as experimental group ( $n_1 = 20$ ) and the second one as control group ( $n_2 = 20$ ). All the participants were informed about the objectives and methodology of this study and they volunteered to participate in this experimental study.

### 2.2. Methodology

The study was restricted to the variables: Muscular strength, muscular endurance, flexibility, and agility. The experimental group has undergone yoga training for 4 weeks by following a sequence of selected yogic asanas, i.e., Parivrtta Trikonasana, Utthita Parsvakonasana, Gomukhasana, Ardha Matsyendrasana, Paschimotanasana, Ustrasana, Dhanurasana, Chakrasana, Bhujangasana, Sarvangasana, Halasana, and Hanumanasana, as per the images given below.

The experimental group was given yoga training of 1½ h morning session daily (excluding Sunday) for a period of 4 weeks and no such training was given to the control group. Both the groups were take part in the pre-training and post-training measurements test for the study. Muscular strength was assessed with the help of flexed-arm hang test; sit-up test was used to assess the muscular endurance; sit and reach test was employed to measure the flexibility while shuttle run test was administered to assess the agility.

### 2.3. Statistical Analysis

The paired samples “t”-test was employed to find out the significance of differences between the experimental and control groups. The level of significance was set at 0.05. The data relate to the variables of the study were analyzed with the help of SPSS (Statistical Package for the Social Sciences) statistical software.

## 3. RESULTS

For the variables, the statistical analysis reveals significant differences between the pre-test and post-test of the experimental group regarding muscular strength, muscular endurance, flexibility, and agility. However, insignificant differences were seen in the control group.

Table 1 exhibits the mean values ( $\pm$  standard deviation) of pre- and post-test of 4-week yoga training of female hockey players of the experimental and control groups in respect to muscular strength, muscular endurance, flexibility, and agility. The table shows that the mean of muscular strength of pre- and post-tests of the experimental group was 29.8 and 33.7, respectively, whereas the mean of muscular strength of pre- and post-test of the control group was 27.45 and 27.95, respectively. The muscular endurance of pre- and post-test of the experimental group was 38.8 and 42.75, respectively.

**Table 1:** Mean values ( $\pm$ SD) of pre- and post-tests of 4-week yoga training of female hockey players of the experimental and control groups

Variables	Experimental group ( $n_1=20$ )		“t”-ratio	Control group ( $n_2=20$ )		“t” ratio
	Pre-test (Mean $\pm$ SD)	Post-test (Mean $\pm$ SD)		Pre-test (Mean $\pm$ SD)	Post-test (Mean $\pm$ SD)	
Muscular strength	29.8 $\pm$ 4.12	33.7 $\pm$ 4.32	6.946*	27.45 $\pm$ 4.31	27.95 $\pm$ 5.87	0.741
Muscular endurance	38.8 $\pm$ 5.39	42.75 $\pm$ 5.55	9.863*	36.35 $\pm$ 2.68	36.95 $\pm$ 4.87	0.890
Flexibility	8.85 $\pm$ .81	10.35 $\pm$ 1.72	11.052*	8.05 $\pm$ 1.43	8.2 $\pm$ 1.44	0.616
Agility	13.58 $\pm$ 0.76	13.19 $\pm$ 0.8	14.068*	13.75 $\pm$ 0.68	13.72 $\pm$ 0.95	0.193

(\*) Significant at 0.05 levels. Tabulated  $t = 2.093$ . SD: Standard deviation



respectively, whereas the mean of muscular strength of pre- and post-test of the control group was 36.35 and 36.95, respectively. The flexibility of pre- and post-test of the experimental group was 8.85 and 10.35, respectively, whereas the mean of muscular strength of pre- and post-test of the control group was 8.05 and 8.2, respectively. The agility of pre- and post-test of the experimental group was 13.58 and 13.19, respectively, whereas the mean of muscular strength of pre- and post-test of the control group was 13.75 and 13.72, respectively.

The critical value of  $t$  at 95% probability level in the experimental group is much lower (2.093) than the observed values of  $t$  with regard to muscular strength (6.946\*), muscular endurance (9.863\*), flexibility (11.052\*), and agility (14.068\*). The data do suggest that the differences between pre- and post-tests of the experimental group with regard to muscular strength, muscular endurance, flexibility, and agility are found statistically significant, whereas the critical value of  $t$  at 95% probability level in the control group is much higher (2.093) than the observed values of  $t$  with regard to muscular strength (0.741), muscular endurance (0.89), flexibility (0.616), and agility (0.193). The data do suggest that the differences between pre- and post-tests of the control group with regard to muscular strength, muscular endurance, flexibility, and agility are insignificant.

#### 4. DISCUSSION

The present study was structured to find out the effects of 4-week yoga training on female hockey players of the experimental and control groups with regard to muscular strength, muscular endurance, flexibility, and agility. Results revealed significant differences between pre- and post-tests of the experimental group in respect to muscular strength ( $t = 6.946^*$ ), muscular endurance ( $t = 9.863^*$ ), flexibility ( $t = 11.052^*$ ), and agility ( $t = 14.068^*$ ). However, in case of the control group, insignificant differences were observed between pre- and post-tests. The findings of the present study are in line with the study of Singh *et al.* (2011), they concluded that yoga asana training improves agility and muscular strength. The result with regard to flexibility is also in line with the result of Volga *et al.* (2013) as they observed that yoga and aerobic training significantly improved flexibility; Petric *et al.* (2014) also favored this result as he found that regular practice of yoga has a significant effect on body flexibility in young healthy women. The results of the present study are partially in

line with the study of Damle (2012) as she concluded that yogic exercises and breathing exercises improve flexibility, agility, strength, concentration, lung capacity, and speed. Pauline and Rintaugu (2011) also concluded that yoga training increases strength and flexibility of females from South West London. Results are also in line with the study of Ezhilarasi and Natarajan (2014) as they concluded that yogic practices group is significantly better than the control group in improving the muscular strength among college women basketball players.

#### 5. CONCLUSION

It is concluded that 4 weeks of yoga training can significantly improve muscular strength, muscular endurance, flexibility, and agility among female hockey players, which ultimately enhances their level of sports performance. Nowadays, it has been observed that yoga can play a pivotal role in all spheres of life including sports.

#### 6. ACKNOWLEDGMENTS

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#### REFERENCES

1. Brochu, M., Savage, P., Lee, M., Dee, J., Cress, M., Poehlman, E., Tischler, M., and Ades, P. Effects of resistance training on physical function in older disabled women with coronary heart disease. *J Appl Physiol*, 2002, 92, 672-678.
2. Damle, S. Effect of yogic practices for development of physical fitness of college girls. *Phys Educ*, 2012, 10(12), 51-52.
3. Ezhilarasi, S., and Natarajan, S. Effects of yogic practices and aerobic exercise on muscular strength among college women basketball players. *Star Phys Educ*, 2014, 2(2), 1-5.
4. Iyengar, B. *Light on Life*. New York: Rodale, Inc.; 2005.
5. Kisner, C., and Colby, L.A. *Therapeutic Exercise: Foundations and Techniques*. 5<sup>th</sup> ed. Philadelphia, PA: FA Davis Company; 2007.
6. Madanmohan. *Role of Yoga and Ayurveda in Cardiovascular Disease*. Buenos Aires, Argentina: Federation Argentina de Cardiologia; 2008.
7. McCall, T. *Yoga as Medicine: The Yogic Prescription for Health and Healing*. New York: Random House, Inc.; 2007.
8. Pauline, M., and Rintaugu, E.G. Effects of yoga training on bilateral strength and shoulder and hip range of motion. *Int J Curr Res*, 2011, 3(11), 467-470.

9. Petric, M., Vauhnik, R., and Jakovljevic, M. The impact of hatha yoga practice on flexibility: A pilot study. *Altern Integr Med*, 2014, 3(2), 160.
10. Singh, A., Singh, S., and Gaurav, V. Effects of 6-weeks yoga asanas training on agility and muscular strength in sportsmen. *Int J Educ Res Technol*, 2011, 2(2), 72-74.
11. Taimini, I.K. *The science of Yoga*. Adyar, Chennai: The Theosophical Publishing House; 2005.
12. Volga, H., Marandi, S.M., Kelishadi, R., and Zahed, A. A comparison between yoga and aerobic training effects on pulmonary function tests and physical fitness parameters. *Pak J Med Sci*, 2013, 29(1), 317-320.
13. Woodyard, C. Exploring the therapeutic effects of yoga and its ability to increase quality of life. *Int J Yoga*, 2011, 4, 49-54.
14. Chetana Center for Yoga and Health Education.

# A Study on Pre- and Post-Competitive State Anxiety among the Athletes

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## ABSTRACT

This study investigates and evaluates pre- and post-competitive anxiety, self-confidence, and performance of the athletes. The Cognitive State Anxiety Inventory-2 was administered to collect data from 73 athletes, both men and women, before and after the competition, who participated in the Reliance Foundation Youth Sports Athletics, held at Gachibowli Stadium, Hyderabad. The paired t-test was used to find the significant difference between the pre- and post-competition. Results showed that the levels of cognitive state anxiety before the competition were low as compared after the competition and the levels of somatic state anxiety before the competition were high as compared after the competition, whereas the levels of self-confidence before the competition were high as compared after the competition. This study concludes that the levels of cognitive state anxiety increase after the competition as athletes could not perform according to the performance expectations; on the contrary, the levels of somatic anxiety decrease as there was no pressure of performance on the athletes after the competition and the levels of self-confidence decrease after the competition as athletes could not reach their desired performance levels.

**Keywords:** Anxiety, Athletes, Competitive state anxiety inventory-2, Performance, Pre and post, Self-confidence.

## 1. INTRODUCTION

### 1.1. Anxiety

To begin with, affect is a generic term used to describe emotions, feelings, and moods. Emotion is a situation-specific affective response to the environment. Lazarus (2000a) defined emotion as “an organized psychophysiological reaction to on-going relationships with the environment, most often, but not always interpersonal or social.” Lazarus further identified 15 specific emotions and core themes associated with each emotion. The emotion of anxiety is closely related to Han Selye’s concept of stress (pronounced “sale-ye”). Selye (1983. p. 2) defined stress as the “non-specific response to the body to any demand made on it.” When aroused, the body is under stress regardless of whether the cause is something negative such as anger or something positive like joy.

### 1.2. Cognitive and Somatic Anxiety

Martens *et al.* (1990) distinguished between two aspects of anxiety. When we are anxious, we experience the physiological changes associated with high arousal,

including increased heart rate and blood pressure, “butterflies” in the stomach, faster breathing, and flushed face.

These effects are similar (though not identical) to the physiological effects of excitement and anger.

We call the experience of physiological changes associated with anxiety somatic anxiety (from the Greek soma meaning body). We can measure somatic anxiety directly by physiological means, or indirectly by self-rating inventories. Direct physiological measures include urinalysis, galvanic skin response, and blood pressure testing. Elevated levels of certain hormones released when we are anxious (such as adrenalin), which can be detected in urine. We also tend to sweat more when anxious. There are two major problems with the physiological measures of anxiety. First, as we vary quite a lot in our normal physiological levels, all individuals studied would have to have physiological measures taken over time to establish their levels with and without anxiety. Second, physiological measures require laboratory equipment and are difficult to administer in the field. Self-rating inventories can be used to measure somatic anxiety indirectly.

Self-confidence is a vital part of athletes' personalities, and others quickly recognize it in them. More important, having optimal self-confidence is probably the most critical aspect of developing a flow mindset. Most of the coaches and athletes think self-confidence means believing they will win or outperform their opponent. Self-confidence is an accumulation of one's unique achievements across many different tasks and situations, coupled with preparation for the upcoming event, which enables one to develop specific expectations of achieving future success (as in the opening quote from Michael Jordan).

Self-confidence is a crucial mental skill without a healthy foundation of realistic self-confidence; your athletes will not be able to reach their true potential.

### 1.3. Purpose of the Study

This study was to measure and evaluate the cognitive and somatic anxiety, self-confidence of the athletes and also to measure the effects of cognitive and somatic anxiety, self-confidence on their performance.

## 2. METHODOLOGY

The Competitive State Anxiety Inventory-2 (CSAI-2) was administered to collect the data from 73 athletes, both men and women, the subjects were randomly selected for the study. An assessment of anxiety and self-confidence 24 h before a competition may not yield the same information about one's state as when administered just 30–60 min prior before the competition and after the completion of the competition and the subjects were also told to write about their feelings before the competition, during the competition and after the competition, held at Gachibowli Stadium in the city of Hyderabad, India.

## 3. RESULTS AND DISCUSSION

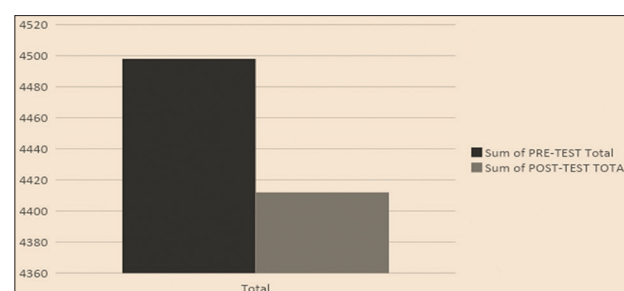
**Table 1: Paired samples correlations**

		<i>n</i>	Correlation	SIG
Pair 1	Pre-test and post-test total	73	0.527	0.05

**Table 2: Paired samples statistics**

		<i>n</i>	<i>n</i>	Standard deviation	Standard error mean
Pair 1	Pre-test total	61.6164	73	9.0154	1.0480
	Post-test total	60.4383	73	10.8804	1.2648

Results showed that the levels of cognitive state anxiety before the competition were low as compared after the competition, and the levels of somatic state anxiety before the competition were high as compared after the competition, whereas the levels of self-confidence before the competition were high as compared after the competition. The mean in the pre-test is higher as compare to post-test. Most athletes have a high level of anxiety and the level of self-confidence was also high. The levels of cognitive and somatic anxiety are almost the same, whereas their self-confidence is very high.



**Figure 1: Pre- and post-test sum of the total in the Competitive State Anxiety Inventory-2**

## 4. CONCLUSION

From the analysis, it can be concluded that the levels of cognitive state anxiety increase after the completion of the competition as the athletes could not perform according to their performance expectations; on the contrary, the levels of somatic state anxiety decrease as there was no pressure of the performance on the athletes after the completion of the competition and the levels of self-confidence decrease after the completion of the competition as athletes could not reach their desired performance levels. Pre-competition and post-competition state anxiety levels were found to have an effect on both the success and failure of an athlete.

## REFERENCES

- Turksoy, A., Bayansalduz, M., Altinci, E.E., Atikir, A. Comparison of pre and post-anxiety levels of volleyball players aged 11-14. *Int J Acad Res*, 2012, 4(1), 143-147.
- Ghorbanzadeh, B., and Bayar, P. A comparison of the pre-competition and post competition anxiety levels of Taekwondo athletes. *Life Sci J*, 2013, 10(2), 5-10.
- Horn, T.S. *Advances in Sports Psychology*. 3<sup>rd</sup> ed. Champaign, IL: Human Kinetic; 2007.
- Leunes, A. *Sports Psychology*. 45<sup>th</sup> ed. New York: Psychology Press; 2002.
- Nayak, B., and Chatterjee, K. Comparative study on

pre-competition anxiety between national and state level women athletes. *IOSR J Sports Phys Educ*, 2013, 1(2), 33-36.

- Singh, A., and Gaurav, V. A study of pre-competition and post-competition anxiety level of inter-collegiate volleyball

players. *Int J Sports Sci Eng*, 2011, 5(4), 237-241.

- Sekeroglu, M.O. Examining the pre and post-competition state anxiety levels of sportswomen of the Dutch women's volleyball national team. *J Educ Train Stud*, 2017, 5(13), 2898.



# Analysis on the Effect of Brisk Walk on the Blood Pressure and Body Fat

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## ABSTRACT

The purpose of the study was to find out the effects of brisk walk on the flexibility of 45–50 years of people. **Methodology:** The study is 100 subjects that were randomly selected and groups were divided into two. People in the age group of 45–50 years were participated. The statistical technique is used for this study that is an analysis of covariance (ANCOVA) with a testing significant level of 0.05. The ANCOVA was done on the basis of the pre-test values. To understand the significant difference among the groups and to find out the comparative effects of the two variable protocols of the selected experimental variables, the Scheffé's *post hoc* individual comparison tests were done. The *post hoc* comparison tests were conducted with the help of the post-test adjusted means values adjusted on the post-test values. **Results:** With 3 months brisk walking program, blood pressure and body fat were decreased in the experimental group.

## 1. INTRODUCTION

Modern technology has enabled the present-day society to exist in a world where the concept of hard or even moderate physical work is almost obsolete. People are continuously looking for different ways to make life even easier. Particularly, after the Second World War, in the past seven decades or so, the rapid development of technology-enabled man leads almost an effortless life resulting in his sedentary lifestyle.

A sedentary lifestyle is a medical term used to denote a type of lifestyle with no or irregular physical activity. A person who lives a sedentary lifestyle is colloquially known as a “couch potato.” A sedentary lifestyle is commonly found in both the developed and developing world. Sedentary activities include sitting, reading, watching television, and computer use for much of the day with little or no vigorous physical exercise. For millions of years, human beings moved their bodies in meaningful ways for all necessities and functions of life for both domestic chores and occupational activities. Modern lifestyle is ridden with domestic appliances such as microwaves, robotic vacuum cleaners, washing machines, mixers, grinders, juicers, and remotely controlled electronic gadgets that make life sedentary. Added to these, tinned pre-cooked foods are robbing people of even meager physical activity.

## 2. METHODOLOGY

The investigator randomly selected 50 sedentary men from Kurnool Town within the age group of 45–60 years. Twenty-five subjects were assigned to an experimental group and 25 subjects to the control group. Before the administration of the test, the investigator held a series of meetings with the subjects and made clear about the objectives and purposes of the test. The testing procedure was explained to them in detail. They were requested to cooperate and participate actively for the same.

### 2.1. Experimental Design

Random group design was used in this study. The subjects numbering 50 sedentary men were divided into an experimental and control group consisting of 25 subjects each. Among the two groups, one group was randomly assigned to the training program and the others acted as the control group. The subjects were selected at random. The experimental groups were given brisk walking program throughout, the only difference being the increase in intensity and duration after every 2 weeks.

### 2.2. Administration of Training Program

The experimental group had to undergo brisk walking every day for 3 months. The control group did not

involve in any fitness program. The training was in the age group of 45–60 years. The walking program included warm-up (10 min), workout (40 min), and cool down (10 min) sessions for 60 min. The intensity of walking was increased after every 2 weeks.

### 2.3. Warm-Up (10 min)

Walking a few steps on the toe, heel, outside and inside of the foot, neck rotation, shoulder rotation, arms rotation, side bends, body twist, hip rotation, hamstring stretch, knee lift, trunk rotation, alternate toe touch, calf stretch, and ankle rotation.

### 2.4. Workout (20–45 min)

The workout was done for 20 min–40 min. Brisk walking was done for 20 min continuously in the early stages of training. In the later stages, the intensity and duration of the walk was increased biweekly.

**Table 1: Bi-weekly schedule of brisk walking program**

Week	Distance in kilometers	Duration in minutes
First 2 weeks	2	20
2–4 weeks	2.5	25
4–6 weeks	3	30
6–8 weeks	3.5	35
8–10 weeks	4	40
10–12 weeks	4.5	45

### 2.5. Cool Down (10 min)

Neck sideward and backward stretching, arms stretching forward, backward, sideward, bending of upper body, hip rotation, calf stretching, hamstring stretching, heel walk, side step, lounge forward and sideward, heel up, down stretch, leg stretch, and ankle rotation.

### 2.6. Statistical Technique

To compare the mean difference between initial and final scores of the experimental and control group, analysis of covariance test was employed each of the selected physiological variables.

## 3. ANALYSIS AND INTERPRETATIONS

The purpose of the study is to determine the effects of 3 months of brisk walking on selected physiological

variables such as blood pressure and body fat of sedentary men.

The subjects of the study were 50 sedentary men from Kurnool Town. These subjects were randomly assigned to two groups that are an experimental group ( $n = 25$ ) and control groups ( $n = 25$ ). The experimental group participated in brisk walking program thrice a week. The control group did not participate in any sort of physical activity during the same period.

All the subjects were tested in the selected physiological variables such as blood pressure and body fat before and after 3 months of brisk walking. Blood pressure was recorded in mmHg with a standard sphygmomanometer. The data pertaining to selected physiological variables was analyzed by paired “*t*”-test to determine the difference between initial and final means for the experimental and control groups.

Significant differences were seen at 0.05% level ( $0.05 = 2.064$ ) in the experimental group following 3 months of brisk walking in body fat, flexibility, resting pulse rate, body weight, blood pressure, and aerobic capacity.

## 4. CONCLUSIONS

The results of the study seem to permit the following conclusions:

- Resting pulse rate is reduced as a result of participation in 3 months brisk walking
- Participation in 3 months brisk walking resulted in a reduction of the percentage of body fat
- Participation in 3 months brisk walking resulted in a considerable lowering of blood pressure.

## 5. RECOMMENDATIONS

In the light of conclusions drawn, the following recommendations are made.

- Similar studies may be undertaken with age group and sex other than mentioned in this study
- Similar longitudinal studies may be undertaken by increasing the duration and intensity of the training program
- Similar studies may be undertaken to understand the effect of a walking program on sedentary diabetic men
- Similar studies may be made by increasing the subjects to a large number.

## REFERENCES

- Gandapur, A.S., Manan, M., Nazir, G., Uzma, N., Chawla, J.A., Jadoon, A., and Tauqeer, A. Comparison of lipid profile and apoprotein in sedentary workers and those involved in regular exercise. *J Ayub Med Coll Abbottabad*, 2009, 18(4), 16-20
- Bernard, R.J. The effect of exercise on fat and relative patterning of skin fold measurements. *Completed Res Health Phys Educ Recreation*, 2004, 27, 125.
- Conory, M.J. The effect of a ten jogging and running programme on an obese subject. *Completed Res Health Phys Educ Recreation*, 2001, 14:76.

# Analysis on the Effect of Aerobic, Anaerobic, Aerobic and Anaerobic Mixed Exercises, and Yogasanas on the Plasma Fibrinogen among the Young Men

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## ABSTRACT

The aim of the study was to examine the effects of aerobic, anaerobic, aerobic and anaerobic mixed exercise, and yogasana's on plasma fibrinogen parameters. Sixty male students were voluntarily participated in this study. They were randomly assigned to aerobic dance ( $n = 15$ ), anaerobic (15), aerobic and anaerobic (15), and yogasanas group ( $n = 15$ ). All groups were participated according to their respective training protocol in a week during 6 months. ANCOVA test was used to analyze pre-test and post-test results of variables. As results, significant differences were found in the pre- and post-intervention scores for plasma fibrinogen in the experimental group when compared to the control group.

**Keywords:** Aerobic, Anaerobic, Plasma fibrinogen.

## 1. INTRODUCTION

Physical fitness is considered as the most desirable lifestyle component of human beings to lead healthy and very active life. This aspect of the human life is now given so much of importance and studied worldwide very extensively. The physical educators around the world sponsor for the concept of all-round development of the human beings through the physical activities. All-round development of the individual encompasses the development of the individuals' physical, mental, social, and emotional aspects.

## 2. HEALTH-RELATED FITNESS – THE DESIRED CONCEPT

The modern-day physical education scientists and wellness experts are not interested in simple skill-related physical fitness for various reasons. People are more desirous of having good health and would like to lead a qualitative life. For this, the wellness experts throughout the world are sponsoring the idea of possessing high levels of health-related physical fitness than simply having the skill-related physical fitness. Hence, a physical education teacher should be able to understand the concept of health-related physical fitness and it is individual components and strives to develop

these components in the students so that the students would be able to lead a healthy and happy life.

## 3. AEROBIC TYPE EXERCISES

To initiate and maintain the utility of oxygen during the each training session and also throughout the experimentation period, the following physical exercises were incorporated in each training session. The experimentation period was lasted for 6 months, but the first 1 month, the subjects were kept under conditioning and consolidation process to develop minimum cardiorespiratory and muscular fitness. Hence, only 5 months were the actual experimentation with the intended physical exercise. During this initial 1 month, the subjects were asked to walk and slowly jog for 5–10 min before going to light calisthenics and stretching exercises. Then, the subjects took an easy and comfortable jog for 15 min, and by the end of the month, the subjects jogged for 20 min. All the time, the subjects were asked to monitor their pulse rates to see that their pulse rate may not go beyond 50–60% of their maximum heart rate. After this initial 1 month period, the protocol of aerobic exercises for the aerobic group was as follows:

- Walking for 10 min slowly increasing the pace
- Calisthenics and light stretching immediately after walk

**Table 1: ANCOVA table for resting plasma fibrinogen values**

Source of variance	Df	SS	MS	F	Table f
Total	74	32865.71422			
Between groups	4	22500.29713	5625.074282	37.98739562	2.49
Within groups	70	10365.41709	148.077387		

- Slow and continuous jogging for 4 km keeping their heart rate at 50–60% of maximum heart rate
- Warm down and cooling the body slowly.

The above routine was done for 4 times/week and for 5 months continuously.

#### 4. ANAEROBIC TYPE EXERCISE

Anaerobic exercise group went through the following protocol of exercises, which will initiate anaerobic metabolic energy-releasing pathway or as a major source of energy. Hence, fast and vigorous exercise protocol was implemented for this group. However, before they started their experimentation exercise regime, they were kept under 1 month conditioning and consolidation of fitness program. During this period, the subjects in each session jogged for 5–10 min and then did light stretching and calisthenics exercise. After the subjects did acceleration sprints of up to 80–100 m with full recovery in between for times initially and improving them to 8–10 times for the month end. After the 1<sup>st</sup>-month conditioning program, the subjects took to the actual experimentation protocol for 5 months as follows in each session.

- Slow jogging for 1 km and then for stretching and calisthenics
- Acceleration sprints with a speed of 50–60% of the maximum speed for 10 times with a recovery period of 3 min for each repetition while walking back slowly
- Cooldown the body by slow limbering down exercises
- This group did this anaerobic protocol for 4 times a week and for 5 months continuously.

#### 5. AEROBIC AND ANAEROBIC (MIXED PHYSICAL EXERCISE)

The idea in selecting this variable was to know the effects on the selected dependent variables, namely, resting HDL and LDL cholesterol levels and resting plasma fibrinogen levels when both the aerobic and anaerobic metabolic pathways are triggered jointly on

**Table 2: Resting plasma fibrinogen values mean differences**

Groups	n	Mx-My	MGenx-My.x	Mx-My.x
Aerobic	15	-50.666667	-48.79271517	-58.7127152
Anaerobic	15	-26.533333	-23.94153752	-37.6615375
Mixed	15	-43.466667	-42.82690366	-46.2135703
Yogasana	15	-44.4	-45.35964451	-40.2796445
Control	15	2	-2.145865802	19.80080086

long term training. For this group also the first 1 month was to see that the subjects of the group develop minimum physical fitness to go through the exercise protocol of experimentation. During this initial month, the subjects jogged for 2 ½ km slowly after slow stretching initially and then would go for acceleration sprints of up to 80 m for 3–5 times immediately after the long medium intensity run. After this 1 month of improvement of physical fitness which is also a part of the experimentation, the subjects went through the actual exercise protocol for 5 months and each session was as follows.

- Three kilometers continuous running after a slight stretching session. The running was done at the intensity of medium level, i.e., 50–60% of the pulse rate and then immediately
- Acceleration sprints for 5 times of 100 m distance with walk back recovery in between of 3 min for each repetition
- Limbering down exercises
- This exercise protocol was practiced for 4 times/week and for 5 months continuously.

#### 6. YOGASANAS

The researcher selected moderately difficult yogasanas to see that the intensity may be considered as medium. After extensive reading and also after extensive consultations with yoga experts, the researcher came to know that the protocol of yogasanas developed by Swamy Shivananda of Rishikesh Ashram would serve the purpose of research. Hence, the series taught in Rishikesh Ashram of Swami Shivananda consisting of seven asanas and one bandha apart from breathing



**Table 3: Scheffe's *post hoc* comparison test for resting plasma fibrinogen**

$$CD = \sqrt{(a-1)F((2(MsError)/n))}$$

Individual comparisons from highest value to lowest value (comparisons for post-test adjusted means)				
Groups and values	Yogasna 231.787022	Mixed 234.319763	Anaerobic 253.2051291	Control 275.0008009
Aerobic 228.354	-3.4330707 n.sig	-5.965811517 n.sig	-24.8511777 significant	-46.64684937 significant
Yogasna 231.787022		-2.532740857 n.sig	-21.418107 significant	-43.21377871 significant
Mixed 234.319763			-18.8853661 significant	-40.68103785 significant
Anaerobic 253.2051291				21.79567172 significant

exercises was selected for the experimentation. This series developed by Swamy Shivananda takes nearly 30 min and all the asanas are moderately difficult asana. Even the timings suggested by the Swamy Shivananda were of moderate time-intensity, hence, highly suitable for the experimentation.

The subjects of the yogasana group were oriented on the following series of yogasanas and were given 1 month conditioning period to gain sufficient experience and physical fitness to go through the series.

1. Sarvangasana
2. Halasana
3. Matsyasana
4. Paschimottanasana
5. Shalabhasana
6. Dhanurasana
7. Ardha matsyendrasana
8. Shirshasana
9. Uddiyana bandha (standing).

The above analysis confirms that all the four experimental groups post-test values are significantly different from the control group. Table 2 shows that the mean reductions from pre-test to post-test adjusted values on pre-test indicate that the aerobic exercise group could reduce the post-test values more than mixed, yogasana, and anaerobic groups in order. This simple analysis of the mean differences could give the impression that the medium intensity aerobic type exercises will reduce the resting plasma fibrinogen values more significantly than the medium intensity mixed type exercises, medium intensity, yogasana, and medium intensity anaerobic type exercise in order.

However, to find out the actual source of significant difference to analyze further Scheffe's *post hoc* test are conducted on the post-test values adjusted on the pre-test values.

The analysis from the ANCOVA table resting plasma fibrinogen elicits that the selected four types of medium intensity exercises are effective in reducing the resting plasma fibrinogen levels. The analysis from Table 2 explains that the medium intensity aerobic type exercises are most effective in reducing the resting plasma fibrinogen levels, followed by medium intensity mixed type exercises, medium intensity yogasanas, and medium intensity anaerobic type exercises.

The analysis of Scheffe's *post hoc* individual comparisons from Table 3 brought out that there is no significant difference among the aerobic, mixed, and yogasana groups in reducing the resting plasma fibrinogen levels, though all the three groups are different in their mean reductions. Hence, in the third hypothesis that the medium intensity aerobic training will also cause to reduce the resting plasma fibrinogen levels and that the medium intensity aerobic training will also cause to reduce the resting plasma fibrinogen levels more than the medium intensity anaerobic training is accepted, but that the medium intensity aerobic training will cause to reduce the resting plasma fibrinogen levels more than the medium intensity yoga training is rejected. Further, in the fourth hypothesis that the medium intensity mixed exercises will cause to reduce significantly the resting plasma fibrinogen levels than the medium intensity anaerobic training is accepted, but that the medium intensity mixed exercises will cause to reduce significantly the resting plasma fibrinogen levels than medium intensity yogasanas is rejected.

## REFERENCES

- Erdemir, I., Okmen, A.S., and Savucu, Y. Effects of 6 months of training prior to a major competition on hematological and biochemical parameters in young elite judoka. *Aust J*

*Basic Appl Sci*, 2013, 7(13), 257-263.

Farooque, I., Singhal, S., Aslam, M., and Khan, J.A. Lipid profile in sports persons playing different sports. *Natl J Integr Res Med*, 2014, 5(1), 13-16.

Fathei, M. Response of lipid biomarkers to four weeks aerobic training in active and inactive men. *Today Sci J Hum*, 2014, 2(1), 11-16.

Gnanou, J., Caszo, B., Khalin, I., Leong, S., Knight, V.F., and Bidin, M.Z.B. The effect of 6-weeks military training on blood hematological parameters in untrained recruits in a

military university. *Med Sci*, 2014, 3(3), 1479-1490.

Hammouda, O., Chtourou, H., Chaouachi, A., Chahed, H., Ferchichi, S., Kallel, C., Chamari, K., and Souissi, N. Effect of short-term maximal exercise on biochemical markers of muscle damage, total antioxidant status, and homocysteine levels in football players. *Asian J Sports Med*, 2012, 3(4), 239-246.

Jothi, K., Rajavel, T., Chandraleka, K. Effect of varied aerobic exercise on selected blood parameters among hockey players. *Online Int Interdiscip Res J*, 2013, 3(4), 81-88.

# A One Season Prospective Cohort Study of Volleyball Injuries

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## ABSTRACT

**Objective:** The objective of this study was to estimate the overall incidence of acute, overuse volleyball injuries, and to describe factors associated with ankle sprains. **Methods:** A total of 486 players from the Rayalaseema University players participated in the study and were followed prospectively during a whole season. Three measurements were made during the season (baseline, follow-up 1, and follow-up 2), where all players completed a questionnaire on demographic variables (only at baseline), sports participation, use of preventive measures, and previous injuries. Volleyball exposure during training and matches was recorded for each individual player by the coach on a weekly exposure form. In case of injury, the coach provided the injured player with an injury registration form, which had to be completed within 1 week after the onset of the injury. **Results:** Hundred injuries were reported, resulting in an overall injury incidence of 2.6 injuries/1000 h. The incidence of acute injuries was 2.0/1000 h. Ankle sprains ( $n = 41$ ) accounted for most of the acute injuries, and 31 (75%) of all players with an ankle sprain reported a previous ankle sprain. Twenty-five overuse injuries were reported. The overall incidence of overuse injuries was 0.6/1000 h; the back and the shoulder were the most common sites. **Conclusions:** Ankle sprain is the most common injury in volleyball, accounting for 41% of all volleyball related injuries. The previous injury seems to be an important risk factor for an ankle sprain. Injury prevention programs should focus on ankle sprains and concentrate on players with the previous ankle sprains.

## 1. INTRODUCTION

Volleyball is one of the most popular sports in the world. It is played by approximately 200 million players worldwide [1]. Despite the popularity and a large number of players, there have been surprisingly few prospective reports on volleyball injuries and their prevention [2]. As volleyball is a non-contact game, where players from the opposing teams are separated by a net, the incidence of injuries might be expected to be low. Nevertheless, volleyball is a sport involving rapid and forceful movements of the body as a whole, both horizontally and vertically, and due to the large forces involved in such movements that it is inevitable that injuries occur [3]. De Loes [4], for instance, found in a 3-year prospective study that with an injury incidence of 3.0/1000 h, volleyball is the 8<sup>th</sup> most injury prone sport in the age group 14–20 years. Schafle *et al.* found an overall injury incidence of 2.3/1000 h during the United States [5].

Our aim in the present study was to examine the overall incidence of volleyball injuries, both acute and chronic,

and to describe the factors associated with ankle sprains. For this purpose, a season-long prospective cohort study in a population of competitive volleyball players was used.

## 2. METHODS

### 2.1. Population

Sixty-eight teams (50% of all Rayalaseema University Region teams) were invited to participate in our prospective cohort study. From these, 50 teams (35 male and 15 female) consisting of 600 players agreed to participate. The coaches of all participating teams were informed face to face of the purpose and procedures of the study.

### 2.2. Design and Measurements

At the start of the season (September 2016), all players completed a questionnaire on demographic variables, sports participation (volleyball and other sports), the

use of preventive measures, and previous injuries. This questionnaire (except for the demographic variables) was repeated in January 2017 (follow-up 1), and again at the end of the season (May 2017, follow-up 2). To be included, players had to be free from injury at the start of the study.

Exposure was recorded by the coach on an exposure form. Coaches noted the total duration of each training session and match and classified the level of participation of each player (that is, in terms of full, three quarters, one half, one quarter, or no participation). If the player did not participate fully, the coach noted the reason, that is, being injured, ill, or absent for other reasons. Completed exposure forms were returned on a weekly basis. Due to the amount of data coaches had to report during each training and match session, it was inevitable that there would be incomplete exposure forms. Incomplete forms were immediately followed up by a phone reminder. Finally, for all but six teams, all exposure forms were collected completely.

In case of injury, the coach provided the injured player with an injury registration form, which had to be completed within 1 week after the onset. In this form, the player was asked to provide information on the injury location, injury type, diagnosis of the injury, direct cause of the injury, preventive measures used at the time of the injury, first aid is given, and subsequent medical treatment. If an injury was noted on the exposure form and no injury registration form had been received within 2 weeks after the injury was logged, the coach was contacted and urged to let the player complete the injury registration form.

### 2.3. Injury Definition

An injury was recorded if it occurred as a result of volleyball and caused the subject to stop this activity, or resulted in the subject not participating fully in the next planned sports activity. All recorded injuries were independently diagnosed as being either acute (that is, resulting from a sudden event during organized volleyball) or overuse (resulting from volleyball but without a sudden event leading to injury) by two certified sports physicians, using the injury registration forms. In a consensus meeting, the two physicians tried to reach an agreement on injuries which they had classified differently. If no accord was reached, a third sports physician would make the final decision. This latter situation, however, did not occur.

### 2.4. Analysis

For each of the 168 non-participating teams, the number of players, their sex, age, and volleyball experience, and the number of registered players in the club were tracked through the administration of the Kurnool District volleyball association for a non-response analysis.

Injury incidence was calculated for all participants and men and women separately, as the number of new injuries reported per 1000 h of play (total, match, or training, as appropriate), using an exposure time of each individual player until the onset of the first injury. For each injury category, that is, chronic or overuse injury incidence was calculated using the exposure time of each individual player until the onset of the first injury of this category. For match compared with training, and for men compared with women, relative injury risk and corresponding 95% confidence interval (CI) were calculated where possible odds ratio (OR) and the corresponding 95% CI were calculated for the factors associated with ankle sprains.

Recorded exposure and injury data of players without complete follow-up were included in the analyses until they dropped out of the study. As exposure sheets provided hours of volleyball participation and served as a control for the registration of injuries, players had to be excluded from further analyses, once exposure data of their team were missing.

## 3. RESULTS

The non-response analysis showed that significantly more male than female teams did not participate in the study. For the other variables (that is, the number of players, age, volleyball experience, and the number of registered players in the club), no significant differences were found (data not shown). Of the 50 teams that agreed to participate in the study, nine dropped out after 4 months (that is, at follow-up 1), and another three after 9 months (at follow-up 2). The baseline variables of these 12 teams did not differ from those of the other teams (data not shown). Exposure data were missing for four male and two female teams. Consequently, these teams were excluded from the analyses. Baseline variables for these six excluded teams did not differ from the other teams (data not shown). All the players from the participating teams reported that they were free from injury at baseline. This resulted in a baseline sample of 44 teams with 419 volleyball players (158 men and 261 women).

A total exposure of 44,891 h was reported throughout the 36-week season, during which 100 injuries occurred. With a relative risk of 2.3 (95% CI, 1.5–3.7), the overall risk of injuries was higher for match play than for training. No differences between men and women were found for total, training, and match injury incidence. The overall mean (Standard deviation) absence from volleyball after injury was 4.3 (4.6) weeks. For men and women, the mean absence was 4.1 (5.7) weeks and 4.4 (3.5) weeks (NS), respectively. With a total of 78 acute injuries, the acute injury incidence was 2.0 (95% CI, 1.5–2.4)/1000 h. With a relative risk of 2.4 (1.4–3.8), the risk of acute injuries was higher for match play than for training. The mean absence from volleyball after an acute injury was 4.0 (3.8) weeks. In terms of acute injuries, the lower extremity was the most commonly injured body region, with 65 injuries (83% of all acute injuries). Ankle injuries ( $n = 41$ ), all sprains, accounted for most of these. The risk of ankle sprain did not differ between match and training, or between men and women.

During the season 25 overuse, injuries were reported, the overall incidence of overuse injuries was 0.6 (0.4–0.8)/1000 h. The mean absence from volleyball due to an overuse injury was 4.0 (6.2) weeks, with the shoulder causing the longest absence (6.2 [9.4] weeks), followed by the knee (2.9 [1.8] weeks), while there were very few acute shoulder injuries, these injuries accounted for 32% of the overuse injuries. Back (32%) and knee injuries (20%) were the other main overuse injury types.

With an absolute number of 41 injuries and an incidence 1.0 (0.7–1.3)/1000 h, ankle sprain was the most common injury type. In all, 25 ankle sprains were sustained in the net zone (61%). The OR for ankle sprains sustained in the net zone versus the backfield was 2.0 (0.7–5.8). Of all ankle sprains that occurred in the net zone, most occurred in contact with either a teammate or an opponent after a defensive action, for example, a block.

Three of the players (7%) were wearing ankle protection at the time of injury, while 31 (75%) of the injured players reported to have sustained a previous ankle sprain. Of these previous sprains, 11 (25%) were sustained within 12 months preceding the recurrence

of the ankle sprain. The OR of recurrent ankle sprains within 12 months versus “fresh” ankle sprains was 1.9 (0.8–4.7). The overall mean absence from volleyball after an ankle sprain was 4.5 (3.6) weeks.

#### 4. CONCLUSIONS

The overall injury incidence in volleyball was 2.6/1000 playing hours. The incidence of acute and overuse injuries was 2.0 and 0.6/1000 playing hours, respectively. The ankle sprain is clearly the most common injury in volleyball, accounting for 41% of all volleyball-related injuries, with an injury incidence of 1.0/1000 playing hours. Although our study was limited to injuries causing absence from volleyball, ankle sprains should be of particular interest in studies on prevention strategies. The previous injury seems to be an important risk factor for ankle sprains. Thus, if an initial ankle sprain can be prevented that the most important risk factor has been eliminated.

#### REFERENCES

1. *Federation Internationale de Volleyball*. Lausanne: X-Press; 1994.
2. Bahr, R., Karlsen, R., Lian, Ø., and Ovrebø, R.V. Incidence and mechanisms of acute ankle inversion injuries in volleyball. A retrospective cohort study. *Am J Sports Med*, 1994, 22, 595-600.
3. Watkins, J., and Green, B.N. Volleyball injuries: a survey of injuries of Scottish National League male players. *Br J Sports Med*, 1992, 26, 135-137.
4. De Loes, M. Epidemiology of sports injuries in the Swiss organization “Youth and Sports” 1987-1989: Injuries, exposures and risks of main diagnosis. *Int J Sports Med*, 1995, 16, 134-138.
5. Schafle, M.D., Requa, R.K., Patton, W.L., and Garrick J.G. Injuries in the 1987 national amateur volleyball tournament. *Am J Sports Med*, 1990, 18, 624-631.
6. Bahr, R., and Bahr, I.A. Incidence of acute volleyball injuries: A prospective cohort study of injury mechanisms and risk factors. *Scand J Med Sci Sports*, 1997, 7, 166-171.
7. Van Mechelen, W., Hlobil, H., and Kemper, H.C.G. Incidence, severity, aetiology and prevention of sports injuries. A review of concepts. *Sports Med*, 1992, 14, 82-99.
8. Aagaard, H., and Jørgensen, U. Injuries in elite volleyball. *Scand J Med Sci Sports*, 1996, 6, 228-232.



# An Investigation on the Effect of Dissimilar Training Etiquettes on Low-density Lipoprotein Cholesterol among Middle-aged Women

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## ABSTRACT

**Background:** This study examined the impact of 16-week program of low to sub-maximal intensity aerobic, resistance, and interval training program on low-density lipoprotein cholesterol (LDL-C) in 60 untrained women ages 30–35 years.

**Objective:** The objective of the study was to investigate the training effect of 16 weeks of sub-maximum intensity progressive aerobic, resistance, and interval training program on LDL-C in young men. **Methods:** Participants were randomly assigned to an aerobic-based training group  $n = 15$ , resistance-based training group  $n = 15$ , interval-based training group  $n = 15$ , and control group (CG)  $n = 15$  participants in the experimental groups performed their training protocols. **Results:** Maximum intensity aerobic, resistance, and interval training program on LDL-C show a significant decrease when compared to CG and in between exercise protocol groups, LDL-C is identical.

**Keywords:** Aerobic, Interval, Low-density lipoprotein cholesterol, Resistance.

## 1. INTRODUCTION

Countries that have in terms of technology development, as residents living, inactivity, and passive enough to become prevalent that the prevalence of direct or indirect cause of many problems and issues such as health and wellness heart diseases – cardiovascular disease, obesity, and coronary artery disease is so that as a major problem in these communities are known. One of the problems today, especially in developed countries is atherosclerosis is one. The health-related physical fitness which is considered as a key component in an individual's life, is develop and protected through participation in various physical activities. Low-density lipoprotein cholesterol (LDL-C) is considered the most potent independent risk factor for coronary heart disease (CHD) and is inversely correlated with CHD.[1] Endurance exercise training characterized by continuous activity at moderate exercise intensity demonstrates significant decreases in LDL-C in both men and women after a period of training, typically 20–30% for endurance athletes compared with inactive controls.[2,3] Aerobic-based training has been proposed as an effective mechanism for improving cardiovascular protection, with training resulting in decreases of LDL-C in men 18 years of age and older[4] also found positive training-related adaptation on total cholesterol

(TC), triglycerides (TG), LDL-C, and high-density lipoprotein cholesterol (HDL-C)[5] or only on LDL-C and TC/HDL-C without changes on HDL-C and TG.[6] Considering the observed deterioration of the cardiovascular system and the metabolic profile that tends to accompany young men, it is important to know the potential benefits derived from the exercise. Although the effects of aerobic versus resistance training on cardiovascular risk factors have been compared.[7,8]

## 2. MATERIALS AND METHODS

Sixty sedentary individuals (30–35 years) volunteered (women [standard deviation] age  $\pm 32.5$  [2] years) to participate in this study. Participants were informed about any potential risks and/or discomforts in associated with participation this study and were required to provide their written informed consent before being included in the study. Participants were randomized into three training groups and one control group (CG). All the participants were from the various colleges of Kurnool city under the Rayalaseema University, Kurnool, Andhra Pradesh, India.

### 2.1. Aerobic-based Training Group

The training was supervised by an exercise physiologist and the frequency was kept 3 times/weeks for 16 weeks

with 45 min/session. The intensity of the main part of the session started with work heart rate (HR) 50% $_{\text{reserve}}$  (1<sup>st</sup>–4<sup>th</sup> week) increasing progressively to 51–55% $_{\text{reserve}}$  (5<sup>th</sup>–8<sup>th</sup> week), 55–60% $_{\text{reserve}}$  (9<sup>th</sup>–12<sup>th</sup> week), and 60–65% $_{\text{reserve}}$  (13<sup>th</sup>–16<sup>th</sup> week).

## 2.2. Resistance-based Training Group

After an adequate warm-up, the participants completed resistance exercise for 3 days a week for 16 weeks. They performed eight exercises with elastic bands for the major muscular groups respecting the following progression.

- 1 set of 8 repetitions (1<sup>st</sup>–2<sup>nd</sup> week) 1 set of 12 repetitions (3<sup>rd</sup>–4<sup>th</sup> week)
- 2 sets of 8 repetitions (5<sup>th</sup>–6<sup>th</sup> week) 2 set of 10 repetitions (7<sup>th</sup>–8<sup>th</sup> week)
- 2 sets of 12 repetitions (9<sup>th</sup>–10<sup>th</sup> week) 2 sets of 15 repetitions (11<sup>th</sup>–12<sup>th</sup> week)
- 3 sets of 12 repetitions (13<sup>th</sup>–14<sup>th</sup> week) 3 sets of 15 repetitions (15<sup>th</sup>–16<sup>th</sup> week).

An interval period of at least 3 min was assured between sets of the same exercise.

## 2.3. Interval-based Training Group (IBTG)

The experimental participants run/walk a distance of 3.2 km 3 days/week for 16 weeks. Participants ran four sets of 800 m interval, i.e., 4 × 800 mts interval 1:1 work:rest ratio at approximately 60–65 of their age-predicted maximal HR (HR Max 220-age in complete years).

## 2.4. CG

The CG was instructed not to undertake any vigorous exercise during the training period.

## 2.5. Materials

Venous blood samples were collected in the morning between 8 AM and 9.30 AM by two specialized staff nurses before the training session and the blood samples have collected after completion of 16-week training session. LDL-C was determined using a direct two-point Kinetic Assay Kit (CH2652, Randox Laboratories, Ltd., U.K.).

## 2.6. Statistical Analysis

Analysis of covariance technique was used to study the effect of the experimental variable on the selected

physiological variables. Scheffe's *post hoc* test also applied to find out the source of significant difference among the groups and to test the hypotheses to arrive at conclusion. The level of significance was 0.05.

## 2.7. Analysis on LDL-C

Table 1 depicts the analysis of covariance for the LDL-C of the subjects on the experimental variable selected. The table indicates that there is a significant effect through the selected experimental variable, i.e., aerobic, resistance, and interval for the selected experimental period. The obtained F value, i.e., 34.915 is much higher than the table F value, i.e., 2.78 and hence the selected experimental variables caused the significant change in the selected LDL-C levels of the subjects.

Table 2 contains the mean values of the selected criterion variable, i.e., LDL-C of the subject. The table brings out the following observations. The aerobic running group showed a better reduction in LDL-C levels when compared to the other two groups, namely, resistance and IBTG. The aerobic running group's post-training LDL-C mean is 116.30, the resistance group's post-training LDL-C mean is 121.7636, and the IBTG post-training LDL-C mean is 125.214. When compared with the mean values of the three groups, it is clear that the aerobic group showed a significant reduction in LDL-C when compared to the other two groups. The resistance group also showed a reduction in the LDL-C levels when compared to the IBTG. This simple analysis on the post-training adjusted mean values shows that there is a significant reduction in the

**Table 1: ANCOVA table**

Source	DF	SS	MS	F	CR.F
Total	59	2849.847			
BG	3	1868.653	622.8845	34.91526	2.78
WG	55	981.1941	17.83989		

**Table 2: Pre-training, post-training, and adjusted post-training means for LDL-C**

Groups	N	MX	MY	MY.X
IBTG	15	115.0667	109	125.2149
RTG	15	124.3333	114.2	121.7626
AG	15	136.4667	120.0667	116.3004
CG	15	153.8667	152.0667	132.0541
		132.4333	123.8333	123.833

LDL-C: Low-density lipoprotein cholesterol, IBTG: Interval-based training group

**Table 3: Scheffe's *post hoc* test for LDL-C CD for Scheffe's test**

$$CD = \sqrt{(a-1)F\sqrt{(2(MsError)/n)}} \quad 4.355$$

**Individual comparisons for LDL-C**

Groups and Values	AG	RBTG	IBTG
	116.3004	121.7626	125.2149
RBTG	-5.4622		
121.7626	Sig		
IBTG	-8.9447	-3.45227	
125.2149	Sig	n.sig	
CG	-15.7537	-10.2915	-6.83918
132.0541	Sig	sig	sig

LDL-C: Low-density lipoprotein cholesterol, RBTG: Resistance-based training group, IBTG: Interval-based training group

LDL-C levels of the subjects due to the selected three activities at the selected intensity.

Although there is variance in the mean values of the LDL-C due to the three protocols of the exercise, to find out the real difference and the cause of significant difference the Scheffe's *post hoc* individual comparison test was conducted.

The Scheffe's *post hoc* individual comparison test for the individual groups is presented in Table 3. The individual comparisons through the Scheffe's *post hoc* test elicited that the aerobic running group has brought out a significant reduction in the LDL-C of the subjects when compared to the other two experimental protocols of exercise. The resistance and IBTG post-training adjusted averages are different in values, the Scheffe's *post hoc* comparison test indicated that the difference between the groups is insignificant and hence the training effect of the resistance and IBTG is identical. However, all the three exercise protocol groups of the experimentation showed significant reductions in the LDL-C levels as per the Scheffe's *post hoc* individual comparison test when compared to the CG.

### 3. CONCLUSIONS AND RECOMMENDATIONS

#### 3.1. Conclusions

The following conclusion has been derived after analyzing the experimentation results through the appropriate statistical tools:

1. All the three different protocols selected for the aerobic training group, resistance training group, and interval training group at the moderate intensity

of maximal HR intensity caused for the significant decrease in the LDL-C levels of the subjects.

#### 3.2. Recommendations

The following recommendations are offered by the scholar in this regard:

- Aerobic exercise programs at a moderate intensity of 60–70% of the maximal HR of not <4 km distance should be needed to better control the precipitating factors for the degenerative diseases such as CHD and hypertension
- A similar study may be conducted cross sectionals for various populations changing the geographical limitations
- The same type of study may be done for various ages of the same geographical population or to the different geographical area population
- A similar study may be conducted for longitudinal studies with an increased experimentation period
- Many similar studies may be conducted changing the intensity factor of the experimentation exercise protocol.

### REFERENCES

1. Spate-Douglass, T., and Keyser, R.E. Exercise intensity its effect on high density lipoprotein profile. *Arch Phys Med Rehabil*, 1999, 80, 691-695.
2. Durstine, J.L et.al. Effect of exercise training on plasma lipids and lipoproteins. *Exerc Sport Sci Rev*, 1994, 22, 477-521.
3. Kelly, G.A., and Kelly, K.S. Aerobic exercise, lipids and lipoproteins in men: A meta analysis of randomized controlled trails. *J Mens Health Gend*, 2006, 3, 61-70.
4. Halverstadt, A., Phares, D.A., Wilund, K.R., Goldberg, A.P., and Hagberg, J.M. Endurance exercise training raises HDL-C and lowers small LDL-C, VLDL-C independent of body fat phenotypes in older men and women. *Metabolism*, 2007, 56, 444-450.
5. Kelly, G.A., Kelly, K.S., and Tran, Z.V. Walking lipids and lipoproteins: A meta analysis of randomized controlled trails. *Prev Med*, 2004, 38, 651-661.
6. Sillanpaa, E., Hakkinen, A., Punnonen, K., Häkkinen, K., and Laaksonen, D.E. Effects of strength and endurance training on metabolic risk factors in healthy 40-65 year oldmen. *Scan J Med Sci Sports*, 2009, 19, 885-895.
7. Poehlman, E.T., Drorak, R.V., DeNino, W.F., Brochu, M., and Ades, P.A. Effects of resistance training and endurance training on insulin sensitivity in non obese, young women: a controlled randomized trial. *J Clin Endocrinol Metab*, 2000, 85, 2463-2568.
8. Kumar, Y.K., Reddy, V.J. Effect of cardio respiratory endurance, anaerobic and yogasana on HDL-C and LDL-C levels among young men. *Br J Sports Med*, 2010, 44 Suppl 1, i1-i82.

# Effect of Physical Activity on Concentration and Memory of Pre-teen Boys with Learning Disabilities

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## ABSTRACT

Children are increasingly using digital media as opposed to erstwhile “playtime” options. This could be due to the “simple” choice of engaging children using television, gaming devices, and other modern gadgets. Due to extensive on-screen activity, children can get through days with a minimum of physical exertion leading toward a sedentary lifestyle. Exposure and preferences to these could lead to mindless food consumption and bad eating habits. A sedentary lifestyle contributes to weight gain, low self-esteem, behavioral problems, reduced concentration, and working memory capacity. Charles H Hillman’s 2014, monograph reveals the importance of physical activity in brain development and cognitive development in children. Well-established learning/developmental mechanisms state that movement and physical activity provide learning experiences that aid and may even be necessary for proper cognitive development. This study aimed to explore the relation of physical activity, concentration, and memory in pre-teen boys with learning disabilities. The study comprised an experimental and control group aged 9–12 years ( $n = 25$ ). Intervention for the boys in the experimental group was in the form of moderate to vigorous physical activities over 7 weeks. The study focused on two dependent variables – (1) selective attention and (2) working memory. We based these choices on the Wechsler Intelligence Scale for Children – Fourth Edition. We collated the pre-test and post-test data and subjected it to statistical analysis using a paired  $t$ -test. The positive correlation between physical activities, concentration, and memory found through this study aligns with the WHO global strategy recommendation of at least 60 min of moderate to vigorous physical activities for children aged between 5 and 17 years urging us to rethink our choice of “playtime” – daily.

**Keywords:** Control group, Experimental group, Intervention, Modern children, Physical activity, Sedentary life, Selective attention, Weight gain, Working memory.

## 1. INTRODUCTION

Active children enjoy benefits beyond healthy physical development. It is well documented, especially in the past two decades that physical activities help in emotional, social, and mental development. When physical activity is a part of a child’s daily routine, it enhances self-confidence, concentration, and cognition. Being physically active fundamentally leads to stronger muscles, better physical fitness, flexibility, stability, posture, and cardiovascular health. Global action plan for the prevention and control of non-communicable diseases 2013–2020 talks about the chances of overweight and obese children becoming obese adults

are more. They tend to develop cardiovascular diseases and diabetes at a younger age, with physical inactivity being one of the major contributing factors.

Physical inactivity is the fourth leading risk factor for global mortality – increasing levels of physical inactivity seen worldwide. One in every three adults is seen to be inactive. This can be mitigated by a supportive environment, thus increasing this level of physical activity, thereby leading on to good health across age groups. Although the World Health Organization recommends a certain optimal amount of activity, incorporating some physical activity is better than none at all. Inactive people should begin with small



bursts of physical activity. Over time, they should only gradually increase the period, frequency, and intensity. The society in general, as well as individuals, can take on initiatives to increase physical activity.

Children engaged in physical activities tend to be happier, confident, concentrate better in school, share, and cooperate with others. A child need not have to be playing organized sports or do a push-up, any opportunity of a free outdoor physical activity would be beneficial. In fact, “children think better on their feet than on their seat,” says Mark Benden, Department Head, Director of the Ergonomics Center, Environmental and Occupational Health, Texas.

Obesogenic factors, like the decline in physical activity, an unhealthy diet that includes ultra-processed, energy-dense, and nutrient-poor foods, which are cheap and readily available, contribute to overweight in individuals. Reduced opportunities for physical activity, both in and out of school, and more time spent on screen-based and sedentary leisure activities are all adding up in deteriorating health and other health-related issues such as hyperlipidemia, hypertension, endocrinological issues like diabetes, and fatty liver.

Children are increasingly using digital media as opposed to erstwhile “playtime” options. This could be due to the “simple” choice of engaging children using television, gaming devices, and other modern gadgets. Due to extensive on-screen activity, children can get through days with a minimum of physical exertion leading toward a sedentary lifestyle. Exposure and preferences to these could lead to mindless food consumption and bad eating habits. A sedentary lifestyle contributes to weight gain, low self-esteem, behavioral problems, reduced concentration, and working memory capacity. Charles H Hillman’s 2014, monograph reveals the importance of physical activity in brain development and cognitive development in children. Well-established learning/developmental mechanisms state that movement and physical activity provide learning experiences that aid and may even be necessary for proper cognitive development.

Numerous studies support the idea that breaks that allow young children to participate in such playground type activities help them concentrate on sedentary tasks that may follow while improving learning on various levels. It optimizes the mind to perform by increasing attention, alertness, and also motivation. It prepares and encourages nerve cells to bind to one another, which

is the cellular basis for learning new information. It spurs the development of new nerve cells from stem cells in the hippocampus, an area of the brain related to memory and learning.

There are multiple ways to bring in a change in the learning approach, including physical activity as a part of the child’s routine, and it is found to have an impact and help a child to perform better. Engaging in physical activities offers opportunities for social interaction, which may explain the link between physical activity and learning. Participation in organized physical activities develops children’s and young people’s ability to listen and follow instructions, wait for their turn, and choose ways of action appropriate for the situation. Furthermore, physical activity provides them with opportunities to vent and process their feelings. At its best, engaging in physical activities develops teamwork skills, self-direction, and the ability to cooperate with different people. These aspects may contribute to explaining physically active children’s good learning outcomes. Physical activity mediates positive effects such as self-esteem and school satisfaction.

The learning/developmental mechanisms state that movement and physical activity provide learning experiences that aid and may even be necessary for proper cognitive development. Educators have suggested that movement, particularly in very young children, stimulates cognitive development. According to Piaget, skills and relationships learned during physical activity carry over to the learning of other relationships and concepts. This would suggest that it is the movement involved in a meaningful activity, rather than the actual physical exertion.

The relationship between physical activity and mental functioning is of particular interest in the school system because such a large portion of the school day spent working in the cognitive domain. Numerous mechanisms have proposed to explain the relationship between physical activity and cognition (Tabatha *et al.*, 2007).

Learning difficulties are disorders that may affect the acquisition, organization, retention, understanding, or use of verbal or nonverbal information. These disorders affect learning in individuals who otherwise demonstrate at least average abilities essential for thinking and/or reasoning. As such, learning disabilities are distinct from intellectual deficiency. Early intervention, accommodations, and modifications happen to be the



**Table 1: Paired samples test of processing speed index between the control group and experimental group**

	Paired differences					<i>t</i>	df	Sig. (two-tailed)
	Mean	SD	SEM	95% Confidence interval of the difference				
				Lower	Upper			
Control group								
Pre-test c – Post-test c	−0.36000	0.90738	0.18148	−0.73455	0.01455	−1.984	24	0.059
Experimental group								
Pre-test e – Post-test e	−6.44000	2.64701	0.52940	−7.53263	−5.34737	−12.165	24	0.000

**Table 2: Paired samples test for working memory index between the control group and experimental group**

	Paired differences					<i>t</i>	df	Sig. (two-tailed)
	Mean	SD	SEM	95% Confidence interval of the difference				
				Lower	Upper			
Control group								
Pre-test c – Post-test c	−0.24000	1.01160	0.20232	−0.65757	0.17757	−1.186	24	0.247
Experimental group								
Pre-test e – Post-test e	−7.12000	3.83319	0.76664	−8.70226	−5.53774	−9.287	24	0.000

key in enabling children to overcome their learning problems and to achieve their full potential. There are multiple ways to bring in a change in learning approach, including physical activity as a part of the child's routine finding way and "learn how to learn" can make a profound impact and help a child to perform better as well.

### 1.1. Purpose of the Study

This study aimed to explore the relation of physical activity, concentration measured through the Processing Speed Index (PSI), and working memory through Working Memory Index (WMI) in pre-teen boys with learning disabilities. Special educators, teachers, and sports psychologists stand to understand the effects of offering physical activity as an intervention strategy for children with learning difficulties and enhance their coping skills, especially in a diverse, multicultural society like India.

## 2. METHODOLOGY

The experimental study was to test the effect of regular, moderate to vigorous physical activities on the experimental and with that of the non-intervention control group ( $n = 25$  each) of pre-teen boys aged 9–12 years with

learning difficulties of matriculation school in the city of Chennai, Tamil Nadu, Southern India. Intervention for the boys in the experimental group was in the form of moderate to vigorous physical activities over 7 weeks. The study focused on two dependent variables – (1) PSI and (2) WMI.

To achieve this, the researcher took a sample of 50 boys who were selected from the age group 8 to 12 years who were screened and diagnosed. All the boys were from a similar socioeconomic background of a middle class to upper-middle-class background. The selected subjects were randomly divided into two groups, they were: The experimental group: Male children with difficulties of learning who received physical activity intervention and Control group: Male children with difficulties of learning without physical activity intervention.

Pre-test was administered before starting the intervention of moderate to vigorous physical activities span over 7 weeks with duration of 45 min for every session.

Wechsler Intelligence Scale for Children – Fourth Edition. Children whose achievement scores are substantially lower than their ability scores were not included in this experiment. The comparing of intellectual ability and academic achievement was done through a simple difference method by the observed

ability and achievement scores comparison. Taking into account the statistical significance and the base rate of the difference using WIAT II administration and scoring manual (the Psychological Corporation, 2001). The Cancellation Random and Cancellation Structured mean scores provide measures of the child's visual selective attention and processing speed in two different modes of visual presentation: Random and structured. The working memory comprised subtest digit span (forward and backward) eight items each, Letter-Number Sequencing and Arithmetic. Scores were collated the pre-test and post-test data and subjected it to statistical analysis using a paired *t*-test.

### 3. RESULTS AND DISCUSSION

A paired samples *t*-test was conducted to compare the difference in the pre-test and post-test scores of the control group and experimental groups in PSI.

It can be observed that there is no significant difference in the scores of the two groups when the pre-test scores (mean between the groups is 0.36). There was a significant difference in the scores for PSI for control group ( $M = 0.36$ ,  $SD = 0.90$ ) and experimental group ( $M = -6.44$ ,  $SD = 2.64$ ) conditions;  $t = 24$ ,  $P = 0.05$ . This signifies the possibility of effectiveness physical activity intervention for bringing about the change of PSI in the experimental post-test values [Table 1].

Table 2 shows the paired *t*-test scores between the groups in pre-test and post-test scores. It can be observed that there is no significant difference in the scores of the two groups when the pre-test scores (mean between the groups is 0.24). There was a significant difference in the scores for WMI for control group ( $M = 0.24$ ,  $SD = 1.01$ ) and experimental group ( $M = -7.12$ ,  $SD = 3.83$ ) conditions;  $t = -1.18$ ,  $P = 0.24$ , control group and  $t = -9.287$ . This signifies the possibility of effectiveness physical activity intervention for bringing about the change of WMI in the experimental post-test values.

The above results show that physical activities can possibly make a difference in concentration and working memory when used as an intervention.

### 4. CONCLUSION

The study showed that there existed a positive correlation between the independent variable, i.e., physical activity and the dependent variables, attention, memory, reading, spelling, writing, and comprehension in the male children who were under study. The obtained results established that physical activity intervention on male children with learning difficulties had a significant influence on their selective attention and working memory. The positive correlation between physical activities, concentration, and memory found through this study aligns with the WHO global strategy recommendation of at least 60 min of moderate to vigorous physical activities for children aged between 5 and 17 years urging us to rethink our choice of “playtime” – on a daily basis.

### REFERENCES

- Australian Government Department of Health. *Australia's Physical Activity and Sedentary Behaviour Guidelines*. Canberra: Commonwealth of Australia; 2017. Available from: <http://www.health.gov.au/internet/main/publishing.nsf/content/health-pubhlth-strateg-phys-act-guidelines>. [Last accessed on 2018 Feb 14].
- Chaddock-Heyman, L., Hillman, C.H., Cohen, N.J., and Kramer, A.F. The importance of physical activity and aerobic fitness for cognitive control and memory in children. *Monogr Soc Res Child Dev*, 2014, 79(4), 25-50.
- Perlow, R. *Educational and Psychological Measurement*. Vol. 59. Thousand Oaks, California: Sage Publications, Inc.; 1999. p. 866-877.
- Texas A&M University. *We think Better on our Feet, Literally*. ScienceDaily; 2015. Available from: <http://www.sciencedaily.com/releases/2015/04/150424121118.htm>. [Last accessed on 2020 Mar 07].
- Claudia, V.R., Ben, G., and Ursula, S. Cardiovascular and motor fitness are both related to cognition in old age. *Eur J Neurosci*, 2010, 31, 167-176.

# Effect of Game-specific Plyometric Training on Selected Physical Fitness Variables among Inter-University Netball Players

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## ABSTRACT

The purpose of the present study was to find out the effect of game-specific plyometric training on selected physical fitness variables among inter-university netball players. To achieve this purpose, 30 netball players, studying in various classes and Departments of Annamalai University, Annamalai Nagar, Chidambaram, Tamil Nadu, in the age group of 18–25 years were selected as subjects. The selected 30 subjects were divided into two equal groups, in which Group – I ( $n = 15$ ) underwent game-specific plyometric training and Group – II ( $n = 15$ ) acted as control which did not participate in any special training. The training program was carried 3 days/week for 12 weeks (alternative days). Before and after the training period, the subjects were tested for speed and agility. Speed was measured by 50 m dash agility measured by shuttle run. The statistical tool was used for the present study is “ $t$ ” ratio. The result of the study was a significant improvement on speed and agility after 12 weeks of game-specific plyometric training. However, the improvement was favor of the experimental group. There was a significant difference occurred between game-specific plyometric training group and control group after 12 weeks of game-specific plyometric training.

## 1. INTRODUCTION

Plyometric training is a form of training in which the individual reacts to the ground surface in such a way that they develop larger than normal ground forces that can then be used to project the body with a greater velocity or speed of movement. It is also known as reactive training.

Game-specific training is simply fitness and performance training designed specifically for performance enhancement. Training programs for performance enhancement could include such areas as strength, speed, power, endurance, flexibility, mobility, agility, mental preparedness (including goal setting), sleep, recovery/regeneration techniques and strategies, nutrition, rehabilitation, prehabilitation, and injury risk reduction. It is the ability of the players to execute the various techniques of the fundamental netball skills efficiently and accurately, according to the game situation.

### 1.2. Statement of the Problem

The purpose of the present study was to find out the effect of game-specific plyometric training on selected

physical fitness variables among inter-university netball players.

## 2. METHODOLOGY

To achieve this purpose, 30 netball players, studying in various classes and departments of Annamalai University, Annamalai Nagar, Chidambaram, Tamil Nadu, in the age group of 18–25 years were selected as subjects. The selected 30 subjects were divided into two equal groups, in which Group – I ( $n = 15$ ) underwent game-specific plyometric training, Group – II ( $n = 15$ ) acted as control which did not participate in any special training. The training program was carried 3 days/week for 12 weeks (alternative days). Before and after the training period, the subjects were tested for speed and agility.

**Table 1:** Selection of tests

Variables	Test items	Unit of measurement
Speed	50 mts dash	Seconds
Agility	Shuttle run	Seconds

**Table 2: Analysis of covariance of game-specific plyometric training and control groups**

Variable name	Group name	Control group	Game-specific plyometric training group	F ratio
Speed	Pre-test mean±SD	7.59±0.89	7.58±0.78	0.058
	Post-test mean±SD	7.57±0.91	7.16±0.86	7.27*
	Adj. post-test mean±SD	7.61	7.24	62.24
Agility	Pre-test mean±SD	10.193±0.163	10.178±0.211	0.25
	Post-test mean±SD	10.153±0.117	9.943±0.125	8.44*
	Adj. post-test mean±SD	10.173	9.947	79.05

Significant at 0.05 level of confidence. \*(The required table value for significance at 0.05 level of confidence with degrees of freedom 1 and 27 is 4.21 and degree of freedom 1 and 28 is 4.20). SD: Standard deviation

### 2.1. Analysis of Data

The data collected before and after the experimental periods on speed and agility on game-specific plyometric training and control groups were analyzed and presented in the following Table 1.

## 3. RESULTS

The adjusted post-test means on speed of game-specific plyometric training and control groups are 7.61 and 7.24, respectively. The obtained “F” ratio value is 7.27 of speed was greater than the required table value of 4.21 for the degrees of freedom 1 and 27 at 0.05 level of confidence. Hence, it was concluded that due to the effect of 12 weeks of game-specific plyometric training, the speed of the subjects was significantly improved.

The adjusted post-test means on agility of game-specific plyometric training and control groups are 10.173 and 9.947, respectively. The obtained “F” ratio value is 8.44 of agility was greater than the required table value of 4.21 for the degrees of freedom 1 and 27 at 0.05 level of confidence. Hence, it was concluded that due to the effect of 12 weeks of game-specific plyometric training, the agility of the subjects was significantly improved.

## 4. CONCLUSION

Based on the results of this study, the following conclusions were drawn by the investigator.

It was concluded that the selected criterion variables such as speed and agility were significant differences between game-specific plyometric training group and control group of inter-university netball players.

## REFERENCES

- Mulcahy, R., and Crowther, R. The effects of an 8 week supplemented plyometric exercise training program on leg power, agility and speed in adolescent netball players. *J Aust Strength Cond*, 2013.
- Roopchand-Martin, S., and Lue-Chin, P. Plyometric training improves power and agility in Jamaica’s national netball team. *West Indian Med J*, 2010, 59, 182-187.
- Terblanche, E., and Venter, R.E. The effect of backward training on the speed, agility and power of netball players. *South Afr J Res Sport Phys Educ Recreation*, 2009, 31(2), 135-145.
- Asadi, A., Ramirez-Campillo, R., Meylan, C., Nakamura, F.Y., Cañas-Jamett, R., and Izquierdo, M. (2017). Effects of volume-based overload plyometric training on maximal-intensity exercise adaptations in young basketball players. *J Sports Med Phys Fitness*, 2017, 57(12), 1557-1563.
- Roopchand-Martin, S., and Lue-Chin, P. Plyometric training improves power and agility in Jamaica’s national el entrenamiento pliométrico mejora la fuerza y agilidad del equipo nacional de netball de Jamaica. *West Indian Med J*, 2010, 59(2), 182.
- Sukumar, B. Effect of plyometric exercises on agility among the netball players. *Int J Phys Educ Sports Health*, 2017, 4(1), 277-279

# Effect of Circuit Training on Selected Biomotor Variables among Female Hockey Players

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## ABSTRACT

The purpose of this study was to find out the effect of circuit training on selected biomotor variables among female hockey players. This study will be restricted to 40 female hockey players from Sri Venkateswara University, Tirupati, Andhra Pradesh. The subjects divided into two groups (Group I [ $n=20$ ] – experimental group and Group II [ $n=20$ ] – control group). The age of the subjects was between 18 and 24 years. Only the selected physical fitness variables, namely, cardiorespiratory endurance and abdominal muscular strength will be used for this study. The duration of the experimental period will be for 8 weeks. The following statistical techniques were used for the analysis of data in this study. Analysis of “ $t$ ”-test was applied to determine the significance of mean difference between the two groups, namely, the experimental group and the control group. In all cases, the criterion for statistical significance was set at 0.05 level of confidence. It is concluded that the physical fitness variables, namely, cardiorespiratory endurance are significantly improved due to the treatment of through circuit training. It is concluded that the physical fitness variables, namely, abdominal muscular strength are significantly improved due to the treatment of through circuit training.

**Keywords:** Abdominal muscular strength, Cardiorespiratory endurance, Circuit training.

## 1. INTRODUCTION

Today's, education not only deals with mental enhancement of an individual but also a source of physical activities that lead to all-round development of an individual. The best individual is one who is physically fit, mentally sound and sharp, emotionally balanced, and socially well adjusted. It is, therefore, physical education who is said to be an integral part of “total education.”

In general, physical education is misunderstood as merely physical activities or merely mass physical training or physical drills. It is necessary to overcome this misconception. The newly born discipline of physical education should be put into proper perspective and thoroughly studied for the welfare of the humanity at large. The importance of physical education was recognized by Plato when he said, “Lack of activity destroys the good conditions of every human being, while movement and methodical physical exercise save it and preserve it” (Nathial, 2008).

### 1.1. Circuit Training

Circuit training was first proposed by Morgan and Adamson (1959) of Leeds University as a method for developing general fitness. Their initial circuit training routine consisted of several stations arranged in a circle (hence the name circuit training) so as to work muscle groups alternately from station to station. As circuit training grew in popularity, other authors began to provide additional information. Perhaps, the best book on the market is Circuit Training for All Sports (Scholich, 1992).

### 1.2. Program Design for Circuit Training Method

Circuit training may be used from the 1<sup>st</sup> week of the anatomical adaptation phase. Athletes should follow a certain progression, depending on their classifications and training backgrounds. Younger athlete with little or no strength training background should start with exercises using their own body weights, then barbells and strength machines. Again, exercise during this phase must be selected to involve most muscle groups irrespective of the needs of the specific sport. However, the prime movers



should also be targeted. After all, they are the engines behind the effective performance of sport-specific skills. The circuits presented below (circuits A, B, and C) although far from exhausting all the possibilities available in a gym, are typical for entry-level, or junior, athletes. Athletes who are new to circuit training may want to split circuit B into two phases. As adaptation occurs, the athlete can begin adding exercise from Phase II to the end of Phase I until he or she can perform all eight exercises nonstop. Start with two groups of four as presented in circuit B, and as the athlete adapts to the program, bring the fifth exercise into Phase I and so forth. This keeps the athlete motivated to reach his or her goal and keeps his or her body open to new challenges and levels of adaptation. Entry-level athletes should individualize the number of reps and sets by working up to the point of feeling slight discomfort or discomfort. Slight discomfort can be translated as uneasiness. Discomfort, on the other hand, refers to the threshold of pain at which the athlete has to stop the exercise. Working to discomfort actually challenges the athlete. Advanced athletes may work to high discomfort, which refers to surpassing the threshold of pain. High discomfort is suggested only for the latter part of a circuit training for advanced athletes.

## 2. METHODOLOGY

The purpose of this study was to find out the effect of circuit training on selected biomotor variables among female hockey players. This study will be restricted to 40 female hockey players from Sri Venkateswara University, Tirupati, Andhra Pradesh. The subjects divided into two groups (Group I [ $n=20$ ] – experimental group and Group II [ $n=20$ ] – control group). The age of the subjects is between 18 and 24 years. Only the selected physical fitness variables, namely, cardiorespiratory endurance and abdominal muscular strength will be used for this study. The duration of the experimental period will be for 8 weeks. The following statistical techniques were used for the analysis of data in this study. Analysis of “ $t$ ”-test was applied to determine the significance of mean difference between the two groups, namely, the experimental group and the control group. In all cases, the criterion for statistical significance was set at 0.05 level of confident. It is concluded that the physical fitness variables, namely, cardiorespiratory endurance are significantly improved due to the treatment of through circuit training.

Table 2 indicates the experimental and control groups of cardiorespiratory endurance mean and standard deviation of female hockey players. The experimental group, pre- and post-test mean values are 8.59 and

**Table 1:** Computation of “ $t$ ”-test on cardiorespiratory endurance of the experimental and control groups of female hockey players

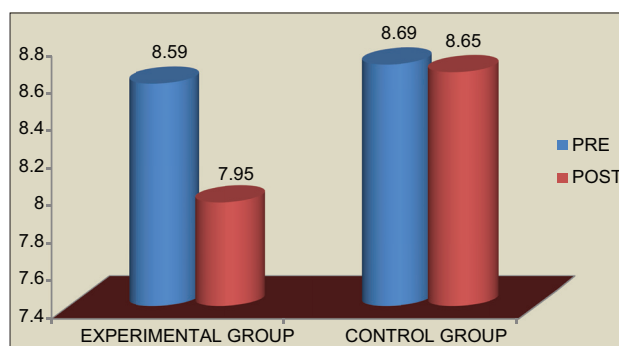
Group	Test	Mean	SD	$\sigma$ DM	“ $t$ ”
Experimental group	Pre-test	8.59	0.76	0.05	13.59*
	Post-test	7.95	0.65		
Control group	Pre-test	8.69	0.94	0.00182	0.83
	Post-test	8.65	0.94		

\*Level of significant was fixed at 0.05

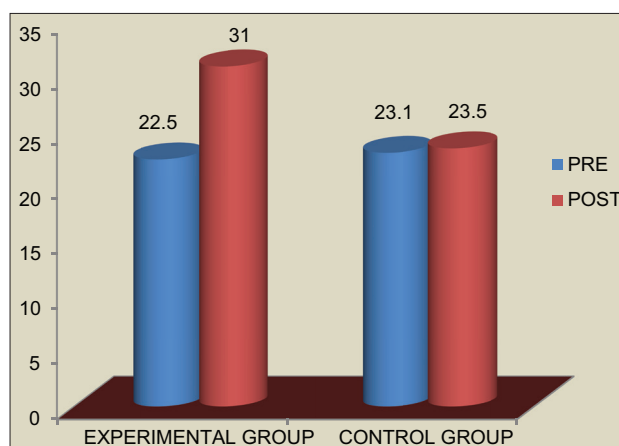
**Table 2:** Computation of “ $t$ ”-test on abdominal muscular strength of the experimental and control groups of female hockey players

Group	Test	Mean	SD	$\sigma$ DM	“ $t$ ”
Experimental group	Pre-test	22.50	5.50	0.68	12.53*
	Post-test	31.00	4.17		
Control group	Pre-test	23.10	5.54	0.01	1.90
	Post-test	23.50	5.99		

\*Level of significant was fixed at 0.05



**Figure 1:** Bar diagram showing the mean values of the experimental and control groups of pre- and post-test on cardiorespiratory endurance of female hockey players



**Figure 2:** Bar diagram showing the mean values of the experimental and control groups of pre- and post-test on abdominal muscular strength of female hockey players

7.75 and standard deviation values are 0.76 and 0.65 and obtained "*t*" value is 13.59 which is greater than table value 2.02 with df 19 and the control group, mean values are 8.69 and 8.65 and standard deviation 0.94 and 0.94. The results of the study "*t*" value 0.83 which is lesser than the table value 2.02. The finding of the study indicates that the experimental group significant improvement on speed due to circuit training.

Table 2 indicates the experimental and control groups of abdominal muscular strength mean and standard deviation of female hockey players. The experimental group, pre- and post-test mean values are 22.50 and 31.00 and standard deviation values are 5.50 and 4.17 and obtained "*t*" value is 12.53 which is greater than the table value 2.02 with df 19 and the control group, mean values are 23.10 and 23.50 and standard deviation 5.54 and 5.99. The results of the study "*t*" value 1.90 which is lesser than the table value 2.02. The finding of the study indicates that the experimental group significant improvement on leg explosive power due to circuit training.

### 3. CONCLUSIONS

- It is concluded that the physical fitness variable, namely, cardiorespiratory endurance is significantly improved due to the treatment of through circuit training
- It is concluded that the physical fitness variable, namely, abdominal muscular strength is significantly improved due to the treatment of through circuit training.

### REFERENCES

1. Hasan. Relationship Between Medicine Ball Explosive Power Tests, Throwing Ball Velocity and Jump Performance in Team Handball Players. 2012.
2. Savitri. Effect of polymeric training and speed agility and quickness (SAQ) training on speed and agility of male handball players. *Asian J Phys Educ Comput Sci Sports*, 2015, 7(1), 26-30.
3. Chaouachi. Investigation on the features of young female volleyball players and important body shape and specific fitness in Chines. *J Phys Educ Univ*, 2009, 24, 94-97.

# Sports Coaching – Long-term Approach with Short-term Strategies

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## ABSTRACT

The main concept of athlete development involves taking a long-term approach to athlete development and training. This long-term approach is designed to help individuals of all ages and all abilities to optimize their development and reach their potential to achieve a high level of performance in athletics. Effective athletics coaching program help the athletes to improve the performance year after year, possibly until the age of 35 years. The Athletes' development is doing the right things at the right time for their long term for development. The long-term athlete development approach is an organized approach toward achieving the optimal training, competition, and recovery throughout an athlete's career. There are five stages of athletes' development. The kids' athletics development stage should be structured for developing basic fitness and fundamental movement skills. The second stage of development is called the multi-events stage, where individual now learn how to train and develop their athletic skills. The third stage is the event group development stage, where an emphasis on greater individualization of fitness and technical training. The fourth stage is the specialization stage, where the athlete tends to focus on an event. The final stage of preparation and participation in athletics is the performance stage, where athletes achieve his high level of performance. The concept of athlete development training should progress from the general training of Kids Athlete Stage to predominantly competition-specific training of the performance stage. The talent identification of children will be at the physical education program. Physical literacy training is very important for the child at school level. The selection of sport can be done through physical education and sports; hence, the athlete approach is a long time for achieving a high level of performance.

**Keywords:** Athlete career, Athlete development, Coaching program.

## 1. INTRODUCTION

The athlete development relates the structure and nature of training at any time to where an individual athlete is on their developmental pathway. Performance sports aim at high sports performances, and for that, the physical and psychic capacities of sportsmen are developed to extreme limits. This normally does not happen in other areas of human activity. As a result, performance sports yield valuable knowledge about the limits to which human performance and various performance factors can be developed. It also leads to the discovery of means and methods for improving various physical and psychic capacities (performance factors) to exceptionally high levels. This knowledge can be fruitfully applied to other areas of sports and human activity. Sports performance is indeed an aspect of complex human performance which has several aspects or dimensions. Hence, several disciplines of sports science are required to work in a coordinated manner to explore the nature of sports performance and the process of improving sports performance. In the past

few decades, several disciplines of sports science have been established, for example, sports medicine, sports physiology, sports training, sports biomechanics, sports psychology, sports pedagogy, sports nutrition, and so on. Sports science is still in its state of infancy, and in the near future, more sports science disciplines are likely to emerge. Some of these disciplines have already emerged, for example, sports statistics, sports biochemistry, sports neurophysiology, sports cybernetics, etc.

### Chronological & Biological Age Differences in Adolescence



## Early versus late-developing girls

- Greater pubertal gains in height, weight, absolute/relative fat mass
- Superior strength, power; poorer endurance, speed, agility
- Less adaptive psychological profile;



## What is long-term athletic development (LTAD)



LTAD is a training, competition, and recovery framework

<b>Active Start</b>	Males and Females 0-6	Learn FUNDamental movements and link them together into play
<b>FUNDamentals</b>	Males 6-9 Females 6-8	Learn all FUNDamental movement skills and build overall motor skills
<b>Learning to Train</b>	Males 9-12 Females 8-11	Learn overall sport skills
<b>Training to Train</b>	Males 12-16 Females 11-15	Build aerobic base, develop speed and strength, further develop and consolidate sport specific skills
<b>Training to Compete</b>	Males 16-23+/- Females 15-21+/-	Optimize fitness preparation and sport-, individual-, and position-specific skills as well as performance
<b>Training to Win</b>	Males 19+/- Females 18+/-	Podium performances
<b>Active for Life</b>	Enter at any age	Smooth transition from an athlete's competitive career to lifelong physical activity and participation in sport

## 2. CONCLUSIONS

The findings reveal that schools draw on an extremely varied range of strategies to identify and develop their talented pupils in physical education. Although the majority of schools appear to have developed a whole school and departmental policy for developing talent, there was a strong indication that whole school policy was a significant driving force for designing a policy at the department level. Although there has been a great deal of research on talent development in sport and education, there has been a distinct lack of research on developing talent, specifically in a curricular physical education context. The most common criteria for assessment were reported to be performed in school sport and club sport. A key finding was that the majority of subject leaders indicated that the main area of expertise for staff was games activities, which may have significance if teachers feel better able to identify talented pupils in areas in which they themselves have expertise.

## 3. RECOMMENDATIONS

Overall, the findings suggest that the effectiveness of Physical Education Programs at school level. The talent identification of children will be at the physical education program. Physical literacy training is very important for the child at school level. The selection of sport can be done through physical education and sports; hence, the athlete approach is a long time for achieving a high level of performance.

## REFERENCES

- Balyi, I. *Sport System Building and Long Term Athlete Development in Canada, the Situations and Solutions, Coaches Report*. Canada: The Official Publication of the Professional Coaches Association; 2001. p. 25-28.
- Meadors, L. *Practical Application for Long-Term Athletic Development*. Colorado Springs, CO: National Strength Conditioning Association.
- Bucher, C.A., and Dvest, D.A. *Foundations of Physical Education and Sports*. Englewood Cliffs, New Jersey: Prentice Hall, Inc.;1982.
- Thompson, P.J; International Amateur Athletic Federation. *The Official IAAF Guide to Coaching Athletics*. Monaco: International Amateur Athletic Federation; 2009.



# The Effect of Resistance Training and Tapering on Selected Physical Variable among Male Intercollegiate Cricket Players, Puducherry

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## ABSTRACT

The purpose of the study was to find out how resistance workouts affect the selected physical variables among selected three groups of intercollegiate male cricket players in Puducherry and to compare the impact of tapering and cessation of training on the physical variables selected between two groups of intercollegiate male cricket players in Puducherry; 45 players were selected according to the lot method. Ages of the subjects varied from 19 to 25 years. Explosive strength is chosen as a study variable. The selected subjects were subdivided into three groups of 15 members each, wherein two groups were assigned as experimental, while the third group was assigned as a control. For a period of 12 weeks, experimental Group I underwent the resistance training session for 3 days each week, and the tapering period of 15 days followed training. Meanwhile, experimental Group II underwent the same period of resistance training followed by a 15-day cessation. The third group, Group III, acted as the control without taking part or undergoing any special training. The collected data were analyzed through analysis of covariance to find the differences between the groups. The *t*-test was performed to determine the significant difference among the groups, while the independent *t*-test was applied to find differences in significance between groups using SPSS. The findings of the present study had strongly indicated that participation in 12 weeks of resistance training program resulted significant improvement on selected physical variable. There was a substantial improvement in explosive strength after the tapering period. There was no significant improvement in explosive strength after the cessation of training period.

**Keywords:** Cessation, Resistance, Tapering.

## 1. BACKGROUND OF THE STUDY

In sports and games, training is mandatory to achieve high-level performance. Systematic training will enhance physical and physiological fitness. Before a major competition, training is usually stopped to recover from training stress and keep away from fatigue. However, if the training is totally stopped, there is a chance of reversibility in fitness variables. Tapering overcomes this disadvantage. Tapering helps in recovering from intense training and making feel energized before major events without compromising fitness variables. There are a number of studies on individual events and only a few on team games and hardly any on cricket.

### 1.1. Training for Cricket

Now, we could witness significant changes in cricket. It has become more demanding in terms of fitness like other international sports. Hence, training has to be designed intensively and tapering be applied before a major competition (Encyclopedia, 2008).

When planning a taper, coaches and athletes should consider:

- By how much they need to reduce the training load
- For how long
- In what manner.



## 1.2. Tapering

According to Bosquet *et al.* (2007), tapering is the decrease in the training load of athletes in the last few days before a major competition to optimize performance. The aim of tapering is to lighten the negative impacts caused during a preparatory phase and meanwhile recover or even increase the physiological capacity. Adjusting the training load and duration of tapering will help develop the adaptation gained during training (Mujika *et al.*, 2004).

## 1.3. Statement of the Problem

- To find the effect of resistance training on the selected physical fitness variables among selected three groups of intercollegiate male cricket players in Puducherry.
- To compare the impact of tapering and cessation of training on selected physical fitness variables among the selected two groups of intercollegiate male cricket players in Puducherry.

## 2. METHODOLOGY

This study was conducted on the intercollegiate cricket players who all participated in intercollegiate cricket tournament which was organized by Pondicherry University in 2016–2017. To achieve the purpose of this study, 45 players were selected according to the purposive random sampling method. The selected subjects were divided into three groups of 15 each; two groups were assigned as experimental, while the third group was assigned as a control. For a period of 12 weeks, experimental Group I underwent the resistance training session for 3 days each week and the tapering period

of 15 days followed training. Meanwhile, experimental Group II undergoes the same period of resistance training followed by a 15-day cessation. The third group, Group III, acted as the control without taking part or undergoing any special training. The significant difference among the three groups was estimated using the analysis of covariance using the SPSS, while the actual main effect was determined using Scheffe's *post hoc* test. Using the SPSS, a dependent *t*-test was applied to determine the significant differences between groups, whereas an independent *t*-test was applied to conclude the significant differences between groups.

## 3. RESULTS OF THE STUDY

Table 1 furnishes the obtained F ratio for the pre-test was 0.009, which was lower than the table value 3.23. Hence, it can be concluded that there was no significant difference at a confidence level of 0.05 set for the degrees of freedom 2 and 42; this proves no significant difference between the control group and experimental group and also proves that the randomization process was proper.

The obtained F ratio of 1.48 was lower than the table value of 3.23, making the post-test mean F ratio insignificant at the 0.05 confidence level with the set df of 2 and 42. Hence, it was insignificant at the 0.05 level of confidence for the degrees of freedom 2 and 42, which proves no significant difference between the control group and the experimental group.

The obtained mean F ratio during the post-test session was 6.8, higher than the table value of 3.22, implying significance at the 0.05 confidence level set at the degrees

**Table 1:** Analysis of covariance for pre- and post-test data on explosive strength of the experimental and control groups

	Exp 1	Exp 2	Control	SOV	SOS	DF	MS	"F" ratio
Pre-test								
Mean	57.0	57.0	57.2	BG	7.11	2	0.356	0.09 <sup>NS</sup>
SD	6.70	5.09	5.6	WG	1582.0	42	37.68	
Post-test								
Mean	61.6	60.5	57.5	BG	136.8	2	68.42	1.48 <sup>NS</sup>
SD	7.02	7.4	5.7	WG	1930.0	42	45.9	
Adjusted post-test								
Mean	61.7	60.6	57.3	BG	153.6	2	77.5	6.8*
				WG	482.9	41	11.6	

\*Significant at the 0.05 level of confidence. (The value to be obtained for significance at the 0.05 confidence level with d.f. of 2 and 42 is 3.23, while of d.f 2 and 41 is 3.22). SD: Standard deviation

of freedom of 2 and 41. The results proved improvements in the level of explosive strength among the experimental groups after the adjusted post-test session.

The multiple comparisons shown in Table 2 proved that there existed significant differences between the training group and the control group. Further, it showed that there was no significant difference between the two experimental groups at the 0.05 confidence level.

The results concluded the existence of a significant difference between the control group and experimental Group I and the same observation was found between the control group and the experimental group at the 0.05 confidence level, concluding significant improvement among the two experimental groups.

The mean values of explosive strength during the three phases of the test are illustrated through a bar diagram for better understanding in Figure 1.

The mean value difference of the variable explosive strength during the post-test and post-tapering periods for experimental Group I was 3.20, while the standard deviation was 0.487. The analyzed value of “*t*” was 10.08, which was greater than the set value of 2.14 at a significance level of 0.05 with 14° of freedom, and it was found to be statistically significant, indicating the level of improvement in explosive strength after the tapering

test. It showed a percentage spike of 5.09, which proves a positive effect of tapering on experimental Group I subjects’ explosive strength.

The “*t*” ratio achieved was 0.180. The ratio obtained was statistically insignificant because the table value was less than the required table value 2.14, significant at the 0.05 level and 14° of freedom. It was found to be statistically insignificant with an improvement percentage of 0.16. The study showed that experimental Group II did not show significant improvement in explosive strength following cessation among the subjects.

The “*t*” ratio achieved was 4.6. Because it exceeded the required 2.14 table value significantly, the obtained “*t*” ratio was statistically significant at the 0.05 level and 14° of freedom. The study findings indicated significant differences in explosive between experimental Groups I and II [Table 5].

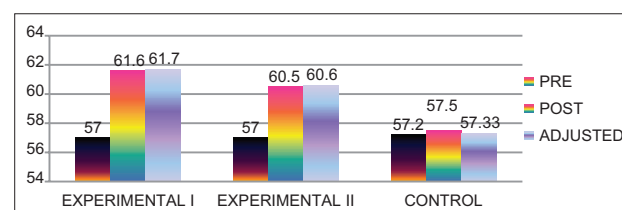
#### 4. DISCUSSION ON FINDINGS

The results of the study showed that there was a significant improvement in explosive strength after the resistance training period. Moreover, there was a significant improvement in explosive strength after the tapering period. However, there was a significant decrease also found in the explosive strength after the cessation of the training period. Pritchard *et al.* (2015) found that there

**Table 2:** Computation of Scheffe’s *post hoc* test and adjusted final mean differences in explosive strength

Adjusted post-test mean			Difference between means	Sig.
Exp I	Exp II	Control group		
61.7	60.6		1.333	0.371 <sup>NS</sup>
61.7		57.3	4.4	0.000*
	60.6	57.3	3.3	0.000*

\*Significant at the 0.05 level



**Figure 1:** The mean values of the experimental and control groups on explosive strength

**Table 3:** Analysis of the dependent *t*-test and % magnitude improvement of physical and physiological variables of tapering

Variable	Df. bt. Mean	Df. bt. SD	<i>t</i>	df	<i>r</i>	Sig. (two tailed)	% magnitude improvement
Explosive strength	3.20	1.14	10.08	14	0.987	0.00*	5.09

SD: Standard deviation

**Table 4:** Analysis of the dependent *t*-test and % magnitude improvement of physical and physiological variables of cessation of training

Variable	Df. bt. Mean	Df. bt. SD	<i>t</i>	df	<i>r</i>	Sig. (two tailed)	% magnitude improvement
Explosive strength	0.066	1.43	0.180	14	0.981	0.860	0.16

**Table 5:** Analysis of the independent *t*-test of the physical and physiological variables of the experimental groups

Variable	Group	Df. Bt. Mean	Df. Bt. SD	<i>t</i>	Sig. (two tailed)
Explosive strength	Exp I	3.20	1.14	4.6	0.03*
	Exp II	0.066	1.43		

SD: Standard deviation

was an improvement in counter jump movement after the resistance training period and tapering period.

Mohan and Kalidasan (2013) determined the effects of aerobic training with and without tapering in male race walkers and also confirmed that the tapering period results in further enhancement in explosive strength after the strength training program.

## 5. CONCLUSION

1. This research concluded that explosive strength was considered – after the training period, no significant difference exists between the two training groups: Experimental Groups I and II.
2. There was a significant difference in explosive strength after the resistance training program.
3. There was a substantial improvement in explosive strength after the tapering period.

4. There were no improvement and differences in explosive strength after the period of cessation.

## REFERENCES

- Bosquet, L., Montpetit, J., Arvisais, D., and Mujika, I. Effects of tapering on performance: A meta-analysis. *Med Sci Sports Exerc*, 2007, 39, 1358-1365.
- Mujika, I., Padilla, S., Pyne, D., and Busso, T. Physiological changes associated with the pre-event taper in athletes. *Sports Med*, 2004, 34(13), 891-927.
- United States of America V Canada. Cricket Archive*; 2008. Available from: [https://www.en.wikipedia.org/wiki/history\\_of\\_cricket](https://www.en.wikipedia.org/wiki/history_of_cricket) on. [Last accessed on 2008 Sep 06].
- Pritchard, J.H., Barnes, J.M., Stewart, J.C.R., Keogh, W.L.J., and McGuigan, R.M. Short-term training cessation as a method of tapering to improve maximal strength. *J Strength Cond Res*, 2018, 32(2), 458-465.

## Sub-theme: Yoga Practices for Cognitive Development among Athletics

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### ABSTRACT

Yoga originated thousands of years ago in India as a technique to help people achieve spiritual enlightenment. Based on the idea that the mind and body are one, students believe that yoga improves health by improving how you see the world, which calms the spirit and decreases stress. Today, people practice yoga to improve their physical, mental, and spiritual well-being. In today's world, all of us suffer from stress and perpetual anxiety to perform well, leading to a plethora of diseases that we expose ourselves to. Yoga aims to calm and compose our minds and help us focus clearly on what really matters good health and the happiness that accompanies it. The practice of yoga was first developed in India and has evolved over. Athletes in all sports are finding that yogic conditioning not only elongates tight, shortened, and fatigued muscles but also brings calmness and clarity to the mind. Some athletes begin the practice to rehabilitate an injury and to gain more flexibility, stability, and strength. Others take it up to increase their powers of concentration and quiet the mind. Hence, the present conceptual paper high lights on Introduction, concept of yoga, definitions of yoga, misconception about yoga, yoga practices for memory development, yoga practices for memory development, yoga practices to improve memory, yoga practices and intelligence quotient, development of intelligence through yoga practices, different type yoga practices for intelligence development, and effect of cognitive development through yoga on athletics and conclusion.

**Keywords:** Cognitive development, Intelligent quotient, Memory, Misconception, Yoga.

### 1. INTRODUCTION

Despite our own true nature, which is blissful, people usually become far too distracted with their own mind and body and material objects. They lose sight of this fundamental truth. This false identification makes us feel imperfect, limited, sorrowful, and at a loss. Yoga seeks to provide people with a way to cast off this ignorance and becomes aware of their true divine self. The goal is to free a person from those imperfections and to unite him or her with their supreme universal self.

Yoga not only provides techniques for the growth of human beings from their animal level to heights of perfection but it also carves out a way of life for them. Yoga way of life is characterized by peace and tranquility, harmony and health, love and happiness, precision, and efficiency. The drive for such a way of a happy life is not indiscriminate for such a way of a

happy life is not an indiscriminate instinctive drive of an animal-man. The drive is featured by discrimination, right understanding of happiness and harmony, and a calculated adoption of a suitable value system congenial to the accomplishment of increasing happiness. The drive and the norms are prescribed by the universal law.

### 2. THE MEANING OF YOGA

The term yoga has its verbal root as (*Yuj*) in Sanskrit. Yuj means joining (*Yujyate anena iti Yogah*). Yoga is that which joins. What are the entities that are joined? In the traditional terminology, it is joining of the individual self with the universal self. It is an expansion of the narrow constricted egoistic personality to an all pervasive, eternal, and blissful state of reality. Pātañjala yoga is one among the six systems of Indian philosophy known as Śaḍdarśanas. One of the great Rṣis (Seers), Patañjali,

compiled the essential features and principles of yoga (which were earlier interspersed in Yoga Upaniṣhads) in the form of “Sūtras” (aphorisms) and made a vital contribution in the field of Yoga, nearly 4000 years ago (as dated by some famous western historians). According to Patañjali, yoga is a conscious process of gaining mastery over the mind.

The scope of yoga as portrayed in the Bhagavadgītā and Upaniṣhads is far more comprehensive. As Swami Vivekananda puts it “it is a means of compressing one’s evolution into a single life or a few months or even a few hours of one’s bodily existence.” In general, there is a growth process due to interactions with nature in all creation. However, it may take thousands and millions of years for this natural growth; that is the long, instinctive way in animals. *Manas*, endowed with discrimination power, conscious thinking faculty, the intellect (*Buddhi*), and well-developed voluntary control systems, aspire to accelerate his growth. Yoga is a systematic conscious process that can compress the process of man’s growth greatly. Sri Aurobindo emphasizes on all-round personality development at the physical, mental, intellectual, emotional, and spiritual levels. He means by yoga a methodical effort toward self-perfection by the development of the potentialities latent in the individual. It is a process by which the limitations and imperfections can be washed away resulting in a superhuman race.

### 3. MISCONCEPTION ABOUT YOGA

A person appeared on a spacious dais with a long rope in his hand. Drawing the attention of the curious audience, he threw one end of the rope holding the other. The rope went swirling up and stood vertically quite unsupported in mid-air. The person using the vertical rope as a ladder climbed up effortlessly to reach the top and saluted the audience from his mid-air position. This rope trick cannot be called as yoga.

There are varieties of misconceptions as associated with yoga. Many persons who are laymen or not acquainted with the Indian culture and traditions think yoga as associated with:

- Religion – dogma, belief, cult or – ism
- Magic, trick, mysticism
- Physical culture – aerobics and anaerobic
- Mental concentration
- Self-mortification, and self-torture.

However, as we have seen earlier in various definitions, the true nature of yoga is not so. It is a complete system

or better a science or a way of life. Yoga being a way of life can be applied irrespective of age, gender, profession, state, conditions, problems, and sufferings. Yoga can be applied in any/every human endeavor – personal, professional, social, family, and spiritual.

### 4. YOGA PRACTICES FOR MEMORY DEVELOPMENT

Memory is the capacity to retain and recall information about past and present incidents. Memory capacity is the ability to analyze and synthesize the assimilated information. The power of memory varies among individuals. Simply put, memory is the mental activity of recalling information that you have learned or experienced. That simple definition, though, covers a complex process that involves many different parts of the brain. Memory can be short-term or long-term.

#### 5. IN SHORT-MEMORY

In short-term memory, your mind stores information for a few seconds or a few minutes: The time it takes you to dial a phone number you just looked up or to compare the prices of several items in a store. Such memory is fragile, and it is meant to be; your brain would soon read “disk full” if you retained every phone number you called, every dish you ordered in a restaurant, and the subject of every advertisement, you watched on TV. Your brain is also meant to hold an average of seven items, which is why you can usually remember a new phone number for a few minutes but need your credit card in front of you when you are buying something online.

#### 6. LONG-TERM MEMORY

Long-term memory involves the information you make an effort (conscious or unconscious) to retain, because:

- It is personally meaningful to you (e.g., information about family and friends);
- You need it (such as job procedures or material you are studying for a test);
- It made an emotional impression on you (a movie that had you riveted, the first time you ever caught a fish, and the day your uncle died);
- Some information that you store in long-term memory requires a conscious effort to recall;
- These are episodic memories, which are personal memories about experiences you have had at specific times;



- These are semantic memories (factual data, not bound by time or place), which can be everything from the names of the planets to the color of your child's hair.

Another type of long-term memory is procedural memory, which involves skills and routines you perform so often that they do not require conscious recall, namely, the motor or intellectual skill that you develop.

The following yoga practices help improve the memory through mind-body coordination, calming the mind, preventing unnecessary thoughts, which Patañjali rightly describes "Citta Vṛtti Nirodah." This helps to eradicate the wrong impressions or Saṁskāras.

### 6.1. Yoga Practices to Improve Memory

- Breathing exercise
  - a. Hands stretch breathing
  - b. Ankle stretch
  - c. Bhujāṅgāsana
  - d. SLR breathing (alternate legs).
- Asanas
  - a. Padmāsana
  - b. Uṣṭrāsana
  - c. Yoga Mudrāsana
  - d. Halāsana
  - e. Vajrasana.
- Prāṇāyāma
  - a. Bhrāmārī.
- Kriyās (Śaṭkarma)
  - a. Kapālabhāti; Alternate; and both nostril.
    - Meditation; silencing the mind with slow breathing

### 6.2. Yoga Practices and Intelligence Quotient (IQ)

Today terms such as IQ, emotional quotient, and social quotient are commonly used. In fact, you hear these concepts not just in academics, but you can be very familiar using these terms in day-to-day life. Let us first try to understand what exactly is meant by Intelligence? Intelligence is usually considered as a complex concept involving the ability to:

- Learn, which includes all kinds of informal and formal learning through any combination of experience, education, and training;
- Pose problems that include recognizing problem situations and transforming them into more clearly defined problems;

- Solve problems that include solving problems, accomplishing tasks, creating, fashioning products, and doing complex projects.

People have different levels of intelligence. Psychologists working in the field of intelligence, traditionally focused on measurement of intellectual differences and individual differences using various tests, called the intelligence test. With the help of such tests, Terman introduced the concept of IQ or IQ.

## 7. DEVELOPMENT OF INTELLIGENCE THROUGH YOGA PRACTICES

We have understood that, in the grossest form, the random mind jumps everywhere and moves from one subject to another. However, in concentration, the mind has to stay on a single subject. The energies are all wasted in a random mind. However, once you come to the level of concentration, the energies are channelized. The channelized energies will start giving all the dividends. Such channelized energy can bring harmony in society. This is possible through proper innermost development. The inner development is related to the three modes of human nature or *Guṇas* – *Tamas* (lethargy), *Rājas* (Active and aggressive), and *Sattva* (goodness). Intelligence should be used to develop the *Sattva* within us. When *Sattva* is predominant, we become selfless and service oriented. Use techniques to see that harmonization takes place, esthetic energization takes place. Intelligence in itself is a pure power which, if not used judiciously, can be used to develop an atomic, nuclear power which, can devastate or if properly channelized, can transform our lives for the betterment of humanity. We have witnessed the horrors of an atomic nuclear explosion in Hiroshima. So let us develop IQ and use it in the right direction.

## 8. DIFFERENT TYPE OF YOGA PRACTICES FOR INTELLIGENCE DEVELOPMENT

- Breathing practices
  - a. Baddhakoṇāsana breathing
  - b. Setubandhāsana breathing
  - c. Navāsana breathing
  - d. Prasārita Pādahastāsana Breathing.
- Śīthilikaraṇa Vyāyāma
  - a. Spinal Stretch
  - b. Pāda Sañcālana
  - c. Situps from standing (2 Types)
  - d. Uthita Ardha Śīrṣāsana Breathing
  - e. Butterfly stretch

- f. Prasārita Pādahastāsana stretch.
- Yogāsanas
  - a. Pārśva Koṇāsana (both sides)
  - b. Gomukhāsana
  - c. Sarvāṅgāsana
  - d. Ardha Śīrṣāsana/śīrṣāsana
  - e. Baddhakoṇāsana
  - f. Pārsvottanāsana
- Prāṇāyāma
  - a. Sūrya Anuloma Viloma
- Kriyas (Śaṭkarma)
  - a. Kapālabhāti (Right Nostril)

## 9. EFFECT OF COGNITIVE DEVELOPMENT THROUGH YOGA ON ATHLETICS

The following are the few effects on athletics:

- Improves team cohesion
- Increases team motivation
- Provides an opportunity for team unity outside the demands of intense training
- Increases trust
- Improves player-player support.

## 10. CONCLUSION

Overall, the studies comparing the effects of yoga and exercise seem to indicate that, in both healthy and diseased populations, yoga may be as effective as or better than exercise at improving a variety of health-related outcome measures including heart rate variability, to improve subjective measures of fatigue pain, and sleep in healthy and ill populations. However, future clinical trials are needed to further examine the distinctions between exercise and yoga, particularly how the two modalities may differ. In their effects on sports performance. Researcher finds out that yoga in sports as important as others think it helps us in different ways and different levels in a sportsmen life.

## REFERENCES

1. Anantharaman, T.R. *Ancient Yoga and Modern Science*. New Delhi: Munshiram Manoharlal Publishers Pvt. Ltd.; 1996.
2. Bhavanani, A.D. *A Primer of Yoga Theory*. Pondicherry: Dhivyananda Creations; 2008.
3. Bucher, C.A. *Foundation of Physical Education*. St. Louis: The CV Mosby Co.; 1975.
4. Nagendra, H.R., and Nagaratna, R. *Yoga Practices*. Bangalore: Swami Vivekananda Yoga Prakashana; 2008.
5. Nagendra, H.R., and Nagaratna, R. *Yoga for Asthma*. Bangalore: Swami Vivekananda Yoga Prakashana; 1998.
6. Nagendra, H.R., and Nagaratna, R. *Yoga for Promotion of Positive Health*. Bangalore: Swami Vivekananda Yoga Prakashana; 1998.
7. Nagendra, H.R., and Nagaratna, R. *Yoga Practices*. Bangalore: Swami Vivekananda Yoga Prakashana; 2008.
8. Nagendra, H.R., and Nagaratna, R. *Yoga for IQ Development: Yoga in Education for Total Personality Development Series-4*. Bengaluru: Swami Vivekananda Yoga Prakashana; 2009.
9. Nagendra, H.R., and Nagaratna, R. *New Perspectives in Stress Management*. Bangalore: Swami Vivekananda Yoga Prakashana; 2011.
10. Nagendra, H.R., and Nagaratna, R. *Yoga for Creativity Development: Yoga in Education for Total Personality Development Series-8*. Bengaluru: Swami Vivekananda Yoga Prakashana; 2011.
11. Nagendra, H.R., and Nagaratna, R. *Yoga for Creativity Development: Yoga in Education for Total Personality Development Series-7*. Bengaluru: Swami Vivekananda Yoga Prakashana; 2012.
12. Nagendra, H.R., and Telles, S. *Yoga and Memory: Yoga in Education for Total Personality Development*. Bangalore: Swami Vivekananda Yoga Prakashana; 2008.
13. Pandey, V.C. *Intelligence and Motivation*. New Delhi: Isha Books; 2005.
14. Teller, R. *Natural Health Peak Performance Longevity Lifestyle*. Portland, Oregon: Vigor, Inc.; 2010.
15. Satyananda, S. *Four Chapters on Freedom. Commentary on Yoga Sutras of Patañjali Saraswathi*. Munger: Bihar School of Yoga; 1999.
16. Śivānanda, S. *The Divine Life Society*. 2<sup>nd</sup> ed. India: Health and Haṭha Yoga; 2007.

# Comparative Study of Selected Agility and Balance between School Level Football and Handball Players

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## ABSTRACT

The aim of the study finds out the assess the comparative study of selected agility and balance between school level football and hand ball players. For this purpose, the subjects, 30 from each category football and handball players, were selected from the teams (including stand byes) of Siddipet district that participated in the school games federation of India, state level competitions. During the year 2019, the subject's average age, height, and weight were 15 years 7 months 156 cm and 42 kg, respectively. The subjects tested on speed and agility to identify the significant difference between the football and handball players.

## 1. INTRODUCTION

The human body is designed for movement and strenuous physical activities; exercise is not typically a part of the average lifestyle. One cannot expect the human body to function optimally and to remain healthy for extended periods if it is abused or not used as intended. Thus, physical inactivity regularly is at greater risk of developing hypokinetic diseases such as coronary heart disease, hypertension, obesity, and musculoskeletal disorders. The best defense against the developing risk is to put the muscles bones, joints, heart, lungs, and internal organs to work on a regular basis through a systematic program of exercises. The primitive man recognized physical fitness as an absolute necessity for his survival. However, modern man, in these electronic and computer age tends to become complacent and forget the importance of physical fitness not only for his efficiency and happiness but also for the survival of future generations. The right kind an amount of physical exercise would develop organic and muscular power, stamina vigor, and the skills involved other factors such as heredity, environment, rest diet and the influence, and physical fitness. However, physical activity is the sole source of the body. Power is the only known means of acquiring the ability to engage in tasks demanding sustained physical effort. There is a direct relationship between physical exercise and physical fitness 1. Nowadays, more and more individuals particularly boys and girls are attracted by sports activities and increasing the number of nations that are represented in the Sports Arena. As prevention and curative health measures have

become more successful throughout the third world war, millions of teenagers should have a chance to enjoy sports.

### 1.1. Handball

The sport of handball is a thrilling and exciting indoor game that can be Handball originated in Germany at the end of the 19<sup>th</sup> century. It was introduced to the world by a gymnastic master KONARD KODI. In 1928, 11 handball nations meet in Amsterdam. In 1928 was included in the program of the game by the International Olympic Committee. Handball was included in the Olympic Games in Berlin in 1936. After the Second World war, several handball nations met at an international congress in Copenhagen to re-establish the spirit. The result of this was the desolation of I.A.M.F. and the birth of international handball federation in India handball played first in the year 1970. Handball is no contact game, played either out of doors (Field Hand Ball) or indoor, it is played by two opposing teams. There are 12 players in one team, ten of them are court players, and two are goalkeepers. However, at 1 time, players not more than seven do not enter the court. Six of them are court players and one is goalkeeper. The remaining five are substitutes. A player may be included in a game or a substitute may be allowed for him. There shall be none in the goal area except the goalkeeper. The playing field for field handball is similar to that of soccer, the indoor version requiring a much more limited playing area. A match is started form the center point, the ball being passed with short or long throws from one player

of a team to the other, and in this way, attacks are built up which culminate in attempts at scoring goalkeepers.

## 2. ACQUIRED QUALITIES THROUGH FOOTBALL

Physical components of the game were athleticism, strength, quickness, agility, balance, and power. The physiological components were speed abilities, explosive strength, speed endurance, and strength endurance increasing steadily. In addition to Olympic Games indigenous sports have also become popular in each country. Sports have become an important social and cultural activity of the modern world which is being given the right place it deserves by the nation and societies.

### 2.1. Statement of the Problem

The present investigation is intended to explore the “differences in Agility and Balance between handball and football players at the school level.”

### 2.2. Delimitations

1. The present study was delimited to school boys who represented the school games federation of India, state level competitions.
2. The investigation was delimited to football and handball only.
3. The age of the subjects was 14–16 years.
4. For the purpose of the study, 30 football and 30 handball players were selected from different schools in Siddipet districts in Telangana.
5. The variables tested were agility and balances.

### 2.3. Limitations

The study was limited in the following factors.

1. Heredity, day to day activities, rest period, food habits, lifestyle, and family factors could not be controlled.
2. The general mood of the subjects while have affected the performance and was recognized as a limitation.
3. All efforts made by the research scholar to motivate the students to put up their optimal performances in various test items. However, there were no objective measures available to make sure that each performed their optimum. It was assumed that these limitations would not have a significant effect on the result of the study as such variations normally have a nullifying effect.

## 2.4. Definition of the Terms

### 2.4.1. Agility

Agility is the ability to move quickly and change directions while maintaining control and balance. Agility is a combination of speed, balance, power, and coordination.

### 2.4.2. Balance

Balance is the ability to maintain a position. Balance depends on the interaction of multiple body organs and systems, including the eyes, ears, brain and nervous system, cardiovascular system, and muscles. Tests or examinations of any or all of these organs or systems may be necessary to determine the cause of loss of balance, dizziness, or the inability to coordinate movement or activities.

## 3. METHODOLOGY

In this chapter, selection of the subjects, selection of variables, reliability of the data, and the statistical technique for the data have been explained in detail.

### 3.1. Selection of Subjects

The purpose of the study was to compare the agility and balance of district level school football and handball players. For this purpose, the subjects, 30 from each category, were selected from the teams (including stand byes) of Siddipet district that participated in the school games federation of India, state level competitions. During the year 2017, the subject's average age, height, and weight were 15 years 7 months 156 cm and 42 kg, respectively.

### 3.2. Selection of Variables

The speed, endurance, agility, and balance performance of the subjects were measured as the dependent variables.

### 3.3. Selection of Tests

The selected criterion variables were tested by using the standardized tests and are presented in Table 1.

Table 1		
S. No.	Variables	Test
1.	Agility	Hexagonal jump test
2.	Balance	Balance beam walk test



### 3.4. Reliability of Tests

The test used to assess the motor performance; balance beam walk test is all standard tests. However, to established the reliability test-retested was conducted and calculated coefficient of correlations between the test and retest of the selected variables was higher than the table value for significance at 0.05 level. The coefficient of correlations for the selected variables is presented in Table 2.

### 3.5. Hexagonal Jump Test

- Purpose to asses ability.
- Equipment: Stopwatch.
- Marking: A 26 inch per side hexagon on the firm floor. The borders of the hexagon are marked with distinct color, and the six sides were name A to F.

#### 3.5.1. Procedure

The subject stands in the middle of the hexagon facing side “F” on the command “go” the subject begin jumping with both feet over side “A” and immediately back into the hexagon. Then continuing to face side “F” jumping over “B” and back into the hexagon, side “C” and back into hexagon side “D” and back in, side “E” and back in one side “F” and back in for one completed revaluations. Similarly, continuously the subject jumps for three revolutions. The elapsed time between the command go and when the feet enter hexagon after jumping side “F” for the third time was recorded as the score of the subject.

- Scoring  
Best of the three trails in second was recorded as the performance.  
Beam walk balance test.

**Table 2:** Intraclass coefficient correlation

S. No.	Test	r value
1.	Agility	0.93
2.	Balance	0.90

- Purpose  
To assess active balance.
- Equipment  
A slightly elevated beam approximately 4" wide and 20 feet long stopwatch.
- Procedure  
The subject steps up onto the beam at one side. With caution “ready” “clap” start walking on the beam to and form for 20 s. The subject makes 1800 after reaching the other end walks back to the other end. If the fall of the beam, he is allowed to continue after reaching his position on the beam. Two trails were recorded as performance.
- Scoring  
The distance the subject walks on the beam in 20 s was recorded as the score.

Table 3 shows that the mean of handball and football players in agility 17.6 and 15.3, respectively. The standard deviation of the handball players is 3.96 and that of football players is 3.14. The “t” ratio is 2.80, which is higher than the table value required for significance. It shows that the means of handball players and football players differ significantly. Further, the observation of the means states that handball players are better in agility when compare to the football players.

Table 4 shows that the mean of handball and football players in balance 40.16 and 33.66, respectively. The standard deviation of the handball players is 7.63 and that of football players is 6.36. The “t” ratio is 6.5, which is higher than the table value required for significance. It shows that the means of handball players and football players differ significantly. Further, the observation of the means states that handball players are better in balance when compare to the football players.

## 4. CONCLUSION

The analysis of the data facilitated the following conclusions; football players were significantly better than the handball players in agility. Handball players were better than the football players in balance.

**Table 3:** “t”-test for the data on agility of handball and football players

Category	Mean seconds	Standard deviation seconds	Mean difference	Standard error	t ratio
Handball	17.6	3.96	2.3	0.82	2.80
Football	15.3	3.14	2.3	0.82	2.80

\*Significance at 0.05 level, table value for significance at 0.05 level with df 0.58 is 2.00



**Table 4: *t*-test for the data on balance of handball and football players**

Category	Mean seconds	Standard deviation seconds	Mean difference	Standard error	<i>t</i> ratio
Handball	40.16	7.36	6.5	1.0	6.5
Football	33.66	6.36	6.5	1.0	6.5

\*Significance at 0.05 level, table value for significance at 0.05 level with df 0.58 is 2.00

## 5. RECOMMENDATION

The results of the study facilitated to make the following recommendation. Similar study may be planned with different games and sex. The result of the study may be compared with state and national level normset be described as a mixture of soccer and basketball. The ball is passed in quick fine succession up the field until, near the goal then striker through it at the back of the net. The current games were evolved from several different various sports played around the world especially in Eastern Europe. Handball was first played in 1895 in Germany. It was introduced into the Olympic Games at Berlin in 1936 as an 11 aside outdoor games with Germany winning but when – introduced in 1972, it was an indoor game with seven a side, the standard size of the team since 1952. The international handball federation was formed in 1946. The first international match was held on September 3, 1925, it did not have its own governing body, and it came under the jurisdiction of the international amateur athletic federation.

## REFERENCES

1. Bhume, R.A. A comparative study of the driving effects of dextroamphetamine and yogic mediation on muscle control for the performance of balance on balance board. *Indian J Physiol Pharmacol*, 1991, 35, 191-194.
2. Craths, B.J., and Hutton, R. *Experiment in Movement Behaviour and Motor Learning*. Philadelphia, PA: Lea and Pabiger; 1969, p. 25.
3. Ellis, C.H. Physical Education and Good Life Spring Field College Bulletin.
4. Harrison, C.H. Historical orientation. *Phys Fit News Lett*, 2007, 3(8), 9-11.
5. Arnot, R., and Gains, C. *Sports Talent*. London, United Kingdom: Penguin Books; 1986.
6. Dick, F., Johnson, C., and Paish, W.H. *Strength Training For Athletics*. London: British Amateur Athletic Board; 1976, p. 5.
7. Hasrani, S.S. *An Analysis of Skill Motor Abilities and Psychological Components as predictive Factors of Basket Ball Playing Ability at Difference levels of Achievements*. Gwalior: Unpublished Doctoral Thesis, Jiwaji University; 1987.

# Entrepreneurship in Sports

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## ABSTRACT

Entrepreneurship is a process of action an entrepreneur undertakes to establish his enterprise. Entrepreneurship is a resultant mix of many qualities and traits of an entrepreneur. Entrepreneurship is the dynamic process of creating incremental wealth and innovating things of value that have a bearing on the welfare of an entrepreneur. It provides civilization with an enormous amount of goods and services and enhances the growth of social welfare. The main importance of entrepreneurship is the creation of job opportunities, innovation, and improves the economy. Thus, this conceptual paper highlights on introduction, concept of entrepreneurship, definitions of entrepreneurship, origin of entrepreneurship, type of entrepreneurship, sports and entrepreneurship, the entrepreneurship challenges in sport colleges, suggestion few strategies to develop entrepreneurship in the sport, and conclusion.

**Keywords:** Challenges, Entrepreneurship, Imitative, Incubative, Strategies.

## 1. INTRODUCTION

Entrepreneurship is the name given to the factor of production which performs the functions of enterprise. In economics, land, labor, capital, organization, and enterprise are the five factors which are thought to be the basis of all the production activities. Entrepreneurship, in a broader sense, can be considered as a process of action undertaken by an entrepreneur (person) to establish his enterprise. It is a creative and innovative response to the environment.

Entrepreneurship can be described as a creative and innovative response to the environment. Such responses may take place in any field of social endeavor may be business, agriculture, social work, education, etc., for the entrepreneur; it is important to have knowledge about the economic and political environment, more particularly about the economic policies of the government and the financial as well as commercial institutions.

## 2. CONCEPT OF ENTREPRENEURSHIP

Entrepreneurship is a process of action an entrepreneur undertakes to establish his enterprise. Entrepreneurship is a resultant mix of many qualities and traits of an

entrepreneur. Entrepreneurship can be defined as a process undertaken by entrepreneur to augment his business interests. It is an exercise involving innovation and creativity that will go toward establishing his/her enterprise. Entrepreneurship is the inclination of mind to take calculated risks with confidence to achieve a predetermined business or industrial objectives.

## 3. ORIGIN OF ENTREPRENEURSHIP

The term entrepreneurship is derived from the French word "Entreprendre" which means "to undertake," "to pursue opportunities," or "to fulfill needs and wants through innovation and starring businesses." The word first appeared in the French dictionary in 1723.

It is believed that the Irish Banker operating in France, Ricardo Cantillon (Kent, 1984) was the first person who used the word "entreprendre" in economics as "an agent who assembles material/inputs for producing goods at a specific price and through coordination of those inputs produces goods whose sales price is uncertain in comparison with production cost."

It is also believed that the Frenchman Say (1824) first used the term "entrepreneur" as an economic agent who

brought together the factors of production in such a way that new wealth can be created.

## 4. DEFINITION OF ENTREPRENEURSHIP

- According to Stepenek, “Entrepreneurship” is the capacity to take risk; ability to organize and desire to diversify and make innovations in the enterprise
- According to Higgins, entrepreneurship is meant for the function of seeing investment and production opportunity, organizing in enterprise to undertake a new production process, raising capital, hiring labor, arranging the supply of raw materials, finding site, introducing new techniques and commodities, discovering new sources of raw materials, and selecting top managers for day to day operation of the enterprise
- “Entrepreneurship entails bearing the risk of buying at a certain price and selling at uncertain prices.” – Ricardo Cantillon
- “Entrepreneurship is any kind of innovative function that could have a bearing on the welfare of an entrepreneur.” – Joseph A. Schumpeter (1934)
- “Entrepreneurship is that form of social decision making performed by economic innovators.” – Robert K. Lamb (1952)
- “Entrepreneurship is the purposeful activity of an individual or a group of associated individuals, undertaken to initiate, maintain, or aggrandize profit by production or distribution of economic goods and services.” – A. H. Cole (1959).

### 4.1. Type of Entrepreneurship

Entrepreneurship is an innovative process that involves multifaceted and diversified activities for providing new things to society and civilization. The orientation makes it different and, therefore, it may be classified as individual and mass entrepreneurship or private and public; entrepreneurship. Entrepreneurship classified into nine types that involve multifaceted and diversified activities for providing new things to society.

#### 4.1.1. *Acquisitive entrepreneurship*

The entrepreneurship that learns from other competencies is acquisitive entrepreneurship. It acquires something new of value from the competitive environment, or achieves the competitors’ technical capacities. It keeps entrepreneurship sustainable in a competitive environment. The failure never restrains them from

acquisition but motivates them further to discover such a thing with a new visitor.

#### 4.1.2. *Administrative entrepreneurship*

The entrepreneurial activity under this category is centered on administrative techniques and functions. It gives a new option to handle prevailing or future situations in a more effective way that provides advantages and a competitive edge. Total quality management, by consensus, is a few of the examples of administrative entrepreneurship that increase overall organizational efficiency and that makes the firm successful and sustainable in the competitive market environment.

#### 4.1.3. *Imitative entrepreneurship*

The entrepreneurship that imitates a good or service operating in the market under a franchise agreement is the imitative entrepreneurship. It is the medium that spreads technology over the world. It adopts an existing technology in countries over the world. It also adopts an existing technology with minor modifications appropriate to the local condition.

#### 4.1.4. *Incubative entrepreneurship*

This category of entrepreneurship generates and nurses new ideas and ventures within the organization. It productively executes them and ensures material gain for the organization.

#### 4.1.5. *Individual entrepreneurship*

The entrepreneurship that is undertaken by an individual or a family with personal initiative is individual entrepreneurship.

#### 4.1.6. *Mass entrepreneurship*

This type of entrepreneurship emerges in an economy where a favorable climate of motivation and encouragement exists for developing a wide range of entrepreneurship among general mass is mass entrepreneurship.

#### 4.1.7. *Opportunistic entrepreneurship*

There is a proverb “Hit! While the iron is hot.” It is the best exhibit of the characteristic of this category of entrepreneurship. Environmental changes always offer new opportunities. However, everybody is not equally capable of identifying and utilizing that opportunity on time. The entrepreneurship that identifies exploits and executes the opportunity in the first hand regarded as opportunistic entrepreneurship.

#### **4.1.8. Private entrepreneurship**

The entrepreneurship that is initiated under the private sector is private entrepreneurship. The government gives various support services through private and public concerns that encourage private initiative in taking entrepreneurial ventures. A layer and mutual relationship between private and public sectors would make economic development speedy and balanced.

#### **4.1.9. Public entrepreneurship**

The entrepreneurship that is undertaken by the government through its various development agencies is public entrepreneurship. All countries, developed or underdeveloped, take a public initiative in venture ideas to fulfill the initial deficiency of private entrepreneurs.

### **4.2. Sports and Entrepreneurship**

Sport is one of the greatest motivators of our time. It is about excellence, pushing yourself to the limit, and also taking success and failure in your stride. Moreover, sports are dramatic, real, and most importantly unscheduled, which makes it inspirational. There are multiple things that can be learned from playing or even watching a sport.

#### **4.2.1. Ability without the right attitude leads to limited success**

Several times you find that talented players who impress early do not seem to progress too far simply because they have a poor work ethic. Entrepreneurs start off because they have a winning idea. However, along with an idea and the skill to take it forward, they need hard work, discipline, the ability to handle pressure, etc. These days funding is not difficult to get if you have an impressive business plan. But that's only the beginning.

#### **4.2.2. The best player does not always make the best captain**

The game of cricket is replete with examples of great players who made poor captains, who were on top of their own game but did not quite enjoy the burden of managing 10 others. A majority of startups have techies as founders. They have very impressive functional skills which are great to start off with. As the team grows, with other partners and then employees, it becomes difficult for him to manage the setup. As a leader, he needs to be a great communicator who can inspire the team to share his vision, something he has not done so far.

#### **4.2.3. Every innings starts from zero**

Some entrepreneurs think of striking out on their own because they have met with considerable success in their previous jobs. You could have scored many runs in your earlier innings or assignments, but you cannot bring that arrogance or baggage to the startup. You have to start from scratch when you startup.

#### **4.2.4. Growth necessitates change**

There is a difference between playing club level sport and playing for your national side. Going to the next level requires upgrading your skills, working on your temperament as well as handling a much higher level of pressure. Even if you were great at the lower level, you need to raise your game.

### **4.3. The Entrepreneurship Challenges in Sport Colleges**

- Lack of programs for entrepreneurship training
- The lack of innovation system in physical education and sport colleges
- Disproportion between educational contents and job skills
- Inadequacy of training in physical education facilities
- Inaccuracies of instructors in educating to the specialists
- Lack of adequacy of higher education and labor market needs
- Failure to provide entrepreneurship guidelines in the comprehensive sports system
- The disparity between the current capacity of student admission to the university and the future needs of the labor market
- Lack of media role in the development of sport entrepreneurial attitudes and the introduction of sports entrepreneurs
- In harmonic between entrepreneurship policy and higher education system.

### **4.4. Suggestion Few Strategies to Develop Entrepreneurship in the Sport**

Following are a few strategies to develop entrepreneurship in the sport and to reduce the challenges from the perspective:

- Providing training courses to help the developing the culture and entrepreneurial attitude of the community through the educational system
- Establishing a research and development system and the use of specialized physical education specialist

for the development of knowledge and innovation and the application of these results to self-employed organizations in the sport

- Development of entrepreneurship in the sports body and the development of institutions and consulting services for entrepreneurship in sport through university centers
- Supporting sport professionals and developing applied research, expanding domestic technology, and applying these technologies by enriching physical education with other disciplines of technical sciences
- Reviewing traditional management by choosing qualified and competent managers in the sport by creating program attitudes and reducing the activities of other operating systems in sport.

## 5. CONCLUSION

It seems management, policy and communication can promote entrepreneurship in physical education and sport colleges. The policy can have a key role in entrepreneurship orientation in universities. Entrepreneurial sport policy can shape innovation, risk-taking, and pro-activeness in sports education. It seems considered that general policy can be the challenge for sports entrepreneurship development and education system. Educational policy should be in line with sport policy.

## REFERENCES

1. Mohammad, A. *Explain the Success of Entrepreneurs and Provide a Suitable Model of the Success of Entrepreneurs in the Iranian Market*. Tehran, Iran: Proceedings of Congress on Entrepreneurship in the Health Sector; 2001.
2. Aminuddin, Y., and Pariah, M. Globalization and Malaysian sports industry. *J Int Stud*, 2008, 8, 112-116.
3. Ball, S. The importance of entrepreneurship to hospitality, leisure, sport, and tourism. *J Hosp Higher Leis Sport Educ Tour Acad Netw*, 2005, 3, 1-14.
4. Bogrese, A. Standards in sports entrepreneurship education. *U S Sports Acad*, 2007, 151(1), 32-35.
5. Boone, T. The entrepreneurship of exercise physiology. *Prof Exerc Physiol J*, 2003, 6(3), 1-11.
6. Bosma, N., Acs, Z.J., Autio, E., Coduras, A., and Levie, J. *Global Entrepreneurship Monitor*. Executive Report; 2009, pp. 9-50.
7. Refaat, A.A. The necessity of engineering entrepreneurship education for developing economies. *Int J Educ Inf Technol*, 2009, 2(3), 85-96.
8. Schalake, M.R., Narjes, C., Faorchild, P. *New Youth Entrepreneurship Curriculum on the Horizon*. Lincoln, Nebraska: University of Nebraska Lincoln, Department of Agricultural Economy; 2006.
9. Seddon, A., and Baldwin, H. *Innovation for growth, University of Alberta Strategic Research Plan for Canada*. Foundation for Innovation and Canada Research Chairs Program; 2008, pp. 1-6.



# Enhancing Physical Exercise for Breast Cancer Risk Reduction

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## ABSTRACT

Breast cancer is the most common cancer and the second leading cause of cancer death among women. It is a disease of public health concern globally due to its prevalence, especially in underdeveloped countries. Physical inactivity or lack of physical exercise is one of the lifestyle risk factors for increasing the risk of breast cancer among women. Numerous studies, on the one hand, revealed that physical inactivity excess body weight or gain and obesity are part of the risk factors, leading to the development of breast cancer among women. On the other hand, several studies demonstrated that physical exercise reduces the risk of breast cancer. There is a need for lifestyle adjustments for women to engage more in both physical activities and organized exercises to avoid excess body weight (weight gain).

**Keywords:** Breast cancer, Physical exercise, Risk reduction.

## 1. INTRODUCTION

Breast cancer is the most common cancer and one of the highest contributors of disability-adjusted life years in women (Azemfac *et al.*, 2019). It is a global disease commonly diagnosed in women and considered as the fifth-largest contributor to cancer deaths worldwide (Buss and Dachs, 2018). The disease is the most frequently diagnosed cancer in the vast majority of the countries (Makluf *et al.*, 2018). Breast cancer is the second leading cause of cancer death among women (Lynch *et al.*, 2018). It is a disease of public health concern globally. In fact, the World Health Organization (2018) noted that one in every 4 of all new cancer cases diagnosed in women worldwide are breast cancer, accounting for 24.2%. About 2.1 million newly diagnosed females' breast cancer cases in the year 2018, accounting for almost 1 in 4 cancer cases among women (Makluf *et al.*, 2018). One in six women worldwide develops cancer during their lifetime, and one in 11 women die from the disease (International Agency for Research in Cancer, 2018 and World Health Organization, 2018).

The incidence and mortality for breast cancer vary with geographical variations (Abdel Hadi *et al.*, 2018). For

example, in the United States, the estimated new breast cancer cases in the year 2020 for females are 276,480 and 2,620 for males (American Cancer Society, 2020). The incidence continues to rise, especially in sub-Saharan Africa (Buss and Dachs, 2018). Cumulative African incidence and death due to breast cancer are 34.5 and 17.2/100,000 females (Zeru *et al.*, 2019). In Nigeria, for instance, breast cancer has been ranked as number one among all cancer cases. It affected about 26,310 women (22.7%) in the year 2018, as revealed by the World Health Organization (2018). Nigeria recorded 102,079 cases of cancer, of which 27,304 (26.7%) were for breast cancer (Morounke *et al.*, 2017).

It was estimated that one-third of postmenopausal breast cancers are caused by behavioral factors that are modifiable, such as physical inactivity and obesity (American Cancer Society, 2018). Again, there is a direct correlation between excess weight and breast cancer occurrence among women and that weight gain during adulthood is linked with a higher risk of postmenopausal breast cancer (Adraskela *et al.*, 2017). Ligibel *et al.* (2020) revealed that excess body weight may also increase the risk of non-Hodgkin lymphoma (diffuse large B-cell lymphoma) and males' breast cancer. Recently, the American Cancer Society noted

about 18% of cancers caused by unhealthy lifestyles such as excess body weight and physical inactivity could be prevented. Greater physical activity is associated with a reduction in breast cancer risk (Guo *et al.*, 2020). Physical inactivity is a contributory factor, leading to excess body weight and obesity which have been linked to high risk of breast cancer (American Cancer Society, 2020 and 2018), along with recurrence and mortality (Ligibel *et al.*, 2020).

Globally, for example, in the year 2016, 32% of women aged 18 years and were insufficiently physically active. In Africa, there were 22% prevalence of insufficient physical activity and women were less active compared to men (World Health Organization, 2016). Physical inactivity-related non-communicable diseases accounted for the deaths of about 3 million peoples in sub-Saharan Africa and predicted to increase up to 80% by the year 2020. In Nigeria, it accounts for one-third of all deaths among females (Oyeyemi *et al.*, 2018). Being overweight or obese increases the risk of breast cancer both in pre- and postmenopausal women, but at different rates (Jerry, 2019). About 15–20% of all cancer deaths can be attributed to obesity (Adraskela *et al.*, 2017). Weight loss in adulthood has been associated with a lower breast cancer risk (Picon-Ruiz *et al.*, 2017).

Exercise plays a role in all phases of breast cancer control (Buss and Dachs, 2018). It is one of the most important lifestyle components to reduce the risk of breast cancer. Evidence suggests a role for increased physical activity in breast cancer prevention and control. Physical exercise inhibits tumor growth across cancer histologies and at all stages of tumor development (Hojman *et al.*, 2018). Exercise can sufficiently influence both the hormonal and the environmental elements of the disease. Different types of exercise, such as aerobic and resistance training, depending on their duration and intensity, may affect in various ways both the prevention and the progression of the disease. Regular exercise decreases the risk of both pre- and postmenopausal breast cancer (Adraskela *et al.*, 2017).

### **1.1. The Need for Enhancing Physical Exercise for Breast Cancer Risk Reduction**

Exercise induces reduction in the risk of breast cancer. Several studies documented the beneficial effect of physical exercise on breast cancer. For instance, a study has shown a decrease of 30–50% risk for developing breast cancer among girls aged 10–15 who were more active than their peers (Siewierska1 *et al.*, 2018). About

15–80% ranges of decrease in the risk of breast cancer and it may help to prevent disease recurrence (Buss and Dachs, 2018). Physical exercise is a low-cost, low-toxicity intervention that improves health-related fitness and quality of life in cancer survivors (Courneya, 2017). Hojman *et al.* (2018) suggested that exercise at intensities associated with increases in catecholamine levels can reduce the ability of cancer cells to form tumors in distant tissues. According to the American Cancer Society (2018), regular physical activity can reduce the risk of breast cancer, including several other cancers. It was estimated that engaging in at least 150 min of moderate intensity or 75 min of vigorous physical activity per week can reduce the risk of breast cancer by 9%. Hojman *et al.* (2018) reported that several studies demonstrated that exercise interventions markedly reduce already established tumors. Adraskela *et al.* (2017) noted that women who participated in vigorous physical activities demonstrated greater cancer risk reductions compared to inactive ones. Evidence indicates a systematic progressive association between exercise and cancer risk reduction from moderate to vigorous physical activities (Adraskela *et al.*, 2017). Seventy-three studies revealed a 25% average risk reduction among physically active women compared to the least active women (Lynch *et al.*, 2018). In more than 100 published exercise intervention studies in cancer patients, the exercise demonstrated positive changes (Hojman *et al.*, 2018).

### **1.2. Mechanism of Exercise Effects on Breast Cancer**

Following long-term exercise training, the acute effects lead to intra-tumoral adaptations of improved blood perfusion, enhanced immunogenicity, and metabolism adjustments, which contribute to slower tumor progression (Hojman *et al.*, 2018). Studies have shown that exercise training controls cancer progression through direct effects on tumor intrinsic factors (growth rate, metastasis, tumor metabolism, and immunogenicity of the tumor) regulate tumor growth through interplay with systemic factors, alleviate adverse events related to cancer and its treatment, as well as improve in cancer treatment efficacy (Hojman *et al.*, 2018). The potential cancer reducing biologic mechanisms of physical activity as revealed by Farr *et al.* (2017) includes lowering sex hormone concentrations (particularly in premenopausal women), lowering levels of insulin and chronic low-grade inflammation, improving antioxidant capacity and immune responses, and helping with weight management as well as the reduction of excess body fat.

## 2. RECOMMENDATION

There is a need for lifestyle adjustments for both women and men to engage more in both physical activities and organized exercises to avoid excess body weight (weight gain).

## REFERENCES

- Abdel Hadi, M.A., Al Madani, R., Abu Arida, L., and Al Ghareeb, B. Breast cancer age in developing countries: The narrowing gap. *Clin Surg*, 2018, 3, 1-3. Available from: [http://www.clinicsinsurgery.com/pdfs\\_folder/cis-v3-id2074.pdf](http://www.clinicsinsurgery.com/pdfs_folder/cis-v3-id2074.pdf).
- American Cancer Society. *Cancer Facts and Figures 2020*. Atlanta: American Cancer Society; 2020. Available from: <https://www.acsjournals.onlinelibrary.wiley.com/doi/full/10.3322/caac.21590>.
- Azemfac, K., Christie, A.S., Carvalho, M.M., Nana, T., Fonje, A.N., Halle-Ekane, G., Dicker, R., Chichom-Mefire, A., and Juillard, C. A community-based assessment of knowledge and practice of breast self-examination and prevalence of breast disease in Southwest Cameroon. *Hindawi J Cancer Epidemiol*, 2019;2019:1-11.
- Buss, L.A., and Dachs, D.U. *The Role of Exercise and Hyperlipidaemia in Breast Cancer Progression*. Christchurch, New Zealand: EIR Mackenzie Cancer Research Group, Department of Pathology, University of Otago; 2018.
- Guo, W., Fensom, G.K., Reeves, G.K., and Key, T.J. Physical activity and breast cancer risk: Results from the UK Biobank prospective cohort. *Br J Cancer*, 2020;1-6. Available from: <https://www.nature.com/articles/s41416-019-0700-6.pdf>.
- Hojman, P., Gehl, J., Christensen, J.F., and Pedersen, B.K. Molecular mechanisms linking exercise to cancer prevention and treatment. *Cell Metab*, 2018, 27, 1-12.
- International Agency for Research in Cancer. *Latest Global Cancer Data: Cancer Burden Rises to 18.1 Million New Cases and 9.6 Million Cancer Deaths in 2018*. Geneva: World Health Organization; 2018. Available from: <https://www.who.int/cancer/prglobocanfinal.pdf>.
- Ligibel, J.A., Basen-Engquist, K., and Bea, J.W. Weight management and physical activity for breast cancer prevention and control. *Am Soc Clin Oncol Educ book*, 2019, 39, e22-e33.
- Oyeyemi, A.L., Oyeyemi, A.Y., Omotara, B.A., Lawan, A., Akinroye, K.P., Adedoyin, R.A., and Ramirez, A. Physical activity profile of Nigeria: Implications for research, surveillance and policy. *Pan Afr Med J*, 2018, 30(175), 1-7.
- Picon-Ruiz, M., Morata-Tarifa, C., Valle-Goffin, J.J., Friedman, E.R., and Slingerland, J.M. Obesity and adverse breast cancer risk and outcome: Mechanistic insights and strategies for intervention. *CA Cancer J Clin*, 2017, 67(5), 378-397.

# Effect of Different Durations of Warming-up on Selected Skill Performance of Soccer Players

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## 1. INTRODUCTION

Warm-up has been found to be important in preventing injury and muscle soreness. When vigorous physical effort is not preceded by sufficient warm-up injuries take place. An effective quick warm-up can also be good motivator. Warming-up results increase of temperature of the muscle and the supply of blood improves performance because muscle contract and relaxes faster, hemoglobin gives more oxygen for this consumption, metabolic process increases, warming-up to that particular activity improves the necessary coordination. Warming-up helps us to prevent injuries.

It is universally accepted that warming-up is essential for any vigorous sports activity to exhibit optimum performance and prevent from injuries, but question arises that what should be the actual duration of warming-up for the football players? To get the answer of this question, the scholars undertake the present study stated as “Effect of different duration of warming-up on selected skill ability of soccer players.”

## 2. PURPOSE OF THE STUDY

The main purpose of the study was to find out the effect of different duration of warming-up on selected motor fitness component and skill ability of soccer players.

## 3. METHODOLOGY

For the present study, 20 male soccer players of 18–25 years’ age those who represented intercollegiate tournament of S.G.B. Amravati University, Amravati, were selected as the subjects. The subjects were chosen by adopting simple random sampling methods. The data pertaining to the study were collected by administering, dribbling test in second, kicking for distance test in meters, kicking for accuracy test in numbers, and juggling test in numbers. All the tests were administered consecutively for 3 days immediately after 15 min of warm-up on the 1<sup>st</sup> day, 20 min of warm-un on the 2<sup>nd</sup> day, and 25 min of warm-up on the 3<sup>rd</sup> day, respectively.

**Table 1:** Summary of one-way analysis of variance for the data on skill performance of soccer players after three different durations of warming-up

Variables	Source of variance	Degree of freedom	Sum of square	Mean of square	F-ratio
Dribbling test	Between the group	k-1 3-1=2	15.1695	7.58475	4.989*
	Within the group	N-k 60-30=57	86.76	1.52	
Kicking for distance test	Between the group	K-1 3-1=2	422.8	211.4	8.667*
	Within the group	N-K 60-3=57	1390.2	24.38	
Kicking for accuracy test	Between the group	K-1 3-1=2	520.534	260.267	42.9058*
	Within the group	N-K 60-3=57	345.8	6.066	
Juggling test	Between the group	K-1 3-1=2	476.1333	238.066	1.8856@
	Within the group	N-K 60-3=57	7196.45	126.253	

\*Significant at 0.05 level. Tabulated  $F_{0.05(2,57)}=3.162$

**Table 2:** Paired mean difference for the data on dribbling three different durations of warming-up

Mean performance on kicking for accuracy			Mean difference	Critical difference
15 min warm-up	20 min warm-up	25 min warm-up		
21.38	20.14		1.24*	1.61
21.38		18.32	3.06*	1.61
	20.14	18.32	1.82*	1.61

\*Significant at 0.05 level

**Table 3:** Paired mean difference for the data on kicking for distance among the three different durations of warming-up

Mean performance on vertical jump			Mean difference	Critical difference
15 min warm-up	20 min warm-up	25 min warm-up		
43.6	46.6		3.40*	3.13
43.6		49.7	6.50*	3.13
	46.6	49.7	3.10	3.13

\*Significant at 0.05 level

**Table 4:** Paired mean difference for the data on kicking for accuracy among the three different durations of warming-up

Mean performance on kicking for accuracy			Mean difference	Critical difference
15 min warm-up	20 min warm-up	25 min warm-up		
6.1	10.1		4.0*	1.5601
6.1		13.3	7.2*	1.5601
	10.1	13.3	3.2*	1.5601

\*Significant at 0.05 level

#### 4. RESULTS AND DISCUSSION

The collected data were examined by applying one-way analysis of variance to determine the difference, if any, when the difference was found to be significant, the least significant difference *post hoc* test was computed to find out paired mean difference and to test the hypothesis level of significance was set at 0.05.

It is evident from Table 1 that the skill performance of dribbling ( $F = 4.989$ ), kicking for distance ( $F = 8.667$ ), and kicking for accuracy ( $F = 42.9058$ ) has shown significant difference due to three different durations of warming-up. It is also observed that insignificant difference was found in the performance of juggling ( $F = 1.8856$ ) at 0.05 level.

The findings of Tables 2-4 indicate that significantly superior performance had shown by the soccer players in the skill performances of dribbling, kicking for accuracy, and kicking for distance after 25 min of warming-up followed by 20 min of warming-up and least performance had shown after 15 min of warming-up. It may be because as a result of 25 min of warm-up, the local temperature in the active muscles optimally increased which lead to developed muscles excitability, joint mobility, and neuromuscular coordination might

have assisted for the optimum performance in the above-mentioned skill performance of soccer players. Hence, such result might have occurred in this study.

#### 5. CONCLUSION

Recognizing the limitation of the study and on the statistical findings, it may fairly concluded that 25 min of warming-up highly favorable for optimum performance in the skill of dribbling, kicking for accuracy, and kicking for distance. It was followed by 20 min of warming-up and least performance had shown after 15 min warming-up. The performance on juggling of the soccer players did not show any significant difference due to three different durations of warming-up.

#### REFERENCES

- Siddik, A.B., and Mondal, S.C. Effect of Different Duration of Warming-up on Selected Skill Performance of Soccer Players. Unpublished Master Dissertation Amravati University; 2012.
- Aslam, K.M. Comparative Study of Different of Warming-up on the Selected Physical Fitness Component of Volleyball Players. Unpublished Master Dissertation Amravati University; 2008.



# A Study on the Effect of Isometric Training on Selected Motor Fitness Variables of Engineering College Students

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## ABSTRACT

The purpose of the present study was to find out the effect of isometric training on selected motor fitness variables of engineering college students. For this study, 80 engineering male students of Andhra University were randomly selected as subjects. Pre-test was taken on selected motor fitness variables, i.e., strength, speed, endurance, flexibility, and agility, before the subjects started the training program. After the pre-test was over, isometric training was taught to them and they started doing the program for 8 weeks period. Post-test was taken immediately after 12 weeks. The collected data were analyzed using *t*-test to find out the significant difference. The results of the study revealed that there was a significant improvement on selected motor fitness variables due to 12 weeks of isometric training on engineering college students.

**Keywords:** Agility, Endurance, Flexibility, Isometric training, Speed, Strength.

## 1. INTRODUCTION

Fitness has a border meaning, which includes not only physical fitness but also anatomical, psychological, and physical fitness. Thus, fitness is not a matter of mere muscles. Neither, it is a matter of physical capacity alone. It includes the realms of mental, moral, social, and emotional fitness as well. Fitness is an individual's matter. It implies the ability of each person to live most effectively with his/her potentialities. Ability to function is a readiness or preparedness for performance with regard to big muscular activity without undue fatigue.

Iso (same) metric (distance) training refers to the method of training, in which there is no change in the joint angle. Without movement, great musculotendinous tension can still occur, thus creating a training effect on the body. Although isometric means same distance training, movement will occur in the form of shorting of the muscle fibers due to the contractile properties of the muscle. Properly performed isometric training is not just holding a position while looking at the clock for a set period of time; in fact, a focused maximal activation of a muscle or group of muscles is required to perform an isometric exercise properly. Isometric exercise is a

strange concept that may go well, against everything you have been lead to believe about exercise, weight loss, and muscle building.

### 1.1. Purpose of the Study

The purpose of the present study was to find out the effect of isometric training on selected motor fitness variables of engineering college students.

### 1.2. Hypothesis

It was hypothesized that the isometric training will significantly improve the selected motor fitness variables of engineering college students.

## 2. METHODOLOGY

### 2.1. Experimental Design

The selected subjects ( $n = 80$ ) were divided into two groups, each group containing 40. The experimental group underwent the isometric training for 5 days in a week and 8 weeks in total and the control group was in kept under the control of the investigator in which they were in as usual activates.

## 2.2. Selection of the Subjects

The purpose of the present study was to find out the effect of the isometric training on selected motor fitness variables for engineering college students. To achieve the aim of the study, the investigator had randomly selected 80 engineering college students from Andhra University. Their age was ranged from 17 to 21 years.

## 2.3. Selection of Variables

The investigator reviewed the available scientific literature and had discussion with experts in the field of training to identify the components underlying the present problem. Based on these, the following variables were considered for the present study as follows:

1. Endurance
2. Speed
3. Agility
4. Flexibility
5. Strength.

## 2.4. Criterion Measures

The following criterion measures were chosen for this study:

1. Endurance was measure using 600 yards run test and recorded in minutes and seconds.
2. Speed was measured using 50-yard dash and record to the nearest one-tenth of a second.
3. Agility was measured using 6×10 yard shuttle run test and record to the nearest one-tenth of a second.
4. Flexibility was measured using forward bend and reach test and recorded to the nearest centimeter.
5. Strength was measured using pull-ups test and recorded in the counts.

## 2.5. Training Procedure

In training period, before going to the experimental treatment, special conditioning program is arranged. Types of isometric exercises used in training period.

1. Plank bridge
2. Side bridge
3. V-shaped hold
4. Isometric push-up
5. Isometric shoulder raise
6. Isometric squat
7. Isometric calf raise
8. Isometric leg extension
9. Isometric hip extension
10. Isometric leg abduction.

The duration of each exercise (holding) is 20–40 s and repetition 2–3 times.

## 2.6. Statistical Technique

The present study paid its attention mainly on testing the effectiveness of isometric training on selected motor fitness variables of engineering students. The significance of the mean difference between the present and post-test values of the variable by the experimental and control groups during the treatment period of 8 weeks was tested by applying “*t*”-test.

An examination of Table 1 indicates that the obtained “*t*” values on selected fitness variables were endurance (12.354), speed (15.980), agility (10.626), flexibility (10.494), and strength (13.153). Since the obtained “*t*” ratios were greater than the required table value of 2.021 for df 39, it was found that the mean difference between the initial and final test on selected variable was

**Table 1: Significance of mean gains/losses between pre- and post-test of the experimental group selected motor fitness variables**

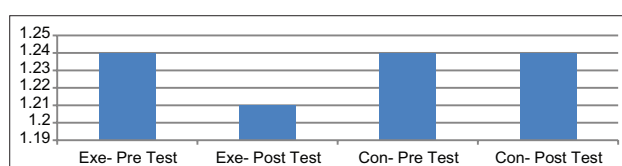
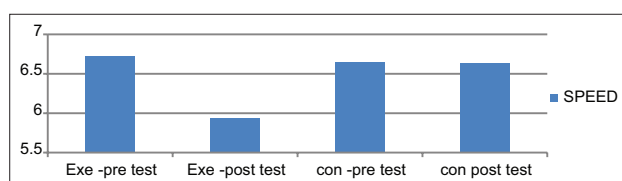
S. No.	Variables	Test	Mean	SD	SEM	Mean difference	“ <i>t</i> ” ratio
1.	Endurance	Pre	1.24	1.21	0.191	0.03	12.354
		Post	1.21	1.23	0.194		
2.	Speed	Pre	6.72	0.29	0.46	0.78	15.980
		Post	5.94	0.25	0.40		
3.	Agility	Pre	12.65	0.41	0.65	1.04	10.626
		Post	11.61	0.51	0.81		
4.	Flexibility	Pre	8.27	1.55	0.245	2.40	10.494
		Post	10.67	2.15	0.340		
5.	Strength	Pre	7.75	1.03	0.163	2.02	13.153
		Post	9.77	1.04	0.165		

\*Significant at 0.05 level

**Table 2: Significance of mean gains/losses between pre- and post-test of the control group selected motor fitness variables**

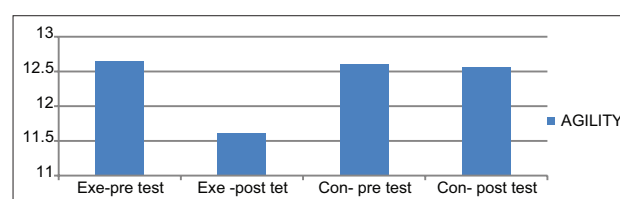
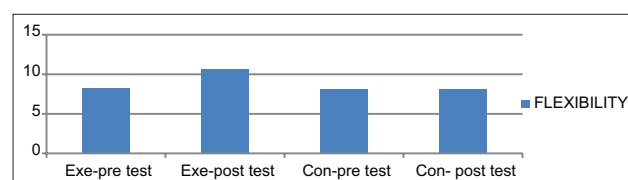
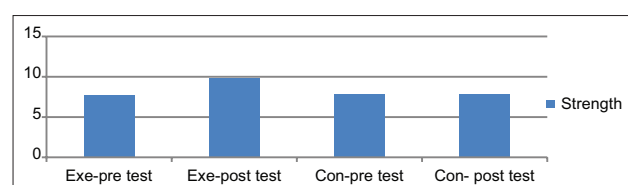
S. No.	Variables	Test	Mean	SD	SEM	Mean difference	"t" ratio
1.	Endurance	Pre	1.24	1.93	0.305	0.00	0.184
		Post	1.24	0.99	0.157		
2.	Speed	Pre	6.65	0.27	0.004	0.01	0.168
		Post	6.64	0.31	0.004		
3.	Agility	Pre	12.61	0.49	0.079	0.04	0.420
		Post	12.57	0.35	0.056		
4.	Flexibility	Pre	8.07	1.04	0.165	0.05	0.251
		Post	8.12	0.99	0.156		
5.	Strength	Pre	7.82	0.98	0.155	0.08	0.400
		Post	7.90	1.00	0.159		

\*Significant at 0.05 level

**Figure 1:** Bar diagram showing the mean difference between the pre-test and post-test of the experimental and control groups in endurance**Figure 2:** Bar diagram showing the mean difference between the pre-test and post-test of the experimental and control groups in speed

statistically significant at 0.05 level. Therefore, it was concluded that the 8 weeks practice of circuit training produced significant improvement on performance variables for intercollegiate cricket players and the formulated hypothesis was accepted.

An examination of Table 2 indicates that the obtained "t" values on selected motor fitness variables were endurance (0.15), speed (1.49), agility (1.04), and flexibility (1.00). Since the obtained "t" ratios were lesser than the required table value of 2.021 for df 39, it was found that the mean difference between initial and final test on selected variables was statistically significant at 0.05 level. Therefore, it was concluded that the formulated hypothesis was rejected [Figures 1-5].

**Figure 3:** Bar diagram showing the mean difference between the pre-test and post-test of the experimental and control groups in agility**Figure 4:** Bar diagram showing the mean difference between the pre-test and post-test of the experimental and control groups in flexibility**Figure 5:** Bar diagram showing the mean difference between the pre-test and post-test of the experimental and control groups in strength

### 3. DISCUSSION ON FINDINGS

The results of the study showed that the end of the 8 weeks of isometric training was a significant improvement on the selected motor fitness variables that were endurance, speed, agility, strength, and flexibility. The improvement

is due to the isometric training program specially designed to develop the performance variables included in this study. In general, endurance, speed, agility, strength, and flexibility were developed in overload principles based on training even by investigator to the subjects. This was confirmed by the studies conducted by Wilmore *et al.* (1978), Gettman *et al.* (1982), Marcinik *et al.* (1985), Jocks *et al.* (1987), Harnnel *et al.* (1989), Wood *et al.* (2001), Gotshalk *et al.* (2004), Takeshima *et al.* (2004), Izquierdo *et al.* (2005), Chtara *et al.* (2008), Alccaraz *et al.* (2008), Taskin *et al.* (2009), and Paoli *et al.* (2010).

#### 4. CONCLUSIONS

Based on the results of the present study, the following conclusions have been drawn:

1. It was concluded that the isometric training program significantly improved the selected motor variables for the experimental group.
2. Further, it was concluded that the selected motor fitness variables showed insignificant improvements on the control group.

#### REFERENCES

1. Buford, B. The effect of isometric exercises on Underhand throwing ability. *Completed Res Health Phys Educ Recreation*, 1966, 8, 341.
2. Clarke, H.H. Isometric and isotonic muscle training. *Phys Fitness News Lett*, 1960, 6(8), 1-5.
3. Clarkson, P.M. Isometric knoo extension and planter flexion muscle fatigue and fibro type composition in distance runners. *Res Q*, 1981, 52, 200.
4. Donald, T. The effects of isotonic strength training on pull-up achievement. *Completed Res Health Phys Educ Recreation*, 1967, 9, 82.
5. Kammeryer, S.J. Reliability and validity of a motor ability test for high school girls. *Res Q*, 1988.

# Self-confidence and Stress among Athletics Players

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## ABSTRACT

**Introduction:** Self-confidence and stress this variable are very important for college students as well as athletics. **Purpose:** The present study investigates the study of self-confidence and stress among male and female athletics players of college students. **Methodology:** Total sample 100 subjects in which 50 subjects were from male athletics and 50 were selected from female athletics. All subjects included in the study from Aurangabad district. The dependent variable self-confidence was measured by self-confidence inventory developed by Dr. M. Basavanna. Stress personal source inventory is use. **Results:** After analysis of the data, following results were drown. Subjects from male and female athletics from college students significantly differ on self-confidence and stress. Independent sample *t*-test shows that main gender-wise differences are significant ( $t = 3.05$ ,  $df = 98$ ) and stress level differences are significant ( $t = 2.52$ ,  $df = 98$ ). **Conclusion:** There is a significant difference between male and female athletics from college students on self-confidence and stress. Level of self-confidence is high in female athletics than male athletics. Female athletics level of the stress is low than the male athletics.

## 1. INTRODUCTION

Self-confidence is affected by life experiences. You are influenced by parents, siblings, friends, and teachers. From them, you learn how to think about yourself and the world around you. It is the support and encouragement you receive from the people around you – or the lack of it – that helps shape your inner feelings about yourself. Self-confidence means believing in yourself and your abilities. It means being ready and willing to face new situations and accomplish difficult tasks. Self-confident people are usually eager, assertive, motivated, willing to accept criticism, emotionally mature, optimistic, and productive. A lack of self-confidence can often keep people from achieving their full potential. That's why it is important to get help if you are affected by this problem.

The term "Stress" refers to the psychological state which derives from the person's appraisal of the success with which he or she can adjust to the demands of the society environment. College students frequently have more complex problems today than they did over decade ago common, stressors in college include greater academic demands, being on your own in a new environment, changes in family relations, changes in social life, and

exposure to new people ideas and temptations. A student reacts to college in a variety of ways. For some students, college is stressful because it is an abrupt change from high school. For others, separation from home is a source of stress. Although some source of stress is necessary for personal growth to occur, the amount of stress can overwhelm a student and affect the ability to cope. Stress is any situation that evokes negative thoughts and feelings in a person. Stressful events can be appraised by individual as challenging or threatening.

### 1.1. Objective of the Study

The objective of the study was as follows:

1. To study the level of self-confidence of male and female athletics college students.
2. To investigate the level of stress of male and female athletics college students.

## 2. HYPOTHESIS OF THE STUDY

- 1 There will be a significant difference of self-confidence between male and female athletics college students.
- 2 There will be a significant difference of stress between male and female athletics college students.



### 3. METHODOLOGY

#### 3.1. Sample

According to the purpose of the present study, a total of 100 male and female athletics from college students randomly selected. There were 50 girls athletics and 50 boys athletics are included. All sample selected from Aurangabad district. The subjects were from age range 18 to 24. All samples selected at least university level athletics sports participation.

#### 3.2. Research Design

Descriptive research design is selected for this study. All data collected by the use of two psychological standardized tests. The first stage of this research mean and SD is calculated from the data. The second stage independent sample *t*-test method is used for statistical analysis.

#### 3.3. Variable

In the present study, following variables treated as dependent and independent. Self-confidence and stress as a treated dependent variable and gender are an independent variable.

#### 3.4. Tool

##### 3.4.1. Self-confidence inventory

The second dependent variable is self-confidence. For measure, the self-confidence used self-confidence inventory developed by Dr. M. Basavanna. Self-confidence as a construct has been measured variously by different researchers in the past. The statements which were agreed upon by 80% of the experts were taken into consideration and tests were discarded. The scale consists of 25 items in which 15 are positive and 10 are negative statements. This scoring procedure yielded each individual a score that was indicative of his level of self-confidence. According to the scoring key, the scores vary between 0 and 25 and here again; lower the score higher would be the level of self-confidence and vice versa.

##### 3.4.2. Personal stress source inventory (PSSI)

To assess the stress of teacher educators, many types of scales have been used by the researchers. For the present study, manual for PSSI was used for measuring the stress of teacher educators. A total of 35 items or personal source of events constituted in the final

inventory. The scoring of PSSI is very simple. Higher the score, the higher is the magnitude of personal stress. Likewise, lower the score, lower is the magnitude of personal stress. The maximum score on PSSI is 105. The test-retest reliability was found to be 0.79 which was not only high but also statistically significant.

### 4. RESULTS AND INTERPRETATION

The total data sets obtained for self-confidence and stress inventory prepared scoring. For each subject initially, data of age group were separately tabulated by employing frequency distribution and descriptive statistics. Significant differences using a mean scores comparison and *t*-test were and calculations were carried out with the help of calculated and SPSS software 20 version is used.

Table 1 shows that the mean differences of self-confidence among male and female athletics of college students. The result shows the self-confidence means and SD score of the male athletics of college students, respectively, 12.67 and 5.12 and female athletics of college students on self-confidence is, respectively, 15.04 and 5.86. The difference between two mean is highly significant at the level of 0.01 ( $t = 3.05$ ,  $df = 98$ ) that means Hypothesis No. 1. "There will be a significant difference between male and female athletics of college students on self-confidence," is accepted.

Gender determines the differential power and control male and female have over the socioeconomic and cultural determinants of their self-confidence and lives, their social position, status, and treatment in society and their susceptibility and exposure to specific mental health risks.

Second dependent variable in this study is stress. Table 1 shows that the mean and SD score of the male athletics of college students on stress is, respectively, 41.33 and 14.02 and mean and SD score of the female athletics of college students on stress is, respectively, 35.70 and 16.81. The difference between two mean is highly significant at the level of 0.05 ( $t = 2.57$ ,  $df = 98$ ) that means Hypothesis No. 2. "There will be a significant

**Table 1: Mean, SD and *t* value of college students on self-confidence and stress**

Variable	Women	<i>n</i>	Mean	SD	<i>t</i> value	Sig.
Self-confidence	Male	50	12.67	5.12	3.05	0.01
	Female	50	15.04	5.86		
Stress	Male	50	41.33	14.02	2.57	0.05
	Female	50	35.70	16.81		

difference between male and female athletics of college students on stress.” is accepted. Several studies have also linked university students, stress, and gender and noted that female students had higher levels of depression than male students.

Although gender differences consistent with general sex-role stereotypes were found, most differences were weak and only of marginal significance. Relative to males, females made fewer influence attempts, used a more limited range of influence strategies, used fewer rewarding strategies, particularly promises of pay increases, and used more coercive strategies, especially pay deductions. Females displayed lower levels of self-confidence than did males and sex-linked differences in self-confidence explained much of the gender difference.

## 5. CONCLUSION

1. There is a significant difference of male and female athletics of college students on self-confidence.
2. There is a significant difference of male and female athletics of college students on stress.

## REFERENCES

- Baron, R., and Byrne, D. *Social Psychology, the Study of Human Interaction*. Boston, MA: Allyn & Bacon; 2002.
- Broota, K.D. *Experimental Design in Behavioral Research*. New Delhi: New Age International Private Limited; 2002.
- Wohlgemuth, E., and Betz, N. Gender as a Moderator of the Relationships of Stress and Social Support to Physical Health in College Students. *J Couns Psychol*, 1991, 38, 367-374.
- Lirgg, C.D. Gender differences in self-confidence in physical activity: A meta-analysis of recent studies. *J Sport Exerc Psychol*, 1991, 13, 294-310.
- Moen, F., Hrozanova, M., and Myhre, K. The effects of coach-athlete working alliance on affect, worry and performance satisfaction among junior elite athletes. *Int J Appl Sport Sci*, 2017, 29, 180-194.
- Kumaraswamy, N. Academic stress, anxiety and depression among college students-a brief review. *Int Rev Soc Sci Humanit*, 2013, 5(1), 135-143.
- Raedeke, T.D., and Smith, A.L. Coping resources and athlete burnout: An examination of stress mediated and moderation hypotheses. *J Sport Exerc Psychol*, 2004, 26, 525-541.

# Self-concept among Individual and Team Sportsman

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## ABSTRACT

The present study is designed to study the self-concept among sportsman of individual and team games. A total of 100 sportsmen were included in the study, 50 sportsmen playing in individual game and 50 sportsmen from team games. For this study, self-concept inventory developed by Dr. Mukta Rani Rastogi which is used. The two-way analysis of variance was used for compare the group of sportsman and gender. The result shows that there is a significant difference of self-concept among individual and team sportsman. There is no significant difference between male and female sportsman. There is a significant interaction difference between sportsman and gender among male and female sportsman on self-concept.

**Keywords:** Self-concept and sportsman.

## 1. INTRODUCTION

Team sports are those in which a person does not play alone, but plays as a team. Although many people consider that team sports are better because the whole team has to play and win games as a unit, the other thought is that the individual sports are better. This is mainly because of the fact that the individual sports are those in which the person can play alone and the talent of one person is known to the whole world. On the other hand, in case of a team game, the whole team has to perform well for a positive result. There may be times when an individual may perform exceedingly well, but the team may lose because of the poor performance of the other members of the team. On the other hand, in team events, when a person fails in the game, the whole team may lose or the whole team may perform in a mediocre way.

Team sports offer an opportunity for children to exercise and enjoy the outdoors. Children who participate in team sports are healthier and happier. The activities surrounding team sports provide a means to socialize and develop problem-solving skills. Playing team sports allow children to have fun and feel accomplished. Many children do not possess proper social skills and team sports provide ample opportunity for children to learn social skills and develop relationships. Team sports provide an environment, in which children must learn

to work as a team to achieve their goals. Children will carry this knowledge through adulthood. Children also learn to be supportive of other teammates. They learn to respect the feelings of others and, in turn, each child is treated with consideration and respect.

### 1.1. Objectives

The objectives of the study were as follows:

1. To investigate the status of self-concept among individual and team sportsman.
2. To find out the gender difference of self-concept of individual and team sportsman.

### 1.2. Hypothesis

1. There will be a significant difference of self-concept among individual and team sportsman.
2. There will be a significant difference of self-concept among individual and team sportsman.
3. There will be a significant interaction effect of sportsman and gender on self-concept.

## 2. METHODOLOGY

### 2.1. Sample

In this study, subjects were included special kind of college students in Marathwada Region. The total sample

of 100 college students has been tested – 50 sportsmen from individual game (25 females and 25 males) and 50 sportsmen from team game (25 females and 25 males). Age range was 18–22.

## 2.2. Variable

In the present study, the following variables treated as dependent and independent.

### 2.2.1. Dependent variables

Self-concept.

### 2.2.2. Independent variables

- Sportsman: In the study, two groups of sportsman, that is, individual and team sportsman.
- Individual sportsman: Those who are play in various individual games such as swimmer, athlete, badminton, and tennis.
- Team sportsman: Those who are play in team game such as cricket, hockey, kho-kho, etc.
- Gender: Male and female.

## 2.3. Design

2 × 2 balance factorial design was used.

	Sportsman (A)	
	Individual (A1)	Team (A2)
Gender (B)		
Male (B1)	A1B1	A2B1
Female (B2)	A1B2	A2B2

## 2.4. Tools

The following psychological tools were used for data collection.

### 2.4.1. Self-concept inventory

This scale developed by Dr. Mukta Rani Rastogi. The reliability of the scale by split-half method following

Spearman–Brown prophecy formula was found to be 0.87 content validity of the scale by 9-point rating scale following Thurston's method of equal appearing intervals.

## 3. RESULTS AND DISCUSSION

For statistical analysis, the descriptive and inferential statistics were used. The descriptive statistics used for the evaluation of central tendency index such as mean and the size of the dispersion (standard deviation). In the inferential statistical test and finally two-way ANOVA was used.

In Table 1, the main effect of sportsman F value was found to be 6.25 for df (1 and 96) which is significant on 0.01 level. The significant F value denotes the individual player who differs significantly than team player about self-concept. That's means hypothesis no. 1, "There will be significant difference between individual and team sportsman on self-concept" is accepted.

Another main effect of gender F value is 1.65 for df (1 and 96) which is not significant on 0.05 and 0.01 level. F value denotes the female sportsman who differs not significant than male students about self-concept. That's means hypothesis no. 1, "There will be significant difference between male and female sportsman on self-concept" is rejected. Moreover, the interaction effect between sportsman and gender F value is 8.22 for df (1 and 96) which is significant at the 0.01 level of confidence. F value denotes the sportsman and gender interaction effect is significant.

## 4. CONCLUSION

There is a significant difference between individual sportsman and team sportsman on self-concept. There is no significant difference between male sportsman and female sportsman on self-concept. There is a significant interaction difference between sportsman and gender among male and female sportsman on self-concept.

**Table 1:** Significant difference of self-concept among individual and team sportsman

Source	Type III sum of squares	df	Mean square	F	Sig.
Sportsman	3769.96	1	3769.96	6.25	0.001
Gender	998.56	1	998.56	1.65	NS
Sportsman * gender	4956.16	1	4956.16	8.22	0.01
Error	57,848.96	96	602.59		
Total	1,232,678.00	100			

## REFERENCES

- Alfermann, D., and Stoll, O. Effects of exercise on self-concept and wellbeing. *Int J Sport Psychol*, 2000, 2(1), 47-65.
- Baron, R.A., and Byrne, D. *Social psychology: Understanding Human Interactions*. 6<sup>th</sup> ed. Boston, MA, Albany: State University of New York, Allyn & Bacon; 1991, pp. 499-522.
- Garrett, H.E. *Statistics in Psychology and Education, a Text Book*. Bombay, India: Vakils, Ferrer and Simons Pvt. Ltd.; 1973, pp. 213-215, 337-370.
- Gupta, V., and Sansanwal, D.N. Influence of caste on self concept. *J Educ Res Ext*, 1998, 35(3), 22-30.
- Rastogi, M.R. *Manual for Self-Concept Scale*. Agra, India: Agra Psychological Research Cell; 1979.
- Rath, S., and Nanda, S. Self-concept: A psychosocial study on adolescents. *Int J Multidiscip Res*, 2012, 2(5), 49-61.
- Alipoor, S., Goodarzi, A.M. Analysis of the relationship between physical self-concept and body image dissatisfaction in female students. *J Soc Sci*, 2009, 5(1), 60-66.



# Effect of Circuit Training on Selected Motor Fitness Variables of Inter Collegiate Cricket Players

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## ABSTRACT

The purpose of the present was to find out the effect of circuit training on selected motor fitness variables of Inter Collegiate Cricket Players. For this study, thirty (30) Inter Collegiate Cricket Player of Andhra University were randomly selected as subjects. Their age category from 18 to 25 years, they were divided into two groups, groups of 15 each. Group I underwent circuit training and Group II underwent control group. They did not participate in any special training, apart from their regular curricular activities. The training was given 8 weeks and alternative 3 days/week. The pre- and post-test was conducted before and after training for 8 weeks. The data collected from two groups before and after the training period were statistically analyzed using *t*-test at 0.05 level of confidence was fixed to test the significance. The result of the study showed there is a significant difference between the experimental group and control group.

**Keywords:** Agility, Circuit training, Endurance, Flexibility, Speed.

## 1. INTRODUCTION

The sport of cricket has a known history beginning in the late 16<sup>th</sup> century. Having originated in South East England, it became the country's national sport in the 18<sup>th</sup> century and has developed globally in the 19<sup>th</sup> and 20<sup>th</sup> centuries. International matches have been played since 1844 and test cricket began, retrospectively recognized, in 1877. Cricket is the world's second most popular spectator sport after association football (soccer). Governance is by the International Cricket Council which has over one hundred countries and territories in membership although only 12 currently play test cricket.

Cricket is played with a bat and ball and involves two competing sides (teams) of 11 players. The field is oval with a rectangular area in the middle, known as the pitch that is 22 yards (20.12 m) by 10 feet (3.04 m) wide. Two sets of three sticks, called wickets are set in the ground at each end of the pitch. Across batting the top of each wicket lie horizontal pieces called bails. The sides take turns at and bowling (pitching); each turn is called an "innings" (always plural). Sides have one or two innings each, depending on the prearranged duration of the match, the object being to score the most runs. The

bowlers, delivering the ball with a straight arm, try to break (hit) the wicket with the ball so that the bails fall. This is one of several ways that the batsman is dismissed, or put out. A bowler delivers six balls at one wicket (thus completing an "over"), then a different player from his side bowls six balls to the opposite wicket. The batting side defends its wicket.

## 2. CIRCUIT TRAINING

Circuit training was invented in 1953 as an efficient way for coaches to train many athletics in a limited amount of time with limited equipment. The exerciser moved through a series of weight training or calisthenics arranged consecutively. It was a fast-paced workout of 15–45 s per station with little (15–30 s) or no rest between stations. Today, this is known as "circuit training." Research has shown that it can increase muscular strength and endurance. There is a mild improvement in aerobic stamina but only if the rest period are kept very short. Another variation is "aerobic circuit training." Aerobic stations such as treadmill, rower, bike, or stepper (1–5 min for station) are interspersed with training stations. This protocol has been found to increase aerobic stamina and muscular endurance and endurance. A well designed circuit can help to

correct the imbalances that occur in any sport played at high level. It can also be one of the training for improving strength endurance be it for a sport such as soccer or a classic endurance event like the triathlon. If you have not quit reached “elite athlete” status yet, circuit training is superb for general fitness and caters for a wide variety of fitness levels. A great time saver, it can be refreshing and fun change from the more monotonous types of exercises. Circuit training in its self not a form of exercise per se, but the way of an exercise session is structured. Routines can be developed for strength developed or for improving endurance or some combination of two.

### 2.1. Objective of the Study

The objective of the study was to study the effect of circuit training on selected motor fitness variables of Inter Collegiate Cricket Players.

### 2.2. Hypothesis

It was hypothesized that the circuit training will significantly improve the selected motor fitness variables of Inter Colligate Cricket Players.

## 3. METHODOLOGY

### 3.1. Experimental Design

The selected subjects ( $n = 30$ ) were divided into two groups, each group containing 15. The experimental group underwent the circuit training for the 5 days in a week and 8 weeks in total and control group was kept under the control of the investigator in which they were in as usual activates.

### 3.2. Selection of the Subjects

The purpose of the present study was to find the effect of the circuit training on selected performance

variables for Inter Collegiate Cricket Players. To achieve the aim of the study, the investigator had randomly selected thirty inter collegiate level cricket players from Andhra University. Their age was ranged from 15 to 25 years.

### 3.3. Selection of Variables

The investigator reviewed the available scientific literature and had discussion with experts in the field of cricket to identify the components underlying the present problem. Based on these, the following variables were considered for the present study as follows.

1. Cardiovascular endurance
2. Speed
3. Agility
4. Flexibility.

### 3.4. Criterion Measures

The following criterion measures were chosen for this study.

1. Cardiovascular endurance was measure using 12 min run or walk test and recorded in minutes and seconds.
2. Speed was measured using 50-yard dash and record to the nearest one-tenth of a second.
3. Agility was measured using 10×10 yard shuttle run test and record to the nearest one-tenth of a second.
4. Flexibility was measured using the sit and reach test and recorded to the nearest centimeter.

### 3.5. Circuit Training Programme

The following circuit training was adopted to develop the performance variables for Inter Colligate Cricket Players.

S. No.	Name of the station	Duration for one station (in seconds)	Rest between the station (in seconds)	Rest between the circuit (in minutes)
1	Jump and split legs	40	20	2
2	Shuttle run	40	20	2
3	Lunge	40	20	2
4	Plank	40	20	2
5	Change of direction	40	20	2
6	Diamond dips	40	20	2
7	T-run	40	20	2
8	High knee	40	20	2

- Exercise duration for 1 circuit 5.20 min (8 stations × 40 s)
- Exercise duration for 3 circuits 15.60 min
- Rest between the stations 1 circuit (8 stations × 20 s)
- Rest between the stations 3 circuits (3 circuit × 2 min).

### 3.6. Statistical Technique

The present study paid its attention mainly on testing the effectiveness of circuit training selected performance variables for Inter Collegiate Cricket Players. The statistical tool used for this present study is described here. The significance of the mean difference between the pre- and post-test values of the variable by the experimental and control group during the treatment period of 8 weeks was tested by applying test.

Table 1 indicates that the obtained “*t*” values on selected fitness variables were cardiovascular endurance (3.67), speed (5.20), agility (5.89), and flexibility (3.11). Since the obtained “*t*” ratios were greater than the required table value of the 2.14 for df 1.14 and it was found that the mean difference between the initial and final test on selected variables was statistically significant at 0.05 level. Therefore, it was concluded that the 8 weeks practice of circuit training produce significant improvement on performance variables for Inter Colligate Cricket Players, and the formulated hypothesis was accepted.

Table 2 indicates that the obtained “*t*” values on selected fitness variables were cardiovascular endurance (0.15), speed (1.49), agility (1.04), and flexibility (1.00). Since

the obtained “*t*” ratios were lesser than the required table value of 2.14 for df 1.14 and it was found that the mean difference between initial and final tests on selected variables was statistically significant at 0.05 level. Therefore, it was concluded that the formulated hypothesis was rejected.

## 4. DISCUSSION ON FINDINGS

The results of the study showed that the end of the 8 weeks of circuit training was a significant improvement on the selected performance variables that were cardiovascular endurance, speed, agility, and flexibility. The improvement is due to the circuit training program specially designed to develop the performance variables include this study. In general, cardiovascular endurance, speed, agility, and flexibility were developed in overload principles based on training even by an investigator to the subjects. This was confirmed by the studies conducted by Wilmore *et al.*, (1978), Gettman *et al.*, (1982), Marcinik *et al.*, (1985), Jocs *et al.*, (1987), Harnnel *et al.*, (1989), Wood *et al.*, (2001), Gotshalk *et al.*, (2004), Takeshima *et al.*, (2004), Izquierdo *et al.*, (2005), Chtara *et al.*, (2008), Alccaraz *et al.*, (2008), Taskin *et al.*, (2009), and Paoli *et al.*, (2010). The cricket is a very competitive field game in nature to require a greater amount of excellence in performance variables. The same may be achieved by this present treatment to the cricket players. These might be a cause of the development of selected fitness variables attained by the subjects.

**Table 1: Significance of mean gains/losses between pre- and post-test of experimental group selected performance variables**

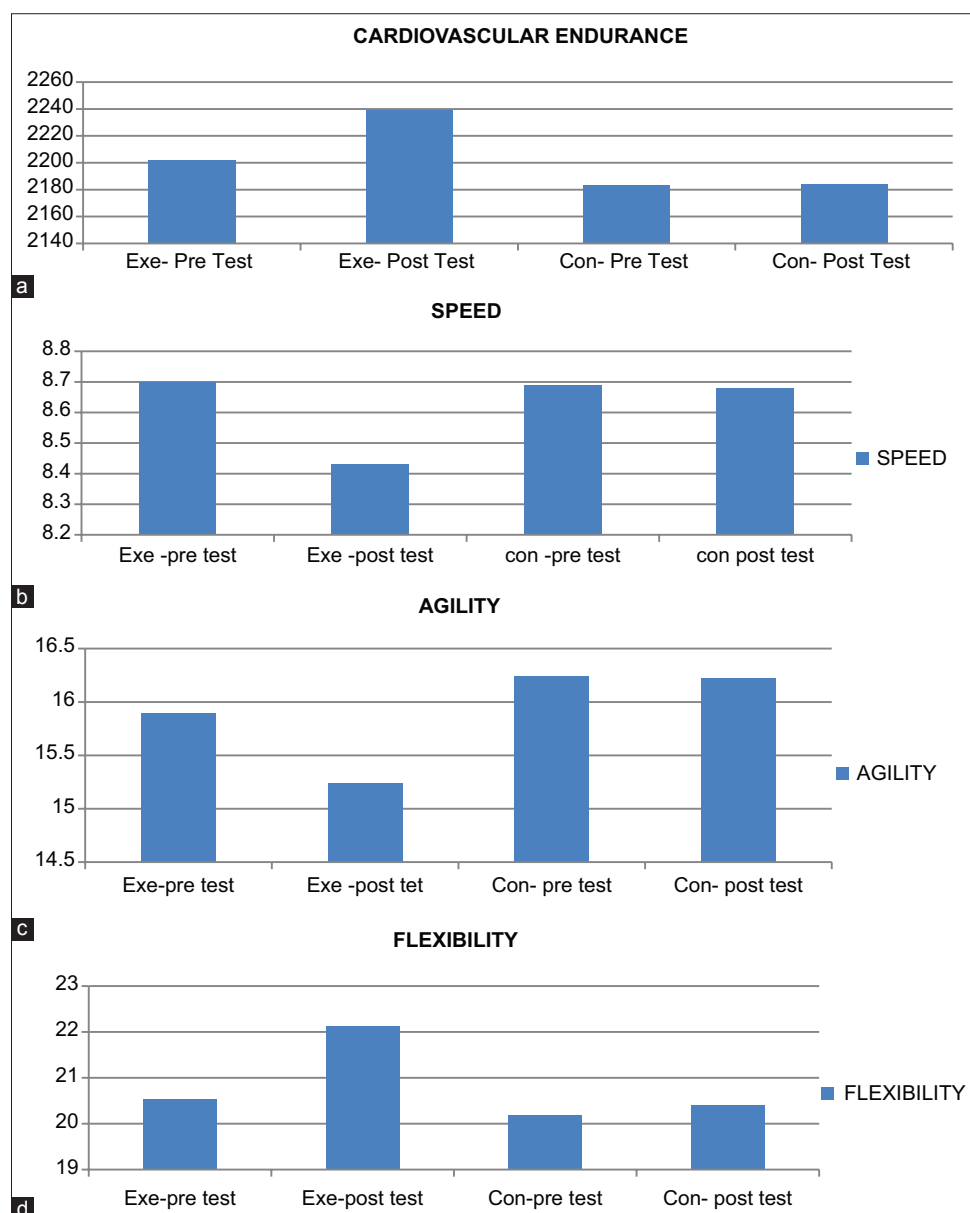
S. No.	Variables	Initial test	Post test	Mean diff	“ <i>t</i> ” ratio
1	Cardiovascular endurance	2202.00	2239.00	91.33	3.67
2	Speed	8.70	8.43	0.27	5.20
3	Agility	15.89	15.24	0.65	5.89
4	Flexibility	20.53	22.13	1.60	3.11

\*Significant at 0.05 level, Mean diff=Mean difference/6 Dm=Standard error

**Table 2: Significance of mean gains/losses between pre- and post-test of control group selected performance variables**

S. No.	Variables	Initial test	Post-test	Mean diff	DM	“ <i>t</i> ” ratio
1	Cardiovascular endurance	2183.33	2184.33	1.00	314.81	0.15
2	Speed	8.69	8.68	0.008	0.0035	1.49
3	Agility	16.24	16.22	0.017	0.018	1.04
4	Flexibility	20.20	20.40	0.20	0.26	1.00

Mean diff=Mean differenced/6 DM=Standard error of the difference between mean



**Figure 1:** (a-d) Bar diagrams showing the mean difference between pre-test and post-test of experimental and control groups

## 5. CONCLUSIONS

Based on the results of the present study, the following conclusions have been drawn.

1. It was concluded that the circuit training program significantly improved the selected performance variables for the experimental group.
2. Further, it was concluded that the selected performance on the control group.

1. The same study can be conducted with other variables such as physiological, socio-economic, and psychological among the cricket.
2. Similar study can be conducted in inter-university, state, and national level cricket players.
3. The same study can be conducted with other games, i.e., football, volleyball, handball, and kho-kho.
4. The same study can be conducted by increasing in terms of numbers of cricket players' subjects.

## 6. RECOMMENDATIONS

The following recommendations have been made from the results of the day.

## REFERENCES

1. Chtara, M., Chaouachi, A., Levin, G.T., Chamari, K., Amri, M., and Laursen, P.B. Effect of concurrent

- endurance and circuit resistance training sequence on muscular strength and power development. *J Strength Cond Res*, 2008, 22(4), 1037-1045.
2. Gattman, L.R., Ward, P., and Hagana, R.D. A comparison of combined running and weight training with circuit weight training. *Med Sci Sports Exerc*, 1982, 14(3), 229-234.
  3. Gotshalk, L.A., Berger, R.A., and Kraemer, W.J. Cardiovascular responses to a high-volume continuous circuit resistance training protocol. *J Strength Cond Res*, 2004, 18(4), 760-764.
  4. Haennel, R., Teo, K.K., Quinney, A., and Kappagoda, T. Effect of hydraulic circuit training on cardiovascular function. *Med Sci Sports Exerc*, 1989, 21(5), 605-612.
  5. Shirtey, K.J. Reliability and validity of a motor ability test for high school girls. *Res Q*, 1988, 27(3), 310-315.



# Effect of Six Weeks Training on the Physical Fitness Basketball Players of Krishna District

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## ABSTRACT

The important of physical fitness programs is liked to a higher quality of life as well as academic achievements. It is well documented that regular physical activity improves strength and endurance health build, healthy bones and muscles, hips control weights reduce anxiety and stress, and increases self-esteem and may improve cardiorespiratory function. The subject for the present study consists of such basketball players within the age of 18–25 years of Krishna district. The selected subject's physical fitness was measured in five motor tests: Speed, flexibility, agility, strength, and endurance. After these, 6 weeks of training significant difference was found.

**Keywords:** Endurance and basketball, Flexibility, Physical fitness, Speed, Strength, Strength.

## 1. INTRODUCTION

Physical fitness is a general state of health and well-being and more specifically, the ability to activities physical fitness is generally achieved through proper nutrition, moderate vigorous physical exercise, physical exercise, physical activity, and sufficient rest. Before the industrial revolution, fitness was defined as the capacity to carry out the daily activities without undue fatigue. However, with automation and changes in lifestyles physical fitness are now considered a measure of the body ability to function efficiently and effectively in work and leisure activities to be healthy to resist hypokinetic diseases and to meet emergency situations.

Physical fitness is your ability to carry out tasks without undue fatigue. Learn about the components of physical fitness, cardiorespiratory endurance, flexibility, and body compositions and why they are important.

### 1.1. Objective of the Study

The study is to determine the effect of 6 weeks training on the physical fitness performance of basketball player of Krishna district.

### 1.2. Hypothesis

There may not be any significant difference between pre-test and post-test of physical fitness performance of basketball players in relation to 6 weeks training.

## 2. MATERIALS AND METHODS

The subjects for the present study consist of 50 basketball players within the age of 18–25 years of Krishna district. The selected subject physical fitness was measured in five motor tests-speed, flexibility, agility, strength, and endurance. Further, the sample was given training for 6 weeks during the morning and evening sessions. After the training physical fitness is again measured in terms of performance of the players in all the five physical fitness tests which were used in pre-training condition.

Table 1

Variables	Test
Speed	50 mts dash
Flexibility	Sit and reach
Agility	Shuttle run (4×10 years)
Strength	Flexed arm hang
Endurance	1 2 min cooper test

Table 2

Tests	Conditions	Mean	SD	t-value	Significant at 0.05 level
Speed	Pre-test	9.21	0.593	5.622	Significant $P < 0.05$
	Post-test	8.96	0.556		
Flexibility	Pre-test	12.97	5.974	7.061	Significant $P < 0.05$
	Post-test	17.59	5.620		
Agility	Pre-test	10.67	0.548	1.519	Significant $P < 0.05$
	Post-test	10.61	0.496		
Strength	Pre-test	7.27	4.811	6.614	Significant $P < 0.05$
	Post-test	13.65	8.257		
Endurance	Pre-test	2486.89	479.469	4.761	Significant $P < 0.05$
	Post-test	2582.84	403.888		

Statistical analysis treated and interpreted in accordance with the rule. The mean standard deviation and  $t$ -test are calculated and data analysis.

### 2.1. Tools Used

The physical fitness variables and test, physical fitness tests AAPHER.

Table 1 shows the five physical tests performance of basketball players of pre- and post-test.

Analysis and interpretation of result Table 2 indicates that the pre-test mean value of speed test performance of the pre-test is 9.21 and post-test is 8.96 the mean value shows that the basketball players have taken more time to complete the given task in pre-training while less time is taken in post-training condition. The standard deviation of speed in pre- and post-test is 0.593 and 0.556, respectively, whereas  $t = 5.622$ , the difference in mean score significant at 0.05 level.

The mean value of flexibility test performance is 12.97 and post-test is 17.59. The results show that flexibility is found to be improved after post-training. The SD of pre- and post-training is 5.974 and 5.620, respectively, whereas the value is 7.061.

The pre-test mean value of agility test performance is 10.67 and post-test mean value is 10.61. There is a difference of 0.6 levels. It shows basketball players have taken more time to complete the given task in pre-training while less time taken after pre-training condition. The SD of pre- and post-test is 0.548 and 0.496, respectively, whereas  $t = 1.519$ . Hence, there was no significant difference was found in regard to agility.

It is also evident that the pre-test mean value of strength test performance is 7.27 and post-test mean value is 13.65. It indicates that the basketball players strength is found better after post training conditions. The SD of pre- and post-test is 4.811 and 8.257, respectively, whereas  $t = 6.614$ , which is significant at 0.05 level.

The pre-test mean value of 12 min cooper run and walk test performance is 2486.89, and post-test mean value is 2582.84. It indicates that basketball players have covered less distance in pre-training while more distance is covered in post-training conditions. The standard deviation of endurance in pre- and post-test is 479.469 and 403.888, respectively, whereas  $t = 4.761$  significant at 0.05 level.

## 3. CONCLUSION

It is concluded that there is a significant difference in physical fitness test performances of speed; flexibility, agility, strength, physical fitness, and endurance. There is no significant difference was found in the physical fitness test performance of agility test performance between pre- and post-training condition; hence, there is a slight significant difference that was found in mean value.

## REFERENCES

- Barik, B. Effect of 6 weeks conditioning programme on some performance variables between tribal and non-tribal students. *NIS Sci J*, 1994, 17, 2.
- Debnah, B. Effect of 6 weeks training camp on physical ability level of elite gymnasts. *NIS Sci J*, 1994, 17, 3.
- Hart, M., and Shy, CT. Relationship between physical fitness and academic success. *Res Q*, 1964.

# The Study of Yoga for Rural Women in Telangana State

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## ABSTRACT

Yoga in daily life is a system of practice consisting of eight levels of development in the areas of physical, mental, social, and spiritual health. When the body is physically healthy, the mind is clear and focused, and stress is under control. This gives the space to connect with loved ones and maintain socially healthy relationships. When you are healthy you are in touch with your inner self, with others and your surroundings on a much deeper level, which adds to your spiritual health. Yoga increases the flexibility of the spine, improves body's physical condition and heightened awareness of the importance of relaxation. It has been emphasized that each exercise be practiced slowly, coordinating movement with the breath, pausing motionless in each position, and always with full concentration. Yoga practices improved physical and psychological and physiological, and healthy. Yoga is able to help a person have control over their body through control of their mind. Yoga leads not only to physical fitness but also peace of mind, which is the ultimate goal of all human beings.

**Keywords:** Yoga health spiritual menstruation cardiovascular.

## 1. INTRODUCTION

The natural state of the body is healthy. Every smallest part and function have one overriding biological aim, to seek and restore health at all times. Wounds heal, bones mend, fevers abate, toxins are removed, fatigue is repaired – we have at our command a miracle of bioengineering which should last us into a peaceful and healthy later life. The most remarkable feat of balance, we perform each day is simply standing upright on two feet. The human frame aligns itself to support and distribute our weight with the greatest economy of effort – the arch of the foot, the precise curves of the spine, the design of every joint, the tilt of the pelvis – is designed to combine freedom of movement with strength, and protection of the vital organs. The joints are held firmly by strong, elastic ligaments, and the whole structure is supported, moved, and returned to alignment by the muscles. Yoga in daily life is a system of practice consisting of eight levels of development in the areas of physical, mental, social, and spiritual health. When the body is physically healthy, the mind is clear and focused, and stress is under control. This gives the space to connect with loved ones and maintain socially healthy relationships. When you are healthy you are in touch with your inner self, with others and your surroundings on a much deeper level, which adds to your spiritual health. Yoga increases the flexibility of the spine, improves body's physical condition, and heightened awareness of the importance

of relaxation. It has been emphasized that each exercise be practiced slowly, coordinating movement with the breath, pausing motionless in each position, and always with full concentration. One of the main concerns of modern Indian health and fitness experts is the concern regarding the physical health of women. Particularly of rural women since the half of the Nation's Population is constituted by rural women, this concern has to be addressed properly. It is on the health of women that the future of the next generation lies. A woman has many roles to play: Taking care of children, looking after the family, maintaining the domestic life, and any other work that wants her attention. In this busy and hectic schedule, she cannot go out for gym, fitness club, or even a moderate evening walk. This prone modern women to many ailments in India. The present article tries to solve this problem by proposing a home-based simple technique that uses the combination of aerobics and yoga. Except when the body is going through hormonally influenced biological changes, yoga practice for women can consist of the same postures as those practiced by males.

Women tend to have more open hips and greater flexibility than men, while men tend to have more strength than women. Women often have less competitive natures than men so that the non-competitive aspect of yoga comes naturally. Their non-competitive nature can help women realize more easily progress in the spiritual realm.

Asanas–Surya Namaskar (Sun Salutation), Sarvangasana (Shoulderstand), Halasana (Plough), Matsyasana (Fish), Kandharasana (Shoulder Pose), Ardha Chakrasana (Half Wheel), Chakrasana (Wheel Pose), Bhujangasana (Cobra), Shalabhasana (Locust), Dhanurasana (Bow), Paschimottanasana (Forward Bend), Ustrasana (Camel), Viparita Karni (inverted Pose), Sirshasan (Headstand), Ashwini Mudra (Horse Gesture), Aakarna Dhanurasana (Archer's Bow), Marjariasana (Cat), Garudasana (Eagle), Veerasana (Warrior), and Trikonasana.

## 2. YOGA AND WOMAN'S LIFE STAGES

A regular yoga practice is beneficial in every stage of life. When an individual goes through changes, such as those associated with pregnancy, menstruation, or menopause, illness, or injury. Yoga helps them approach life with more equanimity. Yoga practitioners with depression, eating disorders arthritis, or bone loss find that yoga can contribute to their healing. Special sequences of poses are available for a wide variety of health conditions. We encourage you to approach yoga with regular ongoing practice, not only doing prescriptive yoga poses. A yoga practice is healing and preventative of many types of illness. It can be emotionally balanced and spiritually nourishing. Yoga can help women on a day-to-day basis by allowing time for inner focus in a culture that is often hurried and which many women find stressful. Transitions in a women's life call for different yoga practices. We offer some guidance about pregnancy and menstruation below. During the postnatal time, women recover physically from birth and should slowly get back to doing yoga after about 4–6 weeks. After pregnancy, women can strengthen abdominal muscles with poses like: The Boat Post (Navasana) and other core strengthening yoga positions. Through a yoga practice, she can regain her muscle tone and help her body deal with the physical strain of feeding, carrying, and taking care of a new baby. Puberty brings hormonal challenges, and yoga can help young women transition gracefully into adulthood while loving themselves and their bodies at the same time, being more attuned to self. In menopause, yoga helps deal with the emotional imbalance and hot flashes that some rural women experience. After menopause, women can expect better posture with a more upright and flexible spine, and more mobility into old age.

## 3. YOGA FOR MENSTRUATION

Women, particularly rural women, are cyclic in their nature and physiology. Most sequences of poses for

menstruation include supported forward bends. Forward bends quiet the brain is perfect for this time in which one typically feels like going inward. For health reasons, it is suggested that you avoid doing inversions during menstruation. Some women also avoid standing poses or backbends at this time. Having a regular practice with a variety of yoga poses for the rest of the month is recommended for women, keeping them healthy, fit, and emotionally centered. Yoga helps a woman particularly rural to deal with heavy or irregular menses and PMS. Special sequences exist for these and other problems, depending on why she is having difficulty becoming pregnant, certain yoga poses may help women become more fertile.

Overall, a woman can balance her endocrine system, improve her blood circulation develop better posture, become more toned, have better physical balance, increase her flexibility and strength, and build her immune system through yoga practice. A lifelong and daily practice will cultivate the many health benefits and spiritual growth possible with yoga throughout all stages of life.

## 4. CHILDBIRTH WOMEN

Childbirth women, who attend yoga classes before, during, and after pregnancy, have almost no problem during and after childbirth. Practicing yoga regularly during pregnancy can help to give birth to a child naturally and without any complications. If you are able to practice yoga on a regular basis, you will find manifold and noticeable benefits in your body. You will also feel the change in your thinking and attitude toward life and other factors. When you are performing yoga asanas, make sure, the room is free from any disturbances and is comfortable and warm. Early morning is the best time for yoga. However, maintaining a good and nutritious diet along with yoga asanas helps women remain healthy for a long time.

### 4.1. Types of Benefits

Physical	Psychology	Health
Weight management	Stress	Asthma
Flexibility	Concentration and sharpness	High blood pressure
Strength	Emotion	Physical benefits
Endurance	Aggression	Blood pressure
Balance	Anxiety	Diabetes



## 5. BENEFITS OF YOGA

1. Improved concentration leading to better and high blood pressure Grades
2. Balanced blood pressure and Type 2 diabetes
3. Decreased absenteeism and tardiness, breast and colon cancer
4. Improved interpersonal relationships and falls
5. Enhanced confidence level and depression
6. Sharper brain and improve bone health
7. Early death and improve cardiorespiratory and muscular fitness
8. Coronary heart disease and decrease levels of body fat
9. Stroke and reduce symptoms of depression.

### 5.1. Cardiovascular Exercise

The main difference between yoga and aerobic exercise occurs in the effect each exercise has on the heart muscle. Cardiovascular exercise such as running and swimming elicit intense demands on the large muscles of the body, which requires more oxygen to perform exercises. The increased need for oxygen causes the heart muscle to work harder, and as your heart adapts to the stress, it becomes more efficient. The slower pace of yoga does not require much oxygen. Therefore, it does have the same conditioning effect on the heart that aerobic exercises do. Another key difference between yoga and aerobic exercise lies in caloric expenditure. The average 50 min Hatha Yoga class burns approximately 144 calories, according to the American Council on Exercise. A 50 min Ashtanga class, the more vigorous style of yoga, burns slightly more at 237. Compare this to 50 min of running or swimming at 355 and 507 calories, respectively. Aerobic exercise burns considerably more calories than yoga.

A study published in the “Indian Journal of Physical and Pharmacology” in 2004 evaluated energy costs and cardiovascular changes during a sequence of eight yoga poses. The highest recorded heart rate among study participants was 101 beats/min, which is only 50% of the maximum heart rate for a 30-year-old. Although yoga involves systematic breathing that improves respiratory fitness, ultimately aerobic exercise outperforms yoga in the cardiovascular arena because it involves elevation of the heart rate for sustained periods or for distinct intervals. This improves the efficiency of the heart muscle, allowing it to do more work with less effort during rest times.

### 5.2. Strength

Yoga does tend to boost muscular strength and muscular endurance, according to the American Council on Exercise,

particularly in the chest, triceps, and abdominal regions. Yoga also helps to develop strength and endurance in many of the core muscles, especially the oblique's and the erector spine. Cardiovascular exercise will help develop muscular endurance; however, as a rule, aerobic exercise does not encourage the development of muscular strength to the same extent that yoga does. In 2011, researchers followed a group of 79 male and female volunteers as they engaged in sun salutations – a basic yoga sequence – 6 days a week for 24 weeks. The “Asian Journal of Sports Medicine” published the study, which found a significant increase in strength and endurance among both men and women whose bench press one-repetition maximum increased by 15 and 6 pounds, respectively.

### 5.3. Flexibility

Aerobic exercise has little impact on the development of flexibility, whereas yoga significantly improves it, according to a 2010 USA Department of Health study published in the “Journal of Bodywork and Movement Therapies.” In the study, 108 physically fit firefighters took yoga classes over 6 weeks. None of the participants had practiced yoga before the study. Researchers marked significant improvements in trunk flexibility, and the study participants also reported less musculoskeletal pain overall.

### 5.4. Fat Loss

Fat loss occurs when more calories are expended than consumed. Aerobic exercise-specifically running at 5 miles/h— burns about 600 calories in 1 h. A yoga class of moderate intensity – as practiced in Ashtanga Yoga – burns about 350 calories. However, calories burned do not tell the whole story. The gain in lean muscle from yoga practice yields a slight improvement in basal metabolic rate. Nevertheless, when exercising 5 days a week for 1 h, running has the potential to burn off pounds more than yoga over the course of 8 weeks.

### 5.5. Health Benefits

Health benefits most rigorous studies suggest that yoga is a safe and effective way to increase physical activity, especially strength, flexibility, and balance. There's some regular practice is beneficial for: Leads to total health of the body.

1. Calms the mind
2. Improves mental strength and perception
3. Increases concentration
4. Several asanas increase the strength of many muscles and improve the efficiency of all the organs and brain.



## 6. CONCLUSION

Yoga practices improved physical and psychological and physiological and healthy. Yoga is able to help a person have control over their body through control of their mind. Yoga leads not only to physical fitness but also peace of mind which is the ultimate goal of all human beings.

## REFERENCES

1. Ananda, S. *The Complete Book of Yoga Harmony of Body and Mind*. Delhi: Orient Books Private Ltd.; 1982.
2. Sandercock, G.R., Bromley, P.D., and Brodie, D.A. Effect of exercise or heart rate variability inferences from meta-analysis. *Med Sci Sports Exerc*, 2005, 37(3), 433-439.
3. Willams, H., Brownell, K.D., Bachorik, P.S., and Ayerle, R.S. Changes in plasma lipid and lipoprotein levels in men and women after a program of moderate exercise. *Circulation*, 1997.
4. Holloszy, J.O., Skinner, J.S., Toro, G., and Cureton, T.K. Effects of six months program endurance exercise in the serum lipids of middle aged men. *Am J Cardiol*, 1964, 14, 753-759.
5. Shenbagavalli, A., and Divya, K. The effect of specific yoga exercise and combination of specific yogic exercise with autogenic training. *J Exerc Sci physiother*, 2010, 6(2), 9-101.

# Preserving the Healthy Futurity: A New Mentoring Framework for Inculcating the Trend of Sports in Engineering Graduates

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## ABSTRACT

As wars cannot be fought empty stomach, similarly, new technologies cannot be brought with unhealthy minds and unhealthy bodies. The era of technology has yielded in the surge of lethargic Homo sapiens. The prompt demand is to tore away the custom of this feeble behavior by inculcating the obsession for a perpetuating fitness regime. The inclination toward this can be embarked by a mentor at any stage of life. This article presents an insight into a new mentoring framework based on rubrics. These will act like an interface between knowledge and impeccable execution of the related task. The presented framework will focus on the dire needs of engineering graduates who have considered education alone to be the primary thing in life. Considering the age, mental, and physical status of personnel, one can be trained to perform better at any level of competition in sports. The rubrics in the article have been designed with the aim of enhancing the trend of fitness and involvement in sports activities by engineering graduates whose consequences can be summed up as an emotionally and physically fit graduate who can give its best individually as well as in a team. This framework will not only find the root cause of individual's deteriorating health but will also suggest the remedial actions that can be taken by a mentor to help the individual meet the fitness criteria again. As it is rightly said, "A healthy mind resides in a healthy body," so it is the sole duty and right of every engineering graduate to be a part of wave, leading to nation's growth and upliftment.

## 1. INTRODUCTION

A healthy and fit nation who remains attached to its roots unconditionally is surely going to survive the race beyond hurdles of cutthroat competitions, hypocrisy, politics, nature's barriers, etc. Since "Mentoring is one of the best methods to enhance individual's learning and development in all walks of life" [1], so there is a need of developing a strategically mentoring process that will help a nation provide healthy individuals. Mentoring not only includes modeling and coaching but also providing assistance, giving advice, feedback, as well as supporting physically [2]. The extent of mentoring will vary according to receptive and grasping degree of a pupil being mentored [3]. Mentoring can be aided with the help of rubrics which are the scoring guide to evaluate the student's response to the set of standards framed.

### 1.1. Purpose of the Study

Nowadays, kind of tradeoff is existing between health and work. A healthy and fit life in engineering individuals is compensated for the achievements that they get in the field of technology and research. Non-stop study hours and incorrect postures are deteriorating the health of engineering graduates at an alarming level. Using the technology, as a facility can render an exaggerated negative output. Reports of suicides due to academic pressures have forced the think tanks to go for options that could bring in students the sportsmanship of handling failures as well.

## 2. METHODOLOGY

The framework presents mentoring based on interest, physical statistics, and personality development. Table 1

Table 1: Evaluation criteria

Type	Parameter	Rubrics	How to evaluate?	Fitness quotient
Interest-based mentoring	Basic knowledge	a. Student suffices the knowledge and interest in the specific game b. Student has got adequate information about the rules of the specific game	<ul style="list-style-type: none"> <li>• Quiz, general talk</li> <li>• Ground skills</li> <li>• Participation in intramurals and extramurals</li> </ul>	FQ1, FQ2, FQ3
	Practical understanding and development of skill/capabilities	a. Students have awareness of the tactics and skills required for a specific sport b. Students are keen to learn the skill and acquire basic fitness required for the game		
	Laurels/active participation	a. Students show self-motivation for participating at any level b. Students are ignited to work hard to learn and improve skills		
Physical statistics based mentoring	Physical appearance	a. Students satisfy the physical parameters for a particular sport/game	<ul style="list-style-type: none"> <li>• Medical tests</li> <li>• Background record</li> <li>• Fatigue exercises</li> <li>• Drill</li> <li>• Situation-based survey</li> <li>• Questionnaire</li> <li>• Personal interviews</li> </ul>	
	Fitness components based	a. Students qualify the fitness-based tests b. Students show awareness of fitness building techniques		
	Psychological preparedness	a. Students deal aptly in cringey situations b. Students are willing to take the physical load and do not quit early		
Personality development based mentoring	Communication skills	a. Students are able to express their ideas effectively, communicate with each other clearly, and develop a bond	<ul style="list-style-type: none"> <li>• Projective activities</li> <li>• Questionnaire</li> <li>• Participation in active sports activities and competitions</li> <li>• Achievements in sports</li> </ul>	
	Ethical and moral values	a. Students exhibit traits of good sportsman and learn to control aggression. Thus, serving the society/institute in a noble and professional way b. Student develops part of decision making and the ability to handle the pressure		
	Leadership skills	a. Students develop leadership qualities through goal setting, discipline, perseverance, planning, multitasking, presence of mind, correct decision making along with lifelong learning, etc. b. Students exhibit leadership in event management and exhibit sportsmanship during participation in events and bringing laurels of the institute		

shows the rubrics based on which the evaluation is done to find out the fitness quotient (FQ), whose levels are bifurcated as FQ1: very less skilled, FQ2: moderately skilled, and FQ3: highly skilled. Once the FQ level is known, the reciprocating actions that can be taken are illustrated in Figure 1, along with the complete description of how the mentoring processing will be done.

### 3. CONCLUSION

This article covers an elaborative framework, spread over a span of 4 years for the technical degree courses or 5 years in some cases of integrated courses, for inculcating the trend of fitness and involvement in sports activities by engineering graduates. Problem realization and corrective measures can be incorporated with the help of this mentoring framework.

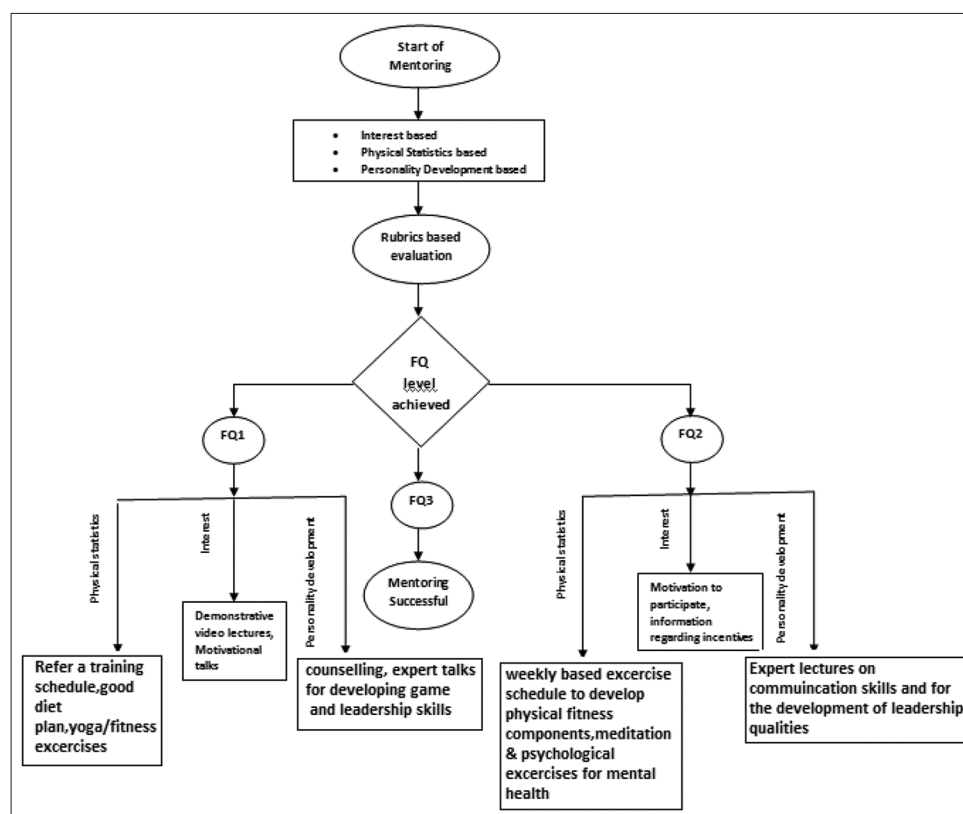


Figure 1: Mentoring process

## REFERENCES

1. Klasen, N., and Clutterbuck, D. *Implementing Mentoring Schemes: A Practical Guide to Successful Programs*. London: Butterworth-Heinemann; 2002, p. 1.
2. Jaipal, K. Re-envisioning mentorship: Pre-service teachers and associate teachers as co-learners. *Teach Educ*, 2009, 20(3), 257-276.
3. Jain, C., Walia, G.K., Kaur, N., Kaur, H., and Kaur, G. *Engineering Cognitively in an Indian Scenario*. 2015 IEEE 3<sup>rd</sup> International Conference on MOOCs. Amritsar: Innovation and Technology in Education (MITE); 2015, pp. 147-151.

# A Study on Attitude of School Students toward Cleanliness with Regard to Swachh Bharat Abhiyan

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## ABSTRACT

Honorable Prime Minister Shri Narendra Modi has launched the Swachh Bharat Abhiyan (SBA) on October 2, 2014, aiming to keep the country clean and open defecation free (ODF). To gather the information on attitude and awareness toward cleanliness with regard to SBA a cross-sectional survey was being conducted on school students (10–16 years of age) of Ujjain region to determine the impact of the SBA on students those are already under the basic learning stage of their life. A semi-structured questionnaire was designed for the data collection, the data further analyzed in LibreOffice Calc and evaluated using percentage and Chi-square test. The findings revealed that 93.97% students are aware of SBA, still after the Abhiyan 53.98% of students witnessed fecal matter in the environment. The significant difference was found among the availability and throwing waste material in dry and wet bin ( $Y^2 = 160.88$ ) and then to municipality garbage vehicle ( $Y^2 = 164.63$ ). A significant difference was observed for using paper/cloth carry bags ( $Y^2 = 82.78$ ) instead of plastic carry bags ( $Y^2 = 84.78$ ). A significant difference was observed in terms of cleaning the surrounding area of the house ( $Y^2 = 38.46$ ), but there was no significant difference found regarding house cleaning ( $Y^2 = 8.97$ ). It can be concluded from the study that there is a definite change in behavior of the students but still some of them need to understand the value of keeping the environment clean and to throw the garbage in particular bin allotted for the purpose, the change in attitude is surely one of the reasons in decreasing communicable diseases caused due to dirty surroundings. The findings revealed that 99.5% of the sample population are using the toilet for early morning defecation; thus, it can be fairly concluded that the region is said to be ODF.

**Keywords:** Attitude, Awareness, Cleanliness, Open defecation free, School students, Swachh Bharat Abhiyan.

## 1. INTRODUCTION

India is transforming toward cleanliness. In the vast field of physical education, sociology is one of the part to understand and to gain knowledge about the society and environment, as per the need of era especially in India where several diseases are spreading because of unhealthy environment and poor socio-economical background which affect the health and fitness of the citizens. Thus, keeping all the aspects in mind Swachh Bharat Abhiyan (SBA) was announced by honorable P.M. Narendra Modi, the main aim is to build the toilets in each and every home around India which in other terms also stated as open defecation free (ODF) India, and other is to keep our environment clean. The mission of dedicating a Swachh Bharat to Mahatma Gandhi on his 150<sup>th</sup> birth anniversary has a great impact in many aspects, as per the report of UNICEF in 2017 with lives and time Indian families in ODF villages save Rs. 50,000 per year on account of medical cost by avoiding

several medication, according to the report of WHO in 2018 over 3 lakh lives saved by avoiding diarrheal deaths, again the results of UNICEF report in 2019 showed there were 7.55 million full-time equivalent jobs created between October 2014 and February 2019. All of these impacts are the result of the innovative idea and its execution from the Ministry of Drinking Water and Sanitation in collaboration with the Ministry of Urban Development.

With the help of this study attitude of school students would be revealed against the cleanliness which may further helpful to find out the effect on their health and fitness by comparing the data from the hospital entries of patients for related diseases such as diarrhea and typhoid. Attitude according to the dictionary defines as “a feeling, emotion, or mental state with regard to a fact or state.” For the study, “attitude” stands for the feelings of said students for cleanliness and the cleanliness campaign called SBA.



### 1.1. Purpose of the Study

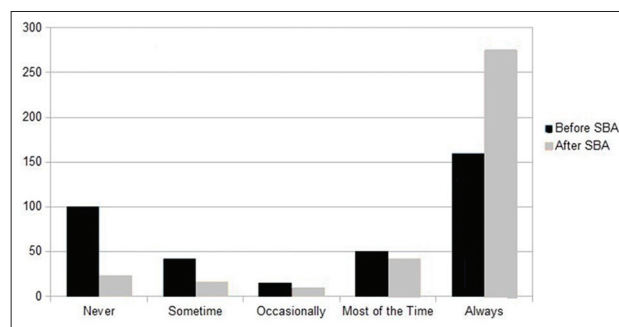
The prime purpose of this study was to investigate the attitude and awareness toward cleanliness with regard to SBA of school students of Ujjain region and to determine the impact of the SBA on those students who are already under the basic learning stage of their life.

## 2. METHODOLOGY

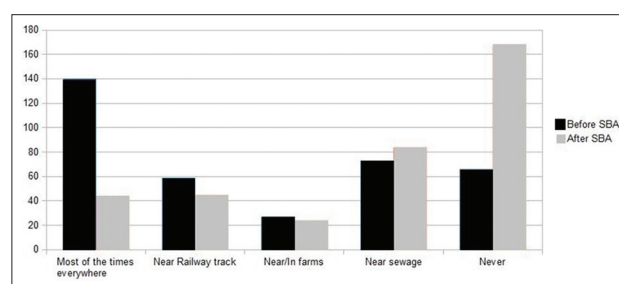
For this study, out of 365 subjects, the majority of students were from four schools, i.e., Oxford Junior College, Nalanda Academy, Kalidas Montessori Senior Secondary School, and Ujjain Public School, and the rest minority were from other school and private coaching classes from the area which somehow did not allow to conduct the survey in their school, all the students were within the age group of 10–16 years. Selection was done by employing multi-stage cluster sampling method. The scholar personally visited and approached several schools and coaching classes, the data pertaining to this study were collected from the students by administering the questionnaire, before distributing the questionnaire purpose of the study and procedure for filling up the questionnaire was clearly explained to the subjects in details so as to enable the respondent to give correct and reliable information. The responses given by the respondents against the options given in the questionnaire were arranged in a table for further calculation to test the hypothesis, the total number of responses was calculated on the percentage basis and to find out the significance of difference Chi-square statistical technique was employed for each question. Observation of cleanliness on streets and societies is also done through photography and videography.

## 3. RESULTS

The findings from the analysis show that 343 students (93.97%) out of 365 are aware of SBA, still, after the Abhiyan 53.98%, students witnessed visible feces which is comparatively less than feces visibility before SBA (i.e., 81.92%) in the environment. The significant difference was found among the availability and throwing waste material in dry and wet bin ( $Y^2 = 160.88$ ), and even if no one will come to collect the garbage 86.84% of the selected sample will dump the garbage in the waste container provided by the municipality for the area. Significant difference is observed for using paper/cloth carry bags ( $Y^2 = 82.78$ ) instead of plastic carry bags ( $Y^2 = 84.78$ ). The significant difference is observed for washing hands before and after meals



**Figure 1:** Responses of having separate dustbin for wet and dry waste at home



**Figure 2:** Responses of observation of any visible feces in the environment/any public or open area

( $Y^2 = 20.66$ ) and after defecation ( $Y^2 = 16.33$ ). The significant difference is observed in terms of cleaning the surrounding area of the house ( $Y^2 = 38.46$ ), but no significant difference is found regarding house cleaning ( $Y^2 = 8.97$ ).

## 4. DISCUSSION

As the result showed the positive attitude of the greater percentage of the students toward SBA, it may be attributed due to the fact that in this Abhiyan media and celebrities played an important role in the promotion as well as to spread awareness all around the country. Several steps and disciplined routines were announced for offices, hospitals, schools, organizations, municipalities, etc. To keep the surroundings neat and clean, the appreciation was given for the deserving ones by the government and PM Modi himself through social media. The future depends on the youth and this study focuses on the school students who will decide the fate of the country. Cleanliness should be the attitude of the school students to build up a healthy and hygienic environment so as to minimize the health hazards and diseases in society. Some questionnaires came with suggestions about the food left after the meal was not thrown in the dustbin rather give it to street animals. About street animals and especially

Pet roaming around with their owners spread feces anywhere, which also cause unhygienic environment and chaos. Another is the status of public toilets are still not up to the mark, citizens have to understand their responsibility to keep it clean at least by flush after using it.

## 5. CONCLUSION

It can be concluded that the attitude of students toward cleaning is positive which is very good sign of emerging youth toward cleanliness, but still, there are some students who are not completely aware of the Abhiyan like where to throw the garbage, segregation of waste in separate dry, and wet bins. About using paper/cloth carry bags, and avoiding plastic carry bags during shopping and for other purpose. Recognizing the delimitations of study on the basis of statistical findings, it may be fairly concluded that, to make the environment clean,

hygienic, and healthy still further steps to be taken up for educating the remaining citizens.

## REFERENCES

- Patric, A.S. The performance of rural and urban areas in the Swachh Survekshan survey: An analysis. *IJRAR Int J Res Anal Rev*, 2019, 6(1), 290-292.
- Verma, L., and Vanshika Assessment of impact of Swachh Bharat Abhiyan on managers: A cross-sectional study. *Int J Home Sci*, 2018, 4(3), 198-201.
- Kumar, N. A study of the awareness and attitude regarding the Swachh Bharat Abhiyan in class 9 of St. Francis D'assisi high school, Mumbai, English-Marathi. *Quarterly*, 2017, 6(3), 27-36.
- Suthar, P., Joshi, N.K., and Joshi, V. Study on the perception of Swachh Bharat Abhiyan and attitude towards cleanliness among the residents of urban Jodhpur. *J Family Med Prim Care*, 2019, 8(10), 3136-3139.
- Available from: <https://www.sbm.gov.in>.

# Effect of 6 Weeks Walking Programs on Selected Health-Related Fitness of Senior Citizens

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## 1. INTRODUCTION

It is very clear that physical inactivity is a major contributor to mortality. The WHO reported that around 3.2 million deaths each year are attributable to physical activity. The government around the world is recognizing the importance and the large impact of physical inactivity on health and health-related expenditure. This has led to the production of global and national guidelines for physical activity. Many non-communicable chronic health conditions prevalent in both developed and developing countries are associated with physical activity. With increasing age, there is an increased risk of developing non-communicable chronic health conditions. A physical active lifestyle that includes walking can improve the quality of life to a great extent in later years through various health benefits. These include the prevention and management of chronic diseases and improvements in physical function.

In addition to the prevention of chronic diseases, physical activity is closely related to physical function, and several studies demonstrated that increased levels of physical activity among older adults are associated with a lower risk of functional limitations, particularly related to the lower body. Any type of physical activity, including habitual walking, performed on a regular basis helps to improve functional performance and maintain mobility. However, greater benefits on physical function observed among those with higher levels of activity.

Fitness is very important for those in their senior years. Older adults need to have adequate strength, flexibility, and endurance to accomplish everyday tasks. Assessing these components of fitness can detect weakness which can be treated before causing serious functional limitations.

### 1.1. Purpose of the Study

The purpose of this study was as follows:

1. The main purpose of this study is to determine the significant effect of 6 weeks of a walking program on health-related physical fitness components of senior citizens of Amravati.
2. The other purpose of this study was to assess the level of health-related physical fitness of senior citizens of Amravati.

It was hypothesized that there would be a significant effect of 6 weeks of walking programs on the selected health-related physical fitness components of senior citizens.

## 2. METHODOLOGY

Thirty male senior citizens were selected as subjects from Amravati city, Maharashtra, through a purposive sampling method. The age of the subjects was ranged from 60 to 70 years. A single group experimental design was adopted. Pre-test was conducted to measure their initial performance on health-related physical fitness, and after the completion of 6 weeks walking program, the post-test was conducted to measure the final results. The data pertaining to the study were collected by administering the Senior Fitness Test, i.e., 6 min walking, chair stand tests, and biceps curl for cardiorespiratory endurance, muscular strength endurance of the lower body, and muscular strength endurance of the upper body, respectively.

## 3. RESULTS AND DISCUSSION

The data pertaining to each of the selected fitness components, i.e., cardiorespiratory endurance, muscular strength endurance of the lower body, and upper body,

**Table 1:** Description of mean, standard deviation, correlation, and “*t*”-ratio for the data on health-related physical fitness components of senior citizens of Amravati

Test and variables	Mean		Standard deviation		Mean difference	Correlation ( <i>r</i> )	Standard error of the mean difference	<i>t</i> -ratio
	Pre	Post	Pre	Post				
6-min walk for cardiorespiratory endurance	535.8	556.366	55.74	59.915	20.566	0.799	6.848	3.003
Chair stand for strength endurance of lower body	10.8	11.866	2.155	2.080	1.066	0.755		2.207
Biceps curl for strength endurance of upper body	12.5	12.833	2.542	2.320	0.333	0.856		1.117

were statistically examined by applying a dependent *t*-test to determine the significant effect if any. The level of significance to test the hypothesis was set at 0.05.

It is evident from the findings of Table 1 that there is significant difference between the means of pre-test and post-test of male senior citizens in the variable of cardiorespiratory endurance and muscular strength endurance of the lower body as the obtained  $t = 3.003$  and 2.207, respectively, are higher than the tabulated  $t = 2.045$  required to be significant at 0.05 level for the 29° of freedom, whereas insignificant difference is observed in the variable of muscular strength endurance of the upper body as the obtained  $t = 1.117$  is less than tabulated  $t = 2.045$  required to be insignificant at 0.05 level for the 29° of freedom.

The findings showed that there was significant effect of 6 weeks walking program on cardiorespiratory endurance and muscular strength endurance of the lower body of the senior citizens; it may be because the systematic regular walking program might have helped to increase the efficiency of heart and lungs functions to supply oxygenated blood to the desired places along with improved energy system that is why significant improvement has been shown in the variables of cardiorespiratory endurance of the senior citizens. Muscular strength endurance of the lower body also improved because regular walking might have helped to increase the number of muscle fibers (hypertrophy) and sufficient amount of oxygen supplied to the lower part of the body; therefore, the strength endurance has developed significantly.

The insignificant effect of 6 weeks training programs was shown for the variable of muscular strength endurance of the upper body of male senior citizens. It may be

because the muscular strength endurance of the upper body was tested using biceps curls. No specific exercise was given for the development of the upper arms; hence, insignificant improvement has been shown in this study.

#### 4. CONCLUSIONS

Recognizing the limitations of this study and on the basis of statistical findings the following conclusion may be drawn:

1. Significant effect was found for the development of cardiorespiratory endurance of senior citizens due to 6 weeks walking program.
2. Significant improvement also observed for the development of muscular strength endurance of the lower body.
3. No significant improvement was found for the muscular strength endurance of the upper body due to 6 weeks walking program.

#### REFERENCES

- Rikli, R.E., and Jones, C.J. The development and validation of a functional fitness test for community-residing older adults. *J Aging Phys Act*, 1999, 7, 129-161.
- Jones, C.J., and Rikli, R.E. Measuring functional fitness of older adults. *J Active Aging*, 2002, 24-30.
- Paterson, D., Jones, G., and Rice, C. Aging and physical activity: Evidence to develop exercise recommendations for older adults. *Appl Physiol Nutr Metab*, 2007, 32, S69-S108.
- World Health Organization. *Global Recommendation on Physical Activity for Health*. Geneva: World Health Organization; 2010.
- Robert, V.H. *Physical Fitness the Pathway to Healthful Living*. Saint Louis: The C. V. Mosby Co.; 1973, p. 22.

# Use of Performance Strategies during Practice and Competition among State and National Level Athletes

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## ABSTRACT

In the recent past, successful athletes often report the use of performance strategies such as visualization, emotional control, self-talk, and so on. However, in India, the extent to which performance strategies used during practice and competition is not reported. The aim of this study is to find out the prevalence of various performance strategies used among athletes and establish the differences in various performance strategies used between state and national level athletes during practice and competition. About 91 female athletes (mean age = 18.1, SD = 0.954) currently competing in various sports answered test of performance strategies (Thomas *et al.*, 1999), the 64-item scale measuring various performance strategies used during competition and practice, respectively. Descriptive and independent *t*-test were used to find out the difference in using various performance strategies (during competition and practice) used between state and national level players. The implication of the study is to promote and encourage practitioners and coaches to educate athletes with various performance strategies that are proven to increase performance.

**Keywords:** Elite athlete, Performance strategies, Psychological skills.

## 1. INTRODUCTION

In the recent past, experts in sports sciences acknowledge that for peak performance in sports, both mental and physical skills are essential (Jemmy and Easvaradoss, 2018). Several studies have also proven the important of learning and using mental skills such as concentration, focus, self-talk, and goal setting in sports for better performance (Gould *et al.*, 1992 and Weinberg and Gould, 2003). Therefore, today, than ever before, researchers and coaches believe that learning performance strategies are crucial for athletes to reach peak performance. However, in India, there is a very limited knowledge of various performance strategies used and its contribution to sports performance.

### 1.1. Purpose of the Study

The aim of the present study is to identify the extent to which these performance strategies are used among athletes and to find out if there is any difference in strategies used among state and national level athletes.

## 2. METHODOLOGY

### 2.1. Design

A survey design was used in this study.

### 2.2. Sample

About 91 female athletes (mean age = 18.1) currently competing in various sports.

### 2.3. Sampling Method

Purposive sampling method was used.

#### 2.3.1. Independent variable

State and national level players.

#### 2.3.2. Dependent variable

Performance strategies.



## 2.4. Operational Definitions

1. Performance strategies are defined as “the psychological process thought to underlie successful athletic performance” (Thomas *et al.*, 1999, p. 699).
2. State and national level players: Individuals who have represented district/state in the state/national level tournaments or games.

## 2.5. Tools used for Data Collection

Test of performance strategies (TOPS) was developed by Thomas, Murphy, and Hardy, 1999 – it is used to measure various psychological skills and strategies used by athletes during competition and practice. This scale has 64 items and it measures over 16 strategies used during competition and practice (seven common strategies in competition and practice are self-talk, activation, automaticity, emotional control, goal-setting, imagery, and relaxation). In addition to this, attention control was added to the competition, and negative thinking was added to practice strategies. The internal consistency of the TOPS subscales was reported to range between 0.66 and 0.81 (Thomas *et al.*, 1999).

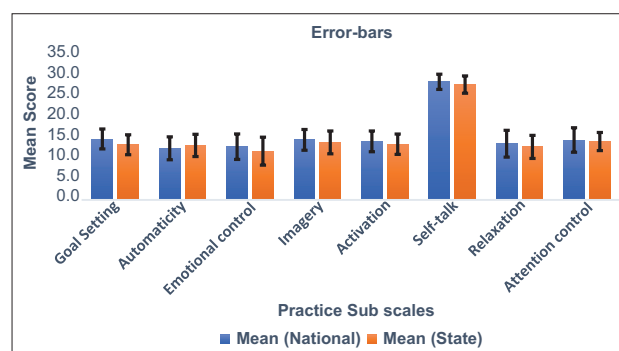
## 2.6. Data Analysis

Descriptive was used to find out the mean and standard deviation of performance strategies used among athletes. Independent *t*-test was used to compare state and national level athletes on various performance strategies used during competition and practice. SPSS was used for data analysis.

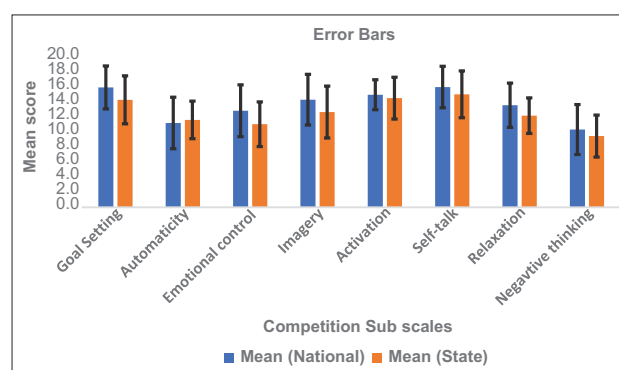
## 3. RESULTS AND DISCUSSION

Figures 1 and 2 show the means scores of various subscales among national and state level athlete. From these graphs, it can see that national athletes are using various psychological strategies such as goal setting, emotional control, imagery, self-talk, relaxation, and attention control more than state athletes.

Independent *t*-test was carried out to find out whether the psychological strategies used among national and state level athletes significantly differ from one another. From Table 1, it can be seen that the mean of national level athletes is higher than that of state level athletes on various subscales such as goal setting (practice subscale), emotional control, imagery, and relaxation (competition subscales). *t* values were found to be significant. This shows that there is a significant



**Figure 1:** The mean scores of performance strategies in the y-axis and subscales in the x-axis for practice subscales



**Figure 2:** The mean scores performance strategies in the y-axis and subscales in the x-axis for competition subscale

**Table 1:** *t*-test for various subscales of tests of performance strategies between state and national level athletes

Subscales	National level			State level			<i>t</i>
	Mean	SD	<i>n</i>	Mean	SD	<i>n</i>	
Practice							
Goal setting	14.79	2.41	38	13.38	2.42	53	2.746**
Competition							
Goal setting	15.97	2.89	38	14.32	3.2	53	2.533*
Emotional control	12.87	3.44	38	11.07	2.98	53	2.649**
Imagery	14.34	3.38	38	12.69	3.46	53	2.256*
Relaxation	13.6	2.95	38	12.21	2.37	53	2.481*

\*\*Significant at 0.01, \*Significant at 0.05

difference between national and state level athletes with respect to psychological strategies used during competition and practice. This finding is consistent with Taylor *et al.* (2008).

The possible explanation of why other strategies were not found significantly different among these two groups could be due to the nature of the sample, where athletes playing various (team and individual) sports were included in the study. For example, activation for a soccer player will be experienced differently than a weightlifter, and therefore, a significant difference was not found in few strategies.

#### 4. CONCLUSIONS

From this study, it is evident that national level athletes use psychological strategies significantly more than state level athletes. The results of this study follow the recurring theme, i.e., using psychological strategies are crucial for peak sports performance. Today, it is considered that, given that the physical readiness equivalent between the opponents, it is the psychological skill that determines who the winner is on a particular day.

#### REFERENCES

- Gould, D., Eklund, R.C., and Jackson, S. 1988 US Olympic wrestling excellence: Mentalpreparation, precompetitive cognition, and affect. *Sport Psychol*, 1992, 6, 358-382.
- Jemmy, S., and Easvaradoss, V. Mental toughness and positivity as predictors of performance strategies used among competing athletes. *Int J Sports Sci Fitness*, 2018, 8(2), 98-119.
- Taylor, M.K., Gould, D., and Rolo, C. Performance strategies of US Olympians in practice and competition. *High Ability Stud*, 2008, 19(1), 19-36.
- Thomas, P.R., Murphy, S.M., and Hardy, L. Test of performances strategies: Development and preliminary validation of a comprehensive measure of athletes' psychological skills. *J Sports Sci*, 1999, 17(9), 697-711.
- Weinberg, R., and Gould, D. Introduction to psychological skills training. In: *Foundations of Sport and Exercise Psychology*. 3<sup>rd</sup> ed. Champaign, IL: Human Kinetics; 2003.

# Stress Reduction through Yoga

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## ABSTRACT

People face numerous psychological stresses that can undermine their work performance. People cope with various forms of stress on the job. Increased risk for psychological and physical disorders may be due to emerging work-related trends such as working in repetitive and monotonous tasks, performing in a fast-paced environment, and fearing a layoff during an unstable period in the economy. Psychological stress can be induced by extremely low or high demands on the individual and is a typical situation of many simple and repetitive work situations, in which health problems are common. These factors have in numerous health and financial implications for both employees and employers. Mental and emotional states can impinge on and alter, for good or ill, any of the body's organs or systems. Low people satisfaction and little variation in people task are significantly associated with back and shoulder pain. People stress also may impact on an employees' mental health and may cause depression, anxiety, or paranoid symptoms. The stress stem from a variety of possible causes has enormous health and financial impacts on persons as well as people. Stress has been shown to be one of the factors leading to muscular-skeletal disorders such as back pain, carpal tunnel syndrome, shoulder or neck tension, eye strain, or headaches. Yoga is an ancient form of exercise that can reduce stress and relieve muscular tension or pain. Practicing yoga at the workplace teaches employees to use relaxation techniques to reduce stress and risks of injury on the job. Yoga at the workplace is a convenient and practical outlet that improves work performance by relieving tension and people stress.

**Keywords:** Anxiety, Mental and emotional.

## 1. INTRODUCTION

Highly stressed people are subject to greater health risks, increased cost, and productivity losses than those with normal stress levels. To address this issue in an evidence-based manner, worksite stress management programs must be able to engage individuals as well as capture data on stress, health indices, work productivity, and health-care costs. These factors have numerous health and financial implications for both men and women. "Mental and emotional states can impinge upon and alter, for good or ill, any of the body's organs or systems." Low people satisfaction and little variation in people task are significantly associated with back and shoulder pain. The majority of headaches that people experience are tension headaches resulting from chronic contraction of neck and shoulder muscles. "With more and more people spending greater amounts of time at the computer, the number of people suffering from carpal tunnel syndrome, the most

common type of repetitive strain injury, is on the rise." People stress also may impact on an employee's mental health and may cause depressive, anxiety, or paranoid symptoms. Costs to people are considerable in terms of absentee rates, loss of productivity, and consumption of health care. Unfortunately, the stigma of "mental health disorders" or "stress-related disorders" thwarts many companies from becoming involved in occupational mental health and stress management. Yet, there has been increasing attention drawn to the legal responsibility of companies for health risks and disorders resulting from people stress.

## 2. FRAMEWORK FOR STRESS AT WORK

The workplace is an appropriate and important setting in which to deal with these "crisis proportion" health

issues. For many, the worksite is a “prime locus of activity” where employees spend the majority of their days and where the worksite is a vital setting to advance healthy lifestyles. People use a three-tiered prevention framework for dealing with stress-related health issues in the workplace. Primary intervention aims at “eliminating, reducing, or altering worksite demands” (e.g., task redesign programs). Secondary prevention aims at educating individuals on skills to manage stress (e.g., corporate fitness programs and relaxation training). Tertiary prevention aims at relieving suffering resulting from worksite demands (e.g., psychological counseling). Although primary intervention may be the preferred initial starting point, circumstances do not always allow for this to transpire due to individual traits and situational circumstances. Therefore, secondary prevention “seems to be the stage at which we most often begin.” Corporate health programs that do exist in the United States emphasize physical fitness and exercise. Lifestyle change is also a strong emphasis on corporate health programs. For example, Johnson and Johnson provides a worksite wellness program to its people called, live for life. This program enhances well-being through motivation and behavioral modifications. Lifestyle change is emphasized through weight reduction and control, nutrition education, and stress management.

### **3. YOGA FOR STRESS REDUCTION AND INJURY PREVENTION**

Hath yoga, an ancient mind-body exercise that incorporates breathing and postures to unify and relax the mind and body, has recently been introduced. Offering yoga to people is a convenient and practical way to relieve tension from stresses on the people and educates people to decrease risks of injury. The breathing and postural techniques can be used “as a means of quietly and unobtrusively coping with the crises that occur during the working day.” Yoga can be taught at group lunchtime workshops or after work hours in any space available at the worksite, for example, a conference room. Once people learn the techniques from a certified teacher, they can independently practice the techniques in their own workspaces. Practicing yoga has been shown to reduce pain, relieve tension, reduce risks of injury, improve posture, improve communication, increase energy and attention span, and enhance feelings of overall wellness and well-being. In an empirical research study, participants in a yoga-based regimen demonstrated improved grip strength and pain reduction in the carpal tunnel area of the wrists.

When people are at work, focusing on productivity, deadlines, meetings, and phone calls, the sympathetic nervous system (otherwise known as the “Fight or Flight” system) kicks in. Heart rate, breathing, blood pressure, and adrenaline are increased. Furthermore, in this focused state of work, people may be unaware of her body positioning and motions and unconcerned about maintaining good postural alignment or taking rest breaks from repetitive movements. Yet, when the individual is practicing the postures, deep breathing, and stretching movements of yoga while working, he or she increases awareness of his or her body positioning and motions and can elicit the relaxation response. In this case, the parasympathetic nervous system kicks in where muscle tension is reduced, less oxygen is consumed, and less carbon dioxide is eliminated, and there is a decrease in the activity of the sympathetic nervous system. Breathing is the only system bodily function that is involuntary as well as voluntary. “If you can learn to control your breath, you can learn to control, or at least influence, how you feel both emotionally and physically.” In comparison to people stress, yoga has a dramatic and opposite effect on the body: Decreased heart rate, breathing, and blood pressure. Being mindful of the body helps break the poor postural habits and encourages rest breaks from repetitive motions that may contribute to pain and risk for muscular-skeletal disorders, thereby decreasing risks of injury. Yoga techniques are prevention skills for life. Although yoga is based on exercises and poses, it is done “without the possibility of further stressing an already stressed-out body.” Yoga classes begin with warm-ups such as head rolls or shoulder rolls. Classes continue with a series of standing, sitting, supine, and prone poses, most of which can be adapted to the sitting position. Finally, once the spine is completely warmed-up, classes may end with a spinal twist and a deep relaxation.

### **4. CONCLUSION**

On a daily basis, people face stressors while on the job. This stress may affect the employee’s physical and psychological well-being as well as the employer’s finances and company morale. “People rush from their high-pressure works and tune into the authoritatively mellow voice of an instructor, gently urging them to solder a union between mind and body.” With increased clarity and mental acuity, people can return to their workdays with improved communication, enhanced teamwork, and increased productivity. “The resulting unification of body and mind can have powerful benefits for the rest of one’s life, especially stress-related woes

associated with professional's hectic lives." Hatha yoga has been shown to relax the body and mind, thereby promoting overall improvement in mental and physical health and well-being.

## REFERENCES

1. Chanen, J.S. Just say "Om": Harried lawyers still their minds with yoga and meditation. *Am Bar Assoc*, 1998, 84, 78-79.
2. Corliss, R. The power of yoga. *Time*, 2001, 157, 54-62.
3. Dumaine, B. Cool curses for burnout. *Fortune*, 1988, 117, 88-91.
4. Dworkis, S. *Recovery Yoga: A Practical Guide for Chronically Ill, Injured, and Post-operative People*. New York: Three Rivers Press; 1997.
5. Garfinkel, M.S., Singhal, A., Katz, W.A., Allan, D.A., Reshetar, R., and Schumacher, R. Yoga-based intervention for carpal tunnel syndrome. *J Am Med Assoc*, 1998, 280, 1601-1603.
6. Gebhardt, D.L., and Crump, C.E. Employee fitness and wellness programs in the workplace. *Am Psychol*, 1990, 45, 262-272.
7. Heilbronn, F.S. The use of hatha yoga as a strategy for coping with stress in management development. *Manage Educ Dev*, 1992, 23, 131-139.
8. Ilgen, D.R. Health issues at work: Opportunities for industrial/organizational psychology. *Am Psychol*, 1990, 45, 273-283.
9. Jacobson, M. Employers zero in on future health. *Bus Health*, 1988, 36-39.
10. Kasl, S.V. Surveillance of psychological disorders in the workplace, In: Keita, G.P., and Sauter, S.L., (eds). *Work and Well-Being: An Agenda for the 1990s*. Washington, D.C: American Psychological Association.



# Role of Yoga in Personality Development

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## 1. INTRODUCTION

Personality is a combination of self, society, and nature. The realization of good conduct is evident in the manifestation of one's reaching the acme in life. The acme of human excellence is the optimum use of the sixth sense that is available only to human beings. Good personality will always be a result of good character. Good character will bring welfare, which will lead him to successful living in all the facets of life.

## 2. PERSONALITY

Personality is a psychobiological symmetry. Personality has been derived from the Latin word "persona" which means "mark" or index of one's own profile.

## 3. PERSONALITY DEVELOPMENT

Personality development can be understood as a process of developing and enhancing one's personality.

According to the Simplified Kundalini Yoga (SKY), yoga "symmetry in the composition, function, and management of bio-magnetism are the index for personality development."

## 4. IMPORTANCE OF PERSONALITY DEVELOPMENT

Personality development grooms and individual and helps him make a mark of his own. It goes a long time to reduce stress and conflicts. Personality will dictate and decide success one's own career, to fulfill one's own goals and to achieve all-round personality.

## 5. OBSTACLES OF PERSONALITY DEVELOPMENT

The growth of personality development is often obstructed by the blemishes, six bad temperaments, and differences among the human beings.

- Blemishes are Ego, Sinful imprints, and illusions.
- Six bad temperaments are Greed, anger, miserliness, immoral sexual passion, the superiority and inferiority complexes, and vengeance.
- The 16 factors decide the man's personality. These are genetic center, variety in food, time, nation, education, profession, government, arts, attempts, stages in age, friends, opportunity research, habits, custom, and morality.

The man's personality and physical strength plus or minus among these 16 factors will decide.

- The following seven assets contribute for the personality development. These are physical future, character, excellence in wisdom, fame, physical strength, health, and wealth.

## 6. SOLUTION TO IMPROVE THE PERSONALITY DEVELOPMENT

The personality development can be promoted, cherished and articulated by the yoga method of introspection. Even though there are some methods suggested by psychologists are found of in the form of counseling. There are only of peripheral use. Only YOGA can stand a powerful medium for personality development and introspection is the powerful method suggested SKY for personality development. Because it deals with the integration of the bioconsciousness with the cosmic consciousness.

## 7. SIMPLIFIED KUNDALINI YOGA

Vethathiri Maharishi (1911–2006), a spiritual leader developed the SKY yoga system. The system includes:

1. Simplified physical exercises for health
2. Meditation for inner peace
3. Kaya Kalpa yoga for antiaging
4. Introspection for happiness.

The SKY Yoga features are

1. Yoga for the modern age
2. Harmonious blend of Divine life, Yogic life, and Secular life
3. The target of secular life is Equality, Security, and Peace
4. The target of Divine Life are pacification, purification, and realization
5. It is having the foundation of space, energy, and mass
6. It is a variant of Raja yoga for achieving Jeeva Brahmaikya Mukthi to the practice of Pranava.

In the SKY yoga, introspection is the best training methods for development of personality.

## 8. INTROSPECTION

The word “Introspection” means an examination of one’s thoughts or feelings. It is the study of the inner self for promoting psychobiological symmetry. It is a training of thought and action.

According to SKY Yoga, “Introspection techniques, one can change a few and accept a few to lead a peaceful and artistic life.”

## 9. SKY YOGA TECHNIQUES FOR INTROSPECTION

1. Analysis of thoughts
2. Moralization of desires
3. Neutralization of anger
4. Eradication of worries.

### 9.1. Analysis of Thoughts

Thought is an idea or the process of thinking. Analysis means a detailed examination of the study. “A detailed study of thoughts is called analysis of thoughts.” According to SKY Yoga, “Thought is a biomagnetic wave.” Analysis of thoughts controls intrapersonal relations.

### 9.2. Moralization of Desire

Desire means a strong feeling of wanting something. Moralization means adapting to the principles of right and wrong behaviors following accepted standards of behavior.

According the SKY Yoga, desire is a linking towards something, desire is to experience something. Desire is attachment, desire is love, and desire is eagerness to acquire something. Desire is lust. Basically, desire comes out of a need. To identify the impact of the desire on oneself and on the society is called moralization of desires. Moralization of desires helps to organize the intrapersonal relations.

1. Neutralization of anger: Anger means a strong feeling of displeasure. Neutralization means prevent from having an effect. It means to prevent the effect of displeasure is the Neutralization of Anger. According to SKY Yoga, “There are objections and obstructions to exhibiting undesirable desire, a person turns emotional and expresses it in the form of Anger.” Neutralization of Anger reduces the expenses of biomagnetism.
2. Eradication of worries: Worry means feel or cause to feel, concern, or anxiety. Eradication means remove or destroy completely. According To SKY Yoga, “Worry can be understood as a state of mind in the absence of required mind to respond to the challenges, worry consumes the biomagnetic energy. Eradication of worries makes the life free of stress and strain and contributes for longevity.

## 10. CONCLUSION

The SKY method of introspection protects and promotes personality development by balancing intrapersonal relations, organizing interpersonal relations by reducing the expenditure of biomagnetism and finally by increasing longevity with stress free life. Thus, it is a means for happiness, calmness, and stress free life.

# Influence of Yogasana Practice on Selected Physical Fitness Variables of College Level Men Volleyball Players

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## ABSTRACT

The purpose of this study was to find out the combined influence of yogasana practices on selected physical fitness variables of college level men volleyball players. The investigator selected 40 women volleyball players from Acharya Nagarjuna University affiliated colleges in Guntur and Prakasam District, Andhra Pradesh; their ages were ranged from 18 to 21 years. The subjects were divided into two equal groups. Group 1 consists of 20 subjects called as experimental group and Group 2 consists of 20 students called as control group. Group I was assigned yogasana practices for a period of 12 weeks training program. The control group was not allowed to participate in any kind of activity. The dependent variables, namely, speed and trunk flexibility were selected and measured by 50 yards dash test and sit and reach test, respectively, for this study. The data were analyzed by the use of paired *t*-test. The obtained "*t*" ratio was tested for significance at 0.05 level of confidence. The analysis of the data revealed that there was a significant improvement on selected variables, namely, speed and trunk flexibility by the application of yogasana practices training program.

**Keywords:** Speed, Trunk flexibility, Yogasana practice.

## 1. INTRODUCTION

Yoga: "Yoga is the artwork of awareness on the canvas of body, mind, and soul." Yoga plays a key role in every walk of life, nowadays, everyone is searching of health that is within them without knowing the concept they are searching here and there. Once they started learning yoga, they will not come out from the healthy secret. It gives all-round development to human both internal and external, one who knows about and learn yoga they will practice regularly and try to teach everyone to learn yoga and preach about the innate wonders within them. If they are good enough to listen to their inner body's feelings and ideas, yoga may add healthy life with good mental health, better attention, self-esteem, and self-regulation with empowerment. Everybody now starts learning yoga and consuming the benefits, especially youth who is learning yoga in schools, colleges, and universities to improve flexibility and sound mind and to overcome the emotion and stress.

## 2. METHODOLOGY

For this study selected 40 women volleyball players' from Acharya Nagarjuna University affiliated colleges in Guntur and Prakasam district, Andhra Pradesh, their ages were ranged from 18 to 21 years. The subjects were divided into two equal groups. Group 1 consists of 20 subjects called as experimental group and Group 2 consists of 20 students called as control group. Group I was assigned yogasana training program for a period of 12 weeks. The control group was not allowed to participate in any kind of treatment. The subjects were tested in the selected variables, namely, speed was tested with 50 yards dash test and flexibility was tested with sit and reach test, before and after the training period. The collected data were treated using paired *t*-test. The level of confidence was fixed at 0.05 levels.

Training Schedule: Total = 12 weeks, Weekly = 3 days,  
Per session = 1 h

### 3. TRAINING PROGRAM

It is most essential to warm up before every session. The method of doing yogasanas training explained to the experimental group before starting the training. The researcher herself demonstrated the training to the subjects. The training was given for a period of 12 weeks on alternate days, 3 days in a week.

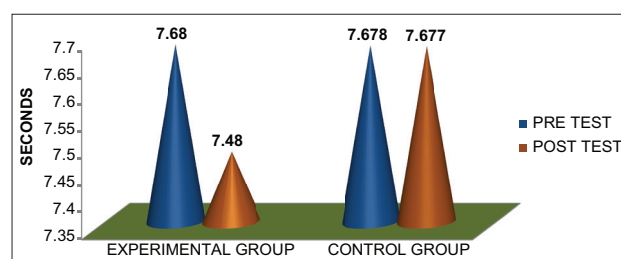
#### 3.1. Yogasanas

Under yogasanas, a batch of 12 asanas, which are commonly called of Surya Namaskar was given to the subjects, followed by Tadasana, Trikona-asana, and Paschimottanasana. The physical base of the practice links together 12 asanas in a dynamically performed series. These asanas are ordered so that they alternately stretch the spine backward and forward. When performed in the usual way, each asana is moved into with alternate inhalation and exhalation (except for the sixth asana, where the breath is held in external suspension). A full round of Surya Namaskar is considered to be two sets of the 12 poses with a change in the second set to moving the opposite leg first through the series. Each stage of Surya Namaskar was accompanied by regulation of breath.

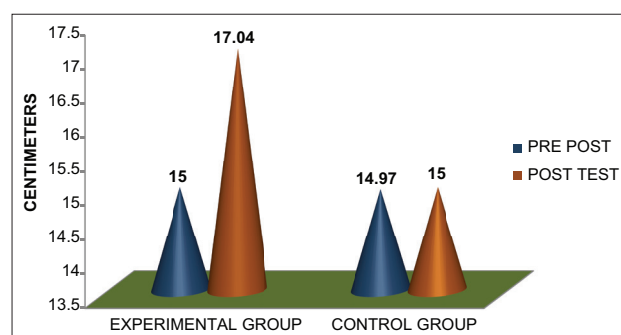
### 4. RESULTS OF THE STUDY

Table 1 indicates that there was a significant improvement on the speed through the yogasana practices. It reveals that the obtained *t*-ratio 5.90 is

significant because  $P < 0.05$  is statistically significant, level of confidence. Hence, there was a significant improvement on the speed between the pre- and post-tests of the experimental group, whereas the control group showed no significant improvement. Hence, the result indicates that the significant improvement on the speed was due to the yogasana practice alone.



**Figure 1:** The mean difference of pre- and post-test scores on speed of the experimental and control groups



**Figure 2:** The mean difference of pre- and post-test scores of trunk flexibility of the experimental and control groups

**Table 1:** Computation of “*t*”-ratio between the pre- and post-tests on speed of experimental and control groups

Group	Test	Mean	SD	$\sigma$ DM	DM	<i>t</i> -ratio	<i>P</i> value
Experimental	Pre-test	7.68	0.38	0.19	0.03	5.90	0.01
	Post-test	7.48	0.35				
Control	Pre-test	7.678	0.39	0.01	0.01	1.45	0.16
	Post-test	7.677	0.39				

\*Significance at 0.05 level

**Table 2:** Computation of “*t*”-ratio between the pre- and post-tests on trunk flexibility of the experimental and control groups

Group	Test	Mean	SD	$\sigma$ DM	DM	<i>t</i> -ratio	<i>P</i> value
Experimental	Pre-test	15	1.51	2.04	0.41	4.85	0.01
	Post-test	17.04	1.54				
Control	Pre-test	14.97	1.84	0.02	0.18	0.12	0.90
	Post-test	15	1.51				

\*Significance at 0.05 level

Table 2 indicates that there was a significant improvement on the trunk flexibility through the yogasana practice. It reveals that the obtained  $t$ -ratio 4.85 was significant because  $P < 0.05$  is statistically significant, level of confidence. Hence, there was a significant improvement on the trunk flexibility between pre- and post-tests of the experimental group, whereas the control group showed no significant improvement. Hence, the result indicates that the significant improvement on the trunk flexibility was due to the yogasana practice alone.

## 5. DISCUSSION ON FINDINGS

The result of the study reveals that the 12 weeks of yogasana training program on the selected dependent variable, there was a significant improvement on the speed. It reveals that the obtained  $t$ -ratio 5.90 is significant because  $P < 0.05$  is statistically significant, level of confidence. Hence, there was a significant improvement on the speed between pre- and post-tests of the experimental group, whereas the control group showed no significant improvement. Hence, the result indicates that the significant improvement on the speed was due to the yogasana training alone.

The result of the study reveals that the 12 weeks of yogasana practice on the selected dependent variables,

there was a significant improvement on the trunk flexibility. It reveals that the obtained  $t$ -ratio 4.85 is significant because  $P < 0.05$  is statistically significant, level of confidence. Hence, there was a significant improvement on the trunk flexibility between pre- and post-tests of the experimental group, whereas the control group showed no significant improvement. Hence, the result indicates that the significant improvement on the trunk flexibility was due to the yogasana training alone. The result of the study is in consonance with the research done by Vairavasundaram and Palanisamy (2014).

## 6. CONCLUSIONS

It was concluded that there was a significant improvement on the selected variables, namely, speed and flexibility by the application of yogasana practices.

## REFERENCES

- Raj, S.T.S., and Sudheer, G.P. Effect of specific yoga and aerobic exercises on selected motor abilities among cricket players. *Int J Yoga Physiother Phys Educ*, 2018, 3(1), 57-60.
- Vairavasundaram, C., and Palanisamy, A. Impact of aerobic dance on selected physical components on intercollegiate handball players. *Star Phys Educ*, 2014, 10(7), 28-32.



# Influence on Different Packages of Yogic Practices on Cardiovascular Endurance among College Men Students

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## ABSTRACT

The purpose of the present investigation is to find out the influence of varied packages of yogic practices on cardiovascular endurance among college men students. To achieve this purpose, 90 men subjects were selected at random from Acharya Nagarjuna University Yoga Centre. Their age ranged from 18 to 25 years. They were divided into three equal groups of 30 subjects each and assigned to experimental Group I, experimental Group II, and control group (CG). In a week, the experimental Group I underwent Surya Namaskar, the experimental Group II underwent Pranayama, and the CG was not given any specific training. All the subjects underwent one area of test, namely, cardiovascular endurance. They assessed before and after the training period of 12 weeks. The analysis of covariance was used to analyze the data. The study revealed that the above said criterion cardiovascular was significantly improved due to the influence of varied packages of yogic practices on cardiovascular endurance among college men students.

**Keywords:** Cardiovascular endurance, Pranayama, Surya Namaskar.

## 1. INTRODUCTION

Yoga is a right life, right movement. We live by the union of several movements and principles. The lungs breathe in union with the air, the lungs live in yoga with the air. The heart beats in union with the blood, the heart lives in yoga with the blood. Our body lives in union with the pure spirit and that in union with the divine. This union is called yoga. All life is verily a yoga. Yoga means union, communion, connection, touch, and contact, yoga is yoking of the mind to the soul, the human to the divine in us. In the technical sense, yoga is psychic science showing us how to live in tune with the pure spirit that is our divine essence. Cardiovascular endurance is also frequently called cardiorespiratory endurance, cardiovascular fitness, aerobic capacity, and aerobic fitness or is sometimes more broadly termed “endurance” although endurance may also refer to the ability of the muscle to do repeated work without fatigue. It is also one of the five components of physical fitness

### 1.1. Statement of the Problem

The purpose of the study was to find out the influence on different packages of yogic practices on cardiovascular endurance among college men students.

## 2. METHODOLOGY

To achieve the purpose of investigation, 90 college men students were randomly selected from Acharya Nagarjuna University Yoga Centre; the subjects' age ranged from 18 to 25 years. The selected subjects were randomly divided into three equal groups, experimental Group I underwent Surya Namaskar, experimental Group II underwent Pranayama, and control group (CG) was not given any specific training each group consisted of 30 subjects. All the subjects underwent one area of test, namely, cardiovascular endurance. They assessed before and after the training period of 12 weeks. The analysis of covariance was used to analyze the data.

**Table 1: Computation of analysis of covariance of cardiovascular endurance (scores in meters)**

Test	Exp. Group I	Exp. Group II	CG	SOV	SS	df	MS	F
Pre-test mean	2596	2698	2701	B	40,055.32	3	20,047.74	0.31*
				W	5,658,416.6	89	64,976.32	
Post-test mean	269.1	2563	2766	B	462,588.56	2	225,689.55	3.31*
				W	5,009,416.67	88	57,576.51	
Adjusted post-test mean	2940	2835	2730	B	504,832.20	2	252,425.21	84.9*
				W	255,474.12	86	2970.65	

\*Significant at 0.05 level of confidence

## 2.1. Dependent Variable

Cardiovascular endurance.

## 2.2. Independent Variables

- Experimental Group I – Surya Namaskar.
- Experimental Group II – Pranayama
- CG – No training.

## 2.3. Collection of Data

The data on cardiovascular endurance were collected by administering Cooper's 12 min run/walk test. Pre-test was collected before the training program and post-test was collected after the training session. In both the cases,

## 3. RESULTS AND DISCUSSION OF CARDIOVASCULAR ENDURANCE

The statistical analysis comparing the initial and final means of cardiovascular endurance assessed through Cooper's 12 min run/walk test due to Surya Namaskar and Pranayama yogic practice group on college men students presented in Table 1.

As shown in Table 1, the obtained F value on the scores of the pre-test which proved that the random assign moment of the subject was successful and their scores in cardiovascular endurance before the training were equal and there were no significant differences. The analysis of post-test means proved that the obtained F value was greater than the required F value of to be significant at 0.05 levels. Taking into consideration of the pre-test and post-test means, the adjusted post-test means were done and the obtained F value of 84.9\* was greater than the required F value of 3.103, hence, it was accepted that Surya Namaskar and Pranayama yogic practice group significantly increased the cardiovascular endurance. Since the

**Table 2: Scheffe's confidence interval test scores on cardiovascular endurance**

Means			Mean differences	Required CI
Exp. Group I	Exp. Group II	Control group		
2596.74	2846.05	-	69.58*	34.31
2698.47	-	2635.36	196.58*	34.01
-	2878.25	2730.58	125.63*	34.25

\*Significant at 0.05 level of confidence. CI: Confidence interval

significant differences were recorded, the result was subjected to *post hoc* analysis using Scheffe's confidence interval test. The results are presented in Table 2.

Table 2 shows that the adjusted post-test mean difference in cardiovascular endurance between the experimental Group 1 and experimental Group 2, the experimental Group 1 and CG, and between the experimental Group 2 and CG is 65.72, 181.26, and 115.54, respectively, which were statistically significant at 0.05 level of confidence. The ordered adjusted means are presented through bar diagram for better understanding of the result of this study.

## 4. DISCUSSION ON THE FINDINGS OF CARDIOVASCULAR ENDURANCE

The result of the study on cardiovascular endurance indicates that all the experimental groups, namely, the experimental Group 1 and experimental Group 2 brought about significant improvement after the training. The result of the study indicates that there was a significant difference on cardiovascular endurance between the experimental Group 1 and experimental Group 2. However, Surya Namaskar yogic practice group was found to be better in increasing of cardiovascular endurance than Pranayama yogic practice group. The result of this study on cardiovascular endurance has in

line with the study conducted by Hagins, Moore, and Rundle (2007).

the cardiovascular endurance among the college men students.

## 5. CONCLUSIONS

Two different yogic practice methods Surya Namaskar helped to increase the cardiovascular endurance than Pranayama. Systematic 12 weeks of yogic practice system were a suitable training system to improve

## REFERENCE

1. Hagins, M., Moore, W., and Rundle, A. Does practicing hatha yoga satisfy recommendations for intensity of physical activity which improves and maintains health and cardiovascular fitness? *J BMC complement Alter Med*, 2007, 30(7), 40.

# Combined and Individualized Effects of Weight Training and Game-specific Exercises Training on Selected Physical Variables of Intercollegiate Men Volleyball Players

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## ABSTRACT

The purpose of the study was to find out the combined and individualized effects of weight training and game-specific exercises training on selected physical variables of intercollegiate men volleyball players. To achieve this purpose, 45 men football players studying bachelor's degree in the University College of Physical Education and Sports Sciences, Acharya Nagarjuna University, Guntur, Andhra Pradesh, India, were selected as subjects and they were divided into three equal groups of 15 subjects each at random, namely, weight training group, game-specific exercises training group, and combined training group. The age of the selected subjects was ranged from 18 to 21 years. Group I underwent weight training, Group II underwent game-specific exercises training, and Group III underwent combined training for 3 days per week for 12 weeks. The three groups participated in the training for a period of 12 weeks to find the outcome of the training packages. To find out a significant difference between the adjusted post-test means by computing analysis of covariance for each variable separately. Since three groups were compared, whenever the obtained "F" ratio for the adjusted post-test was found to be significant, the Scheffe's test was applied as *post hoc* test find out paired mean differences, if any. In all cases, 0.05 level of confidence was fixed to test the significance which was considered as an appropriate. The combined training group had shown significant improvement in all the selected physical variables than the individualized groups.

**Keywords:** Speed, Strength, Weight training.

## 1. WEIGHT TRAINING

Weight training refers to the substitution of skills other than the skills directly involved in the performance of an event helps sustain their aerobic and muscular strength. The main objective is to avoid injuries and maintain muscular balance through a period of intense sports training. Further, weight training as the training program of aerobic and an aerobic in nature, its concurrent effect would have highly positive to the game that underlies speed and endurance.

## 2. SPORTS SPECIFIC TRAINING

The Greek physician Galen (AD 129-210) is generally accepted to be the originator of sports specific training. As a chief physician to Roman gladiators, Galen devised training drills to match the movements from the arena. Galen's gladiator drills are also referred to as functional training, that is, exercises consisting of movements that are specific to a particular sport. But 23 while the gladiators had a training system that meant they did not injure others.

Competitors, they were quite expensive to train and keep ready for the ring. With practice, one may get better at performing this sort of exercise, but there is actually no inclusive evidence that shows it makes any difference to our sporting performance.

### 3. STATEMENT OF THE PROBLEM

The purpose of the present study is to find out the combined and individualized effects of weight training and game-specific exercises training on selected physical variables of intercollegiate men volleyball players.

## 4. METHODOLOGY

### 4.1. Selection of the Subjects

The purpose of the study was to find out the combined and individualized effect of weight training and game-specific exercises training on selected physical variables of intercollegiate men volleyball players. To achieve this purpose, 45 men football players studying bachelor's degree in the University College of Physical Education and Sports Sciences, Acharya Nagarjuna University, Guntur, Andhra Pradesh, India, were selected as subjects and they were divided into three equal groups of 15 subjects each at random, namely, weight training group, game-specific exercises training group, and combined training group. The age of the selected subjects was ranged from 18 to 21 years. Group I underwent weight training, Group II underwent game-specific exercises training, and Group III underwent combined training for 3 days per week for 12 weeks. All the subjects written consent was made to take part in the training program. A qualified physician examined the subjects and declared that they were medically and physically fit to participate in the training program. Since all the subjects were hostlers of Acharya Nagarjuna University, they had a similar academic work and regular activities in accordance with the requirements of the department of physical education and sports sciences curriculum. Medically and declared that they were fit for this study.

### 4.2. Selection of Variables

The following variables are selected for this study: The physical variables, namely, speed and strength.

### 4.3. Independent Variables

Weight training.

### 4.4. Dependent Variables

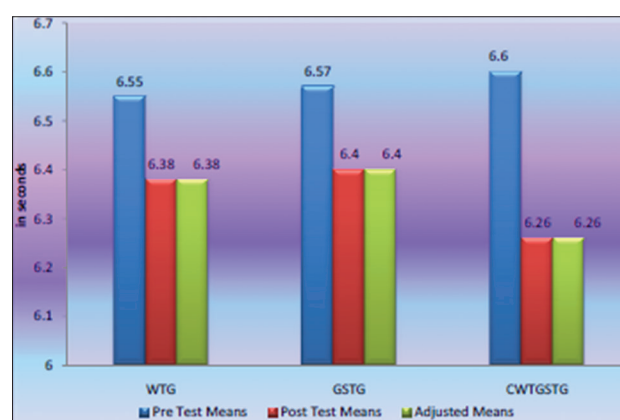
- a. Physical variables
  1. Speed
  2. Strength.

## 5. EXPERIMENTAL DESIGN

The study was formulated as a true random group design, consisting of a pre-test and post-test. The subjects ( $n = 45$ ) were randomly assigned to three equal groups of 15 subjects each. The groups were assigned as weight training group, game-specific exercises group, and combined weight training with game-specific exercises group in an equivalent manner. The three groups participated in the training for a period of 12 weeks to find the outcome of the training packages.

## 6. VARIABLES AND TEST ITEM

S. No.	Variables	Test item	Unit of measurement
1	Speed	50 m dash	Seconds
2	Strength	Bent knee sit-ups	Numbers

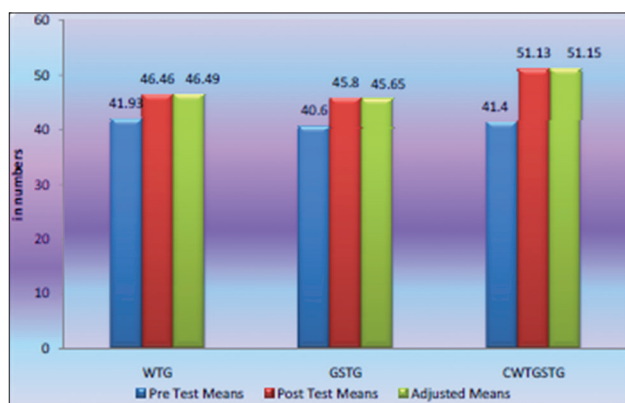


**Figure 1:** The adjusted post-test mean values of weight training, game combined training groups on speed game-specific exercises training, and combined training groups on speed



## 7. TRAINING PROGRAM

During the training period, the three experimental groups, namely, weight training group, game-specific exercises training group, and combined training group underwent their respective training program, 3 days per week for 12 weeks in addition to their regular physical education activities. Everyday, the workout lasted for about 90 min including warming-up and cool-down exercises. The detailed training program for weight training group and game-specific exercises training group was given separately in Appendix I and Appendix II. The subjects underwent their respective training program under strict supervision. All the subjects involved in the training program were questioned about their status throughout the training period. None of them (117) reported injuries; however, muscle soreness reported in the early weeks, subsided later.



**Figure 2:** The adjusted post-test mean values of weight training, game combined training groups on strength game-specific exercises training, and combined training groups on speed

## 8. STATISTICAL TECHNIQUE

To find out a significant difference between the adjusted post-test means by computing analysis of covariance for each variable separately. Since three groups were compared, whenever the obtained “F” ratio for the adjusted post-test was found to be significant, the Scheffe’s test was applied as *post hoc* test find out paired mean differences, if any. In all cases, 0.05 level of confidence was fixed to test the significance which was considered as an appropriate.

## 9. RESULTS AND DISCUSSION

Table 1 shows that the pre-test mean values on speed of weight training, game-specific exercises training, and combined training groups are 6.55, 6.57, and 6.60, respectively. The obtained “F” ratio of 1.08 for pre-test scores is lesser than the table value of 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on speed. The post-test mean values on speed of weight training, game-specific exercises training, and combined training groups are 6.38, 6.40, and 6.26, respectively. The obtained “F” ratio value of 63.47 for post-test scores is greater than the table value of 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on speed.

Table 2 shows that the mean difference between weight training group and combined group, and game-specific exercises training group and combined training group was 0.12 and 0.14, respectively, greater than the required confidence interval value 0.02 at 0.05 level of confidence. Hence, there exists a significant difference.

Table 3 shows that the pre-test mean values on strength of weight training, game-specific exercises training, and

**Table 1:** Analysis of covariance for the pre- and post-test on speed of weight training, game-specific exercises training, and combined training groups (in seconds)

Test	Weight training group	Game-specific exercises training group	Combined training group	Source of variance	Sum of squares	df	Mean squares	Obtained f ratio
Mean	6.55	6.57	6.60	Pre-test Between	0.01	2	0.007	1.08
SD	0.08	0.07	0.08	Within	0.28	42	0.001	
Mean	6.38	6.40	6.26	Post-test Between	0.17	2	0.08	63.47*
SD	0.04	0.03	0.03	Within	0.05	42	0.001	
Mean	6.38	6.40	6.26	Adjusted post-test Between	0.17	2	0.08	61.45*
				Within	0.05	41	0.001	

**Table 2: The Scheffe's test for the difference between paired means on speed**

Weight training group	Game-specific exercises training group	Combined training group	Mean differences	Confidence interval value
6.38	6.40	--	0.02	--
6.38	--	6.26	0.12*	0.02
--	6.40	6.26	0.14*	--

**Table 3: Analysis of covariance for the pre- and post-test on strength of weight training, game-specific exercises training, and combined training groups (in seconds)**

Test	Weight training group	Game-specific exercises training group	Combined training group	Source of variance	Sum of squares	df	Mean squares	Obtained f ratio
Mean	41.93	40.60	41.40	Pre-test Between	13.51	2	6.75	1.39
SD	2.43	2.19	1.95	Within	204.13	42	4.86	--
Mean	46.46	45.80	51.13	Post-test Between	253.33	2	126.66	52.22*
SD	1.68	1.56	1.40	Within	101.86	42	2.42	--
Mean	46.59	45.65	51.15	Adjusted post-test Between	258.13	2	129.06	56.64*
				Within	93.41	41	2.27	

**Table 4: The Scheffe's test for the difference between paired means on strength**

Weight training group	Game-specific exercises training group	Combined training group	Mean differences	Confidence interval value
46.59	45.65	--	0.94	--
46.59	--	51.15	4.56*	1.39
--	45.65	51.15	5.50*	--

combined training groups are 41.93, 40.60, and 41.40, respectively. The obtained "F" ratio of 1.39 for pre-test scores is lesser than the table value of 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on strength. The post-test mean values on strength of weight training, game-specific exercises training, and combined training groups are 46.46, 45.80, and 51.13, respectively. The obtained "F" ratio value of 52.22 for post-test scores is greater than the table value of 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on strength.

Table 4 shows that the mean difference between weight training group and combined group, and game-specific exercises training group and combined training group was 4.56 and 5.50, respectively, greater than the required confidence interval value 1.39 at 0.05 level of confidence. Hence, there exists a significant difference. The results of this study showed that the mean difference between weight training group and game-specific exercises training group was 0.94 lesser than the required confidence interval value 1.39 at 0.05 level of confidence. Hence, there exist insignificant differences.

## 10. CONCLUSIONS

From the analysis of the data, the following conclusions were drawn:

1. The weight training group had shown significant improvement in all the selected physical variables after undergoing the weight training for a period of 12 weeks.
2. The game-specific training group had shown significant improvement in all the selected physical variables after undergoing the game-specific training for a period of 12 weeks.
3. The combined training group had shown significant improvement in all the selected physical variables after undergoing the combined training for a period of 12 weeks.
4. The combined training group had shown significant improvement in all the selected physical variables than the individualized groups.

## **11. RECOMMENDATIONS FOR FUTURE RESEARCH**

1. A similar study may be conducted on players of university, national level football player's team to assess their level in the selected variables.
2. A similar study may be conducted on different games and sports.
3. A similar study may be conducted in greater detail to assess changes on biochemical, anthropometrical, and psychological variables.

# Effect of Resistance Training, Body Resistance Training, and Combined Training on Biochemical Variables

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Puducherry, India.*

## ABSTRACT

The purpose of the study was to assess the effect of resistance (weight) training, body resistance (body weight) training, and combined training (combination of weight and body weight) on biochemical variables (high-density lipoprotein cholesterol [HDL-C], low-density lipoprotein cholesterol [LDL-C], and total protein [TP]). Forty male athletes were randomly selected as three experimental groups and a control group (CG). The resistance (weight) training group (RTG,  $n = 10$ ) had undergone eight weight training exercises of low-intensity training (30%–50% in one repetition maximum [1RM]), medium-intensity training (50%–70% in 1RM), and high-intensity training (80%–100% in 1RM). The body resistance (weight) training group (BRTG,  $n = 10$ ) had undergone 18 body weight exercises training (six exercises of low, medium, and high intensities) and the combined training (weight and body weight) group (CTG,  $n = 10$ ) had undergone eight weight training exercises of low intensity (30–50% in 1RM), high intensity (80–100% in 1RM), and six body weight exercises training (medium intensity) and the CG (CG,  $n = 10$ ) maintained normal activity. The biochemical variables estimated by blood plasma tests. The CTG and RTG also showed a significant increase in blood concentration of HDL-C and TP than the CG. The training resulted in reduced blood concentration of LDL-C for the CTG. The RTG, BRTG, and CG did not demonstrate any significant changes in LDL-C during the training. On the whole, it was concluded that the combined and RTGs produced better results on HDL-C, LDL-C, and TP.

## 1. INTRODUCTION

Human strength, the ability to exert muscular force, has been of interest since antiquity, and many accounts of superhuman ability to lift stupendous weights have been recorded. Presumably, this ability was developed by practicing with increasingly heavier weights. The scientific principle of increasing the load or resistance against which the muscles worked as strength increased has been called progressive resistance exercise.

It has been employed extensively in modern times by individuals, coaches, and athletes for improving competitive performance. Recently, the principle has gained wide use in the area of medicine for rehabilitating the physically weakened by disease and injury. The single most important force responsible for the performance explosion today is by the application of science and technology in the sports field.

A major objective of physical educators and coaches is to construct the most effective individualized conditioning

or training programs for their students and athletes. To achieve this, adequate knowledge of the fundamental principles of physical training and a systematic and scientific approach is essential.

### 1.1. Statement of the Problem

The main purpose of the study was to assess the effect of resistance (weight) training, body resistance (body weight) training, and combined training (combination of weight and body weight) on biochemical variables such as high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), and total protein (TP) which were assessed to find out the effect of resistance training, body resistance training, and combined training.

## 2. METHODOLOGY

This study was undertaken to find out the effect of resistance training, body resistance training, and

combined training on physical and biochemical variables.

### 2.1. Selection of Participants

Eighty male athletes were randomly selected as participants for the experiment. The participant's age ranged between 21 and 25 years and all were residing in the college hostel. The participants were divided into four groups; resistance training group (RTG), body RTG (BRTG), combined training group (CTG), and control group (CG). Each group consists of 20 players.

### 2.2. Training Program

The training was conducted for 16 weeks to the experimental groups in our college fitness center.

Group I, the RTG had to undergo resistance (weight) training such as low-intensity resistance (weight) training (30–50% in one repetition maximum [1RM]), medium resistance (weight) training (50–70% in 1RM), and high-intensity resistance (weight) training (80%–100% in 1RM) on alternate days that are on Mondays, Wednesdays, and Fridays. For low-intensity training, the repetitions are fixed and progressively decreased once in every 3 weeks from 30, 25, and 20; for medium-intensity training, the repetitions are fixed and progressively decreased at the end of every 3 weeks from 15, 10, and 8; and for high-intensity training, the repetitions are fixed and progressively decreased once in every 3 weeks from 6, 5, 4 or 3, and 2 or 1. Group II, the BRTG had to undergo 18 exercises of body weight training programs, once in every 3 weeks, the repetitions are progressively increased from 20, 25, and 30 on alternate days. These exercises were equally divided into six on alternate days. These exercises are divided on the basis of intensities of exercises that are low-intensity exercises were executed every Tuesdays, medium-intensity exercises were undergone on Thursdays, and high-intensity exercises were undergone on Saturdays. Group III, the CTG had to undergo both types of resistance (weight) training of low intensity (30–50% in 1RM) and high intensity (80–100% in 1RM) on Mondays and Fridays and body weight training content of six exercises (medium intensity) on Wednesdays. For all experimental groups, three sets are kept constant in each exercise and the interval between exercises was 2 min for the first 3 weeks, 3 min intervals for the second 3 weeks, and 4 min interval for the last 3 weeks. While Group IV,

the CG was kept away to assess the difference in training. For the experimental group, proper warm-up and warm-down exercises were given on the days of training. The load was fixed after seeing the 1RM of each participant in exercise. This was done before training.

### 2.3. Selection of Variables

The biochemical variables selected were HDL-C, LDL C, and TP. The blood samples were drawn in heparins test tubes for all the participants. The pre and post samples were taken in the identical condition.

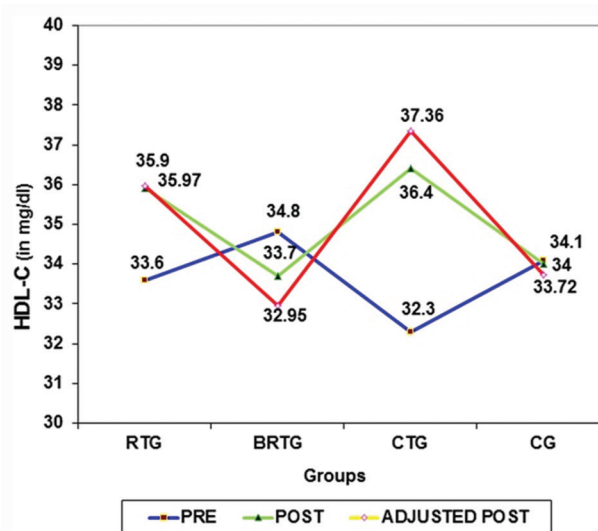
### 2.4. Collection of Data

The data collected from all the four groups were statistically analyzed. To find out the significant improvement between the pre and post means, dependent *t*-test was used as a statistical technique as recommended by Clarke and Clarke (Clarke and Clarke, 1984).

### 2.5. Statistical Tool

To find out the significant difference among groups, analysis of covariance was used. As four groups were involved, whenever the “F” ratio was found to be significant, Scheffe's test was used as *post hoc* test to determine which of the paired mean differed significantly. The criterion for statistical significance was set at 0.05 level of confidence ( $P < 0.05$ ).

## 3. RESULTS AND DISCUSSION





**Analysis of covariance on biochemical variables of the RTG, BRTG, CTG, and CG (in mg/dl)**

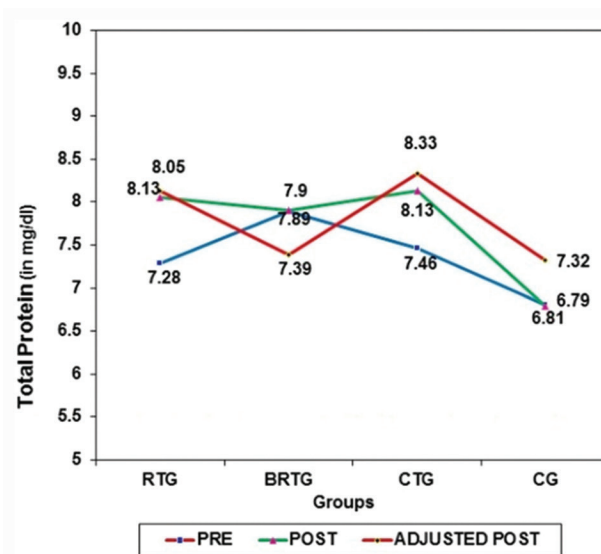
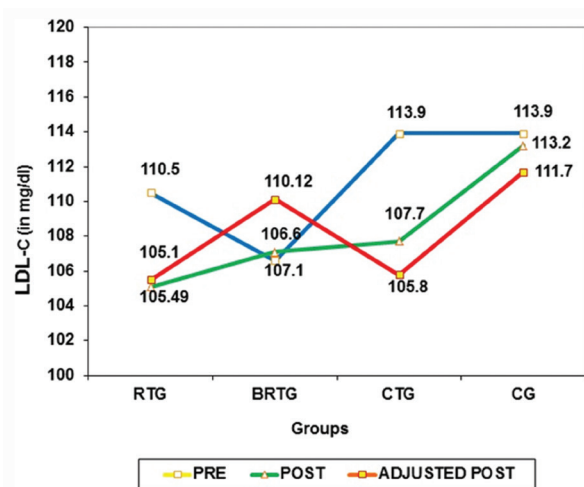
Variable	Adjusted post-test means				df	Sum of squares	Mean square	F-ratio	Sig. (two tailed)
	RTG	BRTG	CTG	CG					
High-density lipoprotein cholesterol	35.97	32.95	37.36	33.72	B W	35.97	32.95	6.93*	0.000
Low-density lipoprotein cholesterol	105.49	110.12	105.80	111.70	B W	289.16 1478.42	96.39 42.24	2.28	0.125
Total protein	8.13	7.39	8.33	7.32	B W	7.89 3.34	2.63 0.095	27.68*	0.000

\*Significant at 0.05 level of confidence

**Scheffe's *post hoc* test for differences the adjusted post-test paired means of high-density lipoprotein cholesterol and total protein (in mg/dl)**

Variable	Adjusted post-test means				Mean difference	Confidence interval
	RTG	BRTG	CTG	CG		
High-density lipoprotein cholesterol	35.97	32.95	-	-	3.02*	2.46
	35.97	-	37.36	-	1.39	
	35.97	-	-	33.72	2.25	
	-	32.95	37.36	-	4.41*	
	-	32.95	-	33.72	0.77	
	-	-	37.36	33.72	3.64*	
Total protein	8.13	7.39	-	-	0.74*	0.38
	8.13	-	8.33	-	0.02	
	8.13	-	-	7.32	0.81*	
	-	7.39	8.33	-	0.94*	
	-	7.39	-	7.32	0.07	
	-	-	8.33	7.32	1.01*	

\*Significant at 0.05 level

**4. CONCLUSIONS**

1. The blood HDL-C increased among the resistance training and CTGs after 16 weeks of training. The

CTG showed significantly increased in HDL-C when compared to the body resistance training and CGs.

2. The LDL-C has reduced significantly in the CTG only and the other two experimental groups have not shown any change significantly after training. Between the experimental groups, there was no significant change taken place in LDL-C.
3. Both the resistance training and CTGs showed increased protein level. The TP level of the CTG was elevated than the BRTG.

## 5. RECOMMENDATIONS

The following recommendations have been made based on the results of the study:

1. Alterations in the biochemical variables such as protein and HDL-C are indicative of damage and building of muscle simultaneously. Hence, it is suggested to reduce the level of damage to muscle and instead concentration may be given to tone and build muscle in a scientific way.
2. The resistance and combination resistance training have increased HDL-C. Hence, these training may be recommended to develop HDL-C.
3. The combination of both resistance and body resistance training had much effect on protein. Hence, the protein may be increased by doing combined training exercises.
4. Similar studies can be conducted by taking more related biochemical variables such as total body cholesterol, fat mass, amino acids, creatinine, and glucose.
5. To assess the training impact and difference on LDL-C variable, different types of training may be given.
6. Hardly, a few studies have been done on females and weight training. Studies may be conducted by taking female subjects exclusively.

## REFERENCES

1. Everett, A. *Resistance Training Instruction*. United States: Human Kinetics; 1999. p. 7.
2. O'Connor, B., Simmons, J., O'Shea, P., and O'Connor, R. *Weight Training Today*. Los Angeles: West Publishing Company; 1989. p. 2.
3. Sho, F. *Physical Conditioning*. Philadelphia, PA: W.B. Saunders Company; 1978. p. 55.
4. Garry, M., and McGlynn, G. *Dynamics of Strength Training*. Iowa, San Francisco: Wm. C. Brown Publishers. 1990. p. 2.
5. Daniel, P.R. *Strength Training*. 2<sup>nd</sup> ed. New York: Leisure Press; 1982. p. 57.
6. Crouse, S.F., O'Brien, B.C., Grandjean, P.W., Lowe, R.C., Rohack, J.J., and Green, J.S. Effects of training and a single session of exercise on lipids and apolipoproteins in hypercholesterolemic men. *J Appl Physiol*, 1997, 83(6), 2019-2028.
7. Durstine, J.L., Grandjean, P.W., Cox, C.A., and Thompson, P.D. Lipids, lipoproteins, and exercise. *J Cardiopulm Rehabil*, 2002, 22(6), 385-98.
8. Frupp, R.R., and Hodgson, J.L. Effect of resistive training on plasma lipid and lipoprotein levels in male adolescents. *J Pediatr*, 1987, 111, 926-931.
9. King, A.C., Haskell, W.L., Young, D.R., Oka, R.K., and Stefanick, M.L. Long-term effects of varying intensities and formats of physical activity on participation rates, fitness, and lipoproteins in men and women aged 50 to 65 years. *Circulation*, 1995, 91(10), 2596-604.
10. Kokkinos, P.F., Hurley, B.F., Vaccaro, P., Patterson, J.C., Gardner, L.B., Ostrove, S.M., and Goldberg, A.P. Effects of low-and high-repetition resistive training on lipoprotein-lipid profiles. *Med Sci Sports Exerc*, 1988, 20(1), 50-54.
11. LeMura, L.M. Lipid and lipoprotein profiles, cardiovascular fitness, body composition, and diet during and after resistance, aerobic and combination training in young women. *Eur J Appl Physiol*, 2002, 82(5-6), 451-458.
12. Phillips, S.M., Tipton, K.D., Ferrando, A.A., and Wolfe, R.R. Resistance training reduces the acute exercise-induced increase in muscle protein turnover. *Am J Physiol*, 1999, 276(1), 118-124.
13. Tokmakidis, S.P., and Volaklis, K.A. Training and detraining effects of a combined-strength and aerobic exercise program on blood lipids in patients with coronary artery disease. *J Cardiopulm Rehabil*, 2003, 23(3), 193-200.
14. Wilund, K.R., Ferrell, R.E., Phares, D.A., Goldberg, A.P., and Hagberg, J.M. Changes in high-density lipoprotein-cholesterol subfractions with exercise training may be dependent on cholesterol ester transfer protein (CETP) genotype. *Metabolism*, 2005, 51(6), 774-778.

# The Art of Arambai: A Weapon of War into Sports Discipline

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## ABSTRACT

Arambai which can roughly be translated into English as “dart” is an indigenous war weapon of the Meitei’s in Manipur. The weapons had a significant place in ancient Manipur Warfare. It was with the help of this weapon that the Manipur soldiers were able to defeat the Burmese invaders and forced them to leave Manipur. The Arambai was once the most feared weapon of war of the Meitei’s. The Manipur soldiers, especially on horseback, are experts in using this weapon. They swirl the deathly poisoned Arambais and throw them to the enemy with great accuracy and speed which that performed or executed through fast galloping of the Manipuri pony. It is unfortunate that the young generations in Manipur are now unaware of the significance of the weapon which was once our pride.

**Keywords:** Arambai, Dart, Devastation, Pony.

## 1. INTRODUCTION

Manipur is a state in Northeast India with the city of Imphal as its capital. It has its border with Nagaland in the north, Mizoram in the south, Assam in the west, and Myanmar to its east. The state covers an area of 22,327 sq/km. This state with her 2000-year-old unique history has produced a breed of horses, known as ponies.

People of Manipur still today fond of riding horses, especially those who are in the village near the breeding areas. Since the ponies are easily available, young boys get the chance of riding ponies without saddle on horseback. Sometimes that ride horse using a rope in place of regular bridle. They imitate the ancient Manipuri Arambai soldiers by riding the ponies and throwing branches of small trees in place of the famous traditional Arambai weapons.

When we speak of the conservation of our cultural heritage, we often forget to consider Arambai as an important part of our rich tradition. In many major ancient battlefields, many indigenous weapons take major role. Among them, Arambai remains one of the traditional weapons that served great role in the past. Arambai which can roughly be translated into English as “dart” is an indigenous war weapon of the Meitei’s in Manipur. The weapons had a significant place in

ancient Manipur Warfare. It is with the help of these weapons that the Manipur soldiers were able to defeat the Burmese invaders and forced them to leave Manipur.

The Arambai was once the most feared weapon of war of the Meitei’s. The Manipur soldiers, especially on horseback, are experts in using this weapon. They swirl the deathly poisoned Arambais and throw them to the enemy with great accuracy and speed which are performed or executed through fast galloping of the Manipuri pony. It is unfortunate that the young generations in Manipur are now unaware of the significance of the weapon which was once our pride.

## 2. METHODOLOGY

The data were collected from the secondary sources such as books, internet, newspaper, magazine, and documents from Arambai association of Manipur.

### 2.1. Physical Fitness Components for the Practice of Arambai

Throwing of Arambai needs various physical components, they are as follows:

1. Cardiovascular components: (A constant elevated heart rate): Controlling the horse, mucking out stalls,

leading feeding, and overall taking care of the horse are a big job which can keep your heart rate elevate.

2. Muscular endurance: The art of Arambai requires constant use of muscle over and extended amount of time at the time of jumping you have to stay in point which is off the horse. This uses your leg muscle over and extended amount of time.
3. Muscular strength: It is also required muscular strength for controlling the moving up and down on a horse while they are trotting.
4. Flexibility: (Ability to stretch the body): In horse riding, the position of the horse rider stretches the leg and straightens the back. Is another important requirement in practicing Arambai.
5. Body composition: Equestrians are mostly ectomorph, slightly built, but they do have muscle.
6. Speed: Ability to handle speed in yet another crucial aspect of the art of Arambai.
7. Reaction time: In horseback riding, if the horse stumbles or knock down a rail one has to be able to react quickly to steady oneself at the horse.
8. Agility: Quick movement that can be sharp which required balance has agility becomes an important quality.
9. Balance: In riding horse, the ground is uneven and if we fail to maintain balance, we could fall down.
10. Coordination: In riding horse, you have to get out of the saddles and lean forward during which the. It required great coordination whole body work together.
11. Power: (Speed and strength): In racing and jumping, we and the horse have to be strong and fast.

Horse riding and Arambai throwing are an enjoyable recreational activity, it may improve physical health, mental health, and improve quality of live.

## 2.2. Physical Health

Recreational activities, especially riding horse, improve one's health such as maintaining lower body fat percentages, lowering blood and cholesterol levels, increasing muscular strength, flexibility, muscular endurance, body composition, and cardiovascular endurance. Overall, it increases one's stamina and energy level resulting in more focus for academic activities besides also having an impact on one's class attendance and attention, thus leading to more learning. And as we all know, "health is wealth."

## 2.3. Mental Health

Mental health is essential for overall physical health. Horse riding helps manage stress. It provides a chance to

nurture oneself and provides a sense of balance and self-esteem, which can directly reduce anxiety and depression. There is also an increased motivation to learn as it can serve as a laboratory for the application of contents learned in classrooms teaching. It provides a channel for releasing tension and anxiety, thus facilitating emotional stability and resilience. Such activities help students to become more self-reliant, emphatic, and self-disciplined.

## 2.4. Improved Quality of Life

People who make recreation a priority are more likely to feel satisfied with their lives overall, according to an American Recreation Coalition Study, 2000. Recreational activities help create a balance between academic pressures with physical and mental well-being. The effects of recreation are multifold. It enriches self-expression, self-fulfillment ability, interpersonal skills, techniques and methods of using leisure, physical strength, creative expression, and esthetic sense. Such attributes have a favorable effect on human beings who have limits in everyday life. Therefore, recreation is allowed to be used as a tool of therapy (Lee, 2000). Physical activity-based recreation helps participants recover from the deteriorated physical strength, caused by the lack of exercise, and develops the latent ability to achieve self-realization. This also helps people to deal with common day-to-day problems more effectively as it makes people more optimists and with a positive outlook to life.

## 2.5. Findings

According to the secretary of all Manipur Arambai Association Meisnam Khelan Sing, who himself has involved in horse-related activities for more than 20 years, "Arambai" can be used both for attacking and during retreating in battlefields. Curiously and quite interestingly, tactics used by the Arambai throwers of Manipur cavalries surprisingly resemble tactics employed by the mighty Mongol themselves.

Khelen says that "the association which was established in 2005 and has its office at Dewlaland has been training young students in throwing the dart weapons. They are taught several skills related with the art form for which horse riding, accuracy of throwing Arambai, gaining of speed, and different swirling are necessary."

## 2.6. Horse Riding

The activity of riding a horse, for enjoyment, exercise, or in competitions. Horse riding is often simply called riding. The usual American word is horseback riding.

## 2.7. Arambai Weapons

Arambai, literally meaning darts, is a simple weapon at the first sight. The weapon has an iron arrow head, which is attached to feathers of peacocks though kites' feathers were also used in the past. Users of these weapons, who are horse riders, swirl the deadly poisoned darts and throw it to the enemy with an unparalleled accuracy and speed which is gathered through fast galloping of the Manipuri ponies.

## 2.8. Skills of Arambai

- A. Front throw: (Throwing of Arambai at front)
  - 1. Hold the Arambai at below the horseback slightly bends your body.
  - 2. Put your both feet tightly close to each other facing them in the direction of throw.
  - 3. Pull the Arambai back with your soldier as far as possible and release the Arambai toward your goal.
- B. Back throw: (Throwing of Arambai at back)
  - 1. Hold the Arambai at below the horseback slightly bends your body.
  - 2. Put your both feet tightly close to each other facing them in the opposite direction of the throw.
  - 3. Pull the Arambai front with your soldier as far as possible and release the Arambai toward your goal.
- C. Side Throw: (Throwing of Arambai at sideward)
  - 1. Hold the Arambai at below the horseback slightly bends your body.
  - 2. Put your both feet tightly close to each other facing them to the direction of the throw (Sideward).
  - 3. Pull the Arambai side with your soldier as far as possible and release the Arambai below horse.

This great heritage which had once protected the former sovereign nation of Manipur from repeated assault by the Burmese, Tripurians, and Kasseris from the west has unfortunately failed to impress the imagination and the knowledge of today's generation due to lack of awareness.

However, this art form has been developing ever since tourism festival started to take more serious foot in this state. In this regard, the old Manipur Arambai Association has organized the Arambai demonstration show on November 29, 2014, following the finals of eight Manipur Polo international at the historic Imphal polo ground as the part of the tourism event Sangai Festival the art form of Arambai becomes more prevalent and knowledgeable to all. Recently, Sangai Festival has also been encouraging the art form an order to make it well known to the people.

## 3. CONCLUSION

From the study, it may be concluded that the possibility and necessity of introducing the Arambai as a unique sporting discipline. This will introduce the world to a new and ancient art in the form of sports.

## REFERENCES

- 1. Arambai. Available from: [https://www.youtube.com/watch?v=RJB\\_E2ZgZA](https://www.youtube.com/watch?v=RJB_E2ZgZA). [Last accessed on 2019 Apr 19].
- 2. Chingkheinganba, P. Arambai-the Meitei Weapon that Kept Medieval Burmese at Bay Article for e Pao Net. 2014.
- 3. Babita, B. A Report on India Kho Kho. Gloval Conference on Physical Education and Sports Science 2018. p. 55.
- 4. Horse-riding. Available from: <https://www.macmillan dictionary.com>. [Last accessed on 2020 Feb 12].
- 5. Javelin Throw-how to Play. Available from: <https://www.tutorialspoint.com>. [Last accessed on 2020 Feb 12].



# Physiological Adaptation of Gastrocnemius, Quadricep and Hamstring Muscles Following Resistance Exercise among Adolescent Males

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## ABSTRACT

**Background:** Resistance exercise is used to increase muscular hypertrophy, strength, power, and endurance, as well as improvement of muscle functional capacity and muscle wasting disease. However, the training duration required for muscle hypertrophy to manifest is unclear or controversial. The purpose of the study is to examine the effect of varying training durations of progressive resistance exercise (PRE) among adolescent male in inducing muscular hypertrophy (girth). The study hypothesized that participants would not differ significantly in muscle girths across varied durations of PRE. **Methods:** Seventy-two volunteer male participants of mean age  $16.44 \pm 0.73$  years were recruited using a random sampling technique. The study was conducted using repeated measures design, in which the participants' gastrocnemius (Calf), quadriceps/hamstring (thigh) girth muscles were measured at baseline using the International Society for the Advancement of Kinanthropometry protocol with an anthropometric tape, within and post-training durations of PRE. The participants were subjected to isotonic PRE programs involving standing calf (heel) raise and seated calf (heel) raise, thigh sled, forward lunge, back squat, front squat, leg (knee) extension, and leg (knee) curl 3 times per week for 12 weeks. Hypertrophy was measured in centimeters in terms of differences of girth (increase in circumference) between the baseline, within, and post-training durations of PRE. The measurements (girths) were subjected to analysis of variance repeated measures using SPSS. **Results:** The results indicated a significant difference between the baseline girth measurement and that of training durations of exercise (4, 8, and 12 weeks) in gastrocnemius (calf) ( $F_{(3,68)} = 14.39, P < 0.05$ ) and quadriceps/hamstring (thigh) muscles ( $F_{(3,68)} = 12.59, P < 0.05$ ). It was revealed that 12 weeks of PRE produced the highest increase in muscle girth (hypertrophy) compared with other training durations. **Conclusion:** PRE training of 12 weeks might result in achieving some optimal level of hypertrophy (girth) of the gastrocnemius and quadriceps/hamstring muscles compared with other training durations. This concurred with other studies, which also found out that longer training durations may not necessarily lead to a higher increase in girth in untrained adolescents. Clinical exercise physiologists and other related professionals may equally consider these durations in prescribing exercises for individuals with musculoskeletal atrophy.

## 1. INTRODUCTION

The goals of individuals to engage in resistance exercise programs are to improve muscle hypertrophy and strength (Zaroni *et al.*, 2019). Both muscle size and strength can increase following exercise (Loenneke *et al.*, 2019). The muscles on the front of the thigh referred to as quadriceps; hamstrings are located on the back of the thigh, while gastrocnemius is calf muscle (Panse *et al.*, 2018). These muscles are involved in almost all human daily activities such as standing, walking, jogging, running, lifting, pushing, pulling, and many other human movements (Panse *et al.*,

2018; Scmitt *et al.*, 2018; Butler and Dominy, 2016). Progressive resistance exercise (PRE) training has been associated with important health benefits, such as increase in muscle size, power, functional strength, and prevention of disease like arthritis (McArdle *et al.*, 2016). The major adaptation that occurs during PRE is an increase in muscle, termed hypertrophy that enhances muscular strength (Brumitt and Cuddeford, 2015; Robergs and Keteyan, 2003). Adaptations from PRE can be noticed in the muscles that have been used during a training period (Jones, 2016). The most important physiological changes that occur following resistance training are an increase in muscle mass.

This study investigated the effect of varying durations of PRE (4, 8, and 12 weeks), in inducing muscular hypertrophy (increase in girth) among adolescents on gastrocnemius (calf), and quadriceps and hamstring (thigh) muscles. It was hypothesized that participants will not differ significantly in muscle girths measure at varying durations of PRE (4, 8, and 12 weeks).

## 2. METHODS

The study was conducted using repeated design, in which the participants' muscles girth was measured before, within, and after the PRE (Baseline, 4, 8, and 12 weeks). Measurements were used in accordance with the protocol of the International Society for the Advancement of Kinanthropometry (ISAK, 2006).

## 3. RESULTS

The mean age, height, and weight of the participants are presented in Table 1.

**Table 1: Physical characteristics of the participants**

Variable	M±SD (n=72)
Age (years)	16.44±0.73
Height (cm)	171.78±6.28
Weight (kg)	56.41±6.25

**Table 2: Girth measurements at baseline and different exercise training durations**

Gastrocnemius (calf)	Mean±SD (n=72) (cm)	%Δ
Baseline	30.42±1.67	
4 weeks	33.54±1.64	1.91
8 weeks	35.57±1.62	3.55
12 weeks	37.14±1.41	5.46
Quadriceps/hamstring (thigh)		
Baseline	46.35±3.58	
4 weeks	47.72±3.49	2.96
8 weeks	48.61±3.46	4.88
12 weeks	49.50±3.32	6.79

%Δ = Percent change

The result indicates significant difference between the baseline girth measurement and that of three different durations of exercise (4, 8, and 12 weeks) at both 95 and 99% confidence level in both muscles gastrocnemius ( $F_{(3,68)} = 14.39, P < 0.05$ ), quadriceps/hamstring ( $F_{(3,68)} = 19.32, P < 0.05$ ). Meaning that, there is an increase in muscle girth in both 4, 8, and 12 weeks

**Table 3: Difference in gastrocnemius, quadriceps/hamstring muscle girths across training durations**

Calf	M±SD	MD	Df	F-value	P-value
Baseline	30.42±1.67			14.39	0.000
4 weeks	33.54±1.64	3.12	3		
8 weeks	35.57±1.62	2.03			
12 weeks	37.14±1.41	1.56	68		
Quadriceps/hamstring (thigh)					
Baseline	46.35±3.58			19.32	0.000
4 weeks	47.72±3.49	1.37	3		
8 weeks	48.61±3.46	2.26			
12 weeks	49.50±3.32	3.15	68		

MD: Mean difference

**Table 4: Scheffe *post hoc* analysis of muscle girth at different duration**

Site	MD	SE
Gastrocnemius muscle		
Baseline to 4 weeks	0.619 cm*	0.029
Baseline to 8 weeks	1.150 cm*	0.054
Baseline to 12 weeks	1.772 cm*	0.103
4–8 weeks	0.531 cm	0.046
4–12 weeks	1.153 cm*	0.096
8–12 weeks	0.622 cm	0.082
Quadricep/Hamstring		
Baseline to 4 weeks	1.372 cm*	0.131
Baseline to 8 weeks	2.264 cm*	0.210
Baseline to 12 weeks	3.150 cm*	0.213
4–8 weeks	0.892 cm	0.171
4–12 weeks	1.778 cm*	0.184
8–12 weeks	0.886 cm	0.077

\*The mean difference (MD) is significant at 0.05 level

of progressive exercise compared with baseline. This implies that these exercise durations do improve gastrocnemius, quadriceps, and hamstring muscle girth.

## 4. DISCUSSION

The finding of this study indicates that in 4 weeks, calf muscle girth increased by 1.9% and thigh by 2.9%. This is in unison with the report of Antonio (2004), who stated that training for as little as 4 weeks can induce a significant increase in muscle area for untrained subjects. Longer training duration does not necessarily translate into a proportional increase in the muscle (Antonio, 2004). In 8 weeks, calf muscle girth increases by 3.6% and thigh by 4.8%. This finding

is lower than that of Bradley and Shields (2006). In 12 weeks, calf girth increases by 5.5% and thigh by 6.79%. This finding is in line with that of Abe *et al.* (2005), who documented an increase in quadriceps and hamstring muscle by 5.9% and 4.5%, respectively. The result of this study is lower than that reported by Karam *et al.*, (1998).

## 5. RECOMMENDATIONS

- The duration of 4, 8, and 12 weeks should be taken into consideration in the training for adolescent males for achieving some level of hypertrophy of the gastrocnemius, quadriceps/hamstring muscles, preferably from 8 to 12 weeks for optimal hypertrophy
- Clinical exercise physiologists and related fields may equally consider these durations in prescribing exercise for patients with musculoskeletal atrophy.

## REFERENCES

- Antonio, J. Human skeletal muscle hypertrophy. *Sports Nutr Rev J*, 2004, 1(1), 1-3. Available from: <http://www.sportnutritionssociety>.
- Harput, G.A., Soyulu, R., Ertan, H., Ergun, N., and Carl, G.M. Effect of gender on the quadriceps-to-hamstrings coactivation ratio during different exercises. *J Sport Rehabil*, 2014, 23, 36-43.
- International Society for the Advancement of Kinanthropometry. *International Standard for Anthropometric Assessment*. Potchefstroom, South Africa: International Society for the Advancement of Kinanthropometry; 2006. p. 73-85.
- Jones, P.J. The Effects of a 10-week High Intensity Strength and Endurance Training Intervention Followed by Cold Water Immersion or Active Recovery. Master's Thesis in Exercise Physiology Autumn Department of Biology of Physical Activity. University of Jyväskylä; 2016. Available from: <https://www.jyx.jyu.fi/bitstream/handle/123456789/54738/URN:NBN:fi:jyu-201706293175.pdf?sequence=1>.
- Loenneke, J.P., Buckner, S.L., Dankel, S.J., and Abe, T. Exercise-induced changes in muscle size do not contribute to exercise-induced changes in muscle strength. *Sports Med*, 2019, 49, 987-991.
- McArdle, W.D., Katch, F.I., and Katch, V.L. *Exercise Physiology: Nutrition, Energy, and Human Performance*. United States: Lippincott Williams & Wilkins; 2016.
- Panase, N., Bhadgale, R., Karanjkar, A., Phulwer, R., Sahasrabudhe, P., and Ramteke, C. The reach of the gastrocnemius musculocutaneous flap: How high is high? *World J Plast Surg*, 2018, 7(3), 1-10. Available from: <http://www.journals.plos.org/plosone/article?id=10.1371/journal.pone.0134736>.
- Mendez-Villanueva, A., Suarez-Arrones, L., Rodas, G., Fernandez-Gonzalo, R., Tesch, P., Linnehan, R., Kreider, R., and Di Salvo, V. MRI-based regional muscle use during hamstring strengthening exercises in elite soccer players. *PLoS One*, 2016, 11(9), e0161356.
- Moon, Y.W., Kim, H.J., Ahn, H.S., and Lee, D.H. Serial changes of quadriceps and hamstring muscle strength following total knee arthroplasty: A meta-analysis. *PLoS One*, 2016, 11(2), 148-193.
- Zaroni, R.S., Brigatto, F.A., Schoenfeld, B.J., Braz, T.V., Benvenutti, J.C., Germano, M.D., Marchetti, P.H., Aoki, M.S., and Lopes, C.R. High resistance-training frequency enhances muscle thickness in resistance-trained men. *J Strength Cond Res*, 2019, 33(7S), 140-151.

# Analysis of Psychological Traits among Sportsmen and Women of Hyderabad

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## ABSTRACT

The present study was conducted to investigate the possible differences of stress level among sportsmen and women. The sample comprised 100 (50 males, and 50 females) state and national level players between 19 and 25 years of age. The research tool used for the study was "Perceived Stress Questionnaire" (PSQ) to measure the stress level of the players who participate in the competitive sport. The PSQ scores indicated that the male sportsmen have more stress level than female sportswomen. Statistically, no significant relationship on stress levels between male and female players was observed.

## 1. INTRODUCTION

In psychology, stress is a feeling of strain and pressure. Stress is a type of psychological pain. Humans experience stress, or perceive things as threatening, when they do not believe that their resources for coping with obstacles stimuli, people, situations, etc., are enough for what the circumstances demand. Some of the psychological and emotional signs that stressed-out include: Depression or anxiety, anger, irritability, or restlessness, feeling overwhelmed, unmotivated, or unfocused, trouble sleeping, or sleeping too much. Stress seems to worsen or increase the risk of conditions such as obesity, heart disease, Alzheimer's disease, diabetes, depression, gastrointestinal problems, and asthma. Stress is a factor of life that affects everyone, but athletes tend to suffer from it more than non-athletes, due to the amount they are required to balance, between academics, practices, and games, as well as family pressures and everyday life.

Not all stress is bad for athlete performance. In the right amount, stress helps to prepare, focus, and perform at an optimal level. Conversely, too much stress, or bad stress, can cause performance anxiety, which hurts your health and does not allow you to play relaxed.

## 2. METHODOLOGY

### 2.1. Selection of Subjects

For this study, 100 (50 males and 50 females) respondents selected from the Government College of Physical Education, Domalguda, Hyderabad, who have

been participated in state and national levels in various sports and games.

### 2.2. Selection of Variable

The instrument used in obtaining data of each player's stress level was the questionnaire of the Perceived Stress Questionnaire (PSQ). The PSQ consists of 30 questions. The questions were in the form of statements that the subject used to describe themselves.

### 2.3. Research Design

Before administering the test, the procedure of the questionnaire and the purpose of the test were briefly explained to all the subjects for better understanding and to increase the motivation level. PSQ had 30 items out, of which eight were positive questions. The subjects were instructed to respond to each item according to how they generally felt at the time of competition.

Every player had four possible responses that are (A) almost (B) sometimes (C) often (D) usually the 30 test items were taken for scoring purpose. Scores obtained for each statement were added up which represent an individual's total score on (PSQ score) then the PSQ score was analyzed

### 2.4. Scoring

Respondents indicate on a scale from 1 ("almost never") to 4 ("usually") how frequently they experience certain stress-related feelings. Higher scores indicate greater levels of stress. A total score is found by tallying

each item (questions 1, 7, 10, 13, 17, 21, 25, and 29 are positive and are scored according to the directions accompanying the scale). A PSQ index can be found by subtracting 30 from the raw score and dividing the result by 90, yielding a score between 0 and 1.

## 2.5. Statistical Analysis

For the purpose of analysis of data, descriptive statistics mean, standard deviation, and Chi-square were applied to evaluate the relationship of competition stress on

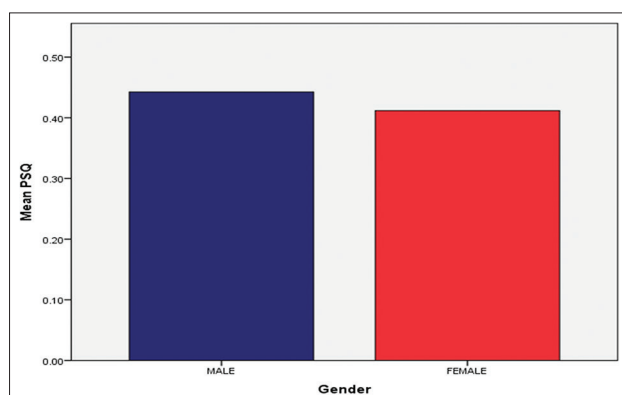
male and female players. The level of significance was set at 0.05.

Table 1 shows the PSQ mean values between males and females. The PSQ mean score was high in males than females. It means that the male sportsmen have more stress level than female sportswomen. The statistical results of Pearson Chi-square = 34.98 and  $P = 0.421$ . The findings of the study state that there was no significant relationship between males and females on stress.

**Table 1:** Comparison of means on PSQ between male and female

	PSQ		$\chi^2$	Sig.
	Male	Female		
Mean $\pm$ SD	0.44 $\pm$ 0.1	0.41 $\pm$ 0.11	34.98	0.421

PSQ: Perceived stress questionnaire



**Graph 1:** Comparison of stress level between male and female players

Graph 1 shows the stress level of male and female players. The blue color bar indicates the male and red color bar indicates the female players. Graph 1 shows that the PSQ value is high in males than females. It means that the male sportsmen have more stress level than female sportswomen.

## 3. CONCLUSIONS

Stress has been a central concept for sports psychology and has received a huge amount of investigation because of its influence on performance. Too much stress can cause performance anxiety. The results of this study explained that there was no significant relationship which was found among female and male players. Hence, the psychological aspects are varied between males and females.

## 4. RECOMMENDATIONS

The more proficiency and higher number of match experiences always enhance the performance of athletes with balanced psychological well-being.



# Sports Nutrition

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## ABSTRACT

The timing of eating and excusing can be important for how you feel and perform during your chosen activity, the body needs correct fuel in the tank to perform well. However, you want to avoid feeling too full or too empty during exercise individuals vary in their prepared timing of food intake and amount that can be eaten before exercise. Some may find 2 h which is plenty of time to digest their meal whereas others may feel uncomfortable when taking part in the activity and need a bit longer. Experimenting with how much and when will help decide what suits you best. Eating well for physical activity and sports can have many benefits, including along you to perform well in your chosen sports or activity reduces the risk of injury and illness. Ensuring the best recovery after exercise or a training programme. In routine life, the most ignorance is toward food and its quality. The busy lifestyle force to adjustment in food style. The children's and younger's are victims of food style whereas adults and old age people are quite aware. The daily need and food components show healthy life to achieve goals critical need of vitamins, micronutrients, essential amino acids, minerals, and phytochemical which are must in diet along with fat, protein, and carbohydrate. Nutrition is a basic human need and a prerequisite for healthy life a proper diet is essential from very every age of life for growth development and active life. It is the science which deals with various factors which food is composed and the way in which proper nourishment is brought about. The average nutritional requirement of a group of people is fixed and depends on such measurable characteristics such as age, sex, height, weight degree of activity, and rate of growth.

**Keywords:** Diseases, Food/diet, Health obesity, Nutrient.

## 1. INTRODUCTION

Food is beneficial as well as dangerous. The relationship between diet and health is so close the absence of essential nutrients resulting in deficiency diseases. Intricate biological processes entrant the energy and other obsequy components that enable us to grow and function.

In general, nutrients are classified as either macro or micro based on the amounts, we require from the diet. Some nutrients can be stored (e.g., glucose as glycogen in liver), while others are required more or less continuously. There is, however, also difference between individuals. Meaning some may require specific nutrients more frequently (e.g., Iron) and it is changing to determine whether individuals have adequate levels of most nutrients because of level in the blood offer only a crude measure of cell and organ status. Today, we require non-nutrients phytochemical. These bioactive are not essential for life in ways that

macro or micronutrients are but not the less have put active health benefits and where acting directly or indirectly diet rich in these compounds significantly reduce our risk. Chronic diseases, including cancer and cardiovascular disease (CVD), we also require dietary fiber, not digestible material such as cellulose or support mechanical function and healthy microbial population.

A lack of nutrients and bioactive or encases of these results into poor health. Only poverty of knowledge and chief food high in fat sugar and salt are leading to obesity and specific deficiencies (e.g., Vitamin D)

### 1.1. Macronutrients

There are three macronutrients carbohydrate fat and protein. They provide structural materials (e.g., Amino acid and lipids) and energy when necessary. Proteins can be broken (diseases occur) down to generate energy, but carbohydrate and fats are used preferential for energy.

## 1.2. Purpose of the Study

The purpose of the study was to take a review of the presence of absence of nutrients in the diet affects protein or negative effects on matter mental and physical health components of physical fitness, weights, and diseases.

## 2. METHODOLOGY

To determine the effect of nutrients in difference organs of body and components of physical fitness, meeting is conducted by segments. Before conducting various tests and abilities explanations given them for what purpose the tests going to conduct for them clarified their droughts. About the aim and objectives of the subject, subject is reenacted to 30 male college students aged between 18 and 25 admitted in 2018–2019. The subject was randomly assigned equally into two groups. Group I undergoes notorious balanced diet ( $n = 15$ ) and Group II ( $n = 15$ ) acted as a control group systematic remove raw data analysis and randomly controls trains before and after conducting test. Group I ( $n = 15$ ) undergoes physical exercise balanced notorious diet good sleep and healthy fresh atmosphere for 12 weeks.

## 3. RESULTS

By analysis data pre- and post-test results cheated, there is significant increase in physical mental health recovery of diseases and increases in motor physical fitness components. Body mass index obesity, degree, bioelectrical impedance analysis, body water composition 70% skeletal and muscle structure, and body fat BMK muscle fat analysis proposition are good condition and under the control.

## 4. GENERAL DISCUSSION

### 4.1. Carbohydrate

It consists of carbon, hydrogen, and oxygen. It is range from monosaccharide's, disaccharide to high complex polysaccharides. They are mainly found in starchy food, fruit, milk, yogurt, vegetables, gleans, nuts, and seeds about half of our daily energy in take should be the source from carbohydrate cells and tissues. It is used glucose for energy. Glucose is stored in mussels and the liver in glycogen for later use being restored to the blood through gluconeogenesis it is also essential for the functioning of brain, kidney, and heart. Potato converts high glucose loading food it stimulates the production

of insulin by beta cells in the pancreas. The dysfunction of insulin leads to diabetes.

Low fiber intake deals with an increased risk of colon cancer. Diet high in fiber helps lower cholesterol and decrease the risk of weight and CVDs. Fruits, vegetables, whole grains, bran, barley, nuts, seeds, peas, and lentils reduce the risk of diabetes.

### 4.2. Protein

Protein is made from amino acids; they are vital for living beings to carry out a wide range of functions essential for life. Quality proteins contain amino acids carbon, hydrogen, oxygen, nitrogen, and sulfate, they are structural molecules as well enzymes. Body does not stored amino acids so requires the continuous source to produce new and replace damaged protein.

Most important nine proteins are sourced from diet proteins in the form of enzymes and hormones and are required for metabolic process. Protein required growth, bodybuilding blocks, and development in pregnancy additional proteins required for the synthesis of maternal tissues. Cereals, millets, nuts and pulses, milk, eggs, legumes, oilseeds, fishy, poultry, and soybean are protein sources.

### 4.3. Micronutrients

These are generally vitamins and minerals required in minute amount for our body. To fight disease to support metabolic activity and protect against infections, it also requires for maintained health and longevity. Carbon, hydrogen, oxygen, nitrogen, calcium, chlorine, magnesium, phosphate, potassium, sulfur, and sodium, these elements include due to lack of micronutrients results into hypertension. Osteoporosis, goiter, scurry, cancer, pour heath, etc.

### 4.4. Fat

Fat is kind of lipids. Used as an energy source with crabs. In skeleton structure in all cell membrane cell wall and all metabolic pale major role. The exceed use of fat leads to obesity. Moderate use of fat is required. The fatty acids are mainly found in oil, daily cooking oil, ghee, or oil nuts for fat-soluble vitamins this is a good source.

### 4.5. Minerals

All types of salts in daily use soil, water, and various types of minerals are needed in daily diet, fruit juice, and lemon, which are the good sources.

#### 4.6. Vitamins

There are two types of vitamins: water soluble and fat soluble.

#### 4.7. Water-soluble Vitamins

Vitamins C, B, and other vitamins are mainly found in fruit juice, lemon, etc.

#### 4.8. Fat-soluble Vitamins

- Vitamins A, D, E, and K are fat-soluble vitamin the good source that is meat, egg, etc.
- The prime source of all vitamins is vegetables food brands such as Amway products powder peals, sports drinks, and packed vegetables, for example, Mushroom.

#### 4.9. Vitamin A

It is fat-soluble it has an important role in vision, human function, and entreaty of skin and mucus membrane. In children deficiency results in bigot spot, night blindness in pregnant women preventing deficiency reduces the risk of mortality and morbidity, green vegetables, and organ colored. Fruits are rich source of beta carotene. Milk and milk products, eggs, yolk, palm oil, fish, and fish liver oil are rich in Vitamin A.

#### 4.10. Vitamin C

It is essential micronutrients and an antioxidant. It gives protection against infection. Vitamin C deficiency causes scurvy results into weakness, bleeding gums, and defective bone growth. It helps in to wound healing, amino acid metabolism, and synthesis of some hormones. It also influences iron absorption. It presents in all citrus trees, fruits such as orange, lemon, awala, and tomato sported grains.

#### 4.11. Iron

It is an essential element for the formation of hemoglobin in red blood cells and plays an important role in the transport of oxygen in our country. Anemia is a major public health problem. In young children's, girls and pregnant women suffer from nutritional anemia. For the learning ability of children and synthesis of thyroid harmony, it adversely affects adult public health, for example, total growth, hypothyroidism, and growth retardation.

Source: Sea foods and water iodized salt.

#### 4.12. Adolescent

More than 1/5 population of India grow or mature signifying the special features of mature. Poor nutrition delay in the upset of puberty in girls weight of 30 kg and critical body composition of 10%. Body fat increases the demand for energy, minerals, and vitamin in an adolescent.

#### 4.13. Energy

Human being needs adequate energy to carry out their routine physical work to maintain body temperature, metabolic activity, and to support growth. About 50% of male and women suffer from tonic energy deficiency. Consumption of energy depends on age, body, weight, growth, and physical status, and daily energy expenditure 70–80% of the total dietary carious is obtained in India from cereals, millets, pulses, tubers, vegetable oils, ghee, butter, oilseeds, nuts, sugar, Jiggery, jowar, and Bajara and millets like ragi.

#### 4.14. Obesity

It is the state in which there is a generalized accumulation of excess fat in adipose tissue. In the body, it has several adverse health effects and concave lead to premature death. It also reduces to high blood cholesterol, high blood pressure, heart diseases, diabetes, gallbladder, kidney stone, and certain type of cancer for avoiding obesity eat less fried food, Eat more fruits and vegetables, use low-fat milk, and eat fiber-rich food.

#### 4.15. Diet/food

Naturopathy is the science which things in detail about nutrition. Meal should be taken 50% fill up 25% of the portion of stomach with liquid and 25% kept empty for air. Some trick in naturopathy and Ayurveda.

- Take balanced diet meal will take as per time schedule
- Do not eat much food. It should take in respect with age, physical fitness, and hunger
- Nutrients kept harmony in between soul mind and organs
- Food should not be spice and have six tests
- Avoid frozen food eat fresh food pure ghee of one spoon take daily. Eat slowly, tea take 1 or 2 time in a day, tobacco, drinking of wine must be avoided
- Do not drink much water at the time of eating.

Diet and disease go hand in hand, for example, scurvy, beriberi, CVDs, obesity, diabetes, chronic diseases, and some type of cancer.

#### 4.16. Malnutrition

It occurs from eating a diet that is insufficient or excess calories, protein, carbohydrate, vitamins, and minerals. It causes physical and mental development thin arm and legs swollen legs and abdomen. It increases the frequency of infections and tiredness. Stunted growth, fever disability, and disease such as cancer and CVD wheat stem live this agriculture productivity.

#### 4.17. Chronic Disease

Lifestyle affects our risk of develop in chronic disease. In the old age, body becomes less effective break down in structure and function increases the risk chronic diseases including cancer, CVD, type II diabetes, and contract muscular degeneration arthritics good nitrous diet, maintain, appropriate weight, taking drugs, smoking, and take daily exercise. Determine high or low risk of developing chronic diseases. Genetic differences associates with diseases modern dietary behavior arises disadvantages.

#### 4.18. Allergy

Food allergy is a common condition. Food causing an allergic reaction. It is an immune response to a protein found in food reaction occurs a point of contact as well as throughout the body symptoms occurs directly in the person when an individual eats some food. Food allergies are limited. Symons include fatigue, gastrointestinal, disturbances, such as diaries, omitting, blunting, irritable bowels, urticaria, eczema, and enzyme defects. It means a substance in the food cannot be digested correctly. What can and cannot be eaten avoided the problem simply.

### 5. CONCLUSION

Until a few decades due to lack of nitrous diet-related illness systems. Study shows that non-communicable

diseases with an intake of dietary constituents including fat, fiber, and broactive substances. Due to data information, it is found that the impact of changes in diet and lifestyle. Choice on the health of population, on the other hand, concerns has shifted from eating enough to avoiding excess and to eating well. Dating what to eat well has finally. However, turned out to be far more complex than defining minimum needs for essential nutrients. The effect of the isolated dietary compound does not reflect adequately the effect of the complex mixture of food we consume daily. Let alone the relationship between this food and our genetic phenotypic makeup or vice versa.

### REFERENCES

1. Mishra, S.C. Fitness Education.
2. Tiwari, S. Exercise Physiology.
3. Macmillan Library Reference. *Encyclopedia of Women Sports*. United States: Macmillan Library Reference.
4. Available from: <https://www.intion.org.uic/healthyliving/anactivelifestyle/eating-for-sport-and-exercishtml?limit=1&start=5>.
5. Introduction to Human Nutrition. In: *The Nutrition Society Textbook*. 2<sup>nd</sup> ed. United States: Wiley-Blackwell.
6. Maughan, R.J., (ed). *Encyclopedia Sports Medicine Nutrition in Sports*. Oxford: Oxford Flack Wheel Science; 2000.
7. National Institute of Nutrition. *Portal-ministry of Electronics and Information Technology Government of India-educated*. Hyderabad: National Institute of Nutrition.
8. World Cancer Research Fund/American Institute for Cancer Research. *Food Nutrition, Physical Activity and Prevention of Cancer. A Global Perspective*. Washington, DC: American Institute for Cancer Research; 2007.
9. World Health Organization. *A Global Brief of Hypertension, Silent Killer, Global Public Crisis, Women*. Geneva: World health organization; 2015.

# Comparative Study of Explosive Arm Strength, Agility, and Eye-Hand Coordination between the Water Polo and Handball Players

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## 1. INTRODUCTION

As sports have developed into a distinct scientific discipline in itself and each nation is vying with other to produce top-class player to win laurels in international competitions, considerable research in sports has developed to identify factors that will be produced of achieving high level of skill in a sport with proper coaching.

Water polo is now popular in many countries around the world, notably Europe (particularly in Hungary, Serbia, Croatia, Montenegro, Russia, Italy, Greece, and Spain), the United States, Canada, and Australia. The present-day game involves teams of seven players with a water polo ball similar in size to a soccer ball but constructed of air-tight nylon.

The International Handball Federation was formed in 1946 and, as of 2016, has 197 member federations. The sport is most popular in the countries of continental Europe, which has won all medals but one in the men's world championships since 1938. In the women's world championships, only two non-European countries have won the title: South Korea and Brazil. The game also enjoys popularity in the Far East, North Africa, and parts of South America.

## 2. METHODOLOGY

Fifteen male water polo players and 15 male handball players were selected as subjects from Degree College of Physical Education, Amravati, through a purposive sampling method. The age of the subjects was ranged from 18 to 25 years.

SEMO agility, Nelson's eye-hand coordination, and medicine ball throw test were used to measure the agility, eye-hand coordination, and explosive shoulder strength, respectively, of the water polo players and handball players.

Before the collection of data, the researcher explained the purpose of the study and demonstrated the tests to the selected subjects so as they could put their best. The data were collected from the water polo and handball players.

## 3. RESULTS AND DISCUSSION

The data pertaining to each of the selected fitness components agility, eye-hand coordination, and explosive shoulder strength were examined statistically by applying independent "*t*-test" to determine the significance of difference if any. The level of significance to test the hypothesis was set at 0.05.

It is evident from the finding of Table 1 that there is a significant difference between the means of water polo and handball players in the variable of agility as the obtained *t*-value of 1.174 is quite higher than the tabulated *t*-value of 2.048 required to be significant at 0.05 level for the 28 degrees of freedom.

It is evident from the finding of Table 2 that there is insignificant difference between the means of water polo and handball players in the variable of eye-hand coordination as the obtained *t*-value of 0.632 is quite less than the tabulated *t*-value of 2.048 required to be significant at 0.05 level for the 28 degrees of freedom.

It is evident from the finding of Table 3 that there is no significant difference between the means of water polo and handball players in the variable of explosive shoulder strength as the obtained *t*-value of 0.70. It is quite lower than the tabulated *t*-value of 2.048 required to be significant at 0.05 level for the 28 degrees of freedom.

The findings of Table 1 showed that there was a significant mean difference between the water polo and hand players in the variable of agility. Further, it was revealed that the handball players were more agile in comparison to the water polo players. The reason for significant difference may be due to the nature of the



**Table 1:** Description of mean, standard deviation, and t-ratio for the data on the agility of water polo and handball players

Groups	Mean	Standard deviation	MD	Standard error of MD	t-ratio
Water polo	6.13	1.407	0.15	0.453	1.174
Handball	5.6	1.055			

\*Significant at .05 level tabulated  $t_{0.05(28)}=2.048$ . MD: Mean difference

**Table 2:** Description of mean, standard deviation, and t-ratio for the data on eye-hand coordination of water polo and handball players

Groups	Mean	Standard deviation	MD	Standard error of MD	t-ratio
Water polo	5.98	1.147	0.22	0.37	0.632
Handball	5.76	0.707			

@Not significant at 0.05 level tabulated  $t_{0.05(28)}=2.048$ . MD: Mean difference

**Table 3:** Description of mean, standard deviation, and t-ratio for the data on explosive shoulder strength of water polo and handball players

Groups	Mean	Standard deviation	MD	Standard error of MD	t-ratio
Water polo	4.39	1.45	0.43	0.607	0.701
Handball	3.96	1.857			

@Not significant at 0.05 level tabulated  $t_{0.05(28)}=2.048$

game, as the handball players move continuously in the court for attack and defense, but in the case of water polo players need not run that much hence showed less agility in comparison to the handball players.

The findings of Tables 2 and 3 revealed that there was an insignificant difference in eye-hand coordination and explosive shoulder strength between water polo and handball players. The reasons for insignificant difference maybe because to play water polo and handball games, players need to develop all variables optimally; accordingly, players might have paid due attention to develop the same; hence, insignificant difference might have occurred in the study.

#### 4. CONCLUSIONS

Recognizing the limitations of this study and on the basis of statistical findings the following conclusion may be drawn:

- Significant difference was found between the water polo and handball players in relation to agility

- No significant difference was found between the water polo players and handball players in relation to eye-hand coordination
- No significant difference was found between the water polo players and handball players in relation to explosive shoulder strength.

#### REFERENCES

- Claire, A., and Mindy, S. Attention-deficit hyperactivity disorder (ADHD) stimulant medications as cognitive enhancer. *Front Neurosci*, 2013, 7, 82.
- Braver, T.S., Reynolds, J.R., and Donaldson, D.I. Neural mechanisms of transient and sustained cognitive control during task switching. *Neuron*, 2003, 39, 713-726.
- Leland, D.S., and Pineda, J.A. Effects of food related stimuli on visual spatial attention in fasting and non-fasting normal subjects: Behavior and electrophysiology. *Clin Neurophysiol*, 2005, 117, 67-84.
- Kang, H.G., and Lipsitz, L.A. Stiffness control of balance during during quiet standing and dual task in older adults: These MOBILIZE Boston study. *J Neurophysiol*, 2010, 104(6), 3510-3517.

# Analytical Study on Motor Fitness of NCC Cadets and Sports Students of Degree College of Hyderabad District of Telangana State

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## ABSTRACT

Fitness is which characterizes the degree to which a person is able to function efficiently. Fitness is an individual matters. It implies the ability of each person to live most efficiently with mental, physical, emotional, moral, and spiritual components of fitness. Motor fitness is a term that describes an athlete's ability to perform effectively during sports, NCC activity or other physical activity. Motor fitness refers to the capability of an athlete to perform effectively at their particular sport. The purpose of the study was to compare the NCC cadets of a degree college and sports student of degree college of Hyderabad district. A total of 120 boys were selected among these 60 from NCC cadets of degree college, 60 from sports students of degree college were randomly selected as subjects for this study. The selected four motor fitness variables were (i) speed, (ii) shoulder strength, (iii) abdominal strength, and (iv) explosive power. To measure speed 50 m, shoulder strength flexed arm hang, abdominal strength bent knee sit-ups, and explosive power standing broad jump were used. The statistical techniques such as mean and SD and *t*-test were used to analyze the data. From the results, it was concluded that NCC cadets are significantly differed from sports student in shoulder girdle strength, abdominal strength, and explosive power. Moreover, in speed, sports student are significantly differed from NCC cadets. This is due to their regress army training might be the reason.

**Keywords:** Fitness, Motor fitness.

## 1. INTRODUCTION

Fitness is which characteristic the degree to which a person is able to function efficiently. Fitness is an individual matter. It implies the ability of each person to live most efficiently with mental, physical, emotional, moral, and spiritual components of fitness. Motor fitness is a term that describes an athlete's ability to perform efficiently during sport, or other physical activity. Motor fitness refers to the capabilities of an athlete to perform efficiently as their particular sports or any other physical activity.

### 1.1. Purpose

The purpose of the study was to compare the motor fitness of NCC cadets and sports students of the degree college of Hyderabad district.

### 1.2. Objectives of the Study

The objective of this study was as follows:

1. To examine the speed between NCC cadets and sports students of degree college of Hyderabad district.
2. To find out the endurance of NCC cadets and sports students of degree college of Hyderabad district.
3. To analyze the explosive power of NCC cadets and sports students of degree college of Hyderabad district.

### 1.3. Hypothesis of the Study

1. There might not be any significant difference in "speed" between NCC cadets and sports students of degree college of Hyderabad district.

**Table 1:** The mean value, standard deviation, t score, and *P* value between NCC cadets and sports student of degree college in relation to “speed”

S. No.	Name of the subjects	Number of subjects	Mean±SD	t value	P value
1.	NCC cadets of degree college	50	5.21±1.011		0.000
2.	Sports students of degree college	50	4.32±1.0121	1.3420	

\*Signification at 0.005 level

**Table 2:** The mean value, standard deviation, t score, and *P* value between NCC cadets and sports students of degree college in relation to “endurance”

S. No.	Name of the subjects	Number of subjects	Mean±SD	t value	P value
1.	NCC cadets of degree college	50	2.12±0.3233		0.001
2.	Sports students of degree college	50	2.00±0.3443	1.2034	

\*Signification at 0.005 level

**Table 3:** The mean value, standard deviation, t score and *P* value between NCC cadets and sports student of degree college in relation to “explosive strength”

S. No.	Name of the subjects	Number of subjects	Mean+SD	t value	P value
1.	NCC cadets of degree college	50	1.23±0.2442		0.002
2.	Sports students of degree college	50	1.12±0.1320	2.4399	

\*Signification at 0.005 level

- There might not be any significant difference in endurance between NCC cadets and sports students of degree college of Hyderabad district.
- There might not be any significant difference in explosive strength between NCC cadets and sports students of degree college of Hyderabad district.

## 2. METHODOLOGY

A total of 100 students 50 from NCC and 50 from sports students of degree college (Age 17–20 years) were randomly selected as subjects for this study. The selected motor fitness variables work speed, endurance, and explosive power. To measure speed 50 m dash, endurance explosive power to measure speed 50 m dash, endurance 600 m run explosive power standing broad jump tests were used. The data collected were analyzed with statistical “t” technique.

## 3. CONCLUSIONS

Finally, motor fitness has yielded that NCC cadets are significantly differed from sports student of degree college in speed, endurance, and explosive power. Sports students of degree college are significantly differed from NCC cadets due to their army regress training.

## REFERENCES

- Andrews, and Craig, B. *Physical Fitness Values of Canadian South African School Boys*. Vol. 36. Dissertation Abstracts International; 1976, p. 5912.
- Miller, D.K., and Allen, T.E. *Fitness a life time commitment*. New Delhi: Surjeet Publications; 1982, p. 4.
- Gandhi, I. *Abstract International Congress on Sports Science*. Patiala: Netaji Subhas National Institute of Sports; 1982, p. 1-10.
- Tsimeas, P.D., and Sifilis, N.D. Estimated risks for developing obesity in the Framingham heart study. *Br Gen Sports Med*, 2005, 39, 671-674.

# Comparison of Selected Motor Fitness Components between the Soccer Players of Guru Ghasidas University and Sant Gadge Baba Amravati University

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## ABSTRACT

The main purpose of this study was to find out the significance of the difference of selected motor fitness components between the soccer players of Guru Ghasidas Vishwavidyalaya and Sant Gadge Baba Amravati University (SGBAU). Fifteen male soccer players from each university of Guru Ghasidas Vishwavidyalaya and SGBAU were selected as subjects who represented their respective university. The age of the subjects was ranging from 18 to 25 years. Purposive sampling method was used for the selection of 30 subjects. Data on selected motor fitness, namely, cardiovascular endurance, speed, agility, muscular endurance, and explosive leg strength were collected by administering Cooper 12 min run and walk, 50 m dash, SEMO agility, bend knee sit-ups, and standing broad jump tests, respectively, on the aforementioned players and the scores were recorded according to the directions of the above-mentioned tests. To determine the significance of the difference in the above-mentioned components between the two groups of players, independent “t” test was employed for each component separately. The findings of the statistical analysis revealed that the significance of difference was observed on cardiovascular endurance, speed, agility, and muscular endurance between the two groups. It is also understood from the mean value that the players of SGB Amravati University were significantly better than the Guru Ghasidas Vishwavidyalaya. The insignificant difference was found in the variable of explosive leg strength. As most of the players of SGB Amravati University were from the North East States of India, where football is a most popular game, accordingly, they used to practice from childhood stage under the coaching of trained coaches who might have put due attention to develop all these above-mentioned components. Hence, such results might have occurred.

**Keywords:** Agility, Cardiovascular endurance, Explosive leg strength, Muscular endurance, Soccer player, Speed.

## 1. INTRODUCTION

Fitness is the basis of any games and sports; accordingly, every coach or trainers pay due attention to develop the motor fitness or physical fitness components of their players up to the optimum level so as to their players can exhibit the best performance during competition and tournaments. Hence, the researcher was interested to undertake the study entitle, “Comparison of Selected Motor Fitness Components between the Soccer Players of Guru Ghasidas University (GGU) and Sant Gadge Baba Amravati University (SGBAU).” The most common motor fitness components are indispensable for the game of soccer, namely, cardiovascular endurance, speed, agility, muscular endurance, and explosive leg strength. Every university selects its teams to take part in the American InterContinental University tour and

then administer a suitable training program to win the title. Therefore, a scholar interested to conduct this study.

### 1.1. Purpose of the Study

The main purpose of the present study was to find out the difference in the selected motor fitness components between the soccer players of Guru Ghasidas Vishwavidyalaya and SGBAU.

## 2. METHODOLOGY

### 2.1. Selection of Subjects

Fifteen male soccer players from each university of Guru Ghasidas Vishwavidyalaya and SGBAU were

**Table 1:** Description of mean, standard deviation, and *t*-ratio for the data on selected motor fitness components of SGBAU and GGU soccer players

Variable	University	Mean	Standard deviation	MD	Standard error of MD	<i>t</i> -ratio
Cardiovascular endurance	SGBAU	183.51	5.960	10.39	1.540	6.75*
	GGU	193.9	8.280			
Speed	SGBAU	7.138	0.473	0.492	0.122	4.03*
	GGU	7.63	0.435			
Agility	SGBAU	11.03	0.459	1.05	0.215	4.88*
	GGU	12.08	0.695			
Muscular endurance	SGBAU	46.80	6.482	8.00	2.440	3.28*
	GGU	38.80	6.901			
Explosive leg strength	SGBAU	10.76	0.773	0.11	0.284	0.39@
	GGU	10.87	0.784			

\*Significant at 0.05 level tabulated  $t_{0.05(28)} = 2.048$ . @Not Significant at 0.05 level. MD: Mean difference, SGBAU: Sant Gadge Baba Amravati University, GGU: Guru Ghasidas University

selected as subjects who represented their respective university. The age of the subjects was ranging from 18 to 25 years. Purposive sampling method was employed for the section of the subjects.

The data pertaining to this study were collected by administering the following standardized tests, i.e.,

- Cardiovascular endurance was measured by administering 800 m run and walk test, and the score was recorded in seconds
- SEMO agility test was applied to assess agility, and the score was recorded in seconds
- 50 mt dash was administered to measure speed, and score was noted down in 100<sup>th</sup> of seconds
- Number of bend knee sit-ups in one minute for muscular endurance
- Explosive leg strength was measured by applying standing broad jump, and the measurement was recorded in centimeter.

### 3. RESULTS AND DISCUSSION

To determine the significant difference in the selected motor fitness components of the soccer players, independent “*t*”-test was employed for each component separately. Independent “*t*”-test was employed to find out the statistical differences between the means. The level of significance was set at 0.05. The result pertaining to the data is presented in Table 1.

It is evident from Table 1 that significant difference was found in the variables of cardiovascular endurance ( $t = 6.747 > 2.048$ ), speed ( $t = 4.032 > 2.048$ ), agility ( $t = 4.88 > 2.048$ ), and muscular endurance ( $t = 3.28$

$> 2.048$ ). It is also observed that insignificant difference was observed in the variable of explosive leg strength ( $t = 0.39 < 2.048$ ) at 0.05 level.

Findings of the study revealed that the performance of SGBAU players is significantly better than the soccer players of GGU in cardiovascular endurance, speed, agility, and muscular endurance, it may be because most of the players of SGBAU were from the North East States of India where football is most popular game; accordingly, they used to practice from childhood stage under the supervision of trained coaches who might have put due attention to develop all these above-mentioned components. Findings also showed that the insignificant difference was found in the variables explosive leg strength.

### 4. CONCLUSION

Recognizing the limitations of this study and on the basis of statistical findings, the following conclusions are drawn:

- Soccer players of SGBAU significantly are better than the players of GGU in the variables of cardiovascular endurance, speed, agility, and muscular endurance
- No significant difference was observed between the soccer players of SGBAU and GGU in explosive leg strength.

### REFERENCES

- Devinder, K.K. *Textbook of Applied Measurement Evaluation and Sports Selection*. New Delhi: Sports & Spiritual Science Publications; 2008. p. 340.



Devinder, K.K. *Textbook of Applied Measurement Evaluation and Sports Selection*. New Delhi: Sports & Spiritual Science Publications; 2008. p. 328.

Devinder, K.K. *Textbook of Applied Measurement Evaluation and Sports Selection*. New Delhi: Sports & Spiritual Science Publications; 2008. p. 313-314.

Devinder, K.K. *Textbook of Applied Measurement Evaluation and Sports Selection*. New Delhi: Sports & Spiritual Science Publications; 2008. p. 317.

Devinder, K.K. *Textbook of Applied Measurement Evaluation and Sports Selection*. New Delhi: Sports & Spiritual Science Publications; 2008. p. 325.

# Comparative Study of Selected Anthropometric Measurement and Reaction Time between Cricket and Hockey Players

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## 1. INTRODUCTION

Anthropometry is the study of the measurements of the human body in terms of the dimensions of bone, muscles, and adipose (fat) tissue. There are numerous physiological factors which are responsible for the performance of a sportsman. The physique and body composition, including the size, shape, and form, are known to play a significant role in this record.

Cricket is the most popular sport in commonwealth countries and one of the most popular sports in the world. The performance of cricketers is enhancing day by day, old records are broken, and new records are forming; scores are reaching new heights, it is due to high-intensity training of the players, which help them to perform well.

Hockey becomes popular when the British Regiments played the game in India and introduced it in the British Indian regiments who quickly picked up the game. India reigned supreme in the game of male hockey for decades together.

### 1.1. Purpose of the Study

The purpose of the study was to find out the significance of the difference in anthropometric measurements and reaction time between the cricket and hockey players.

## 2. METHODOLOGY

For the study, the researcher has selected ten male cricket players and ten male hockey players as subjects from Degree College of Physical Education (DCPE), Amravati, through a purposive sampling method. The age of the subjects was ranged from 18 to 25 years.

### 2.1. Selection of Variables

For this study, the selected variables of anthropometric measurement and reaction time are as follows:

- Anthropometric measurements: Height, weight, arm length, and leg length
- Reaction time: Reaction time of hand and reaction time of leg.

### 2.2. Selection of Test and Criterion Measures

The height was measured using stadiometer and the data are collected in centimeter, the weight was measured using weighing machine, and the data were collected in kilogram, the anthropometric measurements of arm length and leg length were measured by anthropometric rod and reaction time was measured by Nelson's hand and leg reaction time and score was recorded in seconds.

### 2.3. Collection of Data

The necessary data pertaining to the study were collected using the five tests mentioned above from both the cricket players and field hockey players of DCPE Amravati.

It is evident from the finding of Table 1 that there is an insignificant difference between the means of cricket and field hockey tabulated  $t$ -value of 2.101 required to be significant at 0.05 level for the 18 degrees of freedom.

## 3. DISCUSSION OF FINDINGS

Based on statistical findings, the result was justified scientifically and logically.

The findings of Table 1 showed that there was an insignificant difference between the cricket and field

**Table 1:** Description of mean, standard deviation, and t-ratio for the data on anthropometric measurements and reaction time between cricket players and hockey players

Variable	Game	Mean	Standard deviation	MD	Standard error of MD	t-ratio
Height	Field hockey	173.341	6.82	3.16	2.82	1.12 <sup>@</sup>
	Cricket	170.181	5.75			
Weight	Field hockey	65.774	9.25	1.232	3.84	0.32 <sup>@</sup>
	Cricket	64.542	7.89			
Arm length	Field hockey	76.45	4.51	1.89	1.66	1.138 <sup>@</sup>
	Cricket	74.56	2.65			
Leg length	Field hockey	100.7	7.916	3.4	2.836	1.198 <sup>@</sup>
	Cricket	97.3	4.218			
Reaction time (Hand)	Field hockey	0.175	0.0025	0.0682	0.061	1.12 <sup>@</sup>
	Cricket	0.2435	0.192			
Reaction time (Legs)	Field hockey	0.172	0.018	0.005	0.011	0.45 <sup>@</sup>
	Cricket	0.167	0.031			

<sup>@</sup>Insignificant at 0.05 level tabulated  $t_{0.05(18)} = 2.101$ . MD: Mean difference

hockey players in all the variables of anthropometric measurements and reaction time.

### 3.1. Testing of Hypotheses

In the beginning of this study, hypotheses were formulated and on the basis of statistical findings, the formulated hypotheses accepted/rejected are given in the following table.

Hypothesis	Statement	On the basis of statistical results
H <sub>1</sub>	There might be significant difference in selected anthropometric measurements between cricket and field hockey players	Hypothesis rejected
H <sub>2</sub>	There might be significant difference in reaction time between cricket and field hockey players	Hypothesis rejected

## 4. CONCLUSIONS

- Insignificant difference found in height of cricket players and hockey players
- No significant difference found in weight of cricket and field hockey players
- Insignificant difference found in arm length and leg length of cricket players and hockey players
- Insignificant difference found in reaction time of cricket and field hockey players.

## REFERENCES

- Devinder, K.K. *Textbook of Applied Measurement Evaluation and Sports Selection*. New Delhi: Sports & Spiritual Science Publications; 2008. p. 265-269.
- Nath, S. *Anthropometry: The Measurement of Body Size Shape and Form*. New Delhi: Friends Publication; 2005. p. 14-17.
- Hussain, T.P. *Anthropometry in Physical Education and Sports*. New Delhi: Sports Publication; 2011. p. 224-243.

# Comparative Study of Active, Passive, and No Warm-Up on Selected Physical Fitness Performance of Inter-Collegiate Cricket Players

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## 1. INTRODUCTION

Warm-up has been found to be important in preventing injury and muscle soreness. Warming-up for vigorous is needed to prepare the muscles, the joints, and the entire organism for strongest activities, which includes the physiological as well as psychological aspects of the body, so the various attempts are made in parts to establish a standard method of warming-up which can prepare the body in physical activity performance.

### 1.1. Purpose of the Study

The main purpose of the study is to find out the effect of active, passive, and no warm-up on selected physical fitness performance of inter-collegiate cricket players.

## 2. METHODOLOGY

Ten male inter-collegiate players were selected from cricket team of Degree College of Physical Education, Amravati. The age of the subjects was ranging from 18 to 25 years. The subjects were selected by adopting a simple random sampling method.

The data pertaining to this study were collected by administering the following standardized tests, i.e.,

Bent knee sit up was used to measure the dynamic (isotonic) endurance of abdominal muscle and the score was recorded in number.

Fifty-yard dash was administered to measure the speed of the player, and the score was recorded in second.

Sit and reach test was used to measure the flexibility of the back and hamstring muscle. The score was noted in the centimeter.

Southeast Missouri agility test was applied to measure agility of the subject and the score was recorded in second.

## 3. RESULTS AND DISCUSSION

To determine the significant difference among performances in the selected physical fitness components due to active, passive, and no warm-up one-way analysis of variance statistical technique was employed while the obtained F-ratio was found to be significant to find out the paired mean difference least significant difference *post hoc* test was applied and the level of significance to check the differential effect of different warm-up on selected physical fitness components was set at 0.05.

Findings pertaining to the selected physical fitness components of the cricket players, i.e., muscular endurance, speed, flexibility, and agility are presented in Table 1.

It is evident from Table 1 that significant difference was found in the variables of speed ( $F = 4.42 > 3.35$ ), flexibility ( $F = 4.76 > 3.35$ ), and agility ( $F = 6.24 > 3.35$ ). It is also observed that insignificant difference was observed in the variable of muscular endurance ( $F = 0.054 < 3.35$ ) at 0.05 level.

The findings of Table 4 revealed that significantly superior performance was shown after active warming-up then followed by passive warming-up and least performance with no warming-up on the performance of speed, flexibility, and agility by the cricketers. It may be because through active warming-up, all the systems of the body function optimally, namely, energy-yielding capacity, neuromuscular coordination, rhythmic heart and lungs function, and secretion of joint fluids for the mobility. Hence, better performance was observed after a proper active warming-up.

**Table 1:** Summary of one-way analysis of variance for the data on muscular endurance, speed, flexibility, and agility after active, passive, and no warm-up of cricket players

Variable	Source of variance	Degree of freedom	Sum of square	Mean of square	F-ratio
Muscular endurance (Bent knee sit-up)	Between the groups	K-1 3-1=2	09.30	04.65	0.054 <sup>@</sup>
	Within the group	N-K 30-3=27	2288.20	84.75	
Speed (50 m dash test)	Between the groups	K-1 3-1=2	02.183	01.0915	4.42*
	Within the group	N-K 30-3=27	06.677	0.247	
Flexibility (Sit and reach test)	Between the groups	K-1 3-1=2	317.60	158.80	04.76*
	Within the group	N-K 30-3=27	899.90	33.33	
Agility (SEMO Agility Test)	Between the groups	K-1 3-1=2	51.929	25.90	06.24*
	Within the group	N-K 30-3=27	112.08	04.15	

\*Significant at 0.05 level. Tabulated  $F_{0.05(2, 27)}=3.35$ . <sup>@</sup>Not Significant at 0.05 level. SEMO: Southeast Missouri

**Table 2:** Paired mean difference for the data on speed (50 m dash) after active, passive, and no warm-up of cricket players

Mean performance on speed			Mean difference	Critical difference
Active warm-up	Passive warm-up	No warm-up		
7.106	7.156		0.05 <sup>@</sup>	0.456
7.106		7.702	0.596*	0.456
	7.156	7.702	0.546*	0.456

\*Significant at 0.05 level

**Table 3:** Paired mean difference for the data on flexibility (sit and reach test) after active, passive, and no warm-up of cricket players

Mean performance on speed			Mean difference	Critical difference
Active warm-up	Passive warm-up	No warm-up		
30.9	30.7		0.2	4.76
30.9		23.9	7.0*	4.76
	30.7	23.9	6.8*	4.76

\*Significant at 0.05 level

**Table 4:** Paired mean difference for the data on agility (semo agility test) after active, passive, and no warm-up of cricket players

Mean performance on speed			Mean difference	Critical difference
Active warm-up	Passive warm-up	No warm-up		
10.2	12.9		2.7*	1.869
10.2		13.149	2.949*	1.869
	12.9	13.149	0.249	1.869

\*Significant at 0.05 level. SEMO: Southeast Missouri



#### **4. CONCLUSION**

Recognizing the limitations of this study and on the basis of statistical findings, the following conclusions are drawn:

Optimum speed, flexibility, and agility performance were shown after active warm-up. No significance of difference was found in the variable of muscular endurance, i.e., sit-up performance due to active, passive, and no warm-up.

# Comparative Study of Hand Grip Strength and Eye-hand Coordination of Basketball and Cricket Players

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## 1. INTRODUCTION

Today physical education, sports, and games have become a part of the curriculum in schools, colleges, and universities. One of the most important factors in the performance of any sports and skills is concerned with coordination of eyes and hand.

Basketball is surely one of the few most popular sports in the world and this is the game where players have one aim – “to score.” The game basketball has developed into fast and highly skilled areas of coordinative and motor abilities.

Cricket was originally played on ordinary English meadowland with long uncut grass for the outfield and only the actual pitch was prepared. Light wooden rollers were used on pitch. Cricket is a bat and ball game played between two teams of 11 players on field, at the center of which is rectangular 22-yards long pitch.

### 1.1. Purpose of the Study

The main purpose of this study was to compare the grip strength and eye-hand coordination of basketballers and cricketers.

### 1.2. Hypothesis

Based on the review of related literature, discussion with experts and personal experiences of the scholar, it was

hypothesized that there might be a significant difference in grip strength and eye-hand coordination between the basketballers and cricketers.

## 2. METHODOLOGY

For the study, 15 male basketballers and 15 male cricketers were selected as subjects from Degree College of Physical Education (DCPE), Amravati, through a purposive sampling method. The age of the subjects was ranged from 18 to 25 years.

To collect the data pertaining to the study, the grip dynamometer was used for the grip strength and Nelson's eye and hand coordination test were administered for the eye and hand coordination of the selected subjects and the scores were recorded in the table along with respective units of particular tests for further statistical treatment.

## 3. RESULTS AND DISCUSSION

To know the status of subjects in the selected variables descriptive statistical, i.e., mean and standard deviation were computed and to determine the significant difference if any in between the selected group mean difference method, i.e., independent *t*-test was employed. The findings pertaining to the study have been shown in the following tables. The level of significance to test the hypothesis was set at 0.05.

**Table 1:** Description of mean, standard deviation, and *t*-ratio for the data on handgrip strength of basketballers and cricketer

Game	Handgrip strength	Mean	SD	MD	Standard error of mean difference	<i>t</i> -ratio
Basketball cricket	Right hand	39.2	7.51	2.23	5.32	0.41@
		36.97	7.149			
Basketball	Left hand	37.58	7.03	0.24	2.29	0.10@
Cricket		37.82	5.45			

@Not significant at 0.05 level, tabulated  $t_{0.05(28)} = 2.048$ . SD: Standard deviation, MD: Mean difference

**Table 2:** Description of mean, standard deviation, and *t*-ratio for the data on eye-hand coordination of basketball and cricket players

Group	Mean	SD	MD	Standard error of MD	<i>t</i> -ratio
Basketball	33.05	1.28	2.93	0.49	5.97*
Cricket	30.12	1.42			

\*Significant at 0.05 level tabulated  $t_{0.05(28)}=2.048$ . SD: Standard deviation, MD: Mean difference

It is evident from the finding of Table 1 that there is insignificant difference between the means of basketball and cricket players in the variable of handgrip strength as the obtained *t*-value of 0.41 of the right hand and 0.10 of the left hand is quite lower than the tabulated *t*-value of 2.048 required to be significant at 0.05 level for the 28 degrees of freedom.

It is evident from the finding of Table 2 that there is a significant difference between the means of basketball and cricket players in the variable of eye-hand coordination as the obtained *t*-value of 5.97 is quite higher than the tabulated *t*-value of 2.048 required to be significant at 0.05 level for the 28 degrees of freedom.

#### 4. DISCUSSION OF FINDINGS

Based on statistical findings, the result was justified scientifically and logically.

- Findings of Table 1 showed that there was an insignificant mean difference between the basketballers and cricketers in the variable of grip strength
- The findings of Table 2 revealed that there was a significant difference in eye-hand coordination, of basketball and cricket players; hence, it is concluded that basketball players are significantly superior than the cricket players.

#### 4.1. Testing of Hypotheses

In the beginning of this study, hypotheses were formulated and on the basis of statistical findings the formulated hypotheses accepted/rejected are given in the following table

Hypothesis	Statement	On the basis of statistical results
H <sub>1</sub>	There might be a significant difference in grip strength between basketballers and cricketers	Hypothesis rejected
H <sub>2</sub>	There might be a significant difference in eye-hand coordination between basketballers and cricketers	Hypothesis accepted

#### 5. CONCLUSIONS

Recognizing the limitations of this study and on the basis of statistical findings the following conclusion may be drawn:

- The insignificant difference was found in between the basketballers and cricketers in relation to grip strength
- The significant difference was found in between the basketballers and cricketers in relation to eye-hand coordination.

#### REFERENCES

- Khan, B.A. Study of selected psychological variables with playing ability of basketball and volleyball players. *Shree Hanuman Vayaym Prasarak Mandal*, 2019, 53(4), 3-9.
- Devinder, K.K. *Textbook of Applied Measurement, Evaluation and Sports Selection*. 2<sup>nd</sup> ed. New Delhi: Sports and Spiritual Science Publications. p. 334-335.
- Ajmer, S., Jagdish, B., and Singh, G.J. *Essential of Physical Education*. 5<sup>th</sup> ed. Ludhiana: Kalyani Publication; 2019.

# Comparative Study of Explosive Strength and Coordination between Volleyball and Badminton Players

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## ABSTRACT

The main purpose of this study was to find out the significance of the difference in explosive leg strength, explosive arm strength, eye-hand coordination, and eye-foot coordination between the volleyball and badminton players. For the purpose of this study, 15 male volleyball players and 15 male badminton players of Degree College of Physical Education, Amravati, were selected by adopting purposive sampling method. Data of explosive leg strength, explosive arm strength, eye-hand coordination, and eye-foot coordination were collected by administering vertical jump test, medicine ball throw test, eye-hand coordination (ball transfer) test, and eye-foot coordination test, respectively, on the aforementioned players and the scores were recorded accordingly. It was hypothesized that there might be a significant difference on the mentioned components between the volleyball and badminton players. To determine the significance of difference on the mentioned components between the two groups of players, independent “t”-test was employed for each component separately. The level of significance was set at 0.05 for testing the hypothesis. The findings of the statistical analysis revealed that the significance of difference was found in the variable of explosive leg strength and no significance of difference was observed on the variables of explosive arm strength, eye-hand coordination, and eye-foot coordination between the volleyball and badminton players.

**Keywords:** Explosive arm strength, Explosive leg strength, Eye-foot coordination, Eye-hand coordination, Volleyball and badminton.

## 1. INTRODUCTION

Physical fitness is an inseparable part of sports performance and achievements. The quality of its utilization value is directly proportional to the level of performance and skill. Which means greater the level of fitness, greater will be the ability of a person to attain higher levels of performance. Along with all motor fitness components, explosive strength and coordination play an important role in volleyball as well as badminton games to exhibit optimum performance.

It is well-known fact that every sports demand specific motor fitness and accordingly training schedule is developed by the coaches. Few games fundamental movements are very similar skill due to nature of the game fitness varies sport to sport; therefore, scholar interested to undertake the problem is stated as “Comparison of explosive strength and eye-hand coordination between volleyball and badminton players.”

On the basis of literature, discussion with the experts and personal experience, it was hypothesized that there might be a significant difference in explosive leg strength, explosive arm strength, eye-hand coordination, and eye-foot coordination between the volleyball and badminton players.

### 1.1. Purpose of the Study

The main purpose of this study was to find out the significance of the difference in explosive leg strength, explosive arm strength, eye-hand coordination, and eye-foot coordination between the volleyball and badminton players.

## 2. METHODOLOGY

For this study, 15 male volleyball players and 15 male badminton players were selected as subjects from Degree College of Physical Education, Amravati,

**Table 1:** Description of mean, standard deviation, and t-ratio for the data on explosive strength and eye-hand coordination of volleyball and badminton players

Variables	Game	Mean	Standard deviation	Mean difference (MD)	Standard error of MD	t-ratio
Explosive leg strength	Volleyball	36.79	4.66	8.58	1.56	5.5*
	Badminton	28.28	3.84			
Explosive arm strength	Volleyball	9.284	1.189	0.445	0.394	1.129@
	Badminton	8.839	0.96			
Eye-hand coordination	Volleyball	35.909	2.656	1.275	0.762	1.673@
	Badminton	34.634	1.289			
Eye-foot coordination	Volleyball	4.605	0.670	0.292	0.249	1.173@
	Badminton	4.897	0.696			

\*Significant at 0.05 level tabulated  $t_{(0.05 (28))} = 2.048$ . @Not significant at 0.05 level

through a purposive sampling method. The age of the subjects was ranged from 18 to 25 years.

To measure explosive leg strength, explosive arm strength, eye-hand coordination, and eye-foot coordination, vertical jump, medicine ball throw, eye-hand coordination (ball transfer), and eye-foot coordination tests, respectively, were administered on the selected volleyball and badminton players. The scores were recorded according to the units of the particular test.

### 3. RESULTS AND DISCUSSION

The data pertaining to each of the selected fitness components, i.e., explosive leg strength, explosive arm strength, eye-hand coordination, and eye-foot coordination were examined statistically by applying independent “t”-test to determine the significance of the difference between the volleyball and badminton players. The level of significance to test the hypothesis was set at 0.05.

It is evident from the findings of Table 1 that significance of difference was observed in the variable of explosive leg strength ( $t = 5.5 > 2.048$ ) whereas insignificant difference was found in explosive arm strength ( $t = 1.129 < 2.048$ ), eye-hand coordination ( $t = 1.673 < 2.048$ ), and eye-foot coordination ( $t = 1.173 < 2.048$ ) between the volleyball and badminton players.

The findings of Table 1 revealed that there was significant difference in the variable of explosive leg strength and it is also understood from the mean value that volleyball players are significantly superior than the badminton players, it may be because volleyball players

need to jump high to spike or block the opponent as the height of net is 2.43 m so as to players must develop their explosive leg strength for the better performance; therefore, such significant result might have occurred in this study.

Explosive arm strength, eye-hand coordination, and eye-foot coordination between the volleyball and badminton players were found insignificant differences in aforestated variables it may be because both games are very alike in nature as well as the basic movements and skills are very similar. Hence, such insignificant differences might have observed in the study.

### 4. CONCLUSIONS

Recognizing the limitations of this study and on the basis of statistical findings, the following conclusion may be drawn:

- The significant difference was found in between the volleyball and badminton players in the variable of explosive leg strength, whereas explosive arm strength, eye-hand coordination, and eye-foot coordination did not show any significant difference.

### REFERENCES

- Devinder, K.K. *Textbook of Applied Measurement Evaluation and Sports Selection*. New Delhi: Sports and Spiritual Science Publications; 2008.
- Kumar, C.S., Showkat, H., and Amit, R.K. *Test Measurement and Evaluation in Physical Education*. Nagpur: Amit Brothers Publication; 2013.
- Verma, J.P., and Mohammad, G. *Statistics for Psychology*. New Delhi: Tata McGraw-Hill Education Private Limited; 2012.



# Comparative Study of Explosive Leg Strength, Agility, and Cardiorespiratory Endurance in between Kho-Kho Players and Kabaddi Players

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## ABSTRACT

The main purpose of this study was to compare the explosive leg strength, agility, and endurance of Kabaddi and kho-kho players. For this purpose, 24 intercollegiate level male players were selected as the subjects. Twelve players each from the two games were selected using a purposive sampling method from Degree College of Physical Education, Amravati. Their age was ranging from 18 to 25 years. The criterion measures selected for the purpose of the study were standing broad jump in meters, Southeast Missouri agility in seconds and 600 m run min/s. The data pertaining to the selected physical fitness components of Kabaddi and kho-kho players were examined by *t*-test to determine the significance of differences. The findings of the study revealed that only agility showed significant difference ( $t = 4.72$ ) in between kho-kho and Kabaddi players, and no significant difference was found in the variable of explosive leg strength ( $t = 1.574$ ) and cardiorespiratory endurance ( $t = 0.31$ ) in between kho-kho and Kabaddi players. Finally, it may be fairly concluded that kho-kho players are statistically superior than the Kabaddi players in agility, it may be attributed to the nature of the game as the game of kho-kho demands much more agile movement for the optimum level of performance; therefore, such result might have occurred in this study. Explosive leg strength and cardiorespiratory endurance are indispensable to perform both the game of kho-kho and Kabaddi; hence, an insignificant difference was observed.

**Keywords:** Agility, Cardiorespiratory endurance, Explosive leg strength, Kabaddi and kho-kho.

## 1. INTRODUCTION

Sports contribute to physical fitness through intensive training provided for competition. In this era to develop the standard of the game, the players and coaches should have the knowledge of the scientific principles of sports training and must follow them while practicing to enhance the physiological, physical, and psychological parameters along with the proper technique and tactics.

Every human being has a fundamental right to access to physical activities and sports, which is essential for the full development of his personality. The freedom to develop physical, intellectual, and moral powers through physical education and sports must be guaranteed both within the educational system and in other aspects of social life.

### 1.1. Purpose

The main purpose of the study was to compare the explosive leg strength, agility, and cardiorespiratory endurance of Kabaddi and kho-kho players.

## 2. METHODOLOGY

Twelve male kho-kho players and 12 male Kabaddi players were selected as subjects from Degree College of Physical Education, Amravati, through a random sampling method. The age of the subjects was ranged from 18 to 25 years.

The data were collected on the selected subjects by applying Southeast Missouri agility, standing broad jump and 600 m. Run/walk tests to measure the agility, explosive leg strength, and cardiorespiratory endurance,

**Table 1:** Description of mean, standard deviation, and *t*-ratio for the data on selected fitness components of kho-kho and Kabaddi players

Components	Game	Mean	Standard deviation	MD	Standard error of MD	<i>t</i> -ratio
Standing board jump (explosive leg strength)	Kho-Kho	2.195	0.131	0.17	0.108	1.574 <sup>@</sup>
	Kabaddi	2.364	0.35			
Semo agility test (agility)	Kho-Kho	11.075	0.577	1.185	0.251	4.72*
	Kabaddi	12.260	0.651			
600 m yard (cardiorespiratory endurance)	Kho-Kho	2.372	0.254	0.028	0.091	0.31 <sup>@</sup>
	Kabaddi	2.400	0.189			

\*Significant at 0.05 level tabulated  $t_{0.05(22)} = 2.074$ . <sup>@</sup>Not significant at 0.05 level. MD: Mean difference, Semo: Southeast Missouri

respectively, of the kho-kho and Kabaddi players. The scores were recorded according to the directions of the particular tests.

### 3. RESULTS AND DISCUSSION

The data pertaining to each of the selected fitness components, i.e., agility, explosive leg strength, and cardiorespiratory endurance were examined statistically by applying independent “*t*”-test to determine the significance of difference if any. The level of significance to test the hypothesis was set at 0.05. The findings have been shown in given table.

It is observed from the findings of Table 1 that only agility ( $t = 4.72 > 2.074$ ) showed a significant difference in between kho-kho and Kabaddi players, it may be because the game of kho-kho demands much more agile movement for the optimum level of performance. The findings also reveal that no significant difference is found in the variable of explosive leg strength ( $t = 1.574 < 2.074$ ) and cardiorespiratory endurance ( $t = 0.31 < 2.074$ ), it may be because explosive leg strength and cardiorespiratory endurance are indispensable to perform both the games

of kho-kho and Kabaddi; hence, insignificant difference was observed.

### 4. CONCLUSIONS

Recognizing the limitations of this study and on the basis of statistical findings, the following conclusion may be drawn:

- The significant difference was found in between the kho-kho players and Kabaddi players in relation to agility
- No significant difference was found in between the kho-kho players and Kabaddi players in relation to explosive leg strength and cardiorespiratory endurance.

### REFERENCES

- Devinder, K.K. *Textbook of Applied Measurement Evaluation and Sports Selection*. New Delhi: Sports and Spiritual Science Publications; 2008.
- Verma, J.P., and Mohammad, G. *Statistics for Psychology*. New Delhi: Tata McGraw-Hill Education Private Limited; 2012.
- Singh, H. *Science of Sports Training*. New Delhi: D.V.S. Publication; 1993.

# A Study of Frustration Tolerance among Adolescent Sportspersons in Relation to Their Well-being

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## ABSTRACT

The present study was undertaken to investigate frustration tolerance among adolescent sportspersons in relation to their well-being. The sample of the study comprised 100 adolescents sportspersons with equal numbers studying in the government and private schools situated in Chandigarh. Further, out of each 50 sportspersons, 25 adolescent boys and 25 adolescent girls sportspersons were selected randomly from government and private schools. Frustration Tolerance Test by S.N. Rai published by Meerut psychological research (1997) and well-being scale by Jagsharanbir *et al.* (2001) were used for the purpose of data collection. Findings of the study were shown that no significant mean difference in the variables taken in the study, i.e., frustration tolerance among adolescent sportspersons in relation to their well-being.

## 1. INTRODUCTION

In the fast-growing world with rapid change, we often face personal and professional conflicts, competitions, marital problems, social laws and taboos, international tensions, and various other pressures which affect the individuals and the society at large, directly or indirectly. We also face various minor or major frustrations in our day-to-day life such as not meeting the target, losing the competition, broken dates, late trains, fallen cakes, power failures, lost paper, absent friend, late arrivals, blame game, pending assignment to check, and so on and so forth.

Sometimes human beings are a failure in goal achieving. They have so many aspirations and desires to be fulfilled, they plan and strive hard for their realization, but despite their best planning and efforts, they may not get the desired success. At times, they find themselves in the state of alter confusion and bewilderment. All the paths for going a need seem to be blocked. This sort of affairs along with the repeated failure in the attempts put one's into a state or condition that can be termed as frustration.

Frustration tolerance refers to the capacity of the individual to show persistence in affords despite repeated failure and antagonistic environment. The adolescent sportspersons have necessary to tolerate the frustration resulting from such events as a failure

in competition, loss of status, etc., to maintain the integration of the personality. According to Atkison *et al.* (1966), frustration tolerance is the ability to suffer being thwarted without undue psychological harm. "In the ability to tolerate frustration leads to break down, maladjusted, and problems in the inter-personal relationship, frustration tolerance tends to increase with age."

With passage of time with experience when an individual gains knowledge of handling the situation, to cope up with the situation or smart enough to control and to manage stress, which enables the individual to enjoy the good status of well-being.

Well-being considered as a subjective feeling of contentment, happiness, satisfaction, with life's experience, sense of achievements, utility, belongingness and no distress, dissatisfaction or worry etc., and classified well-being in five components. Marks and Shah (2004), "well-being is more than just happiness. As well as feeling satisfied and happy, well-being means developing as a person, being fulfilled, and making a contribution to community."

### 1.1. Design of the Study

The present investigation was designed to study frustration tolerance among adolescent sportspersons in relation to their well-being. A systematic procedure to

collect data was adopted that helps to test hypotheses of the study under investigation. Descriptive survey method was used to collect the data “t” was used to analyze the data.

## 1.2. Sample of the Study

Stratified random sampling technique was employed to collect the data, the sample was comprised 100 adolescent sportspersons studying in the different schools of Chandigarh; further, of 100 adolescent sportspersons, 50 sportspersons were from government schools and 50 sportspersons were taken. Out of each 50, 25 sportspersons were boys and remaining 25 sportsperson were girls from both government and private schools.

## 1.3. Tools Used in the Study

In accordance with the objectives of this study and to test the hypothesis, the following tools were used for data collection:

1. Frustration Tolerance Test by S.N. Rai published by Meerut psychological research (1997)
2. Well-being scale by Jagsharanbir *et al.* (2001).

## 1.4. Objectives of the Study

The objectives of this study were as follows:

1. To study and compare the frustration tolerance among adolescents sportspersons studying in government and private schools of Chandigarh.
2. To study and compare the well-being among adolescent sportspersons studying in government and private schools of Chandigarh.
3. To study and compare the frustration tolerance among adolescent boys and girls sportspersons studying in government and private schools of Chandigarh.
4. To study and compare the well-being among adolescent boys and girls sportspersons studying in government and private schools of Chandigarh.
5. To study and compare the frustration tolerance in relation to their well-being sportspersons studying in government and private schools of Chandigarh.

## 1.5. Hypotheses of the Study

1. There will be no significant difference in frustration tolerance among adolescent sportspersons studying in government and private schools of Chandigarh.

2. There will be no significant difference in well-being among adolescents sportsperson studying in government and private schools of Chandigarh.
3. There will be no significant difference in frustration tolerance among adolescent boys and girls sportspersons studying in government and private schools of Chandigarh.
4. There will be no significant difference in well-being among adolescent boys and girls sportspersons of Chandigarh.
5. There will be no significant difference in frustration tolerance in relation to their well-being among adolescent sportspersons studying in government and private schools of Chandigarh.

## 2. RESULTS AND DISCUSSION

The result reported in Table 1 that shows mean scores among frustration tolerance of adolescent sportspersons studying in government and private schools. The mean score of frustration tolerance of adolescent sportsperson studying in government schools was 46.52 and standard deviation was 9.55, whereas the mean scores of frustration tolerance of adolescent sportsperson students studying in private schools were 45.58 and standard deviation was 8.61. The comparative results presented in Table 1 that shows that there was no significant difference among frustration tolerance of adolescents sportsperson studying in government and private schools because the obtained *t*-value on the sub-variables of frustration tolerance was 1.13 and 0.156, respectively, for time devoted and number of attempts, respectively, were found to be lower than table *t*-value, i.e., 1.98 at 0.05 level of significance with 98° of freedom and there was no significant mean difference found in total mean score among frustration tolerance of adolescents sportsperson studying in government and private schools because the obtained *t*-value (0.517) was also found to be lower than table *t*-value.

The result reported in Table 2 that shows the mean score of adolescents' sportsperson studying in government and private schools on well-being. The mean score of well-being of adolescents' sportsperson studying in government schools was 122.74 and standard deviation was 6.57, whereas the mean scores of adolescents' sportsperson studying in private schools on well-being were 125.04 and standard deviation was 1.10. The comparative results presented in Table 2 shows no significant mean difference between well-being of adolescents sportsperson studying in government and private schools because the obtained *t*-value on the

**Table 1: Mean differential among frustration tolerance of adolescent sportspersons studying in government and private schools**

Dimensions of frustration tolerance	Adolescent sportspersons of government schools		Adolescent sportspersons of private schools		t-value	df	Level of significance
	Mean	SD	Mean	SD			
1. Time devoted	13.52	2.75	12.84	3.22	1.13	98	Not significant
2. Number of attempts	33.00	8.47	32.74	8.21	0.156	98	Not significant
Frustration tolerance	46.52	9.55	45.58	8.61	0.517	98	Not significant

$P > 0.05 = 1.98$  (df=98)

**Table 2: Mean differential among well-being of adolescent sportspersons studying in government and private schools**

Dimensions of well-being	Adolescent sportsperson of government schools		Adolescent sportsperson of private schools		t-value	df	Level of significance
	Mean	SD	Mean	SD			
Positive items	68.02	4.71	67.40	5.72	2.84	98	Not significant
Negative items	54.72	4.25	57.64	5.86	0.591	98	Not significant
Total well-being	122.74	122.54	125.04	7.84	1.58	98	Not significant

$P > 0.05 = 1.98$  (df=98)

**Table 3: Mean differential in frustration tolerance among adolescent boys and girls sportsperson studying in government and private schools**

Dimensions of frustration tolerance	Adolescent boys sportsperson		Adolescent girls sportsperson		t-value	df	Level of significance
	Mean	SD	Mean	SD			
1. Time devoted	13.48	3.12	12.88	2.88	0.998	98	Not significant
2. Number of attempts	33.70	9.06	32.0	47.45	1.00	98	Not significant
Frustration tolerance	47.18	10.00	44.92	7.95	1.25	98	Not significant

$P > 0.05 = 1.98$  (df=98)

sub-variables of well-being was 0.591 and 2.84 for positive items and negative item, respectively, which were found lesser than table  $t$ -value, i.e., 1.98 at 0.05 level of confidence with 98° of freedom, and further, no significant mean difference found in the total mean score among well-being of adolescents sportsperson studying in government and private schools as the obtained  $t$ -value (1.58) was also found lesser than table  $t$ -value required to be significant at 0.05 level of confidence with 98° of freedom.

Moreover, the result reported in Table 3 that shows mean scores among frustration tolerance of adolescent boys and girls sportsperson studying in government and private schools. The mean score of frustration tolerance of adolescent boys sportsperson was 47.18 and standard deviation was 10.00, whereas the mean scores of frustration tolerance of adolescent girls sportsperson studying in government and private schools were 44.92 and standard deviation was 7.95. The comparative

results presented in Table 3 shows that there was no significant difference in frustration tolerance among adolescent boys and girls sportsperson in government and private schools because obtained  $t$ -value on the sub-variables on frustration tolerance was 0.998 and 1.00, respectively, for time devoted and number of attempts were found to be lesser than table  $t$ -value, i.e., 1.98 at 0.05 level of significance with 98° of freedom and there is no significant difference found in total mean score in frustration tolerance among adolescent boys and girls studying in government and private schools because the obtained  $t$ -value (0.517) was found to be lower than table  $t$ -value.

The result reported in Table 4 that shows the mean score of well-being among adolescent boys and girls sportsperson of government and private schools. The mean score of well-being of adolescent boys sportsperson was 123.54 and standard deviation was 7.31, whereas the mean scores of well-being of adolescent girls



sportsperson were 124.24 and standard deviation was 7.32. The comparative result presents in Table 4 shows there will be no significant difference of well-being among adolescent boys and girls sportsperson because the obtained *t*-value on the sub-variables of well-being was 0.859 and 0.188, respectively, for positive items and negative items that were found to be lower than table *t*-value, i.e., 1.98 at 0.05 level of significance with 98° of freedom and there is no significant difference found in total mean score in well-being among adolescent boys and girls sportsperson because the obtained *t*-value (0.478) was found to be lower than table *t*-value.

The result reported in Table 5 that shows the mean scores of frustration tolerance among adolescents sportsperson with high and low level of well-being. The mean score of frustration tolerance among adolescents sportsperson with low level of well-being was 46.48 and standard deviation was 7.36, whereas the mean scores of frustration tolerance among adolescents sportsperson with high level of well-being were 43.55 and standard deviation was 9.85. The comparative result presents in Table 5 shows there was no significant mean difference in frustration tolerance among adolescents with high and low level of well-being because the obtained *t*-value of well-being (1.23), respectively, was found lesser than table *t*-value that was 2.07 at 0.05 level of significance with 52° of freedom.

### 2.1. Discussion of the Result

The result of the presented study indicates that adolescent sportsperson is having above-average

level of frustration tolerance ability while comparing their achieved score to the norms score given in the questionnaire manual of frustration tolerance used in the present study irrespective to the type of institute, where they are getting schooling. The result may be attributed to the facts that the environment in sports conditioned the sportsperson to have more frustration level as compared to common person reason behind is the pressure of the matches, results, spectators, etc., they face on the field and off the field and that type of pressure was equally shared by both the genders (male and female). The results of the present study also indicate there is no significant mean difference in boys and girls adolescent sportsperson in frustration tolerance level in relation to their well-being.

### 3. IMPLICATIONS OF THE STUDY

The findings of the study have various implications for physical education teachers, coaches, trainers, administrators, and guidance workers.

1. This study will help physical education teachers, coaches, trainers to develop a friendly attitude and listening skills so as to reduce the frustration among adolescent sportspersons.
2. Various practices like meditation and pranayama and recreational activities can be included to reduce the frustration among adolescent sportspersons.
3. It is helpful in nurturing creativity among adolescents and reduces frustration.
4. The findings of the study will help the teacher to understand various factors which affect the well-being.

**Table 4:** Mean differential in well-being among adolescent boys and girls sportsperson of government and private schools

Dimensions of well-being	Adolescent boys sportsperson		Adolescent girls sportsperson		<i>t</i> -value	df	Level of significance
	Mean	SD	Mean	SD			
Positive item	67.26	4.92	68.16	5.52	0.188	98	Not significant
Negative item	56.28	6.26	56.08	4.19	0.859	98	Not significant
Total well-being	123.54	7.31	124.24	7.32	0.478	98	Not significant

$P > 0.05 = 1.98$  (df=98)

**Table 5:** Mean differential in frustration tolerance among adolescents sportsperson with high and low level of well-being

Variables	Low level of well-being		High level of well-being		<i>t</i> -value	df	Level of significance
	Mean	SD	Mean	SD			
Frustration tolerance	46.48	7.36	43.55	9.85	1.236	52	Not significant

$P \geq 0.05 = 2.07$  (df=52)

5. The study will help school principals and administration to understand the students in a healthy way.
6. The guidance worker will have deeper insight into well-being of the adolescents. This will further help him or her to find out the causes of certain undesirable behavior which leads to frustration.
7. This study is helpful in nurturing the well-being of the adolescents.

## REFERENCES

Atikison, J., Berne, E., and Woodworth, R. *Dictionary of Psychology*. 4<sup>th</sup> ed. New Delhi: Goyl Saab; 1966.

Bell, A., Rajendarn, D., and Theiler, S. Job stress, wellbeing, work-life balance and work-life conflict among Australian academics. *Electron J Appl Psychol*, 2012, 81(1), 25-37.

Ereaut, G., and Whiting, R. *What do we mean by Wellbeing? And why might it Matter?* London: RW073 DCSF Publications; 2008.

Marks, N., and Shah, H. A well-being manifesto for a flourishing society. *J Public Ment Health*, 2004, 3(4), 9-15.

Munn, N.L. *Psychology*. 4<sup>th</sup> ed. London: George G. Harrap & Co. Ltd.; 1956.

Zizek, S., Milfelner, B., Mulej, M., Breg, T., Potocnik, A., and Hrast, A. *Empirical Data about Social Responsibility in Slovenia*. Vol. 38. Cambridge, Massachusetts: Academic Press; 2012.

Available from: <http://www.wikipedia.org>.

Available from: <http://www.google.co.in>.

# A comparative Study of Mood State on Sportsmen and Non-sportsmen Students

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## ABSTRACT

Mood state can be distinguished from mood swings based on the severity, duration, and domain (Miller, 2008). The specific mood state of a person can be expressed in dimensions such as anxiety, depression, aggression, serene state, relaxed state, excited state, happiness, and vigor. The purpose of this study was to the mood state on sportsmen and non-sportsmen students. **Objectives:** The objectives of the study were sportsmen and non-sportsmen students on anxiety, stress, depression, regression, fatigue, extraversion, and arousal. **Hypotheses:** There will be no significant difference between sportsmen and non-sportsmen students on anxiety, stress, depression, regression, fatigue, extraversion, and arousal. **Methodology-Sample:** A total sample of present study 100 college-going students, in which 50 were sportsmen students (25 male and 25 female students) and 50 non-sportsmen students (25 male and 25 female students). The subject selected in this sample was used in the age group of 18 years–21 years (mean – 19.16, standard deviation [SD] – 2.01.) and ratio 1:1. Non-probability purposive Quota sampling will be used. **Variables:** The independent variables are types of students dependent variables are mood state (anxiety, stress, depression, regression, fatigue, extraversion, and arousal). **Research Design:** 2 × 2 factorial research design will be used. **Research Tools:** Eight state questionnaire developed by Cattell and Curran (1973) and this questionnaire Indian adaption by Kapoor and Bhargava (1990). **Statistical Treatment:** Mean, SD, and analysis of variance will be used. **Conclusions:** Non-sportsmen students' high anxiety, stress, depression, regression, fatigue, extraversion, and arousal than sportsmen students.

**Keywords:** Anxiety, Depression, Extraversion and arousal, Fatigue, Guilt, Non-sportsmen students, Regression, Sportsmen, Stress.

## 1. INTRODUCTION

Sports are as old as human society, and it has achieved a universal following in the modern times. It now enjoys popularity, which outstrips any other form of social activity. Millions of fans follow different sports events all over the world with enthusiasm boarding on devotion may participate in sports activities for the fun of it or for health, strength, and fitness. It is taking the shape of a profession to some with high skills, with ample financial benefits linked with a high level of popularity. Anxiety, stress, depression, regression, fatigue, guilt, extraversion, and arousal. Which are the psychological factors to be studied in the present investigation, play a significant role for the personality development of sportsmen and non-sportsmen. However, very less efforts have been done to see the significant development of these factors in sportsmen and non-sportsmen. Even

very less studies have been done to compare the effects of these factor sportsmen and non-sportsmen. The investigator has taken this hunch to make efforts for comparing the position or anxiety, stress, depression, regression, fatigue, guilt, extraversion, and arousal. Of the sportsmen and non-sportsmen.

### 1.1. Purpose of the Study

The present study in hand is a psychological study of sportsmen and non-sportsmen, in which psychological factors anxiety, stress, depression, regression, fatigue, guilt, extraversion, and arousal shall be studied. These factors influence the normal living condition of a person and normal living condition of sportsmen. The sports performances are most affected due to the development of these four factors arising during a practice session and during a match or a competition

due to this session. Even these factors also affect the living condition and the behavioral pattern of a normal person or non-sportsmen during his general activities and specific work to be done by him. The present study will tell us how the factors of anxiety, stress, depression, regression, fatigue, guilt, extraversion, and arousal their role on the sportsmen and non-sportsmen during their performance and work. The study will have significant contribution to give direction to the sportsmen and non-sportsmen to control these factors for achieving their roles. The finding of the present investigation will also be a beneficial tool for the trainers for the coaches and the organizer of the sport program, sports psychologist, and sport medical professional to add to a significant contribution for the successful achievement of their sport person and players. The results of the study will also help the sportsmen and non-sportsmen in building their all-round personality by the development of these psychological factors.

## 2. REVIEW OF RELATED LITERATURE

Dang-Pyaei (1995), Yousefi (1991), Mazinani (1998), Homaei (1998), and Moghadam (1995), this study found that there is a significant difference between the athletic and non-athletic students. Chawla, 2017, this study found that there is no significant difference in the stress during college exam between the sportsperson and non-sportsperson students. Kumar, (2014), this study found that non-sportsmen having more anxiety level than the sportsmen in high socioeconomic and medium socioeconomic status than the sportsmen. Kumar (2004), this study found that there is no significant difference between the level of anxiety of sportsmen and non-sportsmen and sportsmen have more extraversion than non-sportsmen.

### 2.1. Objective of the Study

The objective of the study was as follows:

- To study the sportsmen and non-sportsmen students on anxiety, stress, depression, regression, fatigue, guilt, extraversion, and arousal.

### 2.2. Hypothesis of the Study

- There will be no significant difference between sportsmen and non-sportsmen students on anxiety, stress, depression, regression, fatigue, guilt, extraversion, and arousal.

## 3. METHODS

### 3.1. Sample

A total sample of present study 100 college-going students, in which 50 were sportsmen students (25 male and 25 female students) and 50 non-sportsmen students (25 male and 25 female students). The subject selected in this sample was used in the age group of 18 years–21 years (mean – 19.16, SD – 2.01.) and ratio 1:1. Non-probability purposive quota sampling will be used.

### 3.2. Research Design

In the present study, a  $2 \times 2$  factorial design will be used.

### 3.3. Variables of the Study

- Independent variable – type's students – (1) sportsman, (2) non-sportsman.
- Dependent variable – mood states – anxiety, stress, depression, regression, fatigue, guilt, extraversion, and arousal.

### 3.4. Research Tools

Table 1 shows the eight state questionnaire.

### 3.5. Statistical Treatment

Mean, SD, and analysis of variance will be used.

## 4. RESULTS AND DISCUSSION

Observation of Table 2A indicated that anxiety of the mean and SD value obtained by sportsmen students  $14.10 \pm 2.80$ , and non-sportsmen students were  $16.96 \pm 2.90$ . It is observed that the calculated 'F' value 28.50 is high than the table value ( $0.01 = 6.90$  and at  $0.05 = 3.94$  levels). This null hypothesis is reject because table value low than calculated value and alternative hypothesis is accepted. It means that non-sportsmen students high anxiety than sportsmen students.

Observation of Table 2B indicated that stress of the mean and SD value obtained by sportsmen students  $14.62 \pm 2.96$ , and non-sportsmen students were  $18.24 \pm 2.45$ . It is observed that the calculated "F" value 46.87 is high than the table value ( $0.01 = 6.90$  and at  $0.05 = 3.94$  levels). This null hypothesis is reject because table value low than calculated value and alternative hypothesis is

**Table 1: Eight state questionnaire**

Aspect	Name of the test	Author	Sub factor	
Mood states	Eight state questionnaire	Developed by Cattell and Curran (1973) Indian adaption by Kapoor and Bhargava (1990)	(1) Anxiety (2) stress (3) depression (4) regression (5) fatigue (6) guilt (7) extraversion (8) arousal	Item – 96 (Par 8 dimensions 12 items) Scoring – four options and is scored either 0, 1, 2, or 3. Reliability – 0.91–0.96 Validity – 0.62–0.92

**Table 2: Mean, SD, and F value of gender on mood states**

Table no.	Factor	Types students	Mean±SD	n	DF	F value	Sign.
Table no. 2A	Anxiety	Sportsmen students	14.10±2.80	50	98	28.50	0.01
		Non-sportsmen students	16.96±2.90	50			
Table no. 2B	Stress	Sportsmen students	14.62±2.96	50	98	46.87	0.01
		Non-sportsmen students	18.24±2.45	50			
Table no. 2C	Depression	Sportsmen students	14.58±2.57	50	98	55.78	0.01
		Non-sportsmen students	17.84±2.19	50			
Table no. 2D	Regression	Sportsmen students	14.32±3.19	50	98	69.71	0.01
		Non-sportsmen students	18.52±2.08	50			
Table no. 2E	Fatigue	Sportsmen students	14.26±2.30	50	98	97.65	0.01
		Non-sportsmen students	18.30±1.84	50			
Table no. 2F	Guilt	Sportsmen students	14.18±2.54	50	98	64.81	0.01
		Non-sportsmen students	17.34±1.74	50			
Table no. 2G	Extraversion	Sportsmen students	16.98±2.19	50	98	13.31	0.01
		Non-sportsmen students	18.32±1.84	50			
Table no. 2H	Arousal	Sportsmen students	15.04±1.70	50	98	20.82	0.01
		Non-sportsmen students	16.34±1.28	50			

accepted. It means that non-sportsmen students high stress than sportsmen students.

Observation Table 2C indicated that depression of the mean and SD value obtained by sportsmen students  $14.58 \pm 2.57$  and non-sportsmen students were  $17.84 \pm 2.19$ . It is observed that the calculated “F” value 55.78 is high than the table value (0.01 = 6.90 and at 0.05 = 3.94 levels). This null hypothesis is reject because table value low than calculated value and alternative hypothesis is accepted. It means that non-sportsmen students high depression than sportsmen students.

Observation of Table 2D indicated that regression of the mean and SD value obtained by sportsmen students  $14.32 \pm 3.19$ , and non-sportsmen students were  $18.52 \pm 2.08$ . It is observed that the calculated “F” value 69.71 is high than the table value (0.01 = 6.90 and at 0.05 = 3.94 levels). This null hypothesis is reject because table value low than calculated value and alternative hypothesis is accepted. It means that non-sportsmen students high regression than sportsmen students.

Observation of Table 2E indicated that fatigue of the mean and SD value obtained by sportsmen students  $14.26 \pm 2.30$ , and non-sportsmen students were  $18.30 \pm 1.84$ . It is observed that the calculated “F” value 97.65 is high than the table value (0.01 = 6.90 and at 0.05 = 3.94 levels). This null hypothesis is reject because table value low than calculated value and alternative hypothesis is accepted. It means that non-sportsmen students high fatigue than sportsmen students.

Observation of Table 2F indicated that guilt of the mean and SD value obtained by sportsmen students  $14.18 \pm 2.54$ , and non-sportsmen students were  $17.34 \pm 1.74$ . It is observed that the calculated “F” value 64.81 is high than the table value (0.01 = 6.90 and at 0.05 = 3.94 levels). This null hypothesis is reject because table value low than calculated value and alternative hypothesis is accepted. It means that non-sportsmen students high guilt than sportsmen students.

Observation of Table 2G indicated that extraversion of the mean and SD value obtained by sportsmen



students  $16.98 \pm 2.19$ , and non-sportsmen students were  $18.32 \pm 1.84$ . It is observed that the calculated “F” value 13.31 is high than the table value (0.01 = 6.90 and at 0.05 = 3.94 levels). This null hypothesis is reject because table value low than calculated value and alternative hypothesis is accepted. It means that non-sportsmen students high extraversion than sportsmen students.

Observation of Table 2H indicated that arousal of the mean and SD value obtained by sportsmen students  $15.04 \pm 1.70$ , and non-sportsmen students were  $16.34 \pm 1.28$ . It is observed that the calculated “F” value 20.82 is high than the table value (0.01 = 6.90 and at 0.05 = 3.94 levels). This null hypothesis is reject because table value low than calculated value and alternative hypothesis is accepted. It means that non-sportsmen students high arousal than sportsmen students.

#### 4.1. Limitations of the Study

1. The finding of the study is based on very sample.
2. The sample was restricted to Ambad city in Maharashtra.
3. The study was restricted to only UG college students only.
4. The study was restricted; students are only 18–21 years only.

### 5. CONCLUSIONS

- Non-sportsmen students high anxiety than sportsmen students.
- Non-sportsmen students high stress than sportsmen students.
- Non-sportsmen students high depression than sportsmen students.
- Non-sportsmen students high regression arousal than sportsmen students.

- Non-sportsmen students high fatigue than sportsmen students.
- Non-sportsmen students high fatigue than sportsmen students.
- Non-sportsmen students high extraversion than sportsmen students.
- Non-sportsmen students arousal than sportsmen students.

### REFERENCES

1. Kumar, A. *A Comparative Study of Anxiety, Neuroticism, Extraversion and Adjustment among Sporteman and Non-Soprtsman of Haryana*. Rohtak, Haryana: Ph.D. Thesis, Maharashi Dayanand University; 2004.
2. Cattell, R.B., and Curran, J.P. *Eight State Questionnaire (8SQ)*. Kapoor, S.M., and Bhargava, M. Indian Adaptation. The Psycho Centre, G19, H-Block, Saket, New Delhi-110017. Saket, New Delhi: The Psycho Centre; 1973.
3. Moghadam, H.E. *A Comparison of Distribution of Depression among Male and Female Athletic and Non-athletic Students of High Schools in Sanandaj, Iran Tehran*, Iran: Unpublished Master’s Thesis) Islamic Azad University of Central Tehran; 1995.
4. Homaei, M. *Comparing Negative Attitudes Leading to Depression among Athletic and Non-athletic Children of Combatants Killed in Action as Students of High Schools*. Tehran, Iran: (Unpublished Master’s Thesis) Islamic Azad University of Central Tehran; 1998.
5. Kumar, J.N. A comparative study of anxiety level between sportsmen and non-sportsmen in relation to their socio economic status at university level. *Int J Multidiscip Res Dev*, 2014, 1(6), 51-52.
6. Chawla, N. A comparative study of stress between sports person and non-sports person during college exam. *Int J Yoga Physiother Phys Educ*, 2017, 2(4), 91-92.
7. Yousefi, B. *A Survey of Depression among Athletic and Non-athletic Students*. Iran: Unpublished Master’s Thesis Faculty of Physical Education, University of Tehran; 1991.

# Effect of Circadian Variation on Selected Motor Fitness Components of Taekwondo Players

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## 1. INTRODUCTION

Circadian rhythm is roughly a 24 h cycle in the physiological process of living being. Circadian rhythm is also known as biorhythmic and diurnal variation, i.e., changes and fluctuation that take place in the physiological parameters of human body within 24 h in a day. The 24 h rhythm is one of the most prominent cycles, which controls variation in body temperature, the pulse rate, the respiratory rate, the hormonal secretion of adrenocortical system, and the amount and composition of urine excreted by person. As it is observed that the players practice in a particular time period and whenever he/she performs in that particular time, optimum performance is observed.

### 1.1. Purpose of the Study

The purpose of the study was to determine the effect of circadian variation on selected motor fitness components of intercollegiate Taekwondo players.

## 2. METHODOLOGY

Ten male intercollegiate Taekwondo players were selected from Degree College of Physical Education, Amravati, by adopting purposive sampling method. The age of the subjects was ranged from 18 to 25 years.

Agility, speed, explosive leg strength, and eye-foot coordination were tested by administering Zig-Zag Run, 50 yards dash, standing broad jump, and Nelson eye-foot coordination tests, respectively, and the scores were recorded according to the instructions of the above-mentioned tests, and the obtained scores were arranged in the table for further statistical treatments.

## 3. RESULTS AND DISCUSSION

To know the status of subjects in the selected variables descriptive statistical, i.e., mean, standard deviation was computed and to determine the significant difference

**Table 1:** Summary of one-way analysis of variance for the data on selected variables of taekwondo players due to circadian variations

Variable	Source of variance	Degree of freedom	Sum of square	Mean of square	F-ratio
Explosive leg strength (Standing broad jump)	Between the group	K-1 4-1=3	0.013	4.33 <sup>-3</sup>	0.17 <sup>@</sup>
	Within the group	N-K 40-4=36	0.95	0.026	
Eye-foot coordination	Between the group	K-1 4-1=3	0.495	0.165	0.6066 <sup>@</sup>
	Within the group	N-K 40-4=36	9.80	0.272	
Speed (50 yard dash)	Between the group	K-1 4-1=3	1.93	0.64	8 <sup>*</sup>
	Within the group	N-K 40-4=36	3.17	0.08	
Agility (Zig-Zag Run)	Between the group	K-1 4-1=3	3.23	1.076	5.38 <sup>*</sup>
	Within the group	N-K 40-4=36	7.54	0.20	

\*Significant at 0.05 level. Tabulated F 0.05 (3,36)=2.86. @Not significant at 0.05 level

**Table 2: Paired mean difference for the data on 50 m. Dash (speed) and Zig-Zag Run (agility)**

Variables	Mean of				Mean difference	Critical difference
Speed (s)	7-10 h	10-13 h	13-16 h	16-19 h		
	7.01	7.031			0.021	0.255
	7.01		6.97		0.04	0.255
	7.01			6.52	<b>0.49*</b>	0.255
		7.031	6.97		0.061	0.255
		7.031		6.52	<b>0.511*</b>	0.255
			6.97	6.52	<b>0.45*</b>	0.255
Agility (s)	7.88	7.96			0.08	0.405
	7.88		8.34		<b>0.46*</b>	0.405
	7.88			7.54	0.34	0.405
		7.96	8.34		0.38	0.405
		7.96		7.54	<b>0.42*</b>	0.405
			8.34	7.54	<b>0.8*</b>	0.405

among the four different time of test one-way analysis of variance (ANOVA) statistical technique was employed independently for each variable, where F-ratio was found significant, *post-hoc* test was applied to find out the paired mean difference. The level of significance to test the hypothesis was set at 0.05. The findings pertaining to the study have been shown in the following Tables 1 and 2.

It is evident from Table 1 that significant differences are found in the variables of speed ( $F = 8 > 2.86$ ) and agility ( $F = 5.38 > 2.86$ ). The findings also revealed that insignificant differences are observed in the variable of explosive leg strength ( $F = 0.17 < 2.86$ ) and eye-foot coordination ( $F = 0.6066 < 2.86$ ) at 0.05 level.

It is observed from the findings of *post-hoc* test that superior performance is performed by the subject in the motor fitness component of speed during 16 to 19 pm, it is followed by 13 to 16 h and 7 to 10 h, whereas least performance is shown during 10 to 13 h in case of speed. The performance on agility of the selected subjects is found superior during 16–19 h, it is followed by during 7–10 h and 10–13 h, whereas least performance is shown during 13–16 h.

From the findings, it is understood that the optimum performance is shown during 16-19 h, it may be because

the selected subjects for the purpose of this study were chosen whom the training used to administer during 6 to 8 pm. Hence, their all the physiological system is tuned to perform optimally in that period, therefore, such result might have occurred in the study.

#### 4. CONCLUSION

Recognizing the limitations of this study and on the basis of statistical findings, it may be concluded that optimum performance is exhibited during 16–19 h in the variables of speed and agility. The second-best performance in the speed is observed during 13–16 h, whereas second-best performance on agility is observed during 7–10 h. Therefore, it can be said that the difference in the performance can be observed in different timing of the day due to circadian variation.

#### REFERENCES

- Sail, D., and Bhowmick S. *Biorhythm in Physical Fitness*. New Delhi: Paper Presented in Sports Psychology; 1991.
- Klaus, G. *Biorhyth Governing Both Men and Animals*. Yours Health; 1972.
- Uppal, A.K.V., Kumar, L.G., and Pande, M.M. *Bio-mechanics in Physical Education and Exercise*. New Delhi: Friends Publication; 2004.

# Comparative Study of Selected Coordinative Abilities between Handball and Basketball Players

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## 1. INTRODUCTION

In sports, today best performance can only be achieved through a meticulously planned, executed, and controlled training system loosed on the scientific knowledge, theoretical, and methodical fundamentals of sports training. Coordinative abilities are primarily depend on the motor control and regulation process of central nervous system. Coordinative abilities enable the sportsman to do a group of movements with better quality and effect. Performance in different games and sports, to a great extent, depends on the level of coordinative abilities of a sportsperson. Coordinative abilities depend on the mechanism involved in control and regulation of movement, the coordinative process of central nervous system, and functional capacity of various sense organs.

Handball is a team sport in which two teams of seven players each (six outfield players and a goalkeeper on each team) pass a ball to throw it into the goal of the other team. A standard match consists of two periods of 30 min and the team that scores more goal wins.

Basketball is a team sport in which two teams of five players each. Each team tries to score points by basket the ball in the other team court under organized rules.

### 1.1. Purpose of the Study

The main purpose of the study was to find out the significant difference of selected coordinative abilities between the handball and basketball players.

## 2. METHODOLOGY

To find the significance of difference, 15 handball and 15 basketball male players of Degree College of Physical Education, Amravati, were selected randomly as subjects.

### 2.1. Selection of Variables

On the basis of available literature in the coordinative abilities and their tests, the following coordinative abilities were selected for the study.

Orientation ability measured using numbered medicine ball run test and score was recorded in seconds.

Differentiation ability was measured using backward medicine ball throw test and score was recorded in number of points.

Balance ability measured using long nose test and score was recorded in seconds.

### 2.2. Administration of Tests and Collection of Data

The necessary data were collected by administering various coordinative ability test.

The necessary markings were done before the start of the test and the scholar strictly followed the given direction in the test. The entire test was demonstrated

**Table 1:** Description of mean, standard deviation, and t-ratio for the data of orientation ability

Players	Mean±Standard deviation	Standard error	t-ratio
Handball	6.506±0.367	0.45	0.915
Basketball	6.615±0.28	0.31	

**Table 2:** Description of mean, standard deviation, and t-ratio for the data of differentiation ability

Players	Mean±Standard deviation	Standard error	t-ratio
Handball	9.8±3.121	0.82	0
Basketball	9.8±1.897	0.74	

**Table 3:** Description of mean, standard deviation, and t-ratio for the data of balance ability

Players	Mean±Standard deviation	Standard error	t-ratio
Handball	3.478±0.66	0.22	0.859
Basketball	3.26±0.726	0.34	

S. no.	Test-item	t-test
1.	Orientation ability	0.915
2.	Differentiation ability	0
3.	Balance ability	0.859

and explained to the subjects by the scholar. They were given a chance to practice and become familiar with the tests and to know exactly what was to be done.

### 3. DISCUSSION AND FINDINGS

#### 3.1. Findings

The data of coordinative abilities collected from 15 handball and 15 basketball male players analyzed using *t*-test.

- Orientation ability: 0.915 – < the table value 2.05 at 0.05 level of confidence with 28 df.
- Differentiation ability: 0 – < the table value 2.05 at 0.05 level of confidence with 28 df.

- Balance ability: 0.859 – < the table value 2.05 at 0.05 level of confidence with 28 df.

### 4. CONCLUSION

Recognizing the limitation and on the basis of statistical finding obtained from the study following conclusion are drawn: There was no significant difference of coordinative ability between handball and basketball male players.

1. No significance of difference is found in orientation ability.
2. No significance of difference is found in differentiation ability.
3. No significance of difference is found in balance ability.

### REFERENCES

- Hirtz, P. *Coordinative Faehigkeitn Schlsport*. Berlin: Verlag, Volb and Wissen Volbseigner; 1985.
- Koley, A. *Relationship of Coordinative Abilities Sprinting Performance in Sprinters*. Unpublished Master Degree Thesis, LNIPE; 1999.
- Sarkar, G. *Relationship of Coordinative Abilities to Shooting Performance in Soccer*. Unpublished Master Degree Thesis, LNIPE; 1999.
- Singh, H. *Science of Sports Training*. New Delhi: D.V.S Publication; 1991.



# Comparative Study of Dynamic and Static Balance between Field Hockey and Football Players

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## ABSTRACT

Field hockey and football are a highly dynamic activity in which balance is considered as an ability to maintain a stable position while performing a task. The present study aimed to find out the significance of the difference in dynamic balance and static balance of field hockey and football players. For the purpose of this study, 15 male hockey players and 15 male football players of S.G.B Amravati University, Amravati, were selected by adopting a purposive sampling method and the age of the subjects was ranged from 18 to 25 years. To measure the dynamic balance and static balance of the field hockey and football players, star excursion balance test (SEBT) and one leg stance test were administered, respectively, and the scores were recorded according to the instructions of the aforementioned tests. It was hypothesized that there might be a significant difference in balancing ability (dynamic and static balance) between the field hockey and football players. To determine the significance of the difference in the aforesaid components in between field hockey and football players, independent “*t*”-test was employed for each component separately. The level of significance was set at 0.05 for testing the hypothesis. The findings of the statistical analysis revealed that no significant difference was observed in the variables of the dynamic balance left leg ( $t = 0.78$ ) and right leg ( $t = 1.94$ ) and static balance left leg ( $t = 1.44$ ) and right leg ( $t = 0.16$ ) between the field hockey and football players. It may be because the nature of the basic movements of both the games is highly dynamic in nature and therefore, the insignificant difference might have shown in this study.

**Keywords:** Dynamic balance, Field hockey and football, Static balance.

## 1. INTRODUCTION

Balance is the ability to stay upright or stay in control of body movement, and coordination is the ability to move two or more body parts under control, smoothly, and efficiently. Static balance is maintaining equilibrium when body is in stationary, whereas dynamic balance is maintaining equilibrium when body is in motion. We use our eyes, ears, and body sense to help retain our balance. Balance is maintained by the vestibular, visual, and somatosensory system along with center of gravity and center of mass. A player has to maintain his body posture while performing the task against his opponent player or by the player themselves while changing directions to avoid injuries while passing or kicking a ball. These perturbations are large and need strong stabilization. Balance ability has a significant effect on athletic performance. Poor balance ability has been associated with an increased risk of ankle injury in a number of sports.

On the field, athletes are always exposed to situations where the balance is dynamically challenged while

performing movements such as walking, running, stepping, and jumping. Balance is essential for football players during most aspects of games. They are required to maintain single-leg balance while shooting accurately, dribbling, and passing the ball. Field hockey like football is a highly dynamic activity. Being a highly dynamic activity, field hockey also demands a good dynamic balance.

A hockey player is usually moving or running while performing a skill and has to seek a point of balance in relation to the ball. A well-balanced position is essential in learning to play an attack role, to dribble quickly in any direction, and pass or shoot the ball in any direction as well as to receive the ball from any direction.

A comparison of dynamic balance in football had been established in relation to other sports. There is a necessity to identify whether the dynamic balance in a hockey player is similar or different to football players. Therefore, this study has been designed to investigate the comparison between field hockey and football players.

**Table 1:** Description of mean, standard deviation, mean difference, standard error, and t-ratio for the data on dynamic balance and static balance of the field hockey and football players

Variables	Game	Mean±Standard deviation	Mean difference	Standard error	t-ratio
Dynamic balance left leg	Hockey	6±1.64	0.53	0.68	0.78 <sup>@</sup>
	Football	6.53±2.06			
Dynamic balance left leg	Hockey	8.28±0.816	0.68	0.35	1.94 <sup>@</sup>
	Football	7.6±1.094			
Static balance of left leg	Hockey	19.33±3.43	1.8	1.25	1.44 <sup>@</sup>
	Football	17.53±3.46			
Static balance of right leg	Hockey	26.86±3.73	0.2	1.27	0.16 <sup>@</sup>
	Football	26.66±3.24			

<sup>@</sup>Not significant at 0.05 level. Tabulated  $t_{0.05}(28)=2.048$

## 2. METHODOLOGY

For the purpose of the study, 15 field hockey and 15 football male players of Sant Gadge Baba Amravati University, Amravati, were selected by random sampling method as subjects.

Dynamic balance was assessed by administering SEBT test, performance scores were recorded using the following simple equation.

- Average distance in each direction (cm) = (Reach1 + Reach2 + Reach3)/3
- Relative (normalized) distance in each direction (%) = (Average distance in each direction/Leg length) \* 100.

These calculations should be performed for both the legs (right and left) in each direction.

Static balance the number of seconds that the player is able to maintain the standing position on one leg was recorded. The average of both the trial with open eye and close eye is recorded. The entire tests were demonstrated and explained to the subjects by the scholar. They were given a chance to practice and become familiar with the tests and to know exactly what was to be done. The scores were recorded in the table systematically for the statistical treatment.

## 3. RESULTS AND DISCUSSION

To determine the significance of the difference between the field hockey and football players in the selected variables, independent *t*-test was employed separately for both the variables. The findings pertaining to the statistical analysis has been shown in the following Table 1.

It is evident from the findings of Table 1 that no significant differences are observed in the selected variables of dynamic and static balance between the field hockey and

football players. It may be because the correct balance is imperative for both football and field hockey players as football players require to maintain single-limb balance while performing many tasks such as shooting accurately, dribbling, and passing the ball. Although field hockey players use their upper extremity for dribbling, passing, and shooting the ball using their hockey stick, proper balance of head, feet, and hand with the stick is necessary to be maintained to perform these quick and skillful movements. It is required for a player to seek a point of balance in relation to the ball with every technique. Therefore, such insignificant difference might have occurred in the study.

## 4. CONCLUSION

On the basis of statistical findings, it may be fairly concluded that

1. No significant difference is found in the dynamic balance left leg.
2. No significant difference is found in the dynamic balance right leg.
3. No significant difference is found in the static balance left leg.
4. No significant difference is found in the static balance right leg.

## REFERENCES

- Borrow, H.M., and McGee, R. *A Practical Approach to Measurement in Physical Education*. Philadelphia, PA: Lea and Febiger; 1979.
- Carlyle, N. A study of relationship between balance on stationary and moving objects. *Completed Res Health Phys Educ Recreation*, 1960, 44.
- Espenshade, A. Development of coordination in boys and girls. *Res Q*, 1947, 18, 30-43.
- Farrow, J.C. An investigation of selected motor/physical performance variables from a sample population of professional basketball players. *Diss Abstr Int*, 1975, 13-69.

# A Case Study on Indian Women in Olympics

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## ABSTRACT

The place and role of women for the advancement of human society are very important. The position enjoyed by women during the Rigvedic period. Games and sports are help to women in different ways. The relationship between women and sports and society is complex. Male-dominated society believed about female physical limitations for sports and in many cases, women were absent in sports participation until 1900. Olympic Games bring tremendous change in women's life. From the 1960s, the scenario began to change due to women's equality, nationalism, development of rapid mass communication and transportation, and the commercialization of sport. The fact is that it was women's personalities from across the world who became the role models for women folk to come out from the four walls of the home. India is a traditional country; parents would not allow wearing sports dresses still now from some traditional families. As women, participation in sports has been an old story but yet not an equal and generalized feature. There are only some but growing number of girls who have made sports part of their life. Gender equality and the right of women to participate play an important role in facilitating positive and healthier lifestyles as a whole for nation and society.

## 1. INTRODUCTION

The Olympic Games inspire humanity to overcome political, economic, gender, racial or religious differences, and forge friendships in spite of those differences. The athletes express this value by forming lifelong. Even in the early years of the modern Olympics, women were not allowed.

Women participated for the 1<sup>st</sup> time at the 1900 Paris Olympics with inclusion of women's events in lawn tennis and golf. Women's athletics and gymnastics debuted at the 1928 Olympics. Over the more women, events were added. In 1952, Helsinki Indian women participated for the 1<sup>st</sup> time in the Olympic Games. The participants were Arati Saha, Dolly Rustom Nazir, Nilima Ghosh, and Mary D, Souza.

After so many decades, Indian women Karnam Malleswari won Bronze medal in weightlifting at Sydney, 2000; she is the first Indian woman to get an individual medal in Olympic Games. Indian women won two of the six medals India picked up in London Olympics 2012. "There has definitely been a resurgence in women's sport if you see the breakup of Olympic medals." Says Ronojoy Sen, author of a definitive history of sport in

India. Keeping with his words, P. V. Sindhu won Silver medal at Rio De Janeiro, 2016 Olympics.

### 1.1. Purpose of the Study

1. Find out the status of Indian women mark on Olympic Games.
2. To prepare historical documents of participation of Indian women in Olympics.
3. Find out the progress of Indian women participation in Olympic Games.
4. Understand the social, educational, and cultural background of the eminent women Olympic personalities of our country.
5. How Olympic medalists inspire the young Indian women to choose sports as their passion as well as profession.

## 2. METHODOLOGY

This study falls under the category of historical research and it involves survey method in the field of research in women Olympians from India. In the study, investigations are conducted to evaluate performances of Indian women athletes who had represented India in various sports events in Olympic Games.

## Indian women in Olympic Games during 1952–2016

Year	Venue	Track and field	Swimming	Shooting	Table tennis	Badminton	Judo	Weightlifting	Tennis	Archery	Boxing	Gymnastics	Wrestling	Hockey	Golf	Total
1952	Helsinki	2	2													4
1956	Melbourne	1														1
1960	Rome															-
1964	Tokyo	1														1
1968	Mexico city															-
1972	Munich	1														1
1976	Montreal															-
1980	Moscow	2														2
1984	Los Angeles	6		1												7
1988	Seoul	5		1	1											7
1992	Barcelona	1		2	1	1	1									6
1996	Atlanta	4	1		1	2	1									9
2000	Sydney	12	1	1	1	1	1	2	2							21
2004	Athens	13	1	3	1	1		4		3						26
2008	Beijing	13		2	1	1	2		2	3						24
2012	London	6		4	1	3	1	1	2	3	1		1			23
2016	Rio de Janeiro	17	1	3	2	4		1	2	3		1	3	16	1	54
Total		84	6	17	9	13	6	8	8	12		1	4	16	1	

**List of Indian women won Olympic medals during 1952–2016**

Year	Venue	Discipline	Athlete name	Position	Remarks
2000	Sydney	Weight lifting	Karnam Malleswari	Bronze	First Indian women to win Olympic medal
2012	London	Badminton	Saina Nehwal	Bronze	First Indian women to win medal in Badminton
2012	London	Boxing	Mary Kom	Bronze	First Indian women to win medal in Boxing
2016	Rio de Janeiro	Wrestling	Sakshi Malik	Bronze	First Indian women to win medal in wrestling
2016	Rio de Janeiro	Badminton	P. V. Sindhu	Silver	First Indian women win Silver medal in Olympics

**3. RESULTS**

Sports were considered as the medium of women empowerment.

**4. DISCUSSION**

Mary D'Souza, Nilima Ghose, Arati Saha, and Dolly Rustom Nazir were the first four Indian women who participated in Olympic Games in 1952 at Helsinki. Geeta Zutshi, M. D. Valsamma, and P. T. Usha raised the bar of sports performance and hope for the nation not only in their events but the female of different walks of life to come out from boundaries of traditional women roles.

Among them, Karnam Malleswari won the Bronze medal in 2000 Sydney Olympics in weight lifting. Malleswari is the first Indian woman to win an individual medal in Olympics. Mary Kom and Saina Nehwal won Bronze medals in Boxing and Badminton at 2012 London Olympics. Sakshi Malik won Bronze and P. V. Sindhu won Silver medals in wrestling and Badminton at 2016 Rio De Janeiro. Dipa Karmakar who is participated 2016 Rio Olympics in gymnastics, she is the first female gymnast at the Olympics, just lost out on a medal, finishing 4<sup>th</sup> in the women's vault gymnastics, and winning the hearts of the nation.

**5. CONCLUSION**

It observed from the case studies that the majority of them had continued their education besides their astonishing

sports performance. That's why they could have got a good job after their sports career which helped them achieving economic and social empowerment apart from sports. It is also observed from the case studies of pioneers of different female sports personalities during the study period that they were the inspiration to many young girls because all things they had achieved were not due to their particular social or economic well-off position. Hard work and determination irrespective of their social positions and support.

Olympic Games are the best platform for young girls to achieve their goals, to uphold racial dignity. The International Olympic Committee (IOC) Women and Sport Trophy represent opportunity recognition and empowerment. Each year IOC Women and Sport Awards are given to women, men or organizations to the development, encouragement, and reinforcement of women and girls participation in sport introduced in 2000, the award winners work to promote gender equality through different projects in also supported with a grant to help them continue and extend their work.

**REFERENCES**

- Chisternsen, K., Guttmann, A., and Pfister, G.D. *Interatonal Encyclopedia of Women and Sports*. New York: Macmillan.
- Garg, C. *Indian Champions: Profiles of Famous Indian Sports Person*. New Delhi: Rajpal and Sons.
- Mohammad, O. *Olympic Movement Book*. Odisha: Sports Publication.
- Indian Olympics Association References.
- Previous Olympic Records.



# Impact of Junk Food on Young Football Players

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## ABSTRACT

Nutrition is an integral part of life. This could be a boon or a curse. Sport is given much importance for various reasons, but this sport rather than doing good is bringing negative effects, on analyzing it is not the sport but the food taken to do that. Any sports require a lot of energy that is got from food, but the high calorie, convenient, and tasty food available seems to have taken the front bench; many people, especially young aspiring sports children are falling prey to it. The study shows that children are becoming obese, lethargic, and very aggressive. They also suffer from many ailments related to respiration gastric, psychological, and heart related too. This performance has come down considerably due to this junk food eating habit.

**Keywords:** Disease, High calorie, Junk food, Low performance.

## 1. INTRODUCTION

When someone decides on taking up a sport that influences the food choice. This sport makes an incredible demand on the body for its additional energy and full requirement. Nutrition is a fine line between balancing to train hard enough to reach those goals and avoid risk of injury. This influences how one makes nutritional decisions. These days the food selection is often based on taste, time convenience, and availability more than the nutritional value. This has resulted in disordered eating, eating more processed food.

Foods that contribute lots of calories but little nutrition, processed foods named as junk foods. These foods have low satiation value, so people do not tend to feel full when they eat them. These are globally available; they are more appealing and simply available. It has been observed that increased intake of junk foods leads to obesity, its related complications, heart problems, lethargy, diabetes, and also depression. According to old literature and related articles and based on athletes targeting healthy exercise and nutrition alternatives, a healthy eating index should be more than 80% is considered good. However, many studies show that this index is standing around 50–55%, which is alarming.

More than 60% of the global food market is filled with what we call junk food. What makes junk food so

interesting and the present study is trying to understand the after effects of this junk food eating habit in children who aspire to become sportspersons. For this study, upcoming football players training for the same at least 20 h a week were selected and their eating habits analyzed.

## 2. WHY ONE CRAVES FOR JUNK FOOD

What makes it so attractive, quoting exactly from the work of Witherly Steven food scientist, the following aspects are presented.

1. Orosensation  
This food what kind of sensation does they give while eating what it smells like and how it feels in the mouth.
2. Macronutrient makeup  
The junk food has a perfect combination of salt, sugar, and fat that excites the brain and gets coming back.
3. Dynamic contrast  
Combination of different sensations in the same food. Foods with an edible shell that goes crunch followed by something soft, creamy, and full of taste active compounds, for example, Pizza.
4. Salivary response  
The more it makes salivation, for example, Chocolate.

5. Rapid food meltdown and vanishing calorie density  
Meeting in the mouth, signal to the brain that you are not eating as much as you actually are. These foods tell that you are not full even when you are eating a lot of calories resulting in overeating.
6. Sensory specific response  
Eating the same food again and again decreases pleasure. Junk foods, however, are designed to avoid this.
7. Caloric density  
Junk food is designed to convince the brain that it is getting nutrition not filling up.
8. Memories of past eating experiences  
This is where psychobiology of junk food works against one. When something is eaten, the brain registers that feeling. The next time even when one reads about that food, the brain starts to trigger the memories and responses of eating it. This, in turn, causes responses such as salivation and create mouthwatering craving.

### 3. NUTRIENT REQUIREMENT FOR SOCCER PLAYERS

According to studies, the nutrient requirement of a soccer player is as follows

- Carbohydrate: This is least energy giving of the three macronutrients. We can consider this weight, the

amount of carbs are takes will give that equivalent energy. This is the most important nutrient during intense activity involving sprints running jumping; thus, it is the only source of energy.

- Fats: A minimum requirement of fat is very important for the body. Care to be taken to see that the saturated fat should never be more than 10% of the diet.
- Protein: This is the bodybuilding food very important for muscle formation. Nearly 60 g of protein is required per day.

### 4. IDEAL DIET FOR SOCCER PLAYERS

A soccer player should aim for a diet that has 60–65% carbohydrate, 20–25% fats, and 10–15% protein.

Carb	60%
Fat	25%
Protein	15%
Calcium	800–1000 mg
Sodium	1100–3300 mg

The goal of a soccer's diet before a game is to maximum carbohydrate stores in the muscle and lives and top up blood glucose stores.

# Injuries in Athletics and Sports

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## ABSTRACT

The physical fitting plays an important role in the sport life of an athlete. It plays an important role in day today life as the athletes have to compete more often at a great level. They have to undergo an enormous amount of tension in their life. The concept "sports injury" refers to the different types of injuries that mostly occur during sports or exercise. The athletes have to be updated and see at the end of the practice or competition and they have to determine whether a reportable injury has occurred or they are suffering from.

**Keywords:** Athletic, Exercise, Injuries, Practice, Sports, Training.

## 1. INTRODUCTION

In the profession of athletes, they need to be fitter today and tomorrow than those in last year. The athletes have to compete often at higher levels to fall the records with competent speed. They have to encounter the stress with which is enormous. The concept "sports injury" refers to the different types of injuries that mostly occur during sports or exercise. There are various reasons of sports injuries such as injuries from accidents, poor training practices, improper equipments, lack of conditioning, insufficient warm-up, and wrong way of stretching or lack of stretching. This term is typically reserved for injuries that involve the musculoskeletal system. It includes the muscles, associated tissues such as cartilage, bones, etc. Athletic injuries caused due to a single traumatic episode or from repeated over-use of a body part. The athletes have to be updated and see at the end of the practice or competition and they have to determine whether a reportable injury has occurred or they are suffering from.

## 2. ATHLETICS

Today athletics is acknowledged as a vast and worldwide sport. It includes a collection of sporting events such as running, jumping, throwing actions, and walking. The athletes need of good quality equipments and the need for expensive equipment. It makes athletics one of the most common competed sports in the world. Today, it has acclaimed throughout the world and it needs a great devotion and hard work.

## 3. SPECIFIC INJURIES IN SPORTS

Every sports activity consists of some specific body parts and specific movement patterns, which leads to some sports injuries. From the research point of view, now the question is what is an injury? The two most important procedures of budding a definition of injury are expanding medical diagnosis and time lost from participation. Injury may be caused of extrinsic/exogenous or intrinsic/endogenous causes of sports injuries. These injuries are classified into acute and overuse, which leads to chronic injury.

### 3.1. Runners

- Sprinters: It creates problems such as muscle tears and strain of quadriceps, hamstring, and adductors of thigh which turns into shin splints, 121 joint injuries, and tearing of the medial and lateral collateral ligaments of knee.
- Long-distance runners: March fracture causes problems like stress fracture of the third metatarsal bone. It also includes knee injuries like simple sprain to periostitis of lateral femoral condyle. Another injury such as heat injuries, foot injuries, bruising of soft tissues and metatarsal bones, Achilles tendinitis, and tenosynovitis.
- Pole vault: It creates problems such as muscle pulls specifically in hamstrings and adductors of thigh. It also brings out the difficulties such as bruising on the side of the leg and ankle sprain.

### 3.2. Throwers

- Discuss: It causes the exigencies like rupture of extensor tendons of terminal phalanges in human organs.
- Hammer: The sportsperson may suffer from injury to pectorals major, rhomboids, and injury to extensor of the back.
- Javelin: The javelin throw may create problems like sprain of ligaments of elbow. It also maintains the difficulties such as fracture of radial head and neck associated with olecranon fracture or dislocation of elbow as well as dislocation of shoulder joint.
- Shot put: The shot put sport type may bring out the different problems such as muscular tear of the lower limb and meniscus injuries of the knee. It also comprises muscle injury to the back, sprain of ligaments of back, rupture of extensors of the back, and avulsion fracture of cervical and thoracic spines. It also results in injury to bicep tendon and wrist sprain.

### 3.3. Jumpers

- Broad jumpers: The broad jumpers may suffer from problems such as bruised heels, lower back injuries, ankle injuries, and knee sprain injury.
- High jump: There are the problems caused due to high jump are patellar tendinitis, low back injuries, bruising of metatarsals, and stress fractures.

### 3.4. Preventive Measures from Injury

There are different preventive measures or ways to avoid physical injuries. They are education of particular sport type, proper choice of sport, proper protection taken during the games, use of proper clothing footwear, and suitable environment. Besides, there should be balanced training, preparation before the games such as warming up and exercise. The sport persons have to follow the

techniques, fitness warming, suitable equipments, and obeying rules. Some more preventive measures taken during the games are individual player's physical condition, proper coaching, and attitude. Besides, skill level and personality characteristics. One has to also think about artificial turf versus natural grass and the athletic arena balanced competition.

## 4. ROLE OF COACH

There are a great role, guidance, and proper supervision of the practice session which is an important role of coach or a sport teacher. There should be a careful analysis of the individual's skill development and correction of errors during the different games has also challenges to the coach. He must give or supply the proper feedback at the proper times. At last, the coach or a sport teacher ought to exercise judgment in identifying actions involving unacceptable risks to the athlete.

## 5. CONCLUSION

While dealing with all the above problems, difficulties, the sports personals, and the coach or teacher must be aware of the different causes of injuries and preventions of injury. There should be proper guidance and careful management by the coach which can be very useful and effective in injury prevention. It gives great help to avoid such problems during the practice and actual games.

## REFERENCES

- Available from: <https://www.stopsportsinjuries.org>.  
Athletics Injuries.  
Walker, B. *The Anatomy of Sports Injuries, Second Edition: Your Illustrated Guide to Prevention, Diagnosis, and Treatment*. Chichester: Lotus Publishing; 2007.

# The Study of Volleyball Universal Injuries: Its Kinds and Remedies

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## ABSTRACT

Sports are the major role played in lives of human beings in the globe. Topmost position acquired in the field of the competitive game as per the spectators concern that is soccer. The second position grasp in the game of volleyball at the international level has one of the highest participation rates in worldwide, including both indoor and beach volleyball. It is the game of many injuries in universal one of the unique team sports that have evolved into two distinct Olympic events – indoor and beach. Although injury patterns differ between indoor and beach volleyball, there are similar injuries commonly seen between the two sports. Overall, overuse injuries are more common than acute injuries due to the amount of repetition, improper technique, and type of playing surface. Overuse conditions of the knee, shoulder, and lower back are not unusual in volleyball. Volleyball players repeatedly use their shoulders for spiking and blocking, overuse of injuries of the shoulder is common. Sprains and strains, most often around ankle, also occur. Finger injuries (phalanges), such as dislocations and tendon tears, frequently occur during setting and blocking in the game of volleyball. It is the part of mankind to their regular rooting in the lives.

**Keywords:** Ankle sprain, Injuries, Performance, Shoulder, Volleyball.

## 1. INTRODUCTION

The present paper has highlighted on the common injuries in the game of volleyball in the world. It is the game of globe. Nowadays, soccer is the most position acquired in the field of the competitive game as per the spectators concern that is soccer. The second position grasp in the game of volleyball at the international level has one of the highest participation rates in worldwide, including both indoor and beach volleyball. It is the game played between many countries, one of the unique team sports that have evolved into two distinct Olympic events – indoor and beach. Although injury patterns differ between indoor and beach volleyball, there are similar injuries commonly seen between the two sports. Overall, overuse injuries are more common than acute injuries due to the amount of repetition, improper technique, and type of playing surface. Overuse conditions of the knee, shoulder, and lower back are not unusual in volleyball. Volleyball players repeatedly use their shoulders for spiking and blocking, overuse of injuries of the shoulder are common. Sprains and strains, most often around ankle, also occur. Finger injuries (phalanges), such as dislocations and tendon tears, frequently occur during setting and blocking in

the game of volleyball. Conditioning injuries and legal and lied drugs are a 14 volume series written for young sports and how to participate in them safely. Volleyball is a game played in over 130 all over universal countries. Indeed the federation international de volleyball estimates that more than 800 million people around the world enjoy bumping setting and spiking at least once one a week. Yet the world's most popular team sport is little more than 110 years old. Today in the United States, volleyball is played at least once a year by nearly 25 million people, making it one of the top-ten team sports. Volleyball is the game that played not only any single nation but also all over every notion. It is most popular among people who are 12–17 years of age. With slightly more girls than boys taking part. Since the turn of the millennium, the sport has boosted its f by nearly 20% fun fast and growing, this successful game was born in the United States in the state of Massachusetts.

### 1.1. Purpose of the Study

The main purpose of my study is to analyze the international and things on injury and trauma in performance the volleyball, which things are needs/ requires to healthy fitness for better sports. Fitness is



played a key role to because healthy sportsman in the various games in the world. It is the integral part of any kinds of games that are played by sportsman in the world. In their ways. There is no meaning of body without soul like that no use of sports without fitness. Fitness is the key of any sports without fitness is like fish out of water.

## 2. METHODS

There are various methods in physical education to write a research paper. In my research paper that I use analytical and theoretical research methods particularly. I give justice with these methods to my research paper. I have also used survey method. We performed the search in Google scholar. All these methods are required to write a research paper as well. These methods are useful to me to find out something new for sports to sportsmen in the world. I think interview method is the best method for researcher scholar. Because we get real feedback of game.

### 2.1. Ankle Injuries

Ankle sprains are the most common acute injuries seen in volleyball sports persons, accounting for about 40% of all volleyball related injuries. They occur most commonly at the net when an opposing player lands onto another player's foot. When dealing with an ankle sprain, it is important to adequately rehab the injury before returning to play, preferably under the supervision of an athletic trainer or physical therapist. Without ankle, we cannot play volleyball. Ankle plays a key role to play volleyball.

### 2.2. Wrist Injuries

It is also a key role play in the position of wrist injuries. It is the injuries in wrist which are extremely common, especially during setting and blocking. Most of the time, wrist injuries in volleyball involve joint sprains. Movement of the shoulder, the player may sense as if the shoulder is unstable and typically will develop pain when the rotator cuff and cartilage gets impinged against structures inside the shoulder joint because of excessive shoulder movement. Most of the volleyball players are suffering from wrist injuries which lead to end of the players' life. Time to time taking exercise and medicine. Over time, this can also lead to a labral tear. Shoulder dislocation injuries occur when the ball of the humerus is dislocated from the socket of the scapula through blunt force trauma.

Shoulder impingement syndrome occurs when the muscles, tendons, and the bursa of the shoulder become inflamed and swollen.

### 2.3. Lower Back Pain

Back pain in volleyball players is very common because of repetitive bending and rotating of the trunk. Strains of the lower back are the most common back injury, although the repetitive hyperextension of the lower back during hitting and setting can also place a lot of stress on the lower backbones. This can lead to stress fractures of the vertebra in the spine, known as spondylolysis, which is a very common cause of low back pain in volleyball players. Adolescents, in particular, are very vulnerable to this injury because their vertebral bones are still weak in this area. Learn how we treat spondylolysis. It gives too much pain to all players and spoils their game. Although volleyball is a relatively safe sport compared to other high contact, collision sports, it does lend itself to unique injury patterns, particularly overuse injuries of the knee, shoulder, and back. Like many young athletes who are training year round or are focusing on just one sport, regardless of which sport, overuse injuries in volleyball players are becoming problematic. It is the injuries of danger of the volleyball game.

### 2.4. Finger Injuries

It plays obligatory role to play a volleyball game. Fingers are vulnerable to injury during volleyball activities such as blocking, setting, and digging. Common finger injuries include fractures, dislocations, and tendon and ligament tears. Without finger, it is highly impossible to play the game. We cannot play without it.

### 2.5. Shoulder Injuries

It is the next important organ of body to play volleyball. Volleyball players repetitively use their shoulders for overhead serving, spiking, and blocking, which commonly lead to shoulder pain. Overuse of the rotator cuff muscles can lead to rotator cuff tendinitis or tears, which is more commonly seen in adults than in young athletes, although it can occur. More often, pain from shoulder instability and resulting impingement is what we typically see in our young volleyball players. In addition to the rotator cuff muscles, there are also ligaments that help to stabilize the shoulder joint during movement. It is the key role play. In volleyball, the player's arm typically goes into extreme positions and rotations for hitting. When these muscles and ligaments

are overworked and unable to restrain excessive. Shoulder is the moving organs of the body to play volleyball. We cannot thing without shoulder in the game.

### 3. DISCUSSION

In this paper, I discuss on every part of the organs of body particularly the points there are different factors that can influence the incidence of an injury. Intrinsic factors are age, gender, core instability, and muscle imbalances, whereas extrinsic factors are the position played and service style. Most injuries take place in the front row, at the net, during blocking and spiking. The middle blocker, being replaced in the back row by the defense specialist, plays exclusively in the front row; thus he is more exposed to ankle sprains due to interference with the opponent during landing. On the other hand, outside hitters and opposites, being the main attacking force. There are some advantages and disadvantages in remedies of injuries.

#### 3.1. Recommendation for Injury can be Prevent

The followings are the most important guidelines to prevent majors and minors injuries.

- To warm up muscles with stretching and light aerobic exercises.
- To use proper strength training for the lower back, shoulders, and legs.
- To use an external ankle support, such as an ankle brace or taping, to prevent the ankle from rolling over, especially if you have had a prior sprain.
- To proper usage of scientific and systematic learning of skills and techniques.
- To minimize the amount of jump training on hard surfaces.
- To be sure to properly cool down after practice.
- If you are having pain, visit your doctor and follow instructions for treatment.

- The athlete should return to play only when clearance is granted by a health care professional.

### 4. CONCLUSION

To sum up, the researcher has found out many remedies and exercises for the injuries of volleyball players in the sports. It has discussed on the above recommendation for injuries can be presented. It is recovered on proper way and time. It is the most general volleyball organized, injuries are searched in the shoulders, ankles, knees, fingers, and the back. The researcher has discussed, the continuous pain after various weeks should prompt forth examine, involving X-rays and magnetic resonance imaging also. In this paper, it is discussed about common volleyball injures and it is remedies. It activities need when playing volleyball powerful the upper body, arms, things, shoulders, abdominals, and lower and upper legs, etc.

### REFERENCES

1. Bahr, R. *Handbook of Sports Medicine and Science Volleyball*. Oslo: Blackwell Science; 2003.
2. Aneja, O.P. *Sports Management*. New Delhi: Sports Publication; 2013.
3. Shiah, P. *Contemporary Issues in Physical Education, Fitness and Wellness*. New Delhi: Sports Publication; 2016.
4. Rokade, P., Hemant, V., and Tenspure, V.S. *Physical Education and Sports Science Encyclopadia*. New Delhi: Lakshay Publication; 2013.
5. Jain, R. *Physical Education a Handbook for Teacher*. New Delhi: Sports Publication; 2006.
6. Anil, S. *Information and Reference Sources in Physical Education*. New Delhi: Sports Publication; 2006.
7. Zetou, E., Malliou, P., Lola, A., Tsigganos, G., and Godolias, G. Factors related to the incidence of injuries appearance to volleyball players. *J Back Musculoskelet Rehabil*, 2006, 19(4), 129-134.

# Comparison of Selected Physical Fitness Components between the Tribal and Non-tribal Schoolgirls

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## ABSTRACT

The main purpose of this study was to find out the significance of the difference between the tribal and non-tribal schoolgirls in selected physical fitness components. For this study, 30 girls of tribal school (Ashram Shala) and 30 girls of non-tribal school (Ramkrishna), Amravati, were selected by adopting a random sampling method. To measure the fitness components of flexibility, agility, cardiorespiratory endurance, and muscular strength, the following test, namely, sit and reach tests, shuttle run, 600 mts run, and medicine ball throw, respectively, was administered, and the scores were recorded accordingly. It was hypothesized that there might be a significant difference in the above-mentioned selected components between the tribal and non-tribal schoolgirls. To determine the significant difference in the components of flexibility, agility, cardiorespiratory endurance, and muscular strength between the two groups, independent "t"-test was employed for each component separately; the level of significance was set at 0.05 for testing the hypothesis. The findings of the statistical analysis revealed that there were significant differences in the aforementioned variables, namely, agility, muscular strength, muscular endurance, and flexibility. From the findings, it is also understood that the girls belong to tribal are significantly superior than the non-tribal girls, it may be because the tribal girls belong to hilly area where they need to be rough and tuff for their daily living activities, i.e., climb up and down the hills which lead to develop agility, muscular strength, cardiovascular endurance, and flexibility optimally; therefore; such results might have occurred in the study.

## 1. INTRODUCTION

The concept of fitness has a long and involved history. According to the literature on the subject, it can be traced to the work done by Charles Darwin of the survival of the fitness. Always the word fitness suggests the ability of Animalia humans to work and play with a maximum degree of physical efficiency and to be prepared to meet unforeseen danger or destruction.

Physical fitness is the capacity to do prolonged hard work and recover to the same state of health in short duration of time. This is the result of the degree of strength, speed, endurance, agility, power, and flexibility one possesses. These elements of physical fitness are useful for different games and sports; physical fitness depends on several factors such as heredity, hygienic living, nutrition, and body man ewers of an individual. Among these, man ewers ever play activities differently.

The state of being fit or in the condition is the primary concern to any nation or people. Physical fitness aster

refers to the two dynamic physiological state of the individual, ranging gone continuum from optimal human performance to serve debilitations and death. There are a number of fitness components that need to be developed. These are agility flexibility, muscular endurance, cardiovascular and respiratory, endurance, strength, power, speed, and the correct maintenance of body weight. It is possible for athletic to have a great deal of one component and very little of another. Furthermore, when considering a wide range of sports, certain components assume a considerable importance, for example, the necessity for flexibility in gymnastics, the importance of strength in weight-lifting most sports of course, and require a contribution from a number of components of fitness is varying degree.

### 1.1. Purpose of the Study

The purpose of the present study was to compare flexibility, agility, muscular endurance, and muscular strength between the tribal and non-tribal schoolgirls.

**Table 1:** Description of mean, standard deviation, and t-ratio for the data on flexibility agility endurance and shoulder strength of the tribal and non-tribal schoolgirls

S. No.	Subjects	Variables	Mean	SD	MD	SE	t-ratio
1	Tribal	Flexibility	24.917	4.055	10	1.235	8.09
	Non-tribal		14.917	5.418			
2	Tribal	Agility	13.51	0.748	1.888	0.435	4.34
	Non-tribal		15.398	2.263			
3	Tribal	Cardiorespiratory Endurance	2.764	0.323	0.331	0.087	3.80
	Non-tribal		3.095	0.348			
4	Tribal	Shoulder Strength	3.715	0.807	0.993	0.151	6.57
	Non-tribal		2.722	0.177			

\*Significant at 0.5 level, Tabulated  $t_{0.05(58)}=2.0017$

## 2. METHODOLOGY

To achieve the desired objective of the study, only girl students were selected from Ashram Shala School, Amravati, and Ramkrishna School, Amravati. As the subject, the data of flexibility, agility, muscular endurance, and muscular strength were collected by applying sit and reach test, shuttle run test, 600 mts run and walk test, and medicine ball throw test, respectively. A total of 60 students in which 30 from tribal and 30 from non-tribal were selected using a simple random sampling method. The age of the students ranged from 12 to 15 years.

## 3. RESULTS AND DISCUSSION

The data obtained from each of the selected fitness components, namely, flexibility, agility, muscular endurance, and muscular strength, were examined statistically by applying independent's test to determine the significance of difference if any. The level of significance to test the hypothesis was set at 0.05. The findings are shown in the following Table 1.

It is evident from the above findings that significant differences are observed between tribal and non-tribal girls' students in the selected physical fitness components through flexibility ( $F=8.09$ ) agility ( $F=4.34$ ), cardiorespiratory endurance ( $F=3.80$ ), and shoulder strength ( $F=6.57$ ). It is also quite comprehensive that tribal girls are significantly superior in each selected component that their counterparts.

It may be because the tribal girls belong to hilly area where they need to be rough and tuff for their daily liking activities, i.e., climb up and down the hills which need to develop flexibility, agility, cardiorespiratory endurance, and muscular strength optimally; therefore, such results might have occurred in the study.

## 4. CONCLUSIONS

Recognizing the limitations of this study and on the basis of statistical findings, the following conclusion may be drawn:

1. Significant difference was found in between tribal and non-tribal schoolgirls in relation to flexibility
2. Significant difference was found between tribal and non-tribal schoolgirls in relation to agility
3. Significant difference was found between tribal and non-tribal schoolgirls in relation to endurance
4. Significant difference was found between the tribal and non-tribal schoolgirls in relation to explosive shoulder strength.

## REFERENCES

- Debnath, S., Mondal, N., and Sen, J. Socio-economic and demographic correlates of stunting and thinness among rural school-going children (aged 5-12 years) of North Bengal, Eastern India. *J Life Sci*, 2018, 10, 29-46.
- Eveleth, P.B., and Tanner, J.M. *Worldwide Variation in Human Growth*. Cambridge: Cambridge University Press; 1990.
- Chowdhury, S.D., Chakraborty, T., and Ghost, T. Fat atterning of santhal children: A Tribal Population of West Bengal, India. *J Trop Pediatr*, 2007, 53, 98-102.

# Effect of Different Proportions of Aerobic and Anaerobic Demands on Diameter of Aorta

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## ABSTRACT

Cardiovascular adjustments in various sports have been broadly depicted, the scientific sports training most in required for every athlete to achieve top form. In this scientific examination on the effect of different proportions of aerobic and anaerobic demands on diameter of aorta (DA) among elite athletes, 45 men elite athletes have volunteered to hit the aim of this study. Subjects were randomly distributed into three groups as 10% aerobic and 90% anaerobic proportions (200 m race), 50% aerobic and 50% anaerobic proportions (1500 m), and 90% aerobic and 10% anaerobic proportions (10,000 m run) (Fox, 1989). The subject's age was between 20 and 25 years. Their sports age is between 5 years and 7 years. To measure the DA, all the subjects underwent M-mode Doppler echocardiography, the obtained values were analyzed by employing SPSS package. The result indicates that 90% aerobic and 10% anaerobic groups and 50% aerobic and 50% anaerobic groups have significantly increased DA compared to 10% aerobic and 90% anaerobic groups at 0.05 level of confidence. Further, it is concluded that 90% aerobic and 10% anaerobic was better training proportion to increase the aortic diameter and also the highest mean difference exists between 90% aerobic and 10% anaerobic groups and 10% aerobic and 90% anaerobic groups.

**Keywords:** Aerobic and anaerobic training, Cardiovascular system, Diameter of aorta, Elite athletes, Sports training.

## 1. INTRODUCTION

Regular systematic and the nature of event participation in sports leads to several cardiac adaptations. Among all the cardiovascular adaptations, the size of the aorta increases. The normal expansion rate is about 1–2 mm/year. It involves during childhood and in young adulthood, results in an increase of the luminal diameter of the entire aorta. In adulthood, the aortic size is related to exercise and workload Erbel *et al.* (2006). In repeated high-intensity sports of athletes, hemodynamic stress may also contribute to aortic root dilatation, Pelliccia *et al.* (2010).

According to Towfiq *et al.* (1986), volumetric cardiovascular yield might be estimated non-intrusively by methods for echocardiography to quantify aortic diameter. The left ventricular stroke volume is determined as the result of aortic cross-sectional area

and systolic velocity necessary or aortic bloodstream. The left ventricular ejects blood into the proximal aorta. Sahlen *et al.* (2016) have concluded that arterial afterload is influenced by the physical properties of the aortic root including its size. Moens–Korteweg equation pointed that the diameter of the aorta is positively related to the aortic elastance wall thickness. The short increments in heart yield related with incredible elevation of systemic arterial pressure, corresponding with strength training, could cause an incessantly raised aortic wall tension responsible for aortic expansion, Bigi and Aslani (2007).

According to Moens–Korteweg equation posits that the diameter of the aorta is positively related to the aortic elastance-wall thickness product (i.e., a measure of aortic stiffness) and inversely related to the square of the local pulse wave velocity. According to Water Hammer equation says that pulse wave velocity is positively related to characteristic impedance. These



equations connect a larger aortic root size with lower characteristic impedance, which should translate into lower afterload and larger stroke volume, Lam *et al.* (2013), Gardin *et al.* (2006), and Mitchell *et al.* (2008). The hemodynamic load during exercise and particularly pressure overload during strength training may also lead to aortic remodeling, Zeppilli *et al.* (2006).

According to Iskandar (2013), aortic root diameter was increased by elite athletic training. This increase is clinically insignificant. Hemodynamic overload during exercise training affects aortic root dimensions. Based on medical literature and applied meta-analytic technique, aortic root dimension was increased by endurance or strength training.

In this study, the investigator has analyzed how 10% aerobic and 90% anaerobic and 50% aerobic and 50% anaerobic and 90% aerobic and 10% anaerobic training are going to influence on diameter of aorta (DA) at rest.

The investigator has chosen elite athletes who have been successfully participating at national and university level competitions. Subject underwent regular training program under the supervision of their regular coaches as per specialized sports event. The subjects age between 20 and 25 years. The training diary revealed that volunteered elite athletes subject was not reported any injuries during their training period and their sports age is 5–7 years.

## 2. METHODS

To explore the full range of aortic root diameters in athletes whichever trained with different proportions of aerobic and anaerobic demands, 45 healthy male elite athletes were undertaken as subjects from different parts of Andhra Pradesh and Telangana state, India. The investigator has segregated them into three groups according to their events and utilization of different aerobic and anaerobic proportions. Group I is 10% aerobic and 90% anaerobic proportions (200 m race),

Group II is 50% aerobic and 50% anaerobic proportions (1500 m race), and Group III is 90% aerobic and 10% anaerobic proportions (10,000 m race), Fox (1989). The assessed DA at rest was measured by M-mode Doppler echocardiography (Philips CX50 ultra image system, Philips Medical Systems, USA, with 2.5–3.5 MHz transducer for was used to determine the) at Lakshya Cardiac Center, Proddatur, Andhra Pradesh, India.

### 2.1. Statistical Analysis

The composed data on DA at rest have been analyzed and presented below. The data collected from experimental groups DA at rest were statistically tested for substantial difference, if any, by employing the analysis of variance (ANOVA) and data were analyzed using computer with IBM-25, SPSS package. The level of confidence was fixed at 0.05 for significance. To determine the significant difference among the three groups, the Scheffe's test was applied as *post hoc* test.

## 3. RESULTS

The ANOVA for data on DA at rest of 10% aerobic and 90% anaerobic groups, 50% aerobic and 50% anaerobic groups, and 90% aerobic and 10% anaerobic groups was analyzed and presented in Table 1.

The table value for significance at 0.05 level with df 2 and 42 is 3.222.

Table 1 shows that the means of 10% aerobic and 90% anaerobic groups, 50% aerobic and 50% anaerobic groups, and 90% aerobic and 10% anaerobic groups are 22.466, 23.533, and 25.933 mm, respectively. The obtained "F" ratio of 35.215 is greater than the table value of 3.222 for df 2 and 42 required for significant at 0.05 level.

The results of the study show that there is a significant difference among 10% aerobic and 90% anaerobic, 50%

**Table 1:** Analysis of variance for the diameter of aorta at rest data on 10% aerobic and 90% anaerobic groups, 50% aerobic and 50% anaerobic groups, and 90% aerobic and 10% anaerobic groups

Test	10% aerobic and 90% anaerobic groups	50% aerobic and 50% anaerobic groups	90% aerobic and 10% anaerobic groups	Source of variance	df	Sum of squares	Mean squares	Obtained "F" ratio	Table "F" ratio
Mean	22.466	23.533	25.933	B:	2	94.578	47.289		
Standard deviation	1.5	0.9	1.0	W:	42	56.40	1.343	35.215*	3.222

\*Significant at 0.05 level of confidence

aerobic and 50% anaerobic, and 90% aerobic and 10% anaerobic groups on DA. To determine the significant difference among the means of three experimental groups, the Scheffe's test was applied as *post hoc* test and the results are presented in Table 2.

Table 2 shows that the tests mean difference on DA at rest between 10% aerobic and 90% anaerobic groups and 50% aerobic and 50% anaerobic groups is 1.067 which is greater than the confidence interval value 0.759 at 0.05 level of confidence. The test mean difference on DA at rest between 10% aerobic and 90% anaerobic groups and 90% aerobic and 10% anaerobic groups is 3.467 which is much greater than the confidence interval value 0.759 at 0.05 level of confidence. The test mean difference on DA at rest between 50% aerobic and 50% anaerobic groups and 90% aerobic and 10% anaerobic groups is 2.400 which is greater than the confidence interval value 0.759 at 0.05 level of confidence. Hence, it is concluded from the results; the significant difference exists between 10% aerobic and 90% anaerobic groups, 50% aerobic and 50% anaerobic groups, and 90% aerobic and 10% anaerobic groups on DA at rest.

From the results, it was concluded that 90% aerobic and 10% anaerobic groups have significantly improved the DA at rest as compared to the other two experimental groups. Further, it is concluded that the highest mean difference exists between 10% aerobic and 90% anaerobic groups and 90% aerobic and 10% anaerobic groups.

The tests mean values on DA at rest of three experimental groups are graphically depicted in Figure 1.

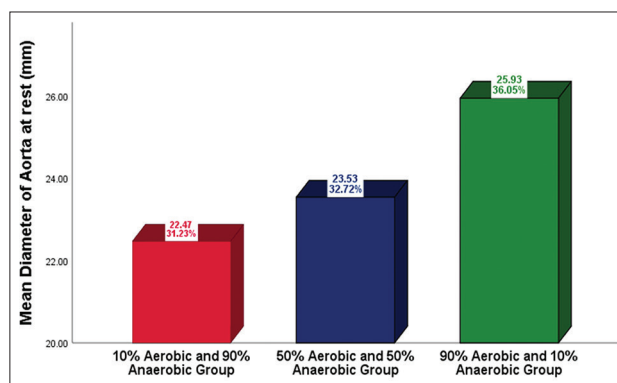
#### 4. DISCUSSION

From the results of the study, it has been concluded that all the three experimental groups 10% aerobic and 90% anaerobic, 50% aerobic and 50% anaerobic, and 90% aerobic and 10% anaerobic groups have significantly increased the DA at rest, however, 50% aerobic and 50%

anaerobic groups and 90% aerobic and 10% anaerobic groups have significantly increased DA at rest as compared with 10% aerobic and 90% anaerobic groups. The results indicate that the significant difference exists among three groups on DA at rest.

Iskandar and Thompson (2013) said that based on exercise performance, athletes aortic root diameter was increased. These studies 5580 athletes and 727 control groups propose that athletes have wider aortic root dimension. Harris *et al.* (2015) stated that a repetitive, pulsatile increment in aortic stretch during each activity session has been claimed to trigger accelerated aortic dilation.

Mitchell *et al.* (2008) found that small but significant increase in pulse pressure in patients with aortic root dilation which is likely to be attributable to larger stroke volume, which is determined by many important differences in central hemodynamics of which the aortic root diameter is in fact one. Contrary to the view that pulsatile load drives aortic root dilation, longitudinal data from the Framingham heart study have shown that individuals that develop aortic root dilation actually have lower baseline pulse pressure and higher diastolic blood pressure, Lam *et al.* (2010).



**Figure 1:** Bar diagram on diameter of aorta at rest means of 10% aerobic and 90% anaerobic groups, 50% aerobic and 50% anaerobic groups, and 90% aerobic and 10% anaerobic groups

**Table 2:** Scheffe's *post hoc* test for the diameter of aorta at rest on the difference between 10% aerobic and 90% anaerobic groups, 50% aerobic and 50% anaerobic groups, and 90% aerobic and 10% anaerobic groups

10% aerobic and 90% anaerobic groups	50% aerobic and 50% anaerobic groups	90% aerobic and 10% anaerobic groups	Mean differences	Confidence interval 0.05 level
22.466	23.533	-	1.067*	0.759
22.466	-	25.933	3.467*	
-	23.533	25.933	2.400*	

\*Significant at 0.05 level of confidence

Bigi and Aslani (2007), to designate the effect of isometric exercise on aortic size from 100 elite strength training, athletes have greater aortic diameter compared to an age and height matched individuals. Aortic root diameter was increased in elite athletes by strength training, Antonello *et al.* (2010).

According to Sahlen *et al.* (2016), larger aortic root was associated with lower left ventricular afterload and left ventricular end-diastolic volume (preload) consequently larger stroke volume. Analytical considerations suggesting that aortic dilation should have a beneficial effect on afterload and stroke volume.

Hence, the researcher concluded that 50% aerobic and 50% anaerobic and 90% aerobic and 10% anaerobic groups have increased DA at rest. The present study concludes that the findings are inconformity with the above research findings.

## 5. CONCLUSIONS

DA at rest has been increased by 90% aerobic and 10% anaerobic groups and 50% aerobic and 50% anaerobic groups as compared to 10% aerobic and 90% anaerobic groups. However, three proportions of aerobic and anaerobic training have successfully augmented the diameter in aorta.

## 6. RECOMMENDATIONS

About 90% aerobic and 10% anaerobic training was better training proportion to increase the DA.

## REFERENCES

1. Iskandar, A., and Thompson, P.D. A meta-Analysis of aortic root size in elite athletes. *Circulation*, 2013, 127, 791-798.
2. Sahlen, A., Hamid, N., Amanullah, M.R., Fam, J.M., Yeo, K.K., Lau, Y.H., Lam, C.S., and Ding, Z.P. Impact of aortic root on left ventricular afterload and stroke volume. *Eur J Appl Physiol*, 2016, 116, 1355-1365.
3. Andrea, A.D., Cocchia, R., Riegler, L., Scarafilo, R., Salerno, G., Gravino, R., Vriz, O., Citro, R., Limongelli, G., Di Salvo, G., Cuomo, S., Caso, P., Russo, M.G., Calabrò, R., and Bossone, E. Aortic root dimensions in elite athletes. *Am J Cardiol*, 2010, 105, 1629-1634.
4. Bigi, M.A.B., and Aslani, A. Aortic root size and prevalence of aortic regurgitation in elite strength trained athletes. *Am J Cardiol*, 2007, 100, 528-530.
5. Baggish, A.L., and Wood, M.J. Athletes heart and cardiovascular care of the athlete: Scientific and clinical update. *Circulation*, 2011, 123, 2723-2735.
6. Towfiq, B.A., Weir, J., and Rawles, J.M. Effect of age and blood pressure on aortic size and stroke distance. *Br Heart J*, 1986, 55, 560-568.
7. Braverman, A.C., Harris, K.M., Kovacs, R.J., and Maron, B.J. Eligibility and disqualification recommendations for competitive athletes with cardiovascular abnormalities: Task Force 7: Aortic diseases, including Marfan syndrome: A scientific statement from the American heart association and American college of cardiology. *J Am Coll Cardiol*, 2015, 66, 2398-2405.
8. Fox, E.L., Bowers, R.W., and Foss, M.L. The physiological basis of physical education and athletics. Dubuque: Institute of Cost Accountants of India, WMC Brown Company Publishers; 1989, p. 1-287.
9. Furakawa, K., Yoshikawa, J., Tanaka, K., Tanaka, C., and Kawai, S. Echocardiographic measurement of aortic root diameter. *Jpn Heart J*, 1976, 17, 465-470.
10. Gardin, J.M., Arnold, A.M., Polak, J., Jackson, S., Smith, V., and Gottdiener, J. Usefulness of aortic root dimension in person  $\geq 65$  years of age in predicting heart failure, stroke, cardiovascular mortality, all-cause mortality and acute myocardial infarction. *Am J Cardiol*, 2006, 97, 270-275.
11. Lam, C.S., Gona, P., Larson, M.G., Aragam, J., Lee, D.S., Mitchell, G.F., Levy, D., Cheng, S., Benjamin, E.J., and Vasan, R.S. Aortic root remodeling and risk of heart failure in the Framingham heart study. *JACC Heart Fail*, 2013, 1, 79-83.
12. Lam, C.S., Xanthakis, V., Sullivan, L.M., Aortic root remodeling over the adult life course: Longitudinal data from the Framingham heart study. *Circulation*, 2010, 122, 884-890.
13. Longhurst, J.C., Kelly, A.R., Gonyea, W.J., and Mitchell, J.H. Echo cardiographic left ventricular masses in distance runners and weight lifters. *J Appl Physiol*, 1980, 48, 154-162.
14. Pelliccia, A., Di Paolo, F.M., De Blasiis, E., Quattrini, F.M., Pisicchio, C., Guerra, E., Culasso, F., and Maron, B.J. Prevalence and clinical significance of aortic root dilation in highly trained competitive athletes. *Circulation*, 2010, 122, 698-706.
15. Erbel, R., and Eggebrecht, H. Aortic dimensions and the risk of dissection. *Heart*, 2006, 92, 137-142.
16. Vasan, R.S., Larson, M.G., and Levy, D. Determinants of echocardiographic aortic root size. The Framingham heart study. *Circulation*, 1995, 91, 734-740.
17. Zeppilli, P., Bianco, M., Bria, S., and Palmieri, V. Bicuspid aortic valve: An innocent finding or a potentially life-threatening anomaly whose complications may be elicited by sports activity? *J Cardiovasc Med*, 2006, 7, 282-287.

## Subtheme: Entrepreneurship in Sports

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### ABSTRACT

Entrepreneurship is a process of action an entrepreneur undertakes to establish his enterprise. Entrepreneurship is a resultant mix of many qualities and traits of an entrepreneur. Entrepreneurship is the dynamic process of creating incremental wealth and innovating things of value that has a bearing on the welfare of an entrepreneur. It provides civilization with an enormous amount of goods and services and enhances the growth of social welfare. The main importance of entrepreneurship is the creation of job opportunities, innovation, and improves the economy. Thus, this conceptual paper highlights on introduction, concept of entrepreneurship, definitions of entrepreneurship, origin of entrepreneurship, type of entrepreneurship, sports and entrepreneurship, the entrepreneurship challenges in sports colleges, suggestion few strategies to develop entrepreneurship in the sport, and conclusion.

**Keywords:** Challenges, Entrepreneurship, Imitative, Incubative, Strategies.

### 1. INTRODUCTION

Entrepreneurship is the name given to the factor of production which performs the functions of enterprise. In economics, land, labor, capital, organization, and enterprise are the five factors which are thought to be the basis of all the production activities. Entrepreneurship in a broader sense can be considered as a process of action undertaken by an entrepreneur (person) to establish his enterprise. It is a creative and innovative response to the environment.

Entrepreneurship can be described as a creative and innovative response to the environment. Such responses may take place in any field of social endeavor may be business, agriculture, social work and education, etc., for the entrepreneur, it is important to have knowledge of the economic and political environment, more particularly about the economic policies of the government and the financial as well as commercial institutions.

### 2. CONCEPT OF ENTREPRENEURSHIP

Entrepreneurship is a process of action an entrepreneur undertakes to establish his enterprise. Entrepreneurship is a resultant mix of many qualities and traits of an

entrepreneur. Entrepreneurship can be defined as a process undertaken by entrepreneur to augment his business interests. It is an exercise involving innovation and creativity that will go toward establishing his/her enterprise. Entrepreneurship is the inclination of mind to take calculated risks with confidence to achieve a predetermined business or industrial objectives.

### 3. ORIGIN OF ENTREPRENEURSHIP

The term entrepreneurship is derived from a French word "Entreprendre" which means "to undertake," "to pursue opportunities," or "to fulfill needs and wants through innovation and starring businesses." The word first appeared in the French dictionary in 1723.

It is believed that the Irish Banker operating in France, Ricardo Cantillon (Kent, 1984) was the first person who used the word "entreprendre" in economics as "an agent who assembles material/inputs for producing goods at a specific price and through coordination of those inputs produces goods whose sales price is uncertain in comparison with production cost."

It is also believed that Say (1824) first used the term "entrepreneur" as an economic agent who brought



together the factors of production in such a way that new wealth can be created.

### 3.1. Definition of Entrepreneurship

1. According to Dr. J.E. Stepenek, "Entrepreneurship" is the capacity to take risk; ability to organize and desire to diversify and make innovations in the enterprise
2. According to Higgins, entrepreneurship is meant for the function of seeing investment and production opportunity, organizing in enterprise to undertake a new production process, raising capital, hiring labor, arranging the supply of raw materials, finding site, introducing new techniques and commodities, discovering new sources of raw materials, and selecting top managers for day-to-day operation of the enterprise
3. "Entrepreneurship entails bearing the risk of buying at a certain price and selling at uncertain prices." – Ricardo Cantillon
4. "Entrepreneurship is any kind of innovative function that could have a bearing on the welfare of an entrepreneur." – Schumpeter (1934)
5. "Entrepreneurship is that form of social decision making performed by economic innovators." – Lamb (1952)
6. "Entrepreneurship is the purposeful activity of an individual or a group of associated individuals, undertaken to initiate, maintain or aggrandize profit by production or distribution of economic goods and services." – Cole (1959).

### 3.2. Type of Entrepreneurship

Entrepreneurship is an innovative process that involves multifaceted and diversified activities for providing new things to society and civilization. The orientation makes it different and therefore. It may be classified as individual and mass entrepreneurship or private and public entrepreneurship. Entrepreneurship classified into nine types that involve multifaceted and diversified activities for providing new things to society.

### 3.3. Acquisitive Entrepreneurship

The entrepreneurship that learns from other competencies is acquisitive entrepreneurship. It acquires something new of value front, the competitive environment or achieves the competitors' technical capacities. It keeps entrepreneurship sustainable in a competitive environment. The failure never restraints them from

acquisition but motivates them further to discover such a thing with a new visitor.

### 3.4. Administrative Entrepreneurship

The entrepreneurial activity under this category is centered on administrative techniques and functions. It gives a new option to handle prevailing or future situations in a more effective way that provides advantages and a competitive edge. Total quality management by consensus is a few of the examples of administrative entrepreneurship that increases overall organizational efficiency and that nukes the firm successful and sustainable in the competitive market environment.

### 3.5. Imitative Entrepreneurship

The entrepreneurship that imitates a good or service operating in the market under a franchise agreement is the imitative entrepreneurship. It is the medium that spread technology over the world. It adopts an existing technology in countries over the world. It also adopts an existing technology with minor modifications appropriate to the local condition.

### 3.6. Incubative Entrepreneurship

This category of entrepreneurship generates and nurses new ideas and ventures within the organization. It productively executes them and ensures material gain for the organization.

### 3.7. Individual Entrepreneurship

The entrepreneurship that is undertaken by an individual or a family with the personal initiative is individual entrepreneurship.

### 3.8. Mass Entrepreneurship

This type of entrepreneurship emerges in an economy where a favorable climate of motivation and encouragement exists for developing a wide range of entrepreneurship among general mass is mass entrepreneurship.

### 3.9. Opportunistic Entrepreneurship

There is a proverb "Hit! While the iron is hot." It is the best exhibit of the characteristic of this category of entrepreneurship. Environmental changes always offer new opportunities. But everybody is not equally capable of identifying and to utilize that opportunity on



time. The entrepreneurship that identifies exploits and executes the opportunity in the first hand regarded as opportunistic entrepreneurship.

### 3.10. Private Entrepreneurship

The entrepreneurship that is initiated under the private sector is private entrepreneurship. The government gives various support services through private and public concerns that encourage private initiative in taking entrepreneurial ventures. A layer and mutual relationship between private and public sectors would make economic development speedy and balanced.

### 3.11. Public Entrepreneurship

The entrepreneurship that is undertaken by the government through its various development agencies is public entrepreneurship. All countries, developed or underdeveloped, take a public initiative in venture ideas to fulfill the initial deficiency of private entrepreneurs.

### 3.12. Sports and Entrepreneurship

Sport is one of the greatest motivators of our time. It is about excellence, pushing yourself to the limit and also taking success and failure in your stride. Moreover, sports are dramatic, real, and most importantly unscripted, which makes it inspirational. There are multiple things that can be learnt from playing or even watching a sport.

#### 3.12.1. *Ability without the right attitude leads to limited success*

Several times you find that talented players who impress early do not seem to progress too far simply because they have poor work ethic. Entrepreneurs start off because they have a winning idea. But along with an idea and the skill to take it forward, they need hard work, discipline, and the ability to handle pressure, etc. These days funding is not difficult to get, if you have an impressive business plan. But that's only the beginning.

#### 3.12.2. *The best player does not always make the best captain*

The game of cricket is replete with examples of great players who made poor captains, who were on top of their own game but did not quite enjoy the burden of managing 10 others. A majority of start-ups have techies as founders. They have very impressive functional skills which is great to start-off with. As the team grows, with other partners and then employees, it becomes difficult for him to manage the setup. As a leader, he needs to be

a great communicator who can inspire the team to share his vision – something he has not done so far.

#### 3.12.3. *Every innings starts from zero*

Some entrepreneurs think of striking out on their own because they have met with considerable success in their previous jobs. You could have scored many runs in your earlier innings or assignments but you cannot bring that arrogance or baggage to the start-up. You have to start from the scratch when you start-up.

#### 3.12.4. *Growth necessitates change*

There is a difference between playing club level sports and playing for your national side. Going to the next level requires upgrading your skills, working on your temperament as well as handling a much higher level of pressure. Even if you were great at the lower level, you need to raise your game.

## 4. THE ENTREPRENEURSHIP CHALLENGES IN SPORTS COLLEGES

- Lack of programs for entrepreneurship training
- The lack of innovation system in physical education and sports colleges
- Disproportion between educational contents and job skills
- Inadequacy of training in physical education facilities
- Inaccuracies of instructors in educating to the specialists
- Lack of adequacy of higher education and labor market needs
- Failure to provide entrepreneurship guidelines in the comprehensive sports system
- The disparity between the current capacity of student admission to the university and the future needs of the labor market
- Lack of media role in the development of sports entrepreneurial attitudes and the introduction of sports entrepreneurs
- In harmonic between entrepreneurship policy and higher education system.

## 5. SUGGESTION FEW STRATEGIES TO DEVELOP ENTREPRENEURSHIP IN THE SPORT

The following are few strategies to develop entrepreneurship in the sports and to reduce the challenges from the perspective:

- Providing training courses to help the developing the culture and entrepreneurial attitude of the community through educational system;
- Establishing a research and development system and the use of specialized physical education specialist for the development of knowledge and innovation and the application of these results to self-employed organizations in sport;
- Development of entrepreneurship in the sports body and the development of institutions and consulting services for entrepreneurship in sports through university centers;
- Supporting sports professionals and developing applied research, expanding domestic technology, and applying these technologies by enriching physical education with other disciplines of technical sciences;
- Reviewing traditional management by choosing qualified and competent managers in the sports by creating program attitudes and reducing the activities of other operating systems in sport.

## 6. CONCLUSION

In general conclusion, it seems management, policy and communication can promote entrepreneurship in physical education and sports colleges. Policy can have a key role in entrepreneurship orientation in universities. Entrepreneurial sports policy can shape innovation, risk taking, and pro-activeness in sports education. It seems considered general policy can be the challenge for sports

entrepreneurship development and education system. Educational policy should be in line with sports policy.

## REFERENCES

1. Mohammad, A. *Explain the Success of Entrepreneurs and Provide a Suitable Model of the Success of Entrepreneurs in the Iranian Market*. Tehran, Iran: Proceedings of Congress on Entrepreneurship in the Health Sector; 2001.
2. Aminuddin, Y., and Pariah, M. Globalization and Malaysian sports industry. *J Intentional Stud*, 2008, 8, 112-116.
3. Ball, S. The importance of entrepreneurship to hospitality, leisure, sport, and tourism. *J Hosp High Leis Sport Educ Tour Acad Netw*, 2005, 3, 1-14.
4. Bogrese, A. Standards in sports entrepreneurship education. *U S Sports Acad*, 2007, 151(1), 32-35.
5. Boone, T. The entrepreneurship of exercise physiology. *Prof Exerc Physiol J*, 2003, 6(3), 1-11.
6. Bosma, N., Acs, Z.J., Autio, E., Coduras, A., and Levie, J. *Global Entrepreneurship Monitor Executive Report*; 2009, pp. 9-50.
7. Refaat, A.A. The necessity of engineering entrepreneurship education for developing economies. *Int J Educ Inf Technol*, 2009, 2(3), 85-96.
8. Schalake, M.R., Narjes, C., and Faorchild, P. *New Youth Entrepreneurship Curriculum on the Horizon*. Lincoln, Nebraska: University of Nebraska Lincoln, Department of Agricultural Economy; 2006.
9. Seddon, A., and Baldwin, H. *Innovation for Growth, University of Alberta Strategic Research Plan for Canada*. Foundation for Innovation and Canada Research Chairs Program; 2008, pp. 1-6.

# A Comparative Study of Self-confidence between Volleyball Players and Football Players of Krishna University

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## ABSTRACT

Everyone believed that self-confidence helps athletes to reach that higher level. Self-confidence allows athletes to thrive in their environment. Self-confidence gives athletes the believe that they can overcome any obstacles and that they can achieve their goals. Confidence in performs physical skills. There is no substitute for hard work. Self-confidence comes out of a solid base of physical training. Since the term of 20<sup>th</sup>-century coaches and selectors expects sportsman to have a high level of self-confidence. The purpose of the study is to assess the status of football and volleyball players' self-confidence. The subject of university level students in this study. We found out the self-confidence of the volleyball players better than football players.

**Keywords:** Football, Physical education, Players, Psychology, Self-confidence, Training, Volleyball.

## 1. INTRODUCTION

Self-confidence is considered an important, necessary mental skill in sportsman, as well as being an important factor in having an impact on sports performance within the framework of thought and behavior. It is known the fact that physical capacity alone is not enough an increasing. Sports performance and success but psychological endurance and elements also have this share. For this reason, the importance of sports psychology increases day by day. Since the term 20<sup>th</sup>-century selectors and coaches expect sportsman to have a high level of self-confidence. Because we have an individual who goes to play in competitions. Self-confidence in physical education means a change in the player attitude and mold their confidence and helping performing motor skills in sports and team games. Self-confidence does not ensure that you win every competition. Instead, confidence is believed in your ability. To perform well, having stable confidence allows you to quickly get over losses just because you lost does not mean that you longer has the ability to compete for high-level competitions. With self-confidence, you can focus on your strength in the upcoming competitions and increase the enjoyment of activity.

### 1.1. Hypothesis

It was hypnotized the self-confidence of volleyball players better than football players.

## 2. METHODOLOGY

A total of 60 subjects consisting of 30 volleyball and 30 football players were randomly selected from different affiliated colleges of Krishna University. All the selected players were taken part in the district level, state level, national level, and inter-university level competitions. The players are range from 18 to 24 years. The questionnaire of self-confidence given by Pandey 1983 was used to analyze the self-confidence. We have used both descriptive and comparative method for statistical analysis. For descriptive analysis, we have used mean and standard deviations and for comparative analysis, we have used a *t*-test.

The table shows the descriptive and comparative analysis of volleyball and football players.

Players	Mean	SD	<i>t</i> -test
30	21.57	2.99	0.000136972
30	18.77		

### 3. RECOMMENDATIONS

Players should have a good rapport with coach so that he can discuss how to hike the attitude, aggression, and release of energy while engaged in sports. The coach should help the players by changing the training methods so that he can boost players' confidence level. The player should engage in positive self-talk while performing to keep his attitude hike. The player should be thought how to visualize the play through imagination identification of opponent strategy to enhance self-confidence.

### 4. CONCLUSION

The primary outcome of the study concluded that self-confidence among volleyball and football players which were how to enhance the self-confidence of players has to go through many progressive therapeutic technics in

training and also in reducing stress anxiety level while involving in sports.

### REFERENCES

- Cecchini, J., Gonzalez, C., Carmona, A., and Arruza. The influence of physical education teacher on intrinsic motivation, self-confidence, anxiety, and pre- and post-competition mood states. *J. Eur J Sports Sci*, 2001, 1, 1-11.
- Koivula, N., and Hassmen, P. Perfectionism in elite athletes: effects on competitive anxiety and self confidence and individual differences. *Pers Individ Dif*, 2002, 32(5), 865-875.
- Deci, E., and Ryan, R. The general causality orientation scale: Self-determination in personality. *J Res Pers*, 1985, 19, 109-134.
- Meyer, K.E. Asian management research need more self-confidence. *Asian Pac J Manage*, 2006, 23, 119-137.

# **+Study on Speed and Muscular Power Status of Girl Students of Residential and Non-residential Schools of Warangal Urban District**

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## **ABSTRACT**

After the launch of fit India movement by the honorable Prime Minister of India Shri Narendra Modi, schools and colleges have shifted their focus on physical activity at their places. Under the circumstances, it is thought of investigating the status of speed and muscular power of girl students studying in residential and non-residential government schools to find out the difference between students of both these schools those who normally adopted to different lifestyles, food habits, and daily routines.

**Keywords:** Muscular power, Physical activities, Speed.

## **1. INTRODUCTION**

Speed and muscular power are two important elements of fitness and play a vital role in sports performance.

Speed is the ability to move quickly as possible across the ground. Speed influencing factors are body weight, body density, muscle viscosity, and such mechanical and structural features as length of limbs and flexibility. Speed is unthinkable without strength. Speed is the ability to perform rapidly successive movements over a short period of time in a single direction.

Muscular power is the ability to exert a maximal force in the shortest possible time. The capacity of the individual to bring into play maximum muscle contraction is expressed in an explosive action. Power is a mechanical principle concerned with propelling the body or projecting its parts in a forceful explosive manner in the shortest period of time. Muscles power is the ability of a muscle or group of muscles to generate maximal force in a single effort.

Hence, both the above fitness components are very much essential ingredients for sports performance.

### **1.1. Purpose of the Study**

The purpose of the study was to find out the status of speed and muscular power of girl students studying in residential and non-residential government schools keeping in view the routine lifestyle practices of the girls studying in residential and non-residential government schools.

### **1.2. Hypothesis**

It was hypothesized that there will be a significant difference among girl students studying in residential and non-residential government schools with respect to speed and muscular power.

## **2. METHODOLOGY**

For this study, 60 healthy girls were selected at random as subjects from the total population of 400 girls aged between 13 and 15 years from Telangana Social Welfare Residential School for Girls Hasanparthy and Zilla Prajaparishath Secondary School, Velair of Warangal Urban District.

Speed is measured with 50 m. Run and muscular power are measured with standing broad jump.



### 2.1. Procedure

Fifty meters sprint test was applied to measure the speed and standing broad jump test was applied to measure the muscular power of the subjects respectively to determine the difference in speed and muscular endurance among the girl students of residential and non-residential schools.



### 3. RESULTS

Test Items	Group	N	Mean	Standard deviation	“t” ratio	Required significant level+0.05
50 yards run	TSRS	30	8.4027	0.4742	5.6942	2.042
	ZPSS	30	9.3410	0.7828		
50 yards run	TSRS	30	1.5570	0.0934	11.8960	2.042
	ZPSS	30	1.2360	0.1216		

To measure the speed and muscular power of residential and non-residential girls, mean and standard deviation

were calculated. The findings indicated that there was a significant difference among speed and muscular power among girl students of residential and non-residential schools.

### 4. CONCLUSION

The result of the study revealed that there is a significant difference in speed and muscular power between the residential and non-residential school girls. It also revealed that government residential school girls are significantly better in speed and muscular power over girls of non-residential school.

### REFERENCES

- Anuradha, M., and Kaur, R. A comparative study of physical fitness of urban and rural school girls. *Indian J Sport Sci Phys Educ*, 1998, 10(1-2), 25.
- Anand, B.S. *Comparative Study of Physical Fitness Among the Rural and Urban Government Junior College Girls in the Age Group of 16 to 18 Years of Mahabubnagar District*. Kuppam: Dravidian University; 2017.
- Kamalesh, M.L. *Test, Measurement Evaluation and Skill Testing in Selected Sports Fourth Impression*. New Delhi: Sports Publication; 2016, p. 981.

# A Comparative Study of Personality Differences among Female Athletes and Female Other Sportspersons of Hyderabad Districts

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## ABSTRACT

Exercise enhances the mind-body connection, which can improve your mood and physical health. Sports psychology as the science of psychology applied to athletes and the athletic situation. It is the science that explains why we do what we do in the sports area. The purpose of the study was to find out the differences of personality among the athletes and other sportspersons. Athletes performance is depended on their own talent and skill but football, basketball, and handball players have to depend on their team efforts. Athletes are having good personality traits compared to other sportspersons.

**Keywords:** Athletics, Basketball, Football, Personality, Physical health, Psychology, Training.

## 1. INTRODUCTION

Success in sports requires your mind and your body and as an athlete, it is very important to have a clear mental picture of what it is you are striving for. By taking some time to think about peak performances you have had in the past. It can aid you in making sure they happen more often. As a sports psychologist is important to be aware of these characteristics, so you can guide each on to help the athletes strengthen each one to help the athletes strengthen each area so they can achieve peak performances on a more consistent basis.

Psychology of sports means applying psychological theories and concepts to aspects of sports such as coaching and teaching. The sports psychologist users psychological assessment techniques and intervention strategies in an effort to help individuals to achieve their optimal performance. While sport psychology is concerned with analyzing human behavior in various types of sport settings. It focuses on the mental aspects of performance.

Personality is defined as distinctive patterns of behavior that characterizes each individual adaptation to the situations of his or her life. Personality can define as a dynamic and organized set of characteristics possessed by a person that uniquely influences his or her cognitions, motivations, and behavior in various situations.

### 1.1. Objective of the Study

The objective of the study was to find out the personality differences between athletes and other sportspersons of Hyderabad district.

### 1.2. Hypothesis

There may not be any significant difference between athletes and other sportspersons of Hyderabad district in relation to personality.

## 2. MATERIALS AND METHODS

The study was conducted on 100 subjects, 50 female athletes and 50 female other sportspersons in the age group of 18–25 years.

Name of the category	Number of subjects
Athletes	50
Other sportspersons	50
Total	100

### 2.1. Tools Used

EYSENCKS personality inventory was used for the study. Questionnaires were distributed to 50 female

athletes and 50 other female sportspersons of football, basketball, and handball players. Neuroticism, extraversion, and psychoticism are the personality traits which are given more importance in this study. The data were treated statistically by employing *t*-test to determine the significant difference of personality characteristics between athletes and other sportspersons.

### 3. RESULTS AND DISCUSSION

The present study deals with the comparison of personality traits among athletes and other sportspersons in respect to neuroticism, extraversion, and psychoticism.

The table shows the significant difference of personality characteristics between athletes and other sportspersons.

Sports persons	Number	Mean	Standard deviation	<i>t</i> -value
Athletes	50	14.89	0.55	3.75
Other sportspersons	50	13.162	2.01	

The table shows that the athletes are good personality traits compare to other sportspersons because the athletes are self-reliant, dedicated, highly motivated

to achieve the high level of performance. Athletes performance is depended on their own talent and skill but other sportspersons from football, basketball, and handball and they have to depend on their team effort to win the competitions. Hence, other sportsperson will differ from each other.

### 4. CONCLUSION

It is concluded that athletes are having good personality traits compare to other sports personality recommended that coaches and trainers must give psychological training to sportspersons to enhance the sports performance.

### REFERENCES

- Cervone, D., and Pervin, L. *Personality: Theory and Research*. 11<sup>th</sup> ed. New York: Wiley; 2010.
- Kovacs M. *Med Sci Sports Exerc*, 2008, 1, 209-210.
- Shrivastaval, P., and Gopal, R. *Exe Sci Physiot*, 2010, 1, 39-42.
- Deci, E., and Ryan, R. The general causality orientation scale: Self-determination personality. *J Res Pers*, 1985, 19, 109-134.
- Anurudan, A.C., and Dasgupta, S.P. *Trainign the Elite Athlete an Introspection*; 2019.

# Comparison of Mental Toughness between Sedentary Women and Women Who Practicing Volleyball as Recreation

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## ABSTRACT

The purpose of the study was to find out the differences in mental toughness between sedentary women and women who practicing volleyball as recreation women belong to Malappuram district between the age groups of 40 and 45 years. The subjects were randomly selected and were shortlisted through purposive sampling. To analyze mental toughness of the subjects, mental toughness questionnaire (Dr. Alan Goldberg, 2004) was used. The statistical technique employed for this study was an independent “t”-test at 0.05 level of significance. Statistical analysis indicates a significant difference in mental toughness of sedentary women and women who practicing volleyball as recreation. Therefore, the hypotheses that there would be no significant difference between mental toughness women have been rejected, though practicing volleyball as recreation women showed are significantly better sedentary women in pressure handling ability, rebound ability, motivation, confidence, and concentration and overall mental toughness.

## 1. INTRODUCTION

Sports, a part of the physical education program, have grown so big that it has come to be recognized as a very strong social force. Some people claim a separate entity for sports, a separate study. The word physical education indicates that physical activity develops the learner. The common denominator in sport and physical education is movement activities. What may not be understood from the combined term is that the motor activities must be performed to develop skillful or artistic execution and also to develop the performer, physical education and sports together form a coherent systematic and scientifically sound program based on the current accepted principles.

Physical inactivity and the increased sedentary nature of our daily living habits are a serious threat to the body, causing major deterioration in normal physiological and psychological function. Such common and serious mental disturbances are mental toughness, stress, anxiety, depression, hypertension, and the physical problems as coronary heart disease, obesity, and lower back problems have been either directly or indirectly associated with our lack of physical activity, so physical fitness and the mental wellness is one's richest possession.

Women are one of the main categories who face many physical and psychological problems. They fail to face psychological problems such as mental toughness, stress, tension, anxiety, and so on more than physical disturbance. Performing physical activity or sports helps to reduce both these mental and physical problems.

In this modern era, 90% of women came out from the world of the kitchen. They begin to work hard physically by doing exercise and sports, some spend their leisure time by playing team games such as volleyball, basketball, and handball. In this study, the scholar tries to find out the difference in mental toughness between sedentary women and women who practicing volleyball as recreation.

The purpose of the study was to hypothesize that there will not be any significant differences between sedentary women and women who practicing volleyball as recreation with respect to their mental toughness.

### 1.2. Objective of the Study

The objective of the study was planned with the aim to compare mental toughness between sedentary women and women who practicing volleyball as recreation.

To compare overall mental toughness between sedentary women and women who practicing volleyball as recreation.

## 2. MATERIALS AND METHODS

The subjects for this study are 40 (20 sedentary women and 20 women who practicing volleyball as recreation players) women that belong to Malappuram district between the age groups of 40 and 45 years. To compare mental toughness between sedentary women and women who participating in volleyball as recreation, the *t*-test was applied at 0.05 level of significance.

### 2.1. Description and Administration of Questionnaire

Mental toughness questionnaire: A trait measure of mental toughness was used (the mental toughness questionnaire: MTQ; Dr. Alan Goldberg, 2004). This test consists of 30 questions that include both positive and negative statements. Each statement consists of two responses: True or false. The respondent made a tick (✓) any one of the responses that fit to them best. The MTQ assesses five factors: Rebound ability, ability to handle pressure, concentration, confidence, and motivation. The purpose of the study was explained to them. The screening of the questionnaire was done to check that no questions are left unanswered.

### 2.2. Data Analysis

For data analysis, responses were expressed as mean and standard deviation. Independent “*t*”-test was performed for comparison between two groups (sedentary women and women who participating in volleyball as recreation),  $P < 0.05$  was considered statistically significant. Data analysis was performed using SPSS software under windows.

## 3. RESULTS

To compare mental toughness between sedentary women and women who practicing volleyball as recreation, mean, standard deviation, and “*t*”-tests were computed. On mental toughness, the means and standard deviations of the two groups along with the significance of difference by “*t*”-test is shown in Table 1.

Table 1 indicates that the means of volleyball practicing women on pressure handling ability, rebound ability,

**Table 1:** Mean and standard deviation of mental toughness components between sedentary women and women who practicing volleyball as recreation

Variables	Mean	Standard deviation	“ <i>t</i> ”-value
Rebound ability			
S.D	3.25	1.51	2.92
W.P.V	4.4	0.88	
Pressure handling ability			
S.D	2.8	1.28	2.44
W.P.V	3.9	1.55	
Concentration			
S.D	2.95	1.39	2.35
W.P.V	3.25	1.51	
Confidence			
S.D	3.25	1.51	2.72
W.P.V	4	1.16	
Motivation			
S.D	3.9	1.51	3.85
W.P.V	4.17	0.57	
Overall mental toughness			
S.D	3.23	1.44	2.85
W.P.V	4.15	1.13	

S.D: Sedentary women, W.P.V: Women who practicing volleyball as recreation, Significant at 0.05 levels

motivation, confidence, and concentration and overall mental toughness were 3.9, 4.4, 4.17, 4, 3.25, and 4.15, respectively, which are higher than the means of sedentary women in the mentioned components and the obtained “*t*”-test was 2.8, 3.25, 3.9, 3.25, 2.95, and 3.23, which was found to be significant at 0.05 level of confidence. This clearly denotes that volleyball practicing women are significantly better than sedentary women in pressure handling ability, rebound ability, motivation, confidence, and concentration and overall mental toughness.

## 4. DISCUSSION

The results of the study indicate that there was a significant difference in mental toughness components between sedentary and practicing volleyball as recreation women. The analyzed data show that practicing volleyball as recreation women are significantly better sedentary women in pressure handling ability, rebound ability, motivation, confidence, and concentration and overall mental toughness. This may be attributed to the fact that the practicing volleyball as recreation women involve themselves more to prepare mentally for



various competitions and participate in competition as a team which helps them to share the pressure of the competition, bouncing back from mistakes and being motivated and confidence level because they compete and manage challenging situations alone. They also have some extra edge and are significantly better in concentration ability.

This study may be utilized for the formulation of various training programs. Women with strong mental toughness would be able to manipulate the situation and absorb pressure and bring goodwill to themselves.

## 5. CONCLUSION

The results of this study are consistent with previous research studies that have demonstrated that the overall mental toughness of practicing volleyball as recreation women is better than sedentary woman.

## REFERENCES

- Alan, G., *Athletes "How Tough Are You?"* 2004.
- Franciosi, E., Guidetti, L., Gallotta, M.C., Emerenziani, G.P., and Baldari, C. Contributions of selected fundamental factors to basketball performance in adult players with mental retardation. *J Strength Cond Res*, 2010, 24(8), 2166-2171.
- Jalili, F., Hosseini, S.A., Jalili, F., and Salehian, M.H. Comparison of personality dimensions, mental toughness, and social skills of female students athletes (team-individual) and non athletes. *Sch Res Libr Ann Biol Res*, 2011, 2(6), 554-560.
- Loehr, J. *Mental Toughness Training for Sports*. New York: The Stephen Greene Press; 1982.
- Garry, K., and Jolly, R. Goal profiles, mental toughness and its influence on performance outcomes among Wushu athletes. *J Sports Sci Med*, 2007, 6(2), 28-33.
- Lee, C., and Kayvon, A. Mental toughness and athletes' use of psychological strategies. *Eur J Sport Sci*, 2009, 10, 56-72.
- Ross, W., Declan, C., and Sheldon, H. The development and maintenance of mental toughness: Perceptions of elite performers. *J Sports Sci*, 2008, 26(1), 83-95.
- Hodge, K. Mental toughness in sport: Lessons for life. The pursuit of personal excellence. *J Phys Educ N Z*, 1994, 27, 12-16.
- Jones, G., Hanton, S., and Connaughton, D. What is this thing called mental toughness? An investigation of elite sport performers. *J Appl Sport Psychol*, 2002, 14, 205-218.
- Loehr, J.E. *Athletic Excellence: Mental Toughness Training for Sports*. Centerport, NY: Forum Publishing Company; 1982.
- Jarvis, M. *Sport Psychology*. New York: Routledge; 1999.
- Cox, R.H. *Sports Psychology Concepts and Applications*. New York: McGraw-Hill Companies Inc.; 2002.
- Solanki, A.S., and Singh, M.K. Comparitive study of mental toughness between the players of tae-kwon do and cricket. *Indian Streams Res J*, 2013, 3(11), 9780.

# Enhancing Skills in Physical Education and Sports Science

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## ABSTRACT

Physical education is defined as a planned sequential standards-based program of curricula and instruction designed to develop motor skills, knowledge, and behaviors of healthy active living, physical fitness, sportsmanship, self-efficacy, and emotional intelligence. This paper covers the importance of enhancing skills in physical education and sports science. The paper recommends that physical education teachers and coaches should always adopt players approach toward teaching physical education and sports coaching. The impact of quality physical education over the individuals and the society has been researched, but more focus should be given on the possible influences in schools and clubs. We are committed to the promotion of physical education, physical activity, and sport in recognition of the educational, social, health, and cultural benefits that can be gained through participation.

**Keywords:** Enhancing, Physical education, Skills, Sports science.

## 1. INTRODUCTION

The term physical education refers to activities taught as part of the curriculum within a class time where the emphasis is on learning. Physical activity is an all-encompassing term which includes physical education, sport, play, and activity undertaken for enjoyment or health or performance enhancing purposes. Sport refers to those activities that are organized in a structured way and have a focus on competition. The students in generally are aware that being healthy is important. However, may not know or understand the importance of physical education. Opinions regarding past physical education experiences in school often distort the link between quality physical education and personal health. Physical education in the nation's schools is an important part of a student's comprehensive, well-rounded education program, and a means of positively affecting life-long health and well-being. At a minimum, the physical education program should provide physical activity to enhance current health while teaching knowledge and skills that foster a long-term commitment to physical activity as part of a healthy lifestyle that will help children prevent

numerous conditions, including abnormal cholesterol, high blood pressure, hyperglycemia, obesity, and ultimately heart disease as well as a host of other non-communicable diseases and mental health problems.

## 2. DISCUSSION

### 2.1. Methods of Enhancing Teaching Skills

- Educating oneself
- Updating
- Research
- Implementation
- Never settle attitude.

### 2.2. Benefits of Sports Sciences

- To understand the theory of exercise physiology, skill acquisition, and sport psychology
- To understand how exercise physiology, skill acquisition, and sports psychology interrelate to influence sporting performance
- Develop analytical and interpretive skills to solve problems and process data presented to them or collected during research

- To undertake scientific research activities and understand ethical issues related to human research studies
- Identify, describe, recall, and comprehend facts, definitions, terminology and principles as they relate to various contexts through the study, observation of, and engagement in, physical activity apply knowledge and understanding of exercise physiology, skill acquisition, and sport psychology to a variety of sporting contexts be able to select, interpret, analyze and manipulate information from a variety of sources identify solutions to problems in exercise physiology, skill acquisition, and sport psychology.

### 2.3. Approaches and Application

- Physical education teachers – Must have basic knowledge of anatomy, physiology, growth and development, gender and age, nutrition, and health hygiene
- Coaches and trainers – Training and coaching principals, diet and sports medicine, biomechanics, kinesiology, psychology, sports rehabilitation, and use of technology

### 2.4. Responsibility as Teacher and Coach

It is our prime duty to contribute to our nation by creating health awareness and building a healthy Nation. Aim of sports – Achievement of high performance for great results. Winning for school, college, State and Nation and that of Physical education – develop motor skill, fitness and health awareness, teamwork, sportsmanship and cooperation, and value education. Nelson Mandela said “Sports has the power to change the world. It has the power to inspire. It has the power to Unite people in a way that little else does. It speaks to youth in a language, they understand sport can create hope where once there was only despair.”

## 3. CONCLUSION

As a coach trainer, teacher we must keep in mind that we are not doctors or physiotherapist, but it is necessary to enhance our learning skills toward sport medicine, rehabilitation, and sports nutrition. Without these three sports science subjects, we cannot withstand at National and International levels. For achieving great results a coach, trainer should not risk the life/health of the sportsperson. Winning is not the ultimate goal.

## 4. SUMMARY

Just learning and mastering sports skills are not enough: It is no longer “Practice Makes Perfect” or “Perfect Practice Makes Perfect.” Coaches and athletes must spend as much time, energy, and effort learning to perform the fundamental skills of their sport in competition conditions as they do to learning and mastering the basic skill. Coaches should progress athletes systematically to ensure they can perform fundamental sports skills in competition conditions Physical education curriculum is one of the most important influences on young people’s participation in physical education, and there is evidence to suggest that positive attitudes, once established, remain consistent across the transition from primary to secondary school (Dismore and Bailey, 2010).

Physical education curriculum is one of the most important influences on young people’s participation in physical education, and there is evidence to suggest that positive attitudes, once established, remain consistent across the transition from primary to secondary school (Dismore and Bailey, 2010).

## REFERENCES

- Sallis, J.F., and McKenzie, T.L. Physical education’s role in public health. *Res Q Exerc Sport*, 1991, 62, 124-137.
- Trost, S.G., van der Mars, H. Why we should not cut P.E. *Health Learn*, 2009, 67(4), 60-65.
- Cawley, J., Frisvold, D., and Meyerhoefer, C. The impact of physical education on obesity among elementary school children. *J Health Econ*, 2013, 32, 743-755.
- Cawley, J., Meyerhoefer, C., and Newhouse, D. The impact of state physical education requirements on youth physical activity and overweight. *Health Econ*, 2007, 16, 1287-1301.
- Clocks, B.D., Watson, D.L., Williams, D.P., and Ransdell, L. Integrated health and physical education program to reduce media use and increase physical activity in youth. *Phys Educ*, 2009, 66, 1-20.
- Constantinides, P., Mantalvo, R., and Silverman, S. Teaching processes in elementary physical education classes taught by specialists and nonspecialists. *Teach Teach Educ*, 2013, 36, 68-76.
- Available from: [http://www.ijcrr.com/uploads/2285\\_pdf.pdf](http://www.ijcrr.com/uploads/2285_pdf.pdf).
- Available from: <https://www.getirelandactive.ie/professionals/education-/primary/resources/des-physical-activity-physical-education.pdf>.
- Available from: [https://www.heart.org/idc/groups/heart-public/@wcm/@adv/documents/downloadable/ucm\\_473782.pdf](https://www.heart.org/idc/groups/heart-public/@wcm/@adv/documents/downloadable/ucm_473782.pdf).
- Available from: <https://www.wgcoaching.com/sports-skills>.

# An Analytic Study on Sports Participation in the Affiliated Colleges of Solapur University

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## ABSTRACT

Physical activity among students is essential for complimenting sedentary behavior and for individuals' future health. This study investigates reasons for sports engagement among students and addresses sports participation by employing a mixed-methods approach. The study consists of a quantitative online survey followed by qualitative interviews. In the survey, we assessed reasons for sport participation using a questionnaire for students and Director of Physical Education and University Sports data along with college participation record. The results may help to generate a more target-group-oriented approach to increase sports participation among students.

**Keywords:** Affiliated, Analytic, Participation, Solapur University, Sports.

## 1. INTRODUCTION

Students who play sports in high school may want to continue these activities in college. Although the playing field shifts somewhat with progression to collegiate level sports, many young people continue to participate in organized sports. By learning about the organizations involved in college sports and the recruiting process, a student can prepare for a successful and enjoyable college sports experience. Through various sports associations, many colleges offer students the chance to play competitive sports at the varsity level. Some varsity athletes are eligible for sports scholarships through their colleges. Varsity athletes must meet academic requirements to win and keep sports scholarships. Every student has an opportunity to play sports thanks to clubs and intramural leagues. All college athletes need strong time-management skills to balance classes and homework with practices and games.

### 1.1. Objective of the Study

The objective of this study was as follows:

- To find the percentage of boys and girls participation in sports
- Taluka wise sports participation
- Measure to increase sport participation at the college level.

## 2. METHODOLOGY

A survey method of research is used for the study.

- Sample – All affiliated colleges under Solapur university
- Limitation – Affiliated colleges of Solapur university
- Tools – Interviews and participation data
- Data collected for the academic year 2011–2016.

### 2.1. Finding

1. To find the percentage of boys and girls participation in sports (2011–2016) – Boys – 19,821 and girls – 9940
2. Taluka wise sports participation (2011–2016) – Number of talukas –11
  - Solapur city – Total number of students (145,419), participation (9970)
  - North Solapur – Total number of students (22,344), participation (2385)
  - South Solapur – Total number of students (4217), participation (588)
  - Mohol – Total number of students (8023), participation (1578)
  - Akkalkot – Total number of students (8866), participation (947)
  - Mangalwedha – Total number of students (10,180), participation (833)

- Pandharpur – Total number of students (42,895), participation (1989)
  - Malshiras – Total number of students (31,005), participation (3043)
  - Madha – Total number of students (13,404), participation (1579)
  - Barshi – Total number of students (27,808), participation (2529)
  - Karmala – Total number of students (9641), participation (1244)
3. Measure to increase sport participation at the college level – Encourage less sitting and more physical activity within workforces (e.g., walking meetings, shower and change facilities, taking the stairs, and standing work stations). Provide accessible information about local sport and active recreation opportunities. Ensure all new and refurbished sport and recreation facilities meet the universal design principles 11 and sport-specific standards. Work with sports clubs to encourage and facilitate the implementation of health promoting policies.

### 3. RECOMMENDATIONS

- Some serious measure should be taken to increase sports participation at the college level
- Girls' sports participation should be focused, counseling with the parents, and motivation to the girls should be done
- College should design such a curriculum that physical education, health awareness, and sports participants should be increased
- Sports facilities and infrastructure should be upgraded to attract students toward sports
- Rural population should be encouraged to take part in sports competitions.

### REFERENCES

- Allison, P.D. Comparing logit and probit coefficients across groups. *Soc Methods Res*, 1999, 28(2), 186-208.
- Braddock, J.H. II race, athletics, and educational attainment: Dispelling the myths. *Youth Soc*, 1981;12(3), 335-350.
- Broh, B.A. Linking extracurricular programming to academic achievement: Who benefits and why? *Soc Educ*, 2002, 75(1), 69-91.
- Buchmann, C., and DiPrete, T.A. The growing female advantage in college completion: The role of family background and academic achievement. *Am Sociol Rev*, 2006, 71(4), 515-541.
- Available from: <https://www.bestcollegereviews.org/students-guide-to-playing-sports-in-college>.
- Available from: <https://www.bigfuture.collegeboard.org/find-colleges/campus-life/playing-sports-in-college-your-options>.



# The Relationship of Self-control and Emotional Intelligence among Pondicherry University Cricket Players

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## ABSTRACT

The aim of this study was to analyze the relationship between self-control and emotional intelligence (EI) of intercollegiate cricket players of Pondicherry University. A total of 120 respondents were selected for this study. The respondent has chosen from various colleges in Pondicherry University level male cricket players who were participated in the intercollegiate tournament conducted by the Directorate of Higher and Technical Education, Government of Puducherry, and Cricket Association of Pondicherry, respectively. The selected respondent's age was ranged from 19 to 25 years. To collect the required data, the researcher has chosen the self-control questionnaire of Tangney, J.P., Baumeister, R.F., Boone, and A.L. and EI questionnaire of Wong and Law EI Scale. The collected data were statistically analyzed using the Pearson correlation two-tailed test. The result of this study showed that the relationship between self-control and EI has a normal positive linear correlation. The study concludes that if the cricket players are having self-control and they have good intelligence emotions also.

**Keywords:** Cricket players, Emotional intelligence, Pondicherry university, Self-control.

## 1. INTRODUCTION

In the field of sports, in addition to physical, technical, and tactical abilities, psychological abilities also play an important role. For example, in cricket, they need many techniques, but in some situations, they have to cope wisely with the help of psychological factors. Certain times, they feel highly pressurized and not able to play with the occurring game circumstances which make them lose their temper. Such will effect negatively for them in the future. Such situations like this happening in every sport. How we are thinking, understanding, controlling ourselves, and acting wisely toward that, the pressure is the most important thing.

Self-control is an ability of an individual to control or regulate the thoughts, behaviors, and emotions in a particular situation. This will help to improve the focus and helps to make better decisions in particular situations like when we are tempted too much. It is the process of controlling our own actions and emotions by our own will.

Emotional intelligence (EI) is the ability of a person to understand, use, and manage their own emotions and

those of others. It will help to defeat our tension and communicate freely with others. According to Salovey and Mayer, EI is "the ability to monitor one's own and other people's emotions, to discriminate between different emotions and label them appropriately, and to use emotional information to guide thinking and behavior." It is the process of perceive and understand our feeling and also other feelings.

The purpose of the study was to analyze the self-control and EI of cricket players, which means to investigate how they are controlling their thoughts and emotions such as anger, frustrations, and all in-game situations and how they are managing their emotions and acting wisely to pressurized situations to achieve the goals. In every sport, the athletes need self-control and EI.

There are so many studies that are done with EI and other variables likewise with self-control and other variables also. They all in other games and for some other purposes. However, according to our knowledge, there are no studies done in this aspect for cricketers until now.

## 2. METHODOLOGY

A total of 120 male respondents were chosen for this study from various colleges in Pondicherry University. They all have participated inter-college level cricket tournament conducted by the Directorate of Higher and Technical Education (DHTE), Government of Puducherry, and Cricket Association of Pondicherry, respectively. Nineteen years–twenty-five years aged respondents were selected purposefully and they were not selected randomly. To collect the required data, self-control questionnaire of Tangney, J.P., Baumeister, R.F., Boone, and A.L. and EI questionnaire of Wong and Law EI Scale were used. Self-control questionnaire consists of 10 items and the EI questionnaire consists of 16 test items measuring four components of self-emotions appraisal, regulation of emotions, use of emotion, and others emotion appraisal. Before filling the questionnaires, the way of filling them and what are all the content was presented in that questionnaire was fully explained to the players. The collected data were statistically analyzed using Pearson's coefficient of correlation two-tailed test at 0.05 level of confidence.

## 3. RESULTS

The results of this study express that self-control has a significant normal positive relationship with the EI. As per Pearson's coefficient correlation two-tailed test,  $P$  value (0.029) is  $< 0.05$  of the table value present in Table 1. Hence, players who have a higher level of the self-control have a higher level of EI ability. The following table is showing the result of this study.

## 4. DISCUSSION

The research showed the relationship between self-control and EI among the cricket players of

Pondicherry University. Pearson correlation test result indicates that there is a normal positive correlation between self-control and EI among Pondicherry University cricket players. According to Sadri and Janani (2014), there was a significant correlation for EI and self-regulation that are reported. According to Mabekoje (2010), the study reported that there are no significant relations with EI and self-regulation. According to Abdolvahabi (2012), there is a correlation between emotional awareness and self-efficacy. We can easily realize that two psychological variables can have many similarities. All the psychological aspects such as perception, cognition, attention, emotion, intelligence, subjective experiences, motivation, and brain functioning are a must for the sports persons. Moreover, they have to know how to control their emotions in the sports field. This study indicates that if an athlete has self-control, their intelligence of emotional is high. You can easily handle the pressure situation in a positive manner if you have a good self-control.

## 5. CONCLUSION AND RECOMMENDATION

The result shows that there is a normal positive correlation in self-control and EI among Pondicherry University cricket players. With this result, the research concluded that, instead of only developing in the sense of physical aspect, we can also have to develop in the psychological aspect too. Players should have to train to be strong psychologically.

## REFERENCES

- Cecchini, J.A., Montero, J., Alonso, A., Izquierdo, M., and Contreras, O. Effects of personal and social responsibility on fair play in sports and self-control in school-aged youths. *Eur J Sport Sci*, 2007, 7(4), 203-211.
- Chan, D.W. Perceived emotional intelligence and self-efficacy among Chinese secondary school teachers in Hong Kong. *Pers Individ Dif*, 2004, 36(8), 1781-1795.
- Gill, G.S. Examining the impact of emotional intelligence and goal setting on basketball performance. *Sport J*, 2016, 1(8), 67-88.
- Gill, G., Lane, A.M., Thelwell, R., and Devenport, T. Relationships between emotional intelligence and psychological skills. *Indian J Fitness*, 2011, 7, 9-16.
- Kirschenbaum, D.S. Self-regulation and sport psychology: Nurturing an emerging symbiosis. *J Sport Psychol*, 1984, 6(2), 159-183.
- Sadri, A., and Janani, H. Relationship of emotional intelligence and self-regulation of male elite swimmers. *Ann Appl Sport Sci*, 2015, 3(4), 9-18.

**Table 1: Correlations**

	Self-control	Emotional intelligence
Self-control		
Pearson correlation	1	0.200*
Sig. (two-tailed)		0.029
<i>n</i>	120	120
Emotional intelligence		
Pearson correlation	0.200*	1
Sig. (two-tailed)	0.029	
<i>n</i>	120	120

\*Correlation is significant at the 0.05 level (two-tailed)

Skowron, E.A., and Friedlander, M.L. Psychological separation, self-control, and weight preoccupation among elite women athletes. *J Couns Dev*, 1994, 72(3), 310-315.

Toering, T., and Jordet, G. Self-control in professional soccer players. *J Appl Sport Psychol*, 2015, 27(3), 335-350.

VanSickle, J.L. *The Relationship between Emotional*

*Intelligence and Coaching Effectiveness in Division I Head Softball Coaches*. Lexington, KY: University of Kentucky; 2004.

Zizzi, S., Deaner, H., and Hirschhorn, D. The relationship between emotional intelligence and performance among college basketball players. *J Appl Sport Psychol*, 2003, 15(3), 262-269.

# Relationship between Wrist Flexibility and Shooting Ability of Basketball Players

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## ABSTRACT

The purpose of the study was to find out the relationship between wrist flexibility and shooting ability of the basketball players. The study was conducted by selecting 20 college basketball players from the various colleges of Idukki District. The age of subjects was ranged between 19 and 25 years. The goniometer was used to measure the flexibility of the right-hand wrist of the basketball players. To measure the shooting ability of the players, the free-throw test was conducted. The data collected were treated statistically using the Pearson Product-Moment Correlation. The study showed that there was a significant relationship that exists between wrist flexibility and the shooting ability of basketball players.

**Keywords:** Shooting ability, Wrist flexibility

## 1. INTRODUCTION

It is necessary for every individual to be physically fit to perform their daily work with ease and to take part in various activities effectively. Everyone should be fit enough through participation in physical activities to develop the different physical components. The components of physical fitness are strength, endurance, cardiovascular efficiency, speed, ability, coordination, and flexibility. Variation of flexibility in several regions in the joints of the body will prevail according to the type of activity, in which the individual is involved. The wrist, hip, and ankle, many of our daily work become limited in their scope. The components of fitness are essential and they are interrelated to each other for their excellent performance. Hence, it is a well-known factor that developing fitness through active participation in physical activity includes a lot of movements which contribute to develop the components of fitness. The components of fitness play a key role in executing the specific type of sports skills. Flexibility refers to the "range of motion possible at a joint or series of joints such as the spine and flexibility is expressed by the range of motion in a given joint (or) combination of joints."

## 2. METHODOLOGY

Subjects were selected from the following colleges of Idukki district in Kerala. Ten students were selected from St. Joseph's academy of higher education and

research Moolamattom, and ten from Newman College, Thodupuzha. The players' age ranges from 19 to 25 years old. This study was formulated as a purposive specific group design. At first, the players were taken into a class for finding the maximum ranges of flexion possible by the right-hand wrist of the players. After collecting the ranges of flexion, the players were taken to the basketball court for the free-throw test, which is commonly used for finding the shooting ability. The goniometer was used to measure the flexibility of the right-hand wrist. Each of the players gets ten trials, no free trials were provided. The data collected were treated statistically using the Pearson Product-Moment Correlation.

## 3. RESULTS

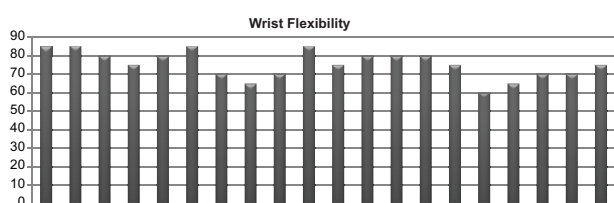
The result shows that the standard deviation of wrist flexibility and shooting ability of men basketball players was 7.23 and 1.45, respectively. The combined standard deviation was 7.6. The obtained coefficient of correlation between the wrist flexibility and shooting ability of a basketball player was 0.73.

The bar diagram shows the values of wrist flexibility (X)

The figure represents the maximum range of flexion of the right-hand wrist made by the players. The difference in the range of flexion made by the 20 basketball players and that made the variation on the graph.

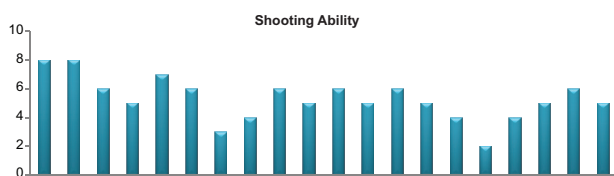
### The mean, sum of the values, standard deviation, sum of XY

Variables	Sum of the values	Mean	Sum of (X <sup>2</sup> andY <sup>2</sup> )	Standard deviation	Sum of XY
Wrist flexibility	1510	75.5	115050	7.23	8155
Shooting ability	106	5.3	604	1.45	



### Standard deviation, combined standard deviation, and coefficient of correlation of wrist flexibility and shooting ability

	Standard deviation	Combined standard deviation	Coefficient of correlation data	Table value
Wrist flexibility	7.23	7.6	0.73	0.426
shooting ability	1.45			



The bar diagram shows the values of shooting ability (Y)

The figure shows the scores made by the players on free-throw shooting ability test. The variation of the graph made a clear image of the number of shots made by the 20 basketball players.

The table shows the standard deviation, combined standard deviation, and coefficient of correlation of wrist flexibility and shooting ability.

## 4. DISCUSSION

The standard deviation of wrist flexibility and shooting ability of men basketball players was 7.23 and 1.45, respectively. The combined standard deviation was 7.6. The obtained coefficient of correlation between the wrist flexibility and shooting ability of a basketball player was 0.73. The table value given in Table of Pearson Product-Moment Correlation given by Rothstein was 0.426 for the degrees of freedom (20-1) 19 at 0.05 level of significance. This shows that there was a significant relationship between the wrist flexibility and shooting ability of basketball players. Hence, the investigator's hypothesis that the players who have greater flexibility may have better shooting ability in the game of basketball was upheld.

## 5. CONCLUSION

The result of the study showed that there was a significant relationship that exists between wrist flexibility and the shooting ability of basketball players.

## REFERENCES

1. Singh, A., Lumpkin, A. *Essential of Physical Education*. New Delhi: Kalyani Publication; 2005, p. 66.
2. Clarke, H., and Clarke, D.H. *Application of Measurement in Physical Education*. 6<sup>th</sup> ed. Englewood Cliffs, New Jersey, USA: Prentice Hall Inc.; 1987, p. 63.
3. Yobu, A. *Test, Measurement and Evaluation*. Chennai: Grace Printers; 1988, p. 444.
4. Josepl, B.K. *Relationship of Power, Agility, Flexibility and Measurement of Selected Body Segments to Volleyball Playing Ability*. Gwalior, Madhya Pradesh: Unpublished Master's Thesis, Jiwaji University; 1989.
5. Noakes, T.D., and Durandt, J.J. Physiological requirements of cricket. *J Sports Sci*, 2000, 18(12), 919-929.
6. Armstrong, M.E., Lambert, E.V., and Lambert, M.I. Physical fitness of South African primary school children, 6 to 13 years of age: Discovery vitality health of the nation study. *Percept Mot Skills*, 2011, 113(3), 999-1016.



# A Study of Yoga Training Program's Effect on Rifle Shooting Player's Performance

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## ABSTRACT

The importance of yoga training has been proven experimentally. By adopting a yoga training program on the mental, emotional, and physical aspects of the players. There are many examples of this. Various experiments have been done to enhance sports performance, concentration, and physical ability through various yoga training programs, but while doing relevant research, it has been shown that the impact on rifle shooting players of the yoga training program has not been studied. Due to this, the researcher has decided to experiment with this type of rifle shooting players in Aurangabad district and test its provenance in a numerical manner. This experiment can certainly be useful to players of rifle shooting. The researcher has created a yoga training program by reviewing various reference materials and discussing it with experts. The researcher selects a rifle shooter by a lottery system and makes two groups by random sample selection (A-B-B-A) system. Their rifle shooting test was compared and compared with those obtained by the *t*-test for each variable that no significant difference at both levels was observed at 0.01 levels. That is, these sample groups were found to be statistically similar to the selected variables. Therefore, independent *t*-tests have been used to draw conclusions in the research presented. The yoga training program was given to the experimental group. After 3 months, the researcher takes test. For numerically analyzed by the researcher using the independent *t*-test. Regular yoga practice increases confidence, mental, and physical health makes good. Become aware of health recovery. Yoga practice strengthens the muscles and organs of the body. Coordination increases the brain and muscles. The mind was concentrated. This yoga training program used to improve the performance of rifle shooting players. The research presented here information on yoga, rifle shooting, yoga training program, and impact of the activity on rifle shooting players of the yoga training program.

**Keywords:** Rifle shooting player, Shooting performance, Yoga training program.

## 1. INTRODUCTION

Yoga has been studied in India for thousands of years as an effective way of mental, emotional, and physical development. The yoga is derived from the Sanskrit language word "Yuse" means binding, harmonizing, and turning your attention to something. There are various meanings to this. It also means unity. Yoga helps rifle shooting players improve their performance. Fast movements are important in some sports. In some sports, stability is an important factor.

Rifle shooting began in the 16<sup>th</sup> century. At that time, the game was recognized as a game of dynasty. This game was useful for hunting and warfare. The rifle shooting association of India was established in 1951. Hence,

the shooting game has created a new identity in India. The game was promoted and developed. At the 2008, Olympic Games in Beijing, China, Abhinav Bindra won a gold medal in rifle shooting. Indian famous players of rifle shooting are Gagan Narang, Anjali Vedpathak, and Tejashwani Sawant. The yoga training program enhances the concentration, endurance, and breathing time of a rifle shooter. Does it benefit the player? This experiment has been performed to test this.

### 1.1. Functional Definitions of Defined Words

#### 1.1.1. Yoga training program

Yoga training programs are Surya Namaskar, Swastikasana, Bhujangasana, Padmasana, Parvatasana,

Anulom Vilom, Ujjayi, Bhastrika, Siddhasana, Kapalbhathi, Omkar, Dhyana, Shavasana.

### 1.1.2. Rifle shooting players

0.177 Peep sight air rifle shooting players who know rules of the rifle shooting and playing this game.

### 1.1.3. Shooting performance

The result of a rifle shooting test is the shooting performance.

## 1.2. Purpose of the Study

The purpose of this study was as follows:

- Creating a yoga training program for rifle shooting players
- To study the impact of the yoga training program on the shooting performance of the players.

## 1.3. Hypothesis

$H_1$  Yoga training program will have a meaningful impact on the shooting performance of rifle shooting players.

$H_0$  yoga training program will not have a meaningful impact on rifle shooting performance.

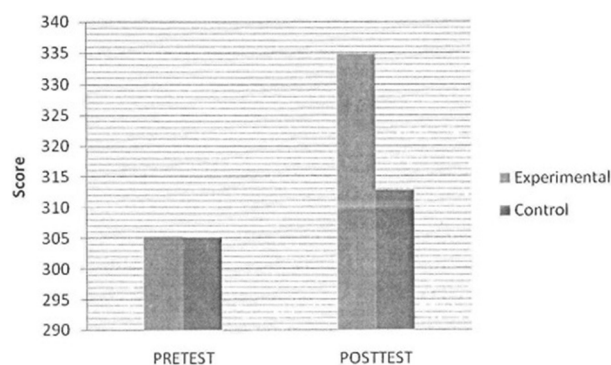
## 2. METHODOLOGY

The researcher used the experimental method here.

In this research, the researcher used the lottery system. The concept of pre-test, post-test, and equivalent group design. In this, two groups of rifle shooters selected by randomly in two groups A-B-B-A to select the experimental and controlled groups of randomly selected masses. Both groups were pre-tested (O1 and O2). The experimental group was given 3 months of the therapeutic yoga training program. The control group was completely isolated from the treatment. After the planned duration of the experiment, both groups were tested (O3 and O4) with the dependent variable. A comparison of the results of the pre- and post-test was made statistically *t*-test used here by comparing the results with regard to the efficacy of the treatment.

## 3. RESULTS

The result of pre- and post-test performance showed that the yoga training program is used to improve the performance of the player.



## 4. DISCUSSION

Different experiments have to be carried out to increase the performance of rifle shooting games but score not to the extent, they are required. The yoga training program by the researcher is useful for improving the performance of shooting players. It is mentioned here. Yoga training develops in terms of concentration, physical, and mental health, proper breathing capacity. The development of these items helps improve the performance of rifle shooting. This research will benefit the players of district, state, national, and international level players.

## 5. CONCLUSION

The test was performed by means, standard deviation, and *t*-test to analyze the rifle shooting test. From the statistical analysis, the researcher concluded that the yoga training program had a significant impact on the performance of rifle shooting players.

## REFERENCES

- Baechle, T.R. *Essential of Strength Training and Conditioning*. Champaign: Human Kinetics; 1996.
- Baeshle, P., and Taylor, J. *Advanced Studies in Physical Education and Sports*. United Kingdom: Thomas Nelson and Sons; 1996.
- Best, J.W. *Scientific Principles of Coaching*. London: Prentice Hall International; 1972.
- Clarke, D.H. *Exercise Physiology*. United States: Prentice Hall; 1995.
- Faith and Congregation. *Introduction to Yoga*. Nashik: Yoga Consciousness Publishing; 1999.
- Iyengar B.K. *Yoga for All*. Pune, Maharashtra: Pune Rohan Publishing; 2004.
- Kopardecker, S. *Yoga for All*. Pune: Indrayani Publishing; 2000.
- Goonday, D. *Yoga and Health*. Kolhapur: Yoga Academy; 1989.
- Ramdev, S. *The Secret of Yoga Practice and Yoga Therapy*. Ahmedabad, Gujarat: Divine Publication; 2003.

# Comparison of Depth Perception and Speed of Movement among Badminton, Table Tennis, and Tennis Players

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## ABSTRACT

The primary aim of the study was to determine the comparative study of depth perception and speed of movement among badminton, table tennis, and tennis players of Degree College of Physical Education, Amravati. For the study, 30 players each from badminton, table tennis, and tennis were randomly selected as a subject, and their age was ranging from 18 to 25 years. To measure depth perception and speed of movement, an electronic depth perception machine and 50 m dash were used, respectively, and the score was recorded according to the instruction of the test. To find out the significant difference among the above-mentioned three groups, one-way analysis of variance (ANOVA) was employed; the level of significance was set at 0.05 for testing the hypothesis. The findings of the statistical analysis revealed that significant difference was observed in both the variable of speed of movement and depth perception; hence, *post hoc* test was applied, it was observed that badminton players are significantly superior in speed of movement than table tennis and tennis players as the obtained mean difference value is quite larger than the critical value. From the findings of the *post hoc* test, it is observed that badminton players have better depth perception than table tennis, as well as tennis players and table tennis players are significantly better than the tennis players. As the nature of the badminton game is very fast and the area of the court is quite larger as compared to table tennis, and this may be the reason that badminton players have better depth perception and speed of movement.

**Keywords:** Badminton, Depth perception, Speed of movement, Table tennis, Tennis.

## 1. INTRODUCTION

Physical education is an integral part of the total education process which aims at the development of physically, mentally, emotionally, and socially fit. In the dynamic age of science and technology, the human element is threatened as even before driven to overexertion in response to the demand for maximum production of all-out effort. Racket games such as badminton, table tennis, and tennis become very famous in the 21<sup>st</sup> century and such game demands a high level of fitness, so the research scholar chose the above-mentioned problem.

### 1.1. Purpose of the Study

The purpose of the study is to find out the significance of the difference in depth perception and speed of movement among badminton, table tennis, and tennis players.

## 2. METHODOLOGY

### 2.1. Selection of Variables

The researcher selected the speed of movement and depth perception as variables.

### 2.2. Selection of Subjects

Thirty subjects, each from badminton, table tennis, and tennis, were selected as subjects.

### 2.3. Tools and Criterion Measures

#### 2.3.1. 50-yard dash

To test the speed of movement of the subjects, the 50-yard dash was used and the score was recorded in seconds.

### 2.3.2. Depth perception test

The electronic depth perception box was used to test the depth perception and the score was rounded off to the nearest millimeter as per the prescribed procedure in the test.

### 2.3.3. Collection of data

The demonstration of the above test was given to the subject and then administered on the subjects with the help of an assistant to collect the data.

## 3. RESULTS

The analysis of data collected on the speed of movement and depth perception test has been done by employing ANOVA test statistical techniques for each variable separately to find out the mean difference *post hoc* test that was applied. To test the hypothesis, the level of significance was set at 0.05.

An analysis of Table 1 reveals that there is a significant difference observed; hence, the data were subjected for *post hoc* test to determine the paired mean difference.

It is evident from the table that there is a significant difference in speed of movement between badminton and table tennis players (MD = 0.603) as the obtained mean difference between the two is quite higher than the critical value of 0.534 at 0.05 level. However, the insignificance difference observed between table tennis and lawn tennis players as the mean value is less than the critical value of 0.534 at 0.05 level.

An analysis of Table 3 reveals that there is a significant difference observed among the players of badminton, table tennis, and tennis players in-depth perception because the calculate F-value 5.436 is greater than the tabulated F-value of 3.354 at 0.05 level of freedom. Hence, the data were subjected to *post hoc* test to the determined paired mean difference among badminton, table tennis, and tennis players.

It is evident from the above finding that there is a significant difference in depth perception between badminton and table tennis as well as badminton and tennis players, but insignificance on depth perception between table tennis and tennis players was observed.

## 4. DISCUSSION ON FINDINGS

- Significance difference observed among the badminton, table tennis, and tennis players in the

**Table 1:** Description of one-way analysis of variance for the data on the speed of badminton, table tennis, and tennis players

Source of variance	Degree of freedom	Sum of squares	Mean sum of square	F-ratio
Between the group	K-1 3-1=2	1.940	0.970	3.805*
Within the group	N-K 30-3=27	6.885	0.255	

\*Significant at 0.05 level tabulated  $F_{0.05(2,27)}=3.354$

**Table 2:** Paired mean difference for the data on the speed of movement among badminton, table tennis, and tennis players

Mean			Mean difference	Critical difference
Badminton	Table tennis	Tennis		
7.374	7.977		0.603*	0.534
7.374		7.811	0.437	0.534
	7.977	7.811	0.166	0.534

\*Significant at 0.05 level

**Table 3:** Summary of one-way analysis of variance for the data on depth perception of badminton, table tennis, and tennis players

Variance	Degree of freedom	Sum of square	Mean Sum of square	F-ratio
Between the Group	K-1 3-1=2	1.455	0.728	5.436*
Within the group	N-K 30-3=27	3.614	0.134	

\*Significant at 0.05 level tabulated  $F_{0.05(2,27)}=3.354$

speed of movement, which shows that badminton game requires more speed of movement

- Significance difference among badminton, table tennis, and tennis was observed in-depth perception.

## 5. CONCLUSION

- Badminton players are much better than the table tennis and tennis players in the speed of movement. It may be due to the nature of the game as badminton game is much faster, need to cover more area in a minimum time
- Table tennis players show good performance in-depth perception than badminton and tennis players. It may be due to the reason that table tennis game is played in the small area, where the movements of the ball are very fast in nature that is why before the movement of the opponent they

need to perceived and accordingly take the position to play the ball. Hence, more depth perception is required for table tennis players.

## REFERENCES

- Llewellyn, J.H., and Blucker, J.A. *Psychology of Coaching Theory and Application*. New Delhi: Surjeet Publications; 1982, p. 44.
- Santhosh, K.K., and George, A. Comparison of motor fitness abilities of rural and urban school students. *Int J Multidiscip Res Dev*, 2015, 2(11), 445-447. Available from: <http://www.allsubjectjournal.com>.
- Koh, L.K., Sedrine, W.B., Torralba, T.P., Kung, A., Fujiwara, S., Chan. S.P., Huang, Q.R., and Prakash, N. Comparative study of speed and coordination of Kho-Kho and Kabbadi girls team of Tripura state. Unpublished Master Thesis. Amravati, Maharashtra: Amravati University; 1988.
- Whitlehead, N. *Conditioning for Sports*. West Yorkshire: EP Publishing Ltd.; 1975.



# A Comparative Study of Balance, Coordination, and Reaction Time of Football, Hockey, Handball, and Basketball Players

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## ABSTRACT

The key purpose of this study was to find out the significance of the difference in balance, coordination, and reaction time among football, hockey, handball, and basketball players. A total of 60 intercollegiate level male players were selected as the subjects for the study, in which 15 male players from each aforementioned game of Degree College of Physical Education, Amravati, were selected by adopting purposive sampling method and the age of the subjects was ranged from 18 to 25 years. The selected variables for the study are dynamic balance, eye-hand coordination, eye-foot coordination, hand reaction time, and foot reaction time. Data on selected variables were collected by administering a balance test, eye-hand coordination test, eye-foot coordination test, Nelson's hand reaction time test, and Nelson's foot reaction time test, respectively, on the aforementioned players of each game. To determine the significance of the difference in the components among the four groups, one-way analysis of variance test was employed. The level of significance was set at 0.05 for testing the hypothesis. The findings of the statistical analysis revealed that a significant difference was observed in the variables of eye-hand coordination and hand reaction time. It was also revealed that no significance of difference was observed in the variables of dynamic balance, eye-foot coordination, and foot reaction time among the four groups of players. It was further revealed that basketball players are superior in the variable of eye-hand coordination and hand reaction time than other selected players.

**Keywords:** Basketball, Dynamic balance, Eye-foot coordination, Eye-hand coordination, Foot reaction time, Football, Hand reaction time, Handball, Hockey.

## 1. INTRODUCTION

Performance of physical activity, skills, sports, and games needs to take into consideration of the development of various components of physical fitness, namely, strength, endurance, body composition, speed, agility, flexibility, coordination, power, balance, and reaction time. Balance is the ability to maintain the equilibrium of the body when stationary or dynamic. Coordination is the ability to integrate muscle movements into an efficient pattern of movement. Reaction time is the time taken to process information and to initiate a movement after receiving a stimulus. Good balance, coordination, and reaction time are vital for sports involving hitting objects, kicking, throwing, and many other activities.

Different games required a different body position of balance, finer coordination, and quicker reaction time to execute any skill successfully. The games of football,

hockey, handball, and basketball players are necessary for all the mentioned variables to have well control and to give a pass or shot at the target successfully.

### 1.1. Purpose of the Study

The purpose of this study was to find out the significance of the difference in balance, coordination, and reaction time among football, hockey, handball, and basketball players.

## 2. METHODOLOGY

Fifteen male players, from each game, namely, football, hockey, handball, and basketball, were selected randomly as the subjects for this study. The age of the subjects was ranging from 18 to 25 years. Their minimum status of participation was intercollegiate level.

Dynamic balance was measured using a modified bass test of dynamic balance and the score was recorded in number as a point. Coordination was measured using eye-hand and eye-foot coordination test and the score was recorded in second. Reaction time was measured using Nelson's hand reaction and foot reaction time test and the score was recorded in seconds.

### 3. RESULTS AND DISCUSSION

To determine the significance of difference in the selected fitness variables, namely, balance, coordination, and reaction time among the football, hockey, handball, and basketball players, one-way analysis of variance was employed independently for each component,

**Table 1:** Summary of one-way analysis of variance for the data on selected fitness variables of football, hockey, handball, and basketball players

Variable	Source of variance	Degree of freedom	Sum of square	Mean of square	F-ratio
Dynamic balance	Between the group	K-1 4-1=3	4013.334	1337.778	1.7391 <sup>@</sup>
	Within the group	N-K 60-4=56	43076.666	769.226	
Eye-hand coordination	Between the group	K-1 4-1=3	235.25	78.4167	11.75*
	Within the group	N-K 60-4=56	373.73	6.738	
Eye-foot coordination	Between the group	K-1 4-1=3	31.3827	10.460	2.432 <sup>@</sup>
	Within the group	N-K 60-4=56	240.800	4.3	
Hand reaction time	Between the group	K-1 4-1=3	0.022	0.0073	3.042*
	Within the group	N-K 60-4=56	0.135	0.0024	
Foot reaction time	Between the group	K-1 4-1=3	0.0155	5.1667	2.3277 <sup>@</sup>
	Within the group	N-K 60-4=56	0.1243	2.2196	

\*Significant at 0.05 level. Tabulated  $F_{0.05(3,56)} = 2.772$ . <sup>@</sup>Not Significant at 0.05 level

**Table 2:** Paired mean difference for the data on eye-hand coordination and hand reaction time

Variables	Mean of				Mean difference	Critical difference
	Football	Hockey	Handball	Basketball		
Eye-hand coordination	34.67	35.13			0.46	1.889
	34.67		36.07		1.40	1.889
	34.67			36.87	2.20*	1.889
		35.13	36.07		0.94	1.889
		35.13		36.87	1.74	1.889
			36.07	36.87	0.80	1.889
Hand reaction time	0.639	0.627			0.012	0.034
	0.639		0.592		0.047	0.034
	0.639			0.538	0.101*	0.034
		0.627	0.592		0.035*	0.034
		0.627		0.538	0.089*	0.034
			0.592	0.538	0.054*	0.034

while F-ratio was found to be significant, LSD *post hoc* test was applied to find out the paired mean difference. The findings pertaining to the statistical analysis have been shown in the following tables.

It is evident from the findings of the above table that a significant difference is found in the variables of eye-hand coordination ( $F = 11.75 > 2.772$ ) and hand reaction time ( $F = 3.042 > 2.772$ ). It is also observed that insignificant difference was observed in the variable of dynamic balance ( $F = 1.7391 < 2.772$ ), eye-foot coordination ( $F = 2.432 < 2.772$ ) and foot reaction time ( $F = 2.3277 < 2.772$ ) at 0.05 level. The paired mean difference of eye-hand coordination and hand reaction time is shown in Table 2.

It is observed from the findings that basketball players are significantly superior in eye-hand coordination compared to football players. It is also found that no significant difference is observed among the other three game players. In the variable of hand reaction time, superior performance is shown by basketball players, followed by handball and hockey players, where least

performance is shown by football players. As the finding had shown that basketball players are superior in eye-hand coordination as well as hand reaction time and it was followed by handball players, it may be attributed to the nature of both the games. Nowadays, basketball and handball are considered fastest game in the sports world and both the games are played with the hands; therefore, they need to develop optimum level of eye-hand coordination and hand reaction time, so as players can anticipate to block, to dribble, to pass, and to take the shot with fast movement. Hence, such results might have occurred in the study.

## REFERENCES

- Frost, R.B. *Psychological Concepts Applied to Physical Education and Coaching*. London: Addison Wesley Publishing Company; 1971.
- Felshin, J. *An Introduction to Physical Education*. Philadelphia, PA: Lea and Febiger; 1972.
- Johson, J., and Blair, N. The endover physical fitness testing programme. *Res Q*, 1944, 124, 399-403.
- Whitehed, N. *Track Athletics*. West Yorkshire: EP Publishing Ltd.; 1967.

# Study of General Mental Ability between International and National Level of Soccer Players

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## 1. INTRODUCTION

The idea of general mental ability (GMA), or intelligence, was first conceptualized by Spearman in 1904. He reflected on the popularly held notion that some people are more academically able than others, noting that people who tend to perform well in one intellectual domain (e.g., science) also tend to perform well in other domains (e.g., languages and mathematics). He concluded that an underlying factor, which he termed general intelligence or “g,” accounted for this tendency of people to perform well across a wide range of areas, while differences in a person’s specific abilities or aptitudes accounted for their tendency to perform marginally better in one area than in another (e.g., to be marginally better at French than they are at geography).

GMA is a term used to describe the level at which an individual learns, understands instructions, and solves problems. Tests of GMA include scales that measure specific constructs such as verbal, mechanical, numerical, social, and spatial ability. The overall score is considered the most important factor, explaining more variation in individual performance than specific abilities.

### 1.1. Purpose of the Study

The purpose of this study was as follows:

1. To find out the level of GMA between two different levels of soccer players
2. To determine the significant difference in GMA between two different levels of soccer players.

## 2. METHODOLOGY

The male soccer players, who represented at the international level and those represented at the national level, were the sources of data for the present study. In

the present study, a total of 56 soccer players of two different levels, age ranged from 18 years to 35 years, were selected out of the 28 who represented India and 28 who represented at the national level of competition.

For the present study, the researcher selected the subjects to determine the significant difference in the variables of GMA of two different levels of soccer players. The researcher adopted a purposive random sampling technique for this study.

To assess GMA, GTGMA questionnaire was used, and the scores were recorded according to the developed key of the concerned questionnaire.

### 2.1. Statistical Treatment

To find out the significant difference between the international and national level of soccer players comparative statistics, i.e., independent t-test was employed, and the level of significance was fixed at 0.05.

## 3. RESULTS AND DISCUSSION

The findings pertaining to the statistical analysis have been described in the following ahead mentioned in Table 1.

It is evident from the above findings that the calculated  $t = 4.18149$  is greater than the tabulated  $t = 2.0042$ , which indicates that the mean difference is statistically significant. From the mean value, it is quite comprehensive that the soccer players at the international level are significantly superior in GMA than the soccer players at the national level. It may attribute to the fact that the level of intensive training, modern facilities associated with training, tactical training, and quality of coaching for the international level of players increased all the prerequisite vice motor fitness and mental fitness to develop the desire traits among the players. Hence, such a result might have shown in the study.

**Table 1:** Description of mean, standard deviation, and t-ratio for the data on the general mental ability of two different levels of soccer players

Level of players	Mean	Standard deviation	Mean difference	Standard error of mean difference	t-ratio
International	82.2143	6.88184	7.35714	1.758	4.18149*
National	74.8571	6.01057			

\*Significant at 0.05 level, Tabulated t 0.05 (56)=2.0042

## REFERENCES

- Bryant, C.J. *Psychological in Contemporary Sport*. New Jersey: Prentice Hall Inc.; 1983.
- Robert, K., and Dennis, S. *Psychological Testing: Principles Applications and Issues*. Boston: Cengage Learning Publication; 2008.
- Pohjonen, T. Perceived teaching ability of educational care of teachers in relation to individual and teaching related factors in different age groups. *Occup Med*, 2001, 51, 209-217.



# Comparative Study of Strength and Speed Components among Basketball, Handball and Netball Players

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## ABSTRACT

Physical fitness is the ability to carry out daily tasks with vigor and alertness. The purpose of this investigation was to find a comparative study on selected strength and speed of variables between male basketball, handball, and netball players. A group of 36 male players represented Andhra Pradesh in Nationals selected randomly for this study. Basketball, handball, and netball male players were divided into three groups, i.e., basketball ( $n = 12$ ), handball ( $n = 12$ ), and netball ( $n = 12$  players. Participant's age ranges between 14 and 17 years. These studies included relevant information on strength and speed variables. The data collected for the selected physical fitness test and were statistically analyzed to find out the purpose of comparison whether there was any significant difference in the various selected components of physical fitness among the handball, basketball, and netball. The mean was calculated from the obtained data. By computing the F ratio, the difference in mean of the handball, basketball, and netball players were tested for statistical significance. The level of significance was set at 0.05 levels. Each dependent variable and the total scores were compared separately and each "F" value was calculated. There was no difference in strength among the handball, basketball, and netball players. In speed, the basketball players obtained the highest value when compared to handball and netball players.

## 1. INTRODUCTION

Sports play a major role in the lives of almost every individual player-coaches, officials, and even spectators, interest in sports is the result of several factors including more time for leisure due to fewer working hours per week and more vacation period. There is also increased emphasis on physical fitness awareness and health consciousness which demonstrated through greater participation in playing such as basketball, handball, skipping and aerobics, and going to gym as a lifetime sports. Through sport participation, children and adults, not only improve and maintain fitness but also develop the overall functional capacity of organs, skill groups, and personal satisfaction and enjoyment, everyone must have full opportunity in accordance with his national tradition of sports for practicing physical education and sports.

### 1.1. Statement of the Problem

A comparative study of strength and speed components among basketball, handball, and netball players.

### 1.2. Delimitation

This study is delimited to basketball, handball, and netball players of age of 14–16 years.

Daily activities and food habits of the subject were not taken into consideration.

The subjects who have participated in the national level were only taken consideration.

### 1.3. Limitation

The subject for this study was the students of basketball, handball, and netball players in Andhra Pradesh.

## 2. METHODOLOGY

This study has been designed to a comparative study on selected strength and speed of variables between male basketball, handball, and netball players. A group of 36 male players represented Andhra Pradesh in nationals selected randomly for this study. Basketball, handball, and netball male players were divided into three groups,

i.e., basketball ( $n = 12$ ), handball ( $n = 12$ ), and netball ( $n = 12$ ) players. Participant's age ranges between 14 and 17 years. These studies included relevant information on strength and endurance variables.

## 2.1. Selection of Variables

The study was taken to pinpoint physical fitness. Therefore, based on literary evidence and scholar's own understanding, the following variables were selected for the purpose of this study: Physical fitness variables were selected for this study: Speed and strength.

## 2.2. Research Design

Selection of variables and tests			
S. No.	Variables	Test	
1	Physical fitness	Speed	50 m
2	Physical fitness	Strength	Standing broad jump

## 2.3. Statistical Technique

Statistical analysis procedures were followed to compare the strength and speed of basketball, handball, and netball players. In each group consisting, 12 subject's calculations were done by raw score method. For this testing of basketball, handball, and netball players was compared. Through the table "F" ratio is calculated.

## 3. RESULTS AND DISCUSSION

Since the purpose of the study was to analyze the selected physical fitness variables of players of basketball, handball and netball were explained with the help of different tables.

Table 1 indicates that there were no significant differences in strength among basketball, handball, and netball players. The "F" value required to be significant at 0.05 level was 3.28. The calculated value 2.50 was less than the required value 3.28 to be significant at 0.05 level. Therefore, the null hypothesis was accepted.

Table 2 indicates that there were significant differences in speed among basketball, handball, and netball players. The "F" value required to be significant at 0.05 level was 3.28. The calculated value 6.55 was greater than the required value 3.28 to be significant at 0.05 level. Therefore, the null hypothesis was accepted.

**Table 1:** Statistical difference on strength between basketball, handball, and netball players

Source of variation	SS	df	MS	F	P	F crit
Between-groups	0.337	2	0.169	2.509	0.096	3.285
Within groups	2.221	33	0.067			
Total	2.559	35				

Not significant at 0.05 level of confidence table value (0.05)=3.28

**Table 2:** Statistical difference on speed between basketball, handball, and netball players

Source of variation	SS	df	MS	F	P	F crit
Between-groups	5.875	2	2.937	6.553	0.004	3.285
Within groups	14.799	33	0.448			
Total	20.667	35				

Significant at 0.05 level of confidence table value (0.05)=3.28

**Table 3:** Ordered adjusted mean for basketball, handball, and netball players for significance using

	Strength		Speed	
	Mean	Std.	Mean	Std.
Basketball	1.95	0.3	6.88	0.5
Handball	2.15	0.25	7.19	0.67
Netball	1.93	0.21	7.85	0.76
P value	0.096		0.004	

\*Significant at 0.05 level

Basketball players were better in speed than.

## 4. DISCUSSION ON FINDINGS

Game basketball needs strength and speed. Each skill required scientific exercise and training to achieve the above purpose. There were no significant differences in the selected physical fitness component strength, handball, basketball, and netball players at 0.05 level of significance. This shows that the physical fitness components of basketball, handball, and netball players were same. The data collected on speed among basketball, handball, and netball show that there was a significant difference among the basketball, handball, and netball players in the speed at 0.05 level of significance.

## 5. CONCLUSION

The following conclusions were drawn based on the limitations and delimitation of the study.

1. There was no difference in strength among the handball, basketball, and netball players
2. In speed, the basketball players obtained the highest value when compared to netball and handball players
3. The basketball players obtained a higher score in speed than the handball players and netball players.

## REFERENCES

- Brain Mackenzie. Seven step model to develop speed. *J Med Sci Sports*, 2003, 35, S369.
- Benetti, G., Schneider, P., and Meyer, F. Sports benefits and the importance of muscular strength trainability in prepubertal volleyball athletes. *Rev Bras Cineantropom Desempenho Hum*, 2005, 7, 87-93.
- Castagna, C., D'Ottavio, S., Vera, J.G., and Alvarez, J.C.B. Match demand of professional futsal: A case study. *J Sci Med Sport*, 2009, 12, 490-494.
- Gabbett, T.J., Sheppard, J.M., Pritchard-Peschek, K.R., Leveritt, M.D., and Aldred, M.J. Influence of closed skill and open skill warm-ups on the performance of speed, change of direction speed, vertical jump, and reactive agility in team sport athletes. *J Stranth Cond Res*, 2008, 22, 1413-1415.
- Gorostiaga, E.M., Granados, C., Ibanez, J., and Izquierdo, M. Differences in physical fitness and throwing velocity among elite and amateur male handball players. *Int J Sports Med*, 2005, 26, 225-232.

# Comparative Study of Selected Physiological Parameters among Ball Game Players

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## ABSTRACT

The main purpose of the study was to find out the significant difference in the selected physiological parameters among the selected ball games players, namely, football, basketball, and volleyball. Thirty male intercollegiate levels of football, basketball, and volleyball players, ten from each game selected randomly as the subjects from Degree College of Physical Education, Amravati, and the age of the subjects was 18–25 years. The data pertaining to the study were collected on the selected subjects, i.e., vital capacity in milliliters using a wet spirometer, heart rate in number putting index, and middle finger on the radial artery and respiratory rate in number counted of inhalation and exhalation in 1 min. To determine the significance of the difference in the components among the three groups, one-way analysis of variance (ANOVA) test was employed. The level of significance was set at 0.05 for testing the hypothesis. The findings of the statistical analysis revealed a significant difference in the parameters of heart rate and respiratory rate among football, basketball, and volleyball players. Heart rate and respiratory rate of football players showed more rhythmic and efficient compared to the basketball and volleyball players. Football players' respiratory rate is significantly less than the volleyball players at 0.05 level of significance. It is also found that no significance of the difference was observed in the vital capacity among the football, basketball, and volleyball players.

**Keywords:** Basketball, Football, Heart rate, Respiratory rate, Vital capacity, Volleyball, Wet spirometer.

## 1. INTRODUCTION

Football, basketball, and volleyball games are very much popular in many of the states of India. For playing better football, basketball, and volleyball games, optimum fitness is needed. These fitness and skills are directly and indirectly depend on varied factors out of them physiological parameters are one of them. Therefore, the research scholar was interested to undertake the study entitled “Comparative Study of Selected Physiological Parameters among Ball Games Players.”

### 1.1. Purpose of the Study

The main purpose of the study was to find out the significant difference in the selected physiological parameters among the selected ball games players, namely, football, basketball, and volleyball.

## 2. METHODOLOGY

Thirty male intercollegiate levels of football, basketball, and volleyball players, ten from each game selected

randomly as the subjects from Degree College of Physical Education, Amravati, and the age of the subjects was 18–25 years. The data pertaining to the study were collected on the selected subjects, i.e., vital capacity in milliliters using a wet spirometer, heart rate in number putting index, and middle finger on the radial artery and respiratory rate in number counted of inhalation and exhalation in 1 min.

## 3. RESULTS AND DISCUSSION

The collected data were arranged in the table systematically for further statistical treatment. To determine the significance of the difference in the selected physiological parameters among football, basketball, and volleyball players, one-way ANOVA statistical treatment was employed for each selected parameter independently, while F-ratio was found significant that least significant difference (LSD) *post hoc* test was applied to find out the paired mean difference. To test, the hypothesis level of significance was set at 0.05. The findings of the statistical analysis have been shown in the following tables.

**Table 1:** Summary of one-way analysis of variance for the data on selected physiological parameters of football, basketball, and volleyball players

Variables	Source of variance	Degree of freedom	Sum of square	Mean sum of square	F-ratio
Vital capacity	Between group	2	0.94	0.47	2.82
	Within group	27	4.52	0.17	
Heart rate	Between group	2	1101.27	550.63	22.10*
	Within group	27	672.60	24.91	
Respiratory rate	Between group	2	15.80	7.90	3.41*
	Within group	27	62.50	2.31	

**Table 2:** Paired mean difference on selected physiological parameters of football, basketball, and volleyball players

Variables	Means of			M.D	C.D
	Football	Basketball	Volleyball		
Heart rate	55.50	68.20		12.70*	4.58
	55.50		68.50	13.00*	4.58
		68.20	68.50	0.30	4.58
Respiratory rate	20.70	22.00		1.30	1.40
	20.70		22.40	1.70*	1.40
		22.00	22.40	0.40	1.40

An examination of Table 1 reveals that there is a significant difference in the parameters of heart rate and respiratory rate among football, basketball, and volleyball players as the obtained F-ratio 22.10 and 3.41, respectively, are higher than the tabulated  $F = 3.355$  needed to be significant at 0.05 level for the 2/27 degree of freedom. Since the F-ratio was found to be significant. Therefore, to determine the paired mean difference among the football, basketball, and volleyball players. LSD *post hoc* test was employed. It is also observed from the above findings that there is no significant difference in vital capacity among football, volleyball, and basketball players ( $F = 2.82 < 3.355$ ) at 0.05 level. The paired mean difference is shown in Table 2.

It is evident from the above findings that football players' heart rate is significantly lesser than the basketball players ( $MD = 12.70 > 4.58$ ) and volleyball players ( $MD = 13.00 > 4.58$ ). It is also evident from the table that there is no significant mean difference in-between basketball and volleyball players ( $MD = 0.30$ ) at 0.05 level. Football players' respiratory rate is significantly less than the volleyball players ( $MD = 1.70 > 1.40$ ) at 0.05 level. It is also evident from the table that there is no significant difference between football and basketball players ( $MD = 1.30 < 1.40$ ) and basketball and volleyball players ( $MD = 0.40 < 1.40$ ) at 0.05 level.

Heart rate and respiratory rate of football players showed more rhythmic and efficient compared to the basketball and volleyball players. It may be attributed to the nature

of the game of football which demands such efficient cardiopulmonary functions to supply sufficient amount of oxygenated blood to the desirable places of the body throughout the playing performance during 90 min; therefore, football players undergo a systematic and strenuous training to improve all those physiological parameters to attain optimum level of performance; hence, such result might have occurred in this study.

#### 4. CONCLUSION

Recognizing the limitations of this study and on the basis of statistical findings, the following conclusion may be drawn:

1. Significant difference is observed in heart rate and respiratory rate among football, basketball, and volleyball players
2. Significantly strong heart rate and respiratory rate of football players are found compared to basketball and volleyball players.

#### REFERENCES

- Amber, V.I.C. *Basketball Ball, for Coach and Player*. London: Lea & Febiger; 1979, p. 71.
- Richard, L.N. *Soccer for Men*. Iowa; WMC Brown Company; 1976, p. 1.
- Sprynarovas, S., and Parikova, J. Comparison of the functional, circulatory and respiratory capacity in girl gymnasts and swimmers. *Sports Med Phys Fitness*, 1969, 3(2), 165.



# Impact of Resistance Training on Selected Physical Fitness Variables among South Zone Inter-University Kabaddi Players

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## ABSTRACT

The purpose of the present study was to find out the effect of resistance training on selected physical fitness variables among south zone inter-university kabaddi players. To achieve this purpose, 30 kabaddi players, studying in various classes and departments of Annamalai University, Annamalai Nagar, Chidambaram, Tamil Nadu, in the age group of 18–25 years, were selected as subjects. The selected 30 subjects were divided into two equal groups, in which Group I ( $n = 15$ ) underwent resistance training and Group II ( $n = 15$ ) acted as control which did not participate in any special training. The training program was carried 3 days/week for 12 weeks (alternative days). Before and after the training period, the subjects were tested for speed and agility. Speed was measured by 50 m dash and agility measured by shuttle run. The statistical tool was used for the present study which is “ $t$ ” ratio. The result of the study was a significant improvement on speed and agility after 12 weeks of resistance training. However, the improvement was favored of the experimental group. There was a significant difference was occurred between the resistance training group and control group after 12 weeks of resistance training.

## 1. INTRODUCTION

The definition of resistance in this form of training is simple as well. Resistance is any force that makes the movement harder to perform. Resistance can be provided simply by moving your body against gravity or by adding weighted dumbbells. You can also add resistance using machines at the gym or using equipment such as weighted bars, bands, or kettlebells. This form of training can also be called weight lifting or weight training. The benefits of resistance training are significant. If you start a weight training program, you can expect your body to get stronger, tighter, and leaner.

Kabaddi is a contact team sport, played between two teams of seven players each. The objective of the game is for a single player on offense, referred to as a “raider,” to run into the opposing team’s half of a court, tag out as many of their defenders as possible, and return to their own half of the court, all without being tackled by the defenders, and in a single breath.

### 1.1. Statement of the Problem

The purpose of the present study was to find out the impact of resistance training on selected physical fitness

variables among south zone inter-university kabaddi players.

## 2. METHODOLOGY

To achieve this purpose, 30 kabaddi players, studying in various classes and departments of Annamalai University, Annamalai Nagar, Chidambaram, Tamil Nadu, in the age group of 18–25 years, were selected as subjects. The selected 30 subjects were divided into two equal groups, in which Group I ( $n = 15$ ) underwent resistance training and Group II ( $n = 15$ ) acted as control which did not participate in any special training. The training program was carried 3 days/week for 12 weeks (alternative days). Before and after the training period, the subjects were tested for speed and agility. Speed was measured by 50 m dash and agility measured by shuttle run. The statistical tool was used for the present study which is “ $t$ ” ratio.

### 2.1. Analysis of Data

The data collected before and after the experimental periods on speed and agility on the resistance training and control groups were analyzed and presented in Tables 2 and 3.

**Table 1: Selection of tests**

S. No.	Variables	Test items	Unit of measurement
1.	Speed	50 m dash	Seconds
2.	Agility	Shuttle run	Seconds

**Table 2: Analysis of “t” test on speed of the resistance training and control groups**

Group	Test	n	Mean	SD	DM	“t” – ratio
Resistance training	Pre-test	15	7.58	0.72	0.42	9.74*
	Post-test	15	7.16	1.03		
Control	Pre-test	15	7.59	0.63	0.02	0.89
	Post-test	15	7.57	0.81		

\*Significant at 0.05 level of confidence, \*required table value for significance at 0.05 level of confidence for df of 14 is 2.15

**Table 3: Analysis of “t” test on agility of the resistance training and control groups**

Group	Test	n	Mean	SD	DM	“t”-ratio
Resistance training	Pre-test	15	10.183	0.72	0.243	12.51*
	Post-test	15	9.940	1.03		
Control	Pre-test	15	10.187	0.63	0.03	0.74
	Post-test	15	10.157	0.81		

\*Significant at 0.05 level of confidence, \*required table value for significance at 0.05 level of confidence for df of 14 is 2.15

Table 2 presents the pre- and post-test mean and standard deviation values on speed for the resistance training and control groups, respectively. Since the obtained “t” = 9.74 on speed was higher than the required table value of 2.15 for significant level 0.05 with 14 degrees of freedom. Hence, significant level of difference on speed between pre- and post-test mean value of resistance training and control groups. Hence, it was concluded that due to the effect of 12 weeks of resistance training, the speed of the subjects was significantly improved.

Table 3 presents the pre- and post-test mean and standard deviation values on agility for the resistance training and control groups, respectively. Since the obtained “t” = 12.51 on agility was higher than the required table value of 2.15 for significant level 0.05 with 14 degrees of freedom. Hence, significant level of difference on speed between pre and post-test mean value of resistance training and control groups. Hence, it was concluded that due to the effect of 12 weeks of resistance training, the agility of the subjects was significantly improved.

### 3. CONCLUSION

Based on the results of this study, the following conclusions were drawn by the investigator.

It was concluded that the selected criterion variables such as speed and agility were significant difference between the resistance training group and control group of south zone inter-university kabaddi players.

### REFERENCES

- Behringer, M., Vom Heede, A., Yue, Z., and Mester, J. Effects of resistance training in children and adolescents: A meta-analysis. *Pediatrics*, 2010, 126(5), e1199-e1210.
- Behm, D.G., and Sale, D.G. Velocity specificity of resistance training. *Sports Med*, 1993, 15(6), 374-388.
- Christou, M., Smilios, I., Sotiropoulos, K., Volaklis, K., Pilianidis, T., and Tokmakidis, S.P. Effects of resistance training on the physical capacities of adolescent soccer players. *J Strength Cond Res*, 2006, 20(4), 783-791.
- Munn, J., Herbert, R.D., Hancock, M.J., and Gandevia, S.C. Resistance training for strength: Effect of number of sets and contraction speed. *Med Sci Sports Exerc*, 2005, 37(9), 1622-1626.
- Amirtharaj, M.V., and Kumar, P.K.S. Effect of low and high intensity resistance training on selected physical fitness variables among college level men kabaddi players. *Phys Educ*, 2015, 5, 36108.

# Exercise: The Alternative to Antidepressants Treatment

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## ABSTRACT

Low level of physical activity is one of the modifiable risk factors for the onset of depression. Exercise reduces depression in populations with clinical and non-clinical symptoms. Particularly, it appears to affect, such as antidepressants and neurotransmitter systems in the brain. It increases neurotrophin levels by reducing cortisol release by an inhibitory effect on the hypothalamic–pituitary–adrenal axis, leading to a decrease in the psychological stress response. The beneficial effects of exercise and physical activity are comparable to the effects of antidepressants in depressed individuals. Against the above backdrop, attempts were made in this paper to analyze the concept of exercise as the alternative to antidepressants treatment. To do this, the concept of depression was reviewed alongside its causes, signs, and symptoms. Then, the mechanism and effects of depression changes with exercise were also examined. Several studies demonstrated that exercise is beneficial to depressed patients and that its effects could be considered as the alternative to antidepressants in some circumstances.

**Keywords:** Antidepressant, Depression, Exercise.

## 1. INTRODUCTION

Depression is a chronic devastating mental condition that affects the mood which leads to severe functional impairment in human everyday life (Rizvi and Khan, 2019). It is a common health condition that affects about 350 million people globally (Kołomanska *et al.*, 2019). One person in every five people during their lifetime is likely to be affected by depression (Hidalgo and Dep-exercise Group, 2019). Major depressive disorder (MDD) is the leading cause of disability globally with a lifetime prevalence of about 17% (Haller *et al.*, 2018). Depressive disorders are the second leading cause of global burden on illness (Schuch *et al.*, 2018). It is a condition that can affect people differently and cause a wide variety of distressing symptoms. It can lead to relationship and family breakdown, increase the likelihood of drug or alcohol addiction, reduce the ability to overcome serious illness, and increase mortality rates, not just from the risk of suicide (Royal College of Psychiatrists, 2019).

It is one of the leading causes of disability and a huge amount of money has been spent to treat this disorder (Rizvi and Khan, 2019). It is recognized as a potential risk factor for the onset of other diseases. Recently, past studies have shown that depression increases the

mortality and morbidity of diabetes (Rizvi and Khan, 2019). For example, in pregnant women, it is a threat not only to the mother's health but also to the health of the child. It may also affect the course of labor as well as the mother-child relationship in subsequent years (Kołomanska *et al.*, 2019).

Depression is commonly treated with either antidepressive medication (antidepressants) or psychotherapy (Brupbacher *et al.*, 2019; Royal College of Psychiatrists, 2019; Hidalgo and Dep-Exercise Group, 2019; Haller *et al.*, 2018). However, for individuals with mild to moderate or severe depression, medication can be expensive; psychotherapy can be inaccessible along with limited efficacy (Brupbacher *et al.*, 2019; Brett *et al.*, 2018). Antidepressants can cause considerable adverse effects (Brupbacher *et al.*, 2019) because many patients did not respond to antidepressants. They also experienced side effects, instead. Evidence has shown that these drugs do have undesirable effects such as insomnia, sexual dysfunction, and dissatisfaction, among others. Due to their side effects, clinicians seek non-pharmacologic alternatives such as exercise which has recently been given an increasing attention (Hidalgo and Dep-Exercise Group, 2019). In the recent past, Morres *et al.* (2018) documented that physical exercise is widely recommended in depression treatment. Recently,

the American Psychological Association (2019) suggests exercise monotherapy as complementary and alternative treatments for adults with depression for whom psychotherapy or pharmacotherapy is either ineffective or unacceptable. Numerous other recent studies revealed the efficacy of physical exercise in the treatment or management of depressive disorders (Brupbacher *et al.*, 2019; Kołomanska *et al.*, 2019; Rizvi and Khan, 2019; Brett *et al.*, 2018; Schuch *et al.*, 2018). The protective effects of physical exercise can be noted among varied individuals regardless of age and sex (Schuch *et al.*, 2018).

## 2. SIGNS AND SYMPTOMS OF DEPRESSION

There are several signs and symptoms for the diagnosis of depression revealed by different experts. For example, Kołomanska *et al.* (2019) outlined the main symptoms of depression as sadness, loss of interest, feelings of tiredness, and a loss of energy that last for a minimum of 2 weeks. In addition, it is accompanied by anxiety, sleep problems, changes in appetite, concentration disorders, and feelings of guilt, low self-esteem, or suicidal thoughts, loss of pleasure or interest (Brupbacher *et al.*, 2019), fatigue feelings of worthlessness, diminished ability to think appropriately, suicidal plan, or attempt (American Psychological Association, 2019).

## 3. EFFECTS OF EXERCISE ON DEPRESSION

Regular physical activity or exercise provides a range of mental health benefits such as reducing the risk of depression, anxiety, managing existing conditions, and developing and maintaining mental functions (United Kingdom Government Department of Health of Social Care, 2019). The beneficial effects of exercise and physical activity are comparable to the effects of anxiolytics and antidepressants in healthy and depressed individuals (Rizvi and Khan, 2019). Brupbacher *et al.* (2019) found no significant differences between exercise interventions and antidepressant medication. Exercise may benefit depressed patients and its effect can be comparable to antidepressant treatment (Hidalgo and Dep-Exercise Group, 2019). Haller *et al.* (2018) demonstrated that exercise may lead to a marked reduction in depressive symptoms comparable with pharmacotherapy. Many recently past meta-analyses supported the antidepressive effects of exercise on depressive symptoms (Haller *et al.*, 2018). Kołomanska *et al.* (2019) reported that

both physical activity and psychotherapy in pregnancy effectively reduce the risk of depression in the perinatal period. Further, they stated that during pregnancy, the ways of treating depression are limited and the use of antidepressants is not recommended. It seems important to note that even regular walks (low-intensity exercises) carried out during pregnancy can significantly reduce the symptoms of depression in pregnant women (Kołomanska *et al.*, 2019).

Several studies have shown that physical exercise is associated with lower depressive disorders and can be used as an alternative in the treatment of depression. For instance, Brupbacher *et al.* (2019) revealed the effects of exercise on depressive symptoms that have been summarized in multiple meta-analyses. Furthermore, systematic reviews found moderate-to-large effect sizes for aerobic, resistance, as well as yoga exercises on depression. Moreover, no significant differences between these interventions and antidepressant medication were found. Aerobic exercise interventions in depressive patients have also been found to improve cardiorespiratory fitness. This is relevant because depression is known to increase the risk of cardiovascular mortality and morbidity (Brupbacher *et al.*, 2019). Morres *et al.* (2018) revealed that aerobic exercise demonstrated a significant large and overall antidepressant effects on adult patients recruited through mental health services with a referral or a clinical diagnosis of major depression.

Antidepressant effect of aerobic exercise has been demonstrated in numerous studies in MDD patients (Heinzel *et al.*, 2018). Brett *et al.* (2018) reported that both aerobic and resistance exercises have positive benefits in decreasing depression. Exercise interventions are promising treatments for depressive symptoms and are free from the adverse effects and high costs associated with antidepressant medications and psychotherapy. The available empirical evidence supports resistance exercise training as an alternative or adjuvant therapy for depressive symptoms (Brett *et al.*, 2018).

Higher levels of physical activity are consistently associated with lower odds of developing future depression. People with MDD are known to have 50% odds of not meeting the recommended physical activity levels (e.g., performing 150 min of moderate-intensity physical activity each week) compared with people without major depression (Schuch *et al.*, 2018). The protective effects of physical activity were observed regardless of age and sex and are significant across all



geographical regions (Schuch *et al.*, 2018). Exercise would be considered as an effective non-pharmacologic treatment with fewer side effects in reducing depression (Khoshnab and Nikseresht, 2017). Prior studies also revealed that exercise can be as effective as pharmacotherapy in the treatment of depression (Helgadottir, 2016; Stanton and Reaburn, 2014).

#### 4. MECHANISM OF DEPRESSION CHANGES WITH EXERCISE

Recent studies suggest that exercise stimulates the growth of new nerve cells and releases proteins, for example, brain-derived neurotrophic factor, to improve the survival of nerve cells. This results in a decrease in the psychological stress response (Hidalgo and Dep-Exercise Group, 2019). Moreover, Heinzl *et al.* (2018) revealed that mediating physiological and, specifically, neurobiological mechanisms of this effect are not well understood. Recently, past hypotheses based on findings mainly in healthy subjects that exercise leads to an increase in cardiorespiratory fitness (e.g., maximum oxygen uptake) that, in turn, influences neurotrophins (specifically, the brain-derived neurotrophic factor), stress-associated hormone cortisol, and the oxygen and energy supply of the brain. Increases in neurotrophin levels were found to reduce the cortisol release by an inhibitory effect on the hypothalamic–pituitary–adrenal axis, leading to a decrease in the psychological stress response and positive affect (Heinzl *et al.*, 2018).

#### 5. CONCLUSION

Exercise has a significant antidepressant effect in people with depression. Studies have shown that exercise is effective in the reduction of depression and may be considered the alternative to antidepressants in some circumstances. There is a need to further emphasize the importance of policies targeting increased physical activity levels among people to enjoy the benefits associated with exercise.

#### REFERENCES

- Alexandrino-Silva, C., Ribeiz, S., Frigerio, M., Bassoli, L., Alves, T., Busatto, G., and Bottino, C. Prevention of depression and anxiety in community-dwelling older adults: The role of physical activity. *Arch Clin Psychiatry*, 2019, 46(1), 14-20.
- American Psychological Association. *Clinical Practice Guideline for the Treatment of Depression across three Age Cohorts: American Psychological Association Guideline Development Panel for the Treatment of Depressive Disorders APA Policy*. Washington, DC: American Psychological Association. Available from: <https://www.apa.org/depression-guideline/guideline.pdf>. [Last accessed on 2019 Feb 16].
- Brett, R.G., Cillian, P.M., Mats, H., Jacob, D.M., Mark, L., and Matthew, P.H. Association of efficacy of resistance exercise training with depressive symptoms meta-analysis and meta-regression analysis of randomized clinical trials. *J Am Med Assoc Psychiatry*, 2018, 75(6), 566-576. Available from: <https://www.gwern.net/docs/psychology/2018-gordon.pdf>.
- Brupbacher, G., Gerger, H., Wechsler, M., Zander-Schellenberg, T., Straus, D., Porschke, H., Gerber, M., von Känel, R., and Schmidt-Trucksäss, A. The effects of aerobic, resistance, and meditative movement exercise on sleep in individuals with depression: Protocol for a systematic review and network meta-analysis. *Syst Rev*, 2019, 8(105), 1-10. Available from: <https://www.systematicreviewsjournal.biomedcentral.com/track/pdf/10.1186/s13643-019-1018-4>.
- Heinzl, S., Rapp, M.A., Fydrich, T., Ströhle, A., Terán, C., Kallies, G., Schwefel, M., and Heissel, A. Neurobiological mechanisms of exercise and psychotherapy in depression: The SPeED study rationale, design, and methodological issues. *Clin Trials*, 2018, 15(1), 53-64.
- Khoshnab, L.P., and Nikseresht, A. Comparison of the effect of aerobic exercise and antidepressant medications on depression and sexual desire of depressed middle-aged women. *Int J Women's Health Reprod Sci*, 2017, 5(2), 119-122.
- Kołomanska, D., Zarawski, M., and Mazur-Bialy, A. Physical activity and depressive disorders in pregnant women: a systematic review. *Medicina*, 2019, 55(212), 1-16. Available from: <http://www.mdpi.com/journal/medicina>.
- Gartlehner, G., Gaynes, B.N., Amick, H.R., Asher, G.N., Morgan, L.C., Coker-Schwimmer, E., Forneris, C., Boland, E., Lux, L.J., Gaylord, S., Bann, C., Pierl, C.B., and Lohr, K.N. Comparative benefits harms of antidepressant, psychological, complementary, and exercise treatments for major depression: An evidence report for a clinical practice guideline from the American college of physicians. *Ann Int Med*, 2016, 164(5), 331-341.
- Rizvi, S., and Khan, A.M. Physical activity and its association with depression in the diabetic hispanic population. *Cureus*, 2019, 11(6), e4981.
- Royal College of Psychiatry. *Position Statement on Antidepressants and Depression*. London, United Kingdom: Royal College of Psychiatry; 2019. [https://www.rcpsych.ac.uk/docs/default-source/improving-care/better-mh-policy/position-statements/ps04\\_19---antidepressants-and-depression.pdf?sfvrsn=ddea9473\\_5](https://www.rcpsych.ac.uk/docs/default-source/improving-care/better-mh-policy/position-statements/ps04_19---antidepressants-and-depression.pdf?sfvrsn=ddea9473_5).



# A Comparative Study on Sports Motivation among Telangana State Sports School Male and Female Athletes

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## ABSTRACT

The purpose of this study was to investigate the sports motivation among male and female athletes of Telangana state sports school players. A total of 40 athletes ( $n = 40$ ), male ( $n_1 = 20$ ) and female ( $n_2 = 20$ ), were randomly selected as subject for this study from Telangana state sports school, Thumukunta, Hyderabad. The age group of the subject is ranged from 12 to 15 years. To measure, sports motivation with the help of sport motivation scale 2 tool is developed by Pelletier, Michelle Fortier was applied for this study used to assess the level of sports motivation among Telangana state sports school male and female athletes. The collected data from the subject were statistically analyzed using independent “ $t$ ”-test and the level of the significance was tested at 0.05. The results of the study showed that there is a significant difference among Telangana state sports school male and female athletes.

**Keywords:** Athletes, Motivation, Sports, Telangana.

## 1. INTRODUCTION

*Confusion of goals and perfection of means seem, in my opinion, to characterize our age.*

-Albert Einstein

In sport and physical activity, we can manage our own motivation or motivation can be managed by others – parents, teachers, coaches, and peers. One of the most powerful strategies for managing motivation and performance is the use of goal setting. To understand sports motivation and be able to enhance it in the context of sport, we must make an attempt to understand the process of motivation and the constructs that drive the process, and how goal setting becomes an integral part of the process. Sports motivational processes can be defined by the psychological constructs that energize, direct, and regulate achievement behavior (cf., Roberts, 2001). Motivation is at the heart of many of sport’s most interesting problems, both as a developmental outcome of social environments such as competition and coaches’ behaviors and as a developmental influence on behavioral variables such as persistence, learning, and performance. In light of the importance of these consequences for athletes, one can easily understand researchers’ interest in motivation as it pertains to sport settings. Several conceptual perspectives

have been proposed to better understand athletes’ motivation. One perspective that has been found to be useful in this area posits that behavior can be intrinsically motivated, extrinsically motivated, or amotivated, identified, introjected, and integrated. This theoretical approach has generated a considerable amount of research and appears pertinent to the field of sports (Duda, 1989).

### 1.1. Significance of the Study

Although many investigations have been carried out in the field of sports psychology, there has been a little done on the field of athletics. Athletics is a somatic-oriented game and an individual sport. That presence stated, the researcher attempted to study that there is a need to study the sports motivation of male and female athletes.

### 1.2. Hypothesis

- It was hypothesized that there is no significant difference between male and female athletes of Telangana state sports school players on their sports motivation.

### 1.3. Reviews on Related Literature

Kumar *et al.*, 2017, the purpose of the study was “Comparison of sports motivation among contact and

non-contact sportspersons.” The subjects for this study were district, state, national, and international level sportspersons who are 250 from contact and 250 from non-contact sportspersons between 18 and 40 years of age who were selected. The selected variables of sports motivation were intrinsic motivation, extrinsic motivation, and amotivation. The obtained data were analyzed by applying independent “*t*”-test to compare the sports motivation (intrinsic motivation, extrinsic motivation, and amotivation) among contact and non-contact sportspersons. Further, the level of significance was set at 0.05 level of confidence.

Janitha and Esan, 2017, the intention of this study was to compare sports motivation between high school boys and girls players of Coimbatore district. Fifteen boys and 15 girl’s players, total of 30 boys and girls subjects were randomly selected for the study. Their age ranged from 13 to 15 years. The objective of the study was to identify the sports motivation tests which were administered. The results showed that there is a significant difference between boys and girls players. Boy’s players have more sports motivation.

## 2. METHODOLOGY

The determination of the study was to compare the sports motivation between male and female athlete players. To achieve the purpose of the study, 20 male athlete players and 20 female athlete players randomly selected from Telangana state sports school at Thumukunta, Hyderabad. The age group of the subject is ranged from 12 to 15 years. Sports motivation scale-2 (SMS-2), questionnaires contain 18 questions that are divided into 6 major subcomponents are intrinsic, integrated, identified, introjected, external, and amotivated and each component is having three items. The players were willing to take part in the study and they were administered by SMS-2 questionnaire that is developed by Pelletier *et al.* (1995). Athletes of participants are asked to indicate for each item on a 7-point scale which is correspondent best to them to put circle. The statistical technique independent *t*-test was used to check the significance at 0.5 level of confidence.

### 2.1. Objective of the Study

The purpose of the study was to analyze the comparative study of sports motivation between male and female athletes on SMS-2.

### 2.2. Selection of Variable

The following variables were selected for the comparative study of male and female athletes on sports motivation:

- Intrinsic
- Integrated
- Identified
- Introjected
- External
- Amotivated.

### 2.3. Analysis of Data

The data collected from the athletics players on selected criteria variable were statistically examined on independent “*t*”-test samples using the SPSS 26.0 to determine male and female athletes of Telangana state sports school players on sports motivation. The level of significance was tested at 0.05 levels.

## 3. RESULTS AND DISCUSSION

The statistical analysis of data has been presented in this study. The sports motivation data were collected on total of 40 athlete players, 20 males and 20 females were selected from Telangana state sports school at Thumukunta, Hyderabad. To characterize and compare the sports motivation test of male and female Athletes players. It was found “*t*” value (0.253) from Table 1 that there is no significant difference between male and female athlete players of Telangana state sports school athletes at Thumukunta, Hyderabad.

## 4. DISCUSSION ON FINDINGS

Based on the results, we can state the following:

From the data, it infers that the mean of the male and female athlete players on sports motivation was found

**Table 1:** The descriptive statistics between male and female of Telangana state sports school athletes on sports motivation

Groups	<i>n</i>	Mean	Std. deviation	Std. error mean	F	Sig.	“ <i>t</i> ”	Sig. (two tailed)	Level of significance
Female	20	35.50	32.186	7.197	0.763	0.388	0.253	0.802	<0.05
Male	20	33.25	23.25	5.225					

\*\*Correlation is significant at the 0.01 level (one tailed). \*Correlation is significant at the 0.05 level (two tailed)

to be 35.50 and 33.25, respectively, female athletes are high level of motivation on sports when we compared with male athletes. The standard deviation was found to be 32.186 and 23.25, respectively. The standard error mean was found to be 7.197 and 5.225, respectively. The *t*-score was found to be 0.253 which was significant at 0.05 level. Thus, the hypothesis which stated that “that there’s no significant difference between male and female athlete players on sports motivation” was rejected and accepted the alternative hypothesis.

## 5. CONCLUSION

Within the limitation of the present study, there is a significant difference among Telangana state sports

school athletes of male and female players on sports motivation.

## REFERENCES

- Deci, E., and Ryan, R. *Intrinsic Motivation and Self-determination in Human Behavior*. New York: Plenum; 1985.
- Janitha, S., and Kumaresan, G. Comparative study of sports motivation between boys and girls of Coimbatore district. *Int J Physiol Nutr Phys Educ*, 2017, 2(2), 1079-1081.
- Kumar, V., Singh, A., Sandhu, J.S., Gupta, N., Pandey, R.M. Comparative study of sports motivation among contact and non-contact sports persons. *Int J Phys Educ Sports Health*, 2017, 4(4), 128-131.

# The Effect of Athletic Identity on Social Behavior and Aggression in School Basketball Games

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## ABSTRACT

The present study examined the effect of athletic identity on social behavior and aggression during school basketball games as well as whether it could be considered as a prediction indicator for such behaviors. A total of 156 students (86 boys and 70 girls) participated at the study during a school basketball tournament at the premises of Anatolia College. A questionnaire was used to measure athletic identity, pro-social and antisocial behavior and aggressiveness, and anger. Statistical analysis was done with SPSS 17. The following statistical analyses were used for results: Student's *t*-test for differences among sexes, mediation analysis for examining the effect of identity on social behavior and aggression, and correlation analysis for the effect of identity on antisocial behavior. For the rest of the criteria, multiple regression analysis was used. Findings showed that the identity affects antisocial and aggressive behaviors and that it can be considered as a predictive indicator of such behaviors. The study showed significant differences among the two sexes regarding identity, antisocial behavior, and aggression with boys showing higher scores.

## 1. INTRODUCTION

During the past years, sports have become a vast area for research and studies on various social, antisocial, and aggressive behaviors. According to Ewing (1997) and Seefeldt (1987), sports offer great educating opportunities and social develops youth. Metzl (2002) claims that sports are highly valued by society so that many parents push their kids toward organized sports from a very young age. Participation in sports develops and promotes social behavior and athletic spirit. Bredemeier *et al.* (1986) and Romance *et al.* (1986) supported that sports teach morality and develop virtues such as honesty, courage, self-control, respect, and justice. Nowadays, though, according to Hopkins and Lantz (1999), sports show common anti-athletic behaviors on all levels of competitive sports. Bredemeier and Shields (2006) claimed that sports enhance moral development but often are fed by a series of observed immoral behaviors related to sports such as aggression, deception, and irreverence. Watching sports event or news is enough for someone to realize that moral behavior in sports is not always obvious. For the reasons, we mentioned above relationship between sports and morality is often a discussion topic for contemporary society. It was already mentioned

that sports enhance moral development. It is often observed that sports are related to aggression or deception (i.e., breaking of rules) for athletes to acquire an unfair advantage, Lee *et al.* (2007). According to them, deception includes breaking of sports rules and effort to avoid detection. The relationship between sports and aggression has been studied for decades, but researchers continue not to have a complete picture of this relation although many studies have proved its existence. Researchers in various scientific areas have been trying to improve and understand this relation through studies and methods within sports and society. In the first half of the 20<sup>th</sup> century, many psychologists assumed that participation in sports may avert people from aggressive behaviors. Recent studies though show the exact opposite, i.e., that participation in sport activities is possible to increase aggression. According to Aicinen (2007), aggression is an internal unit based on disappointment and/or instinct and athletes may use aggression to show their absolute commitment to sports or to just win the opponent. Sport psychologists differentiate hostile from organic aggression. The primary aim of hostile attack is to evoke physical or psychological damage to someone to achieve a specific goal, winning a game. These two forms of aggression are distinct in sports and especially in contact team or

individual sports. The appearance of arrogant behavior such as “playing with pain or intentionally injuring the opponent,” according to Aicinema (2007), may be “based on the uncritical acceptance of athletes and their commitment to win no matter what,” especially in competitive sports. Many studies such as those of Bredemeier and Shields (1986), Kavussanu and Roberts (2001), and Miller *et al.* (2005) have found that in sports moral maturity is significantly different in boys and girls with girl athletes to show higher moral reasoning and higher scores than boys. Usually, these differences on athletic behavior are attributed to the current perception that boys and girls are affected by various social expectations. According to Greendorfer (1993), sports are a traditionally manly area and are based on the stereotypical expectations for masculinity that is believed to affect men athletes.

## 1.2. Purpose

The aim of the present study was to examine the mediation of athletic identity on the effect of aggression on pro-social and antisocial behavior as well as to examine the correlation of anger and aggressiveness in students during school games. The study also examined whether the athletic identity is an indicator for the prediction of such behaviors.

## 2. METHODOLOGY – PROCEDURE

The study took place during a school tournament at the premises of Anatolia College from November 28, 2012, to December 2, 2012. A total of 156 students participated 86 of which were boys and 70 were girls.

### 2.1. Measurement

For the measurement of athletic identity, the questionnaire of Brewer *et al.* (1993) athletic identity

measurement scale was used. The questionnaire was used successfully for the evaluation of athletic identity of Greek athletes by Proios (2012). For measuring of pro-social and antisocial behavior, the questionnaire of M. Kavussanu (pro-social and antisocial behavior, 2006) was used for the measurement of anger and aggressiveness; the questionnaire of Maxwell and Moores (2005) competitive aggressiveness and anger scale was used.

### 2.2. Procedure

Instructions were given to students and then they received the relevant questionnaires for completion. Following the completion of the questionnaires by the participants, the questionnaires were gathered to analyze the results.

## 3. RESULTS

Statistical analysis was done with the use of SPSS 17. Student's *t*-test was used for the differences among sexes. To examine the effect of the identity on pro-social behavior and aggressiveness, mediation analysis suggested by Baron and Kenny (1986) which was implied. Correlation analysis was used for the effect of identity on antisocial behavior. The results of preliminary analysis showed the following: The means, standard deviations, internal consistency indicators, and regular distribution variable indicators are shown in Table 1. The correlation analysis results showed that the identity had low and positive relation to antisocial behavior and a medium positive correlation to aggressiveness.

### 3.1. Differences among Sexes

Student's *t*-test analysis for independent samples showed the existence of statistically significant differences among the two sexes regarding identity,  $t = 7.16$ ,

**Table 1:** Means, std. deviation, int. consistency, and reg. distr. variables indicators

	N statistic	Minimum statistic	Maximum statistic	Mean statistic	Std. deviation statistic	Skewness statistic	Kurtosis statistic	Std. error
Identity	150	2.40	6.60	4.2419	0.97964	0.199	-0.235	0.394
Pro-social	150	1.00	5.00	3.7389	0.94052	-0.767	0.089	0.394
Antisocial	150	1.00	3.70	2.0038	0.55496	0.616	0.728	0.394
Anger	150	1.33	4.00	2.4329	0.80859	0.530	-0.816	0.394
Aggressiveness	150	1.000	3.17	1.6418	0.63850	1.177	0.172	0.394
Age (in years)	150	14	18	15.85	0.992	0.592	-0.808	0.394
Athletic experience	150	2	12	6.66	2.819	-0.148	-1.136	0.394



$P < 0.001$ , antisocial behavior,  $t = 3.86$ ,  $P < 0.001$ , and anger,  $t = 5.06$ ,  $P < 0.001$ . In all three variables, boys presented higher scores ( $M = 4.76$  for identity,  $M = 2.18$  for antisocial behavior, and  $M = 2.75$  for anger) in relation to girls ( $M = 3.77$  for identity,  $M = 1.84$  for antisocial behavior, and  $M = 2.13$  for anger). No statistically significant differences were found in pro-social behavior,  $t = 0.85$ ,  $P > 0.05$ , and aggressiveness,  $t = 0.52$ ,  $P > 0.05$ .

### 3.2. Effect of Identity on Behavior

To examine the effect of identity on pro-social and antisocial behavior as well as the mediating role of anger and aggressiveness, the intermediation analysis suggested by Baron and Kenny (1986) which was used. According to this analysis for intermediation to exist, a. Identity should show a significantly important relation to pro-social and antisocial behavior, b. anger and aggressiveness should show effect on pro-social and antisocial behavior when included parallel to identity, and c. the effect of identity on pro-social and antisocial behavior should show a statistically significant decrease when intermediates are included as independent prediction variables of the dependent variable. Results of correlation analysis showed that identity is significantly related to antisocial behavior but not with social behavior. The first criterion, therefore, for intermediates is not met regarding pro-social behavior, and for this reason, no further analysis was done. To examine the rest of the criteria, multiple regression analysis was used. At the first stage, identity was included and at the second stage, anger and aggressiveness were included in the analysis. Results showed that identity at the first stage was a significant indicator for antisocial behavior,  $R^2 = 0.02$ ,  $F(1, 149) = 5.38$ ,  $P < 0.05$ ,  $b = 0.18$ ,  $t = 2.32$ ,  $P < 0.05$  [Table 2]. The addition of anger and aggressiveness improved the ability of the model to predict antisocial behavior,  $R^2 = 0.20$ ,  $R^2$  change = 0.19,  $F(3, 149) = 14.13$ ,  $P < 0.001$ . From the two variables added, only aggressiveness showed a statistically significant contribution to the prediction of antisocial behavior,  $b = 0.42$ ,  $t = 5.73$ ,  $P < 0.001$  ( $b = 0.13$ ,  $t = 1.82$ ,  $P = 0.070$  for anger). The

addition of these variables though did not reduce but increased the predicting ability of the identity ( $b = 0.22$ ,  $t = 3.08$ ,  $P < 0.001$ ).

## 4. DISCUSSION

It is widely acknowledged that sports are highly valued within society. Participation in sports usually favors the development of pro-social behavior and athletic spirit. Many supporters such as Bredemeier *et al.* (1986) and Romance *et al.* (1986) stated that sports are a mean for moral development and education and reveal many virtues such as honesty, courage, self-control, respect, and justice. All mentioned above make parents to direct their kids toward organized sports from a very early age (Metzl, 2002). This is the reason why the relation between sports and aggressiveness is rather important for those who wish to use sports as a mean for expansion and moral development. The results of the present study showed that identity affects antisocial and aggressive behaviors as well as that it can be a prediction indicator for such behaviors. The study certified statistically significant differences among the two sexes in identity, antisocial behaviors, and anger with boys showing higher scores than girls. The present study also showcases a question: Why is it that although athletic identity affects the behavior of athletes is more related to antisocial and aggressive behaviors instead of pro-social ones? This question could consist of a subject for investigation for future studies.

## REFERENCES

1. Aicinena, S. Moral imperatives and modern sport. *J Educ Hum Dev*, 2007, 1, 99-114.
2. Bredemeier, B.J.L., and Shields, D.L. Divergence in moral reasoning about sport and everyday life. *Hum Kinet J*, 1984, 1(4), 348-357.
3. Baron, R.M., and David, A.K. Moderator-mediator variables distinction in social psychological research. *Soc Sport J*, 1986, 1, 348-357.
4. Bredemeier, B., Weiss, J., and Shields, M. Sports and character development. *Res Dig Pres Counc Phys Fit Sports*, 2006, 7, 1-8.

# The Role of Laws in Sports in India

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## ABSTRACT

Sports law is a vital part to sports. There needs to be a strong presence of good governance and someone to uphold the rules of the game when they come into disrepute. The popularity of sports and the large amount at stake (last season's Champions League winner's Bayern Munich won €10,500,000 – enough to go a long way even in today's football setting) mean that a breach of rules can have devastating effects. Governing bodies are also keen to ensure and maintain the integrity of their sport. In recent years, cycling's reputation has been severely damaged by not merely allegations of doping but widespread use of performance-enhancing drugs. While Lance Armstrong's use of banned substances is certainly the most well-known, his use is certainly the tip of the iceberg when it comes to doping in cycling. If the cycling governing body (the UCI) want to stand any chance in improving the reputation of their sport, a legal presence is absolutely vital in aiding them in refining rules and procedure to alleviate doping in the sport. Aside from the regulatory aspects, a lot of work sports lawyers do involve disputes over contracts and, predominantly in the case of football and rugby, employment issues. Michael Laudrup, for example, has sought professional legal advice over his dismissal from Swansea City. Ultimately, sports like football still require a need for "traditional" legal advice, though advice with a certain expertise. One particularly famous case from employment law is *Walker v Crystal Palace F.C.* which emphasizes how much of a role sport plays in our legal system. We tend to forget that athletes, managers, and backroom staff are still subject to the same rules and laws as everyone else.

## 1. INTRODUCTION

India is a place that is known for umpteen games. While sports like cricket have been pursued like a religion, the present occasions have achieved a dynamic change and numerous different games are being pursued currently more than ever. As the type of amusement has developed significantly and India has turned into an overflowing scene for holding numerous national and international sporting events amid its time that rules and regulations are additionally set up. The UN has officially acknowledged sport as a method for advancing health, education, and development. Therefore, there is a need to streamline the field of sports with reasonable law framework. However, India has been seeing litigations on issues of broadcasting rights and arbitrary actions of sports authorities. However, the Indian judiciary's contribution toward developing sports jurisprudence has been very negligible. Adjudication in the field of sports generally involves the application of several laws. It has been seen that courts have refrained themselves from adjudicating on issues involving sports. This situation can be ascribed to the incompetence of the Indian courts as sports issues include matters which require technical expertise in the field of games and the judicial officers in India or in some other countries are not technically equipped for the same.

Nevertheless, in the past decade, dispute resolution in matters relating to sports has certainly seen imperative advancements across the globe. The international sports bodies are commonly independent bodies, having their very own adjudicatory organs for settling sports-related debate and always express their hesitance to submit to any jurisdiction. For example, when sued in the American Courts for banning Butch Reynolds from international athletics, the governing body of the sport replied, "Courts create a lot of problems for our anti-doping work, but we say we don't care in the least what they say. We have our rules, and they are supreme." Indian legislator too has not shown much interest in contributing to sports jurisprudence. Sports law in India, in contrast to the USA, France, China, or Canada, is still underdeveloped despite the presence of numerous sports authorities.

## 2. APPROACH OF THE INDIAN JUDICIARY

This judgment of the Hon'ble Supreme Court in *Zee Telefilms* (aforementioned) is referred as Magna Carta of Indian Sports Law. The issue in question in this case was BCCI's arbitrary termination of broadcasting rights

agreement. Zee Telefilms, being the aggrieved party, filed a writ petition in the Supreme Court under Article 32 of the Constitution. However, a writ under Article 32 can only be filled against authorities that come within the meaning of “State” under Article 12 of the Constitution. The court in its majority judgment ruled that BCCI did not constitute state within the meaning of Article 12 of the Constitution. Although, in his minority opinion, Justice Sinha opined that BCCI is state. Over the span of his judgment, he featured the significance of sports in India with explicit reference to cricket. His minority opinion discussed that importance of the role played by the sports authorities in various jurisdictions, for example, the United States of America, Australia, the United Kingdom, Scotland, and New Zealand. This is presumably the only ruling in India which has talked about the significance of games in such expound detail.

Aside from Zee Telefilms case, there are different decisions as well which have contributed to the jurisprudence of Sports Law in India. In 1991, the Supreme Court in the case of K. Murugan v. Fencing Association of India, Jabalpur, discussed the importance of sports in India. The issue under consideration was regarding election of members to the executive council of the Indian Olympic Association (I.O.A). The Supreme Court while expressing its hesitance to adjudicate upon the issue commented “This does not appear to us to be a matter where individual rights in terms of the rules and regulations of the society should engage our attention. Sports in modern times have been considered to be a matter of great importance to the community. International sports have assumed greater importance and have been in the focus for over a few decades. In some of the recent Olympic games, the performance of small states has indeed been excellent and laudable while the performance of a great country like India with world’s second highest population has been miserable.”

### **3. UNGOVERNED AUTHORITIES**

Subsequent to the absence of enthusiasm of the state in sports, the sports experts in India remain generally ungoverned. There are different sports bodies, for example, the Board of Cricket Control India for Cricket, the Indian Hockey Federation for Hockey, the All India Football Federation for Football, the Indian Basketball Association for Basketball, the All India Tennis Federation for the Tennis, and the I.O.A and the Sports Authority of India at the Zenith. There is no focal sports authority other than the Ministry of Sports Affairs which externally administers these games bodies. Truth

be told, there are instances where the financially sound sports authorities like BCCI have denied any intention to join the Ministry of Sports Affair. This shows that the sports authorities integrate themselves with the ministry for monetary advantages alone. In *Zee Telefilms v Union of India*, the Supreme Court touched upon this issue. It said that “the Sports bodies largely remain unaccountable to the state or any other central body inside the territory of India, which, however, should not be the case considering the importance of sports in the modern arena.”

### **4. ENACTMENTS TO GOVERN SPORTS**

In the absence of a specific enactment for the entire country, the National Sports Development Code, 2011 governs the conduct of the National Sports Federations in India. Even though sports form a part of Entry 33 of the State List, Seventh Schedule of the Constitution of India, the validity of the above-mentioned code has been upheld by the Delhi High Court in *I.O.A v. Union of India*. There are two other draft central bills, i.e., the National Sports Development Bill, 2013, and the Prevention of Sporting Fraud Bill, 2013, which if promulgated would give further credence to the existence of sports law in India.

### **5. CORRUPTION – BETTING AND MATCH-FIXING**

The sports law majorly revolves around the corruption that takes place in an event of sports. Betting, gambling, and match-fixing are among the other integral factors contributing particularly to this corruption. Every event of sports, big or small, has been and is continued to be subject to betting and match-fixing. To this topic, betting is acceptable to some extent; however, when such betting leads to match-fixing is when it becomes problematic. This has led to the development of profit-making industry that indirectly is regulating sports while defeating the main essence of having a sport.

### **6. REMEDIES TO SPORTSMEN**

In this part, we will examine the remedies available to sportsmen if he finds himself in dispute with the sports authority. Every sports authority has its own dispute resolution mechanism to deal with disputes. When a dispute arises between the sports authority and the sportsmen, the sports authority would of course be a party to the dispute as well as the adjudicator.

## 6.1. Issues

The international body to which they owe their allegiance also has a great role to play in the outcome. Hence, it is never an ideal process of adjudication when the disputes are handled by the sports authority. An athlete lives in a world where one misplaced word or action often threatens the immediate end of his athletic career. An athlete is always placed in a vulnerable situation in relation to sports authorities. The second option left for an aggrieved sportsman is to approach the judiciary, which in all probability will add to the agony of the sportsmen rather than providing any relief. There are various infirmities associated with the Indian judiciary. The delay in disposing cases. Given that the opportunities for sportsmen in their career are scarce and short-lived, it is wiser for him to restrain himself from approaching the judiciary. The judges are not well equipped with intricate aspects relating to the particular sports. There are very few advocates with dedicated practice in sports law, Khurana and Khurana being one of exceptional few. It is also to be noted that sports disputes tend to rest on complex issues of law.

Further, it is also to be noted that all the sports authorities in India which are affiliated with the I.O.A have a much complex and unreasonable mode of dispute resolution. It is to be noted that a precondition to affiliation with the I.O.A is that the respective National Sports Federation/ Association/State Olympic associations would have to surrender right of seeking redress in any court of law. All the disputes involving these sports authorities would be submitted to the I.O.A which would suggest a panel of arbitrators from the I.O.A who would resolve the disputes. This practice goes against the fundamental principles of Natural Justice *Nemo Judex in Causa Sua*, as it fails to provide an independent adjudicatory mechanism. In case a sportsman finds himself in dispute with the I.O.A or any sports federation affiliated with the I.O.A, the adjudicators of the dispute would be his adversaries.

## 7. THE RIGHT TO HAVE RESORT TO CIVIL COURT IS FORFEITED

Such is the agony of Sportsmen who a member of I.O.A or of a Sports federation which is affiliated to I.O.A in India. The third option for the sportsmen is to have resort to private arbitration or submit the dispute to dispute resolution bodies such as International Chamber of Commerce (ICC) and Federation of Indian Chamber of Commerce & Industry (FICCI). These institutions have

a panel of arbitrators from among whom the arbitrator or mediator is appointed. Although it provides reasonable degree of flexibility regarding the choice of arbitrators, it is a rare possibility to choose an arbitrator reasonably well versed in the sporting arena. A formal sports dispute resolution body has its own advantage over any other form of alternative dispute resolution body such as ICC or FICCI. This demonstrates the urgent need for establishing a standardized sports dispute resolution body.

Is alternative dispute mechanism an ideal method of resolution of sports disputes. The success of Court of Arbitration Sports or other central dispute resolution mechanisms in Canada, Australia, or Ireland stands testimony to the success of alternative dispute mechanism in resolution of sports disputes. However, it is important at this juncture to identify the reasons why there is a sudden influx toward these bodies. The prime advantage is that these dispute resolution bodies are specialized and standardized sports dispute resolution bodies. Due to the dearth of sports-related litigation in Indian courts, we take clue from the cases in other jurisdictions. There are numerous deficiencies in litigation and has not been a satisfactory mode or resolution of disputes whenever litigation has occurred. The general reluctance of sports authorities to submit to the jurisdiction of national courts has been the major drawback. For example, in the case of the track star, Butch Reynolds famously brought legal action that went on for 4 years and some 15 stages of litigation and arbitration. At one point, after the International Amateur Athletic Federation had refused to appear in the proceedings, Reynolds won a \$27 million default judgment. This on the contrary would not be the case if the dispute was referred to specialized sports dispute resolution bodies, to which the sports authorities have reverently submitted themselves.

The resolution of dispute through litigation gets unnecessarily protracted and complicated. The popular Lindland's case featured two competitors for a single weight class position on the United States wrestling team for the 2000 Olympics in Sydney. The loser of the match, Matt Lindland, complained that the winner, Keith Seracki, had used illegal holds. The dispute went through thirteen stages of arbitration and litigation in the federal courts, including unsuccessful appeals to the United States Supreme Court as well as the CAS. In the end, the plaintiff won both his case and the silver medal in the Olympics. A simple one- or two-step arbitration process would have been preferable. Moreover,



alternative dispute resolution (ADR) process allows the parties to obtain timely hearing, low overall costs, confidentiality, flexibility, and a decision made by an expert familiar with sports. Confidentiality is one of the major highlights of ADR process in sports. We live in a world where sportsmen are regarded morally very high in the society. Media glare could do irreparable damage to this facet of sports. Apart from the success rate of the sports dispute resolution, bodies specialized in ADR mechanism like CAS, these are few of the advantages of having resort to ADR. In the light of the arguments advanced above, we suggest that ADR on a comparative scale is an ideal mode of dispute resolution for sports disputes.

A legal action brought at the 11<sup>th</sup> h of a sports competition can disrupt the competition. It raises very important questions of respecting judiciary and continuing with the competition as well as connected questions about the eligibility of the player. In 1994 winter games, world-class skater Tony Harding was accused of physical assault on her United States competitor. The consequences of this timely litigation resulted in severe hardships to the United States Olympic Committee. Pursuant to this, the United States Congress amended Amateur Sports Act in 1998. According to the amendments, a court may not generally impose any injunction against the United States Olympic Committee within 21 days of the beginning of a major sports competition. In contrast, none of the Indian legislations or judicial pronouncements have imposed

any such embargo limiting such timely litigations. ADR process allows the parties to obtain timely hearing, low overall costs, confidentiality, and flexibility. Further, arbitrators have expertise in the field. Apart from the success rate of the sports dispute resolution, bodies specialized in ADR mechanism like court of arbitration of sports, these are few of the advantages of having resort to alternative dispute resolution.

## 8. CONCLUSION

For sports and sportsmen to flourish, sport law needs to flourish in India; the intervention of the legislature is must. India needs to understand that sports are no more an insignificant array of sportsmen battling for top position, but it also involves intricate legal issue and the entire career of the sportsmen is at stake. There is a distinct legal system emanating from this field and should be given adequate attention. Sports law should form part of the course curriculum for law students. Sports law is definitely a rewarding profession. Attempt should be made to ameliorate the sporting environment with the aid of law. Sport is not limited to recreation alone but is a matter of National pride. The emergence of Indian Premiere League and Indian Cricket League has started to raise very important issues regarding competition law in recent times. This adequately demonstrates the need to improve sports law in India. Khurana and Khurana is actively involved in sports litigation as well as sports law arbitration.



# Effect of Yogic Exercises on Performance of Volleyball Players

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## 1. INTRODUCTION

Volleyball is a game played all over the world. It is one of the more popular games. Since it is a well-known game, it demands one to be physically and mentally fit to perform well in the game. A lot of varied skills are involved in the game of volleyball, such as the serve, passing, and blocking. Yoga is a very beneficial in the flexibility and concentration of players, and therefore, it can be a boost in enhancing every individual's game. It has focused on both mental and physical fitness. In a highly tense situation, it is difficult for the mind to focus, and in such a case, proper breathing that helps the player to stay focused is essential.

Volleyball requires proper coordination of the upper body and the lower body, and this can be acquired only when the player has a good core. Yogic practices help maintain the proper shape and tone of the core muscles. Very often, volleyball players suffer from back injuries as they have weak core muscles. Regular yogic exercises are also useful in getting proper sleep. This helps the player get proper rest which is essential to revitalize to play again. Yoga also activates the parasympathetic nervous system, thereby promoting coordination. During the game, yoga helps control the stress and anxiety level of players.

## 2. WHAT ARE THE BENEFITS OF YOGA

- Increase the total body flexibility
- Improve the body strength and stamina
- Build the muscle strength
- Maintains the nervous system
- Balance mind and body
- Improve general, mental, physical, and spiritual health.

## 3. BENEFITS OF YOGIC EXERCISES ON VOLLEYBALL PLAYERS

- Yoga has a positive impact on volleyball player's concentration. Clearly, the sport of volleyball

requires a lot of concentration. A volleyball player should watch the ball as well as opposing teams players during the game

- Yoga is a great way to warm-up before volleyball match and practice. Proper warm is a key to preventing the most common volleyball injuries. Yoga offers a lot of great stretches that can be done by volleyball athletes to arm up and reduce the risk of injuries
- Yoga strengthens muscles and prevents injuries. Doing yoga exercises are something that has a huge positive impact on the muscles of the back, calves, hands, shoulder, hamstring, ankles, and feet. Obviously, yoga makes it possible for volleyball players to improve his/her performance on the court. And of course, doing yoga helps volleyball players minimize the risk of injuries dramatically
- Yoga lowers the stress and anxiety. There has been a lot of talk about the importance of pre-match mental preparation in volleyball. It is important to note that volleyball athletes must be prepared for games both physically and mentally.

## 4. SOME OF THE BEST YOGA POSES FOR VOLLEYBALL PLAYERS

The yogic exercises to keep the volleyball player's body healthy and reduce the risk of injuries. Yoga is a way of understanding restriction, alleviating restriction, and working to maintain a healthy injury-free body.

A lot of movements as volleyball players come from our hips/core/lower back. Ability to lunge, jump, squat, and pivot is driven from muscles surrounding volleyball players' hips, core, and lower back. Hence, there are some yogic exercises for hips or lower back/legs and feet. These are (1) Pigeon pose (Eka Pada Rajakapotasana), (2) Eagle pose (Garudasana), (3) Warrior yoga pose (Virabhadrasana types), (4) Low Lunge pose (Virabhadrasana), and (5) Lying-down body twist or dances pose (Natarajasana).

## 5. CONCLUSION

Yogic exercises a lot of great benefits to volleyball players of all skill levels. It is important to know that yoga provides volleyball players with a number of importance advantages. Yogic exercises improve the body flexibility and strengthen the muscles. Volleyball athletes can benefit from doing yoga because it enhances our ability to perform during a game. Coaches are

finding that their athletes overall mental, physical, and even inspiration well-being as a result of incorporating yoga and mindfulness into practice time.

## REFERENCES

- Available from: <http://www.pakmen.com>.
- Available from: <http://www.yogajournal.com>.
- Available from: <http://www.jvavolleyball.org>.

# Yoga for Well-being of Adolescent Girls

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## ABSTRACT

Yoga has proved to the world that it is essential to any human being from birth till his last breath. Yoga has taken birth in India and today it is one of the leading healthy trends in the world being practiced by many experts across the globe. Adolescence is one stage of a human being's life where a child transforms into an adult, i.e., between the ages of 13 years and 19 years. This paper was designed to study the impact of regular yoga practice on various aspects of well-being of adolescent girls pursuing graduation. A sample of 60 girl students pursuing graduation at Sarojini Naidu Vanita Mahavidyalaya, Hyderabad, was taken and these girls were those who were practicing yoga regularly for at least a minimum of 1 year before this research. The tool used for the evaluation of these students' experience with respect to various aspects of their well-being was a questionnaire to assess the impact of yoga on relaxation, behavior, responsibility, concentration, sleep, fatigue, eating awareness, knowledge in nutrition, posture, confidence, etc. The subjects expressed their responses in the form of points from 1 (strongly disagree) to 5 (strongly agree) based on which the data were analyzed. The results obtained reflected various benefits gained by these teenage girls by practicing yoga regularly. The results and outcomes of this study will be of great help to enlighten the benefits of yoga to teenage girls so that it makes an impact on their daily living and well-being.

**Keywords:** Concentration, Enthusiasm, Relaxation.

## 1. INTRODUCTION

### 1.1 Benefits of Yoga Practices for Teens

#### 1.1.1. Stress management

Several studies have proven that teenagers who practice yoga are less stressed and perform better than their counterparts in academics. Working with mindfulness tools and breathing practices to reduce anxiety comes in handy in the pressure-filled life of a high school teen. Find the details of one of these studies here.

#### 1.1.2. Build strength

In adolescence, bodies are changing. Yoga builds physical strength from the core out. As if that is not enough, the auxiliary benefit is that feeling strong in the body will translate to strength and confidence in the mind.

#### 1.1.3. Expand attention span

Mind-body practices teach focus and concentration and remind us to bring the focus back over and over.

Learning skills like these can translate into increased concentration in all areas of life.

#### 1.1.4. Emotional resiliency

Mindfulness helps with critical thinking and executive function. There are no better skills for your teen to learn than how to make good decisions and think for themselves. Those are skills that can be applied to all of life.

#### 1.1.5. Community

Let's not forget that yoga classes create the opportunity to meet like-minded friends. One of the tenets of Buddhism is the right friends. Finding people who support you and want to see you succeed goes a long way in building confidence.

## 1.2. Purpose of the Study

The study was designed to evaluate the benefits experienced by teenage girls pursuing graduation by

performing yoga regularly in their daily life. The study was designed with respect to 18 various components of well-being of human being and the same were analyzed individually.

## 2. MATERIALS AND METHODS

This research was mainly designed to evaluate the benefits experienced by teenage girls with respect to various components of their well-being by practicing yoga regularly in their daily life. To serve the purpose of this study, we have identified 60 girl students pursuing graduation in S. N. Vanita Mahavidyalaya, Hyderabad. These subjects were regular practitioners of yoga for a minimum of 12 months.

The subjects have given their willingness to participate in the survey. The tool used to evaluate the benefits experienced with respect to subjects' well-being was a standard customized questionnaire with 18 statements. Each statement could be given a rating of 1–5 (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree) based on their experience of performing yoga regularly.

### 2.1. 18 Components of Well-being

The 18 components of human well-being which were evaluated through the questionnaire were (1) relaxation, (2) behavior, (3) responsibility, (4) concentration, (5) sleep, (6) fatigue, (7) eating awareness, (8) nutrition knowledge, (9) better appetite, (10) relationships, (11) listening, (12) calmness, (13) knowledge of own body, (14) posture, (15) confidence, (16) joy, (17) Enthusiasm, and (18) self-esteem.

### 2.2. Analysis and Results

All the 60 subjects were educated about the purpose of the research and about the process of evaluation through questionnaire. They agreed to participate in the survey and to give their responses in the questionnaire provided. After collecting the data from all the 60 subjects, it was

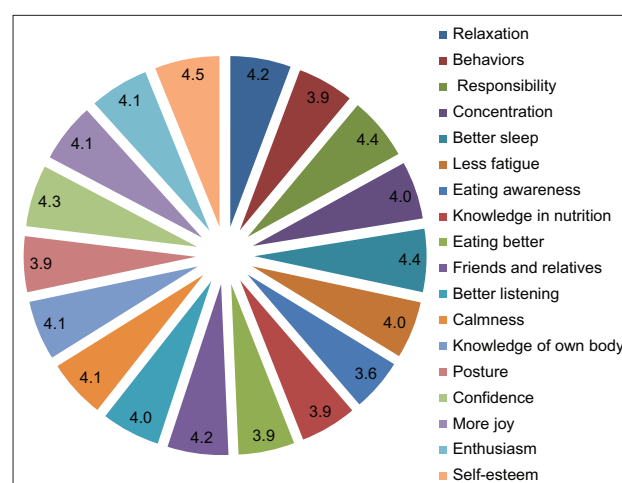
tabulated and analyzed with basic statistical process to calculate the average scores toward every component of well-being.

Table 1 shows the average score obtained out of 5 maximum points toward benefits experienced by girls with respect to various aspects of their daily living and well-being.

## 3. DISCUSSION

From the data obtained and from the graphical representation and values obtained, we have divided the range of response scores (3.9–4.5) into three parts to discuss, i.e., (1) 3.5–4.0, (2) 4.0–4.5, and (3) 4.5 and above.

- I. From the pie diagram produced above, it is seen that there are five components of the study which scored scores between 3.5 and 4.0 out of 5 points. They are (1) behavior (3.9/5), (2) eating awareness (3.6/5), (3) knowledge in nutrition (3.9/5), (4) eating better (3.9/5), and (5) posture (3.9/5)
- II. There are 12 components of the study which scored scores between 4.0 and 4.5 out of 5 points. They are relaxation (4.2/5), responsibility (4.4/5), concentration (4.0/5), better sleep (4.4/5), less fatigue (4.0/5), friends and relatives (4.2/5), better listening (4.0/5), calmness (4.1/5), knowledge of own body (4.1/5), confidence (4.0/5), more joy (4.2/5), and enthusiasm (4.3/5).



**Graph 1:** Graphical representation of responses obtained through questionnaire

**Table 1:** The average scores obtained toward well-being components (max-5)

Relaxation	Behaviors	Responsibility	Concentration	Better sleep	Less fatigue	Eating awareness	Knowledge in nutrition	Eating better
4.2	3.9	4.4	4.0	4.4	4.0	3.6	3.9	3.9
Friends and relatives	Better listening	Calmness	Knowledge of own body	Posture	Confidence	More joy	Enthusiasm	Self-esteem
4.2	4.0	4.1	4.1	3.9	4.3	4.1	4.1	4.5

listening (4.0/5), calmness (4.1/5), knowledge of own body (4.1/5), confidence (4.3/5), more joy (4.1/5), and enthusiasm (4.1/5) and

- III. There is one component of the study which scored 4.5 out of 5 points which was found to be the highest. It was the self-esteem (4.5/5).

#### 4. CONCLUSIONS

- I. It is concluded from this study that the teenage girls who regularly practice yoga experience benefit in almost all the aspects of well-being with varying range of benefits. The highest benefit experienced by girls was with respect to self-esteem which is very essential
- II. In the second level are social and psychological benefits such as relaxation, responsibility, concentration, better sleep, less fatigue, friends and relatives, better listening, calmness, knowledge of own body, confidence, more joy, and enthusiasm and
- III. Minor benefits experienced were with respect to behavior, eating awareness, knowledge in nutrition, eating better, and posture.

#### 5. RECOMMENDATIONS

It is recommended that yoga has a very useful impact over teenagers with respect to physical, psychological,

social, and educational aspects. Hence, if it is made mandatory in every educational institution to implement yoga in curriculum, especially for girls, it will make a huge impact on their daily living and literacy.

#### REFERENCES

- Creswell, J. *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. Thousand Oaks, CA: Sage; 2007.
- Cryne, B. *The Benefits of Yoga for Teenage Girls*. Alaska Highway News; 2010, p. A6.
- *Hollinger Canadian Newspaper Partnership*; 1999.is
- Danko, S., Meneely, J., and Portillo, M. Humanizing design through narrative inquiry. *J Inter Des*, 2006, 31(2), 10-28.
- Dante, A. *The Divine Comedy Pt. 1 Inferno Canto*; 2014, pp. 1-3.
- Davies, B., Browne, J., Gannon, S., Honan, E., and Somerville, M. Embodied women at work in neoliberal times and places. *Gend Work Organ*, 2005, 12(4), 343-362.
- De Beauvoir, S., Borde, C., and Malovany-Chevallier, S. *The Second Sex*. New York, Paris: Random House, Gallimard; 2011.
- Deleuze, G., and Guattari, F. *A Thousand Plateaus: Capitalism and Schizophrenia*. Minneapolis: University of Minnesota Press; 1987.



# A Analytical Study of Injuries among Taekwondo and Kickboxing Players of Hyderabad

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## ABSTRACT

Engaging in sport activities has numerous health benefits but also carries the risk of injury. Combat sports include four Olympic sports (boxing, wrestling, judo, and taekwondo) and other popular sports such as karate, kickboxing, and wushu. These sports are popular in most countries of the world, both at competitive and recreational levels. Combat sports are practiced by people of different ages for a variety of reasons such as to gain fitness and health benefits and to learn self-defense. The sample for the study consists of 50 male players engaged in two combat sports (taekwondo and kickboxing), the age group of 18–20 years. The data are collected through questionnaire. The results of the study show that kickboxing players that upper extremities injuries are 80%, lower extremities injuries are 15%, and vertebral column 5%. It is concluded in taekwondo players that lower extremities injuries are 75%, upper extremities 25. It is concluded that players must have good conditioning and prevention to avoid the injuries. This type of study is useful to coaches to give proper coaching for the development of motor qualities for the prevention of injuries among players.

**Keywords:** Injuries, Lower extremities, Upper extremities, Vertebral column.

## 1. INTRODUCTION

Engaging in sports activities has numerous health benefits but also carries the risk of injury. At every age, sportspersons sustain a wide variety of soft tissue, bone, ligament, tendon, and nerve injuries caused by direct trauma or repetitive stress. Different sports are associated with different patterns and types of injuries, whereas age, gender, and type of activity influence the prevalence of injuries. Sports trauma commonly affects joints of the extremities, i.e., knee, ankle, hip, shoulder, elbow, wrist, and spine. The sports injuries that occur in competition or practice have a loss of time for participation in Sport.

Combat sports include four Olympic sports (boxing, wrestling, judo, and taekwondo) and other popular sports such as karate, kickboxing, and wushu. These sports are popular in most countries of the world, both at competitive and recreational levels. Combat sports are practiced by people of different ages for a variety of reasons such as to gain fitness and health benefits and to learn self-defense.

According to the translation of research into injury prevention practice model (Finch, 2006), the first step in injury research is to understand the extent of the problem. The prevalence and prevalence proportion of sport injuries have been widely investigated across sports. Unfortunately, such studies have only included groups selected by either one or more criteria, such as specific sport (Jacobsson *et al.*, 2012), level (Hall *et al.*, 2013), age (Scase *et al.*, 2012), or injury type (Maselli *et al.*, 2015).

### 1.1. Purpose of Research

This study was designed to assess the prevalence, distribution, and patterns of injury among athletes engaged in combat sports and compare the prevalence, pattern, and types of oral and maxillofacial trauma in these athletes.

### 1.2. Population and Sample Group

The sample for the study consists of 50 male players engaged in two combat sports (taekwondo and

kickboxing) who had sustained bodily trauma was studied; which includes 25 taekwondo players and 25 kickboxing players between the age group of 18–20 years.

### 1.3. Research Instruments

Questionnaire forms were used to collect the data and were distributed to participants who regularly practiced combat sports (taekwondo and kickboxing) in Hyderabad.

1. The form included items on age, gender, length of practice, and injury diagnosis. On the questionnaire, the length of practice was categorized as follows: (1) <1 year since the beginning, 2) 1 through 3 years, and 3) more than 3 years.
2. Lower extremities.
3. Upper extremities.
4. Head.
5. Neck.
6. Spine.

For the classification of injury diagnosis and locations, the criteria that Kazemi *et al.* used in 2009 were adopted. According to these criteria, injury diagnoses were categorized as contusions, sprains, strains, fractures, joint dysfunction, and concussion of the brain, facial laceration, facial fractures, jaw dislocation, etc.

## 2. RESULTS

The results of the study show that taekwondo players secured 75% injuries in lower extremities, 0% injuries in vertebral column, and 25% injuries in upper

extremities, kickboxing players secured 15% injuries in lower extremities, 5% injuries in vertebral column, and 80% injuries in upper extremities. It is concluded that players must have good conditioning and prevention to avoid the injuries. This type of study is useful to coaches to give proper coaching for the development of motor qualities for the prevention of injuries among athletes.

### 2.1. Results and Discussion

It is concluded in kickboxing players that upper extremities injuries are 80%, lower extremities injuries are 15%, and vertebral column 05%. It is concluded in taekwondo players that lower extremities injuries are 75%, upper extremities 25. The current status and types of injuries are high (roughly 80%), especially in kickboxing (in part due to use of less protective guards).

### 2.2. Research Recommendations

Sufficient warm-up, proper technique, correct biomechanics, proper conditioning, optimizing balance, coordination, optimizing reaction times, optimal diet, adequate rest, and positive attitude will reduce the risk of injuries. Increase your flexibility by performing dynamic warm-up before practice and competition followed by static stretching post activity.

### 2.3. Recommendations' for Further Research

Consult a coach or physical trainer to incorporate the conditioning programs during the practice. Have a pre-season physical examination and follow your doctor's recommendations.

## REFERENCES

1. Finch, C. A new framework for research leading to sports injury prevention. *J Sci Med Sport*, 2006, 9(1-2), 3-9.
2. Jacobsson, J., Timpka, T., Kowalski, J., Nilsson, S., Ekberg, J., and Renstrom, P. Prevalence of musculoskeletal injuries in Swedish elite track and field athletes. *Am J Sports Med*, 2012, 40(1), 163-169.
3. Kazemi, M., Chudolinski, A., Turgeon, M., Simon, A., Ho, E., and Coombe, L. Nine year longitudinal retrospective study of Taekwondo injuries. *J Can Chiropr Assoc*, 2009, 53, 272-281.
4. Kordi, R., Maffulli, N., Wroble, R.R., and Wallace, W.A. *Combat Sports Medicine*. Berlin: Springer Science and Business Media; 2009.

**Table 1: Percentage of injuries among taekwondo players**

Lower extremities injuries	Upper extremities	Head	Neck	Vertebral column
75	10	15	Nil	Nil

**Table 2: Percentage of injuries among kickboxing players**

Lower extremities injuries	Upper extremities	Head	Neck	Vertebral column
15	30	35	10	05

# Effect of Eno Supplement on Muscular Endurance among College Kabaddi Player

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## ABSTRACT

**Purpose:** This research aimed to determine the effect of Eno supplement on muscular endurance. **Methods:** Twenty-two men kabaddi players taken as participants from Dr. Sivanthi Aditanar College of Physical Education, Tiruchendur. Participants are randomly selected and split into two groups, such as experimental (Group B,  $n = 12$ ) and control group (Group A,  $n = 10$ ). Treatment was offered to the experimental group (Eno supplement), there is no treatment given to the control group and performance of both groups was evaluated by sit-up test, before the treatment pre-test and after the treatment post-test were taken. **Results:** The paired “ $t$ ” test value between the pre- and post-tests means of the experimental and control groups were 5.06\* and 0.83, respectively. Since the obtained “ $t$ ”-ratio value of treatment group is greater than the table value 2.201 with df 11 and control group is less than table value 1.833 with df 9. The result concluded that the experimental group had a significant difference in the performance of the sit-up test. In analysis of covariance, the adjusted post-test value of the sit-up test for the experimental and control groups was 39.47 and 36.53, respectively. The obtained “ $F$ ”-ratio for adjusted post-test mean 6.810\* is greater than the table value 4.38 with df 1 and 19 at 0.05 level of confidence. **Conclusion:** Based on the research finding significant difference exist between control and experimental group, so results concluded that Eno supplement improves muscular endurance among college kabaddi players.

## 1. INTRODUCTION

Kabaddi player must need muscular endurance during the competition, but their performance reduced due to lactic acid formation, it decreases muscle fiber contraction and they did not perform in the second-half as same as first-half performance, so we need to reduce the body acidification and lactic acid formation through alkaline product ingestion (Khanna *et al.*, 1996) and (Chycki *et al.*, 2018). In our body physical activity or exercise produce lactic acid, it quickly dissociates into lactate and a free hydrogen cation ( $H^+$ ). Even though lactic acid and lactate are often used interchangeably, they are not the same thing (Cairns, 2006).

The presence of hydrogen positive ions leads to blood vessel constriction, bones get weaker, muscle loss tone and insomnia, impaired digestion, and reduced brain activity. The hydrogen anion  $H^-$  is a negative ion of hydrogen that is a hydrogen atom that has captured an extra electron. The presence of hydrogen anion leads to improve the respiratory system, blood PH increases, normalize blood pressure, and improve blood circulation, increasing cells metabolism, strengthening the immune

system, and regulating functions of autonomic nerves (Kraig *et al.*, 1987) and (Hopkins, 2019).

Alkaline water stick hydrogen negative ion. Eno is an alkaline supplement that it acts as an antacid (against acid); it first marketed by James crossly Eno (1852). Dennis Embleton, a medical doctor of Newcastle, (Northeast England). Embleton often prescribed an effervescent drink made by mixing sodium bicarbonate and citric acid in water. It neutralizes acidity in our body ingredients of Eno is sodium bicarbonate (46.4%), citric acid (43.6%), and sodium carbonate (10%).  $NaHCO_3$  (PH 8.4) and  $Na_2CO_3$  (PH 11.6) are alkaline in nature. Citric acid is a weak organic acid that has the chemical formula  $C_6H_8O_7$  (Johnson, 2009). It occurs naturally in citrus fruits. In biochemistry, it is an intermediate in the citric acid cycle, which occurs in the metabolism of all aerobic organisms. Sodium carbonate is the inorganic compound with the formula  $Na_2CO_3$  and all forms are white, water-soluble salts. All forms have a strongly alkaline taste and give moderately alkaline solutions in water. Sodium bicarbonate is alkaline in nature and commonly known as baking soda, it is a salt composed of a sodium cation ( $Na^+$ ) and a bicarbonate anion ( $HCO_3^-$ ) (Stephens, 2012).

When it reacts with the acid, carbon dioxide is released, and it is mostly used in cooking. Eno works by neutralizing the excess acid in your stomach. Sodium citrate is the sodium salt of citrate with alkalinizing activity. On absorption, sodium citrate dissociates into sodium cations, and citrate anions. Organic citrate ions are metabolized to bicarbonate ions, resulting in an increase in the plasma bicarbonate concentration, the buffering of excess hydrogen ion, the raising of blood pH, and potentially the reversal of acidosis.

## 2. METHODS

### 2.1. Participants

To achieve the purpose of the study, 22 ( $n = 22$ ) male kabaddi players were randomly selected as subjects from Dr. Sivanthi Aditanar College of Physical Education, Tiruchendur. During the years 2018–2029, the age of the selected subjects was ranged between 20 and 28 years. The selected participants were divided into two groups, such as the experimental group ( $n = 12$ ) and control group (10). All were informed about the treatment procedure and possible risk and this study was approved by the Ethics Committee of Sivanthi Aditanar College of Physical Education.

### 2.2. Supplementation Protocol

The investigator provides Eno supplement to the subject before post-test. Ninety minutes before the post-test supplement given to treatment group subjects and 5 g of Eno supplement mix with 200 ml of normal water, all subjects taken the same amount of supplement. If the subject asks extra water investigator provide it up to 50 ml. All subjects were informed about the treatment procedure, supplement characteristics and possible risk, and side effects.

### 2.3. Test Procedure

Sit-up: up to 15 min of warmup gives to subjects with an intensity of 60%. The participants lie flat on the back with knees bent and feet on the floor with the heels no more than 1 foot from the buttocks. Before the test clearly explain the procedure and demonstrate the test. The knee angle should be no  $<90$  degrees. The fingers are interlocked and placed behind the neck with the elbows touching the floor. The feet are held securely by a partner. The participants then curl up to a sitting position and touch the elbows to the knees. This exercise is repeated as many times as possible in the time requirement. Your fingers must remain interlocked

and in contact with the back of your neck at all times. You curl up from the starting position, but you may not push off the floor with an elbow. When you return to the starting position, your elbows must be flat on the floor or mat.

- Scoring: One point is scored for each correct sit-up. The score is the maximum number of sit-ups completed in 60 s
- Equipment: mat, stopwatch, and partner.

### 2.4. Statistical Analysis

A dependent *t*-test was used to analyze the significant difference between pre- and post-test means of both groups. Analysis of covariance (ANCOVA) was used to find out the significant difference between the experimental and control groups through F-ratio of adjusted post-test means which are analyzed. The significance level was accepted as  $P < 0.05$ . The SPSS statistical program was used for data analysis.

## 3. RESULTS

The dependent “*t*”-test is used to analyze value between the pre- and post-tests means of the experimental and control groups where were 5.06\* and 0.83, respectively. Since the obtained “*t*”-ratio value of the experimental group is greater than the table value 2.201 with df 11 and control group is less than table value 1.833 with df 9 at 0.05 level of confidence. In ANCOVA, the adjusted post-test value of the sit-up test for the experimental and control groups was 39.47 and 36.53, respectively. The obtained “*F*”-ratio for adjusted post-test mean 6.810\* is greater than the table value 4.32 with df 1 and 19 at 0.05 level of confidence. The results of the study indicate that the experimental group had a significant difference in the performance of muscular endurance. However, the control group has a negligible significance difference in the performance of muscular endurance and significant difference exists between the adjusted post-test means of the experimental and control groups on the muscular endurance and control group has a negligible significance difference in the performance of muscular endurance.

## 4. FINDING AND DISCUSSION

This study has provided a direct analysis of the influence Eno supplement on muscular endurance with college kabaddi players. Based on the result of the study, Eno supplement improves important physical fitness component muscular endurance. Following the 7-day



loading phase of Alka-Myte®-based alkalizing tablets, trained Nordic skiers experienced significantly lower cardiorespiratory stress, lower blood lactate responses, and higher upper body power measures. Thus, the use of this supplement appeared to impart an ergogenic benefit to the skiers that may be similar to the effects expected from consuming well-studied extracellular buffering agents such as sodium bicarbonate (Heil, 2012). After exercise-induced dehydration, consumption of the electrolyzed, high-pH water reduced high-shear viscosity by an average of 6.30% compared to 3.36% with standard purified water ( $P = 0.03$ ). (Weidman *et al.*, 2016). Drinking hydrogen-rich water may protect healthy individuals from gastric damage caused by oxidative stress (Xue *et al.*, 2014). Based on the result of the study, Eno supplement improves important physical fitness component muscular endurance.

## 5. CONCLUSION

Using a randomized pre- and post-test design, I investigated the effectiveness of Eno supplement on muscular endurance among college kabaddi players. After the treatment, the experimental group showed improvements (10%) on muscular endurance and negligible amount of improvement (2.2%) in the control group. Hence, I concluded that Eno supplement (Antacid) improved muscular endurance among college men kabaddi players.

## REFERENCES

- 1) Khanna, G.L., Majumdar, P., Malik, V., Vrinda, T., and Mandal, M. A study of physiological responses during match play in Indian national kabaddi players. *Br J Sports Med*, 1996, 30(3), 232-235.
- 2) Stecker, R.A., Harty, P.S., Jagim, A.R., Candow, D.G., and Kerksick, C.M. Timing of ergogenic aids and micronutrients on muscle and exercise performance. *J Int Soc Sports Nutr*, 2019, 16(1), 37.
- 3) Delextrat, A., Mackessy, S., Arceo-Rendon, L., Scanlan, A., Ramsbottom, R., and Calleja-Gonzalez, J. Effects of three-day serial sodium bicarbonate loading on performance and physiological parameters during a simulated basketball test in female university players. *Int J Sport Nutr Exerc Metab*, 2018, 28(5), 547-552.
- 4) Carr, A.J., Hopkins, W.G., and Gore, C.J. Effects of acute alkalosis and acidosis on performance: A meta-analysis. *Sports Med*, 2011, 4(10), 801-814.
- 5) Van Montfoort, M.C., Van Dieren, L., Hopkins, W.G., and Shearman, J.P. Effects of ingestion of bicarbonate, citrate, lactate, and chloride on sprint running. *Med Sci Sports Exerc*, 2004, 36(7), 1239-1243.
- 6) Jones, R.L., Stellingwerff, T., Artioli, G.G., Saunders, B., and Cooper, S. Dose-Response of sodium bicarbonate ingestion highlights individuality in time course of blood analyte responses. *Int J Sport Nutr Exerc Metab*, 2016, 26(5), 445-453.
- 7) Lancha-Junior, A.H., Vde, S.P., and Saunders, B. Nutritional strategies to modulate intracellular and extracellular buffering capacity during high-intensity exercise. *Sports Med*, 2015, 45 Suppl 1, S71-S81.
- 8) Chycki, J., Kurylas, A., Maszczyk, A., Golas, A., and Zajac, A. Alkaline water improves exercise-induced metabolic acidosis and enhances anaerobic exercise performance in combat sport athletes. *PloS One*, 2018, 13(11), e0205708.
- 9) Cairns, S.P. Lactic acid and exercise performance: Culprit or friend? *Sports Med*, 2006, 36(4), 279-291.
- 10) Kraig, R.P., Petito, C.K., Plum, F., and Pulsinelli, W.A. Hydrogen ions kill brain at concentrations reached in ischemia. *J Cereb Blood Flow Metab*, 1987, 7(4), 379-386.
- 11) Hopkins, E., and Sharma, S. Physiology, acid base balance. In: *StatPearls*. Treasure Island (FL): StatPearls Publishing; 2020.
- 12) Stephens, T.J., McKenna, M.J., Canny, B.J., Snow, R.J., and McConell, G.K. Effect of sodium bicarbonate on muscle metabolism during intense endurance cycling. *Med Sci Sports Exerc*, 2012, 34(4), 614-621.
- 13) Johnson, S.M., and Suralik, J. A Comparison of the Effect of Regular Eno® and Placebo on Intragastric pH; 2009.
- 14) Heil, D., Jacobson, E.A., and Stephanie, M. Influence of an alkalizing supplement on markers of endurance performance using a double-blind placebo-controlled design. *J Int Soc Sports Nutr*, 2012, 9(1), 8.



# Effect of Different Packages of Training on Selected Biomotor Ability Variables among Cricket Players

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## ABSTRACT

The present study was undertaken to find out the effect of different packages of training on selected biomotor ability variables among cricket players. For the purpose of the study, 60 male cricket players were selected from in and around Kurnool district of Andhra Pradesh and their age ranged from 18 to 21 years. The subjects chosen for the study were divided into four equal groups and designated as experimental Group A, experimental Group B, experimental Group C, and control Group (CG) D. Circuit training was given to Group A, plyometric training was given to Group B, resistance training was given to Group C, and the CG D was restricted to participate in any of the fitness training. The fitness training programs were given for a period of 12 weeks of 3 days/week. The obtained data were analyzed by analysis of covariance which was further subject of Scheffe's *post hoc* test, wherever the F-ratio was found significant. The result of the study revealed that the circuit training, plyometric training, and resistance training programs were significantly improved on selected biomotor ability variables such as muscular strength endurance, explosive power, agility, and coordination among cricket players when compared with the CG.

**Keywords:** Agility, Circuit training, Coordination, Cricket players, Endurance, Explosive power, Muscular strength, Plyometric training, Resistance training.

## 1. INTRODUCTION

In the past few decades, sports have gained tremendous popularity all over the global. The popularity of sports is still increasing at a fast pace and this happy trend is likely to continue in the future also. With the enhanced status in society, the provision of sports training has gained importance although the need for competent training has been a felt factor without any effective sports training. Sportspersons potential will never be fulfilled. Comprehensive sports training program is the key factors in the production of the skillful high performance of a sportsperson.

Training includes physiological changes in almost every system of the body, particularly within the skeletal muscles and the cardiorespiratory system. The changes resulting from training are influenced by the frequency, duration, and particularly by the intensity of the training program and by heredity. The effect of training is specific to the type of training exercises performed used. The specificity

of training and exercise has two broad physiological bases – metabolic and neuromuscular (Edwad, 1984).

In this context, the word “Training” has gained meaningful significance from the language of sports from ancient times. It denotes the process of preparation for achieving a given task. This process invariably extends to a number of days, even months, and years. Thus, training is a program of exercises designed to improve various capacities of an athlete to accelerate his/her performance for a particular event.

### 1.1. Statement of the Problem

The purpose of this study was to find out the effect of different packages of training on biomotor ability variables among cricket players.

### 1.2. Hypothesis

1. It was hypothesized that there would be a significant improvement on selected biomotor ability variables

- among cricket players due to the effect of circuit training when compare with the control group (CG)
2. It was hypothesized that there would be a significant improvement on selected biomotor ability variables among cricket players due to the effect of plyometric training when compare with the CG
  3. It was hypothesized that there may be a significant improvement on the selected biomotor ability variables among cricket players due to the effect of resistance training when compare with the CG.

## 2. METHODOLOGY

The purpose of the study was to find out the effect of different packages of training on biomotor ability variables among cricket players. For the purpose of the study, 60 male cricket players were selected as subjects in and around Kurnool district of Andhra Pradesh and their age ranged from 18 to 21 years. They were divided into four groups, each group consists of 15 subjects. Three experimental groups and one CG, namely, circuit training, plyometric training, resistance training, and CG. The training program was given for a period of 12 weeks. The obtained data were analyzed using analysis of covariance (ANCOVA) which was further subject of Scheffe's *post hoc* test, wherever the F-ratio was found significant.

## 3. RESULTS AND DISCUSSION

All the subjects of four groups were tested on selected criterion variables such as muscular strength endurance in terms of bent knee sit-ups, explosive power in terms of standing broad jump, agility in terms of Semo agility test, and coordination in terms of Scott obstacle race. The data were collected before and after the 12 weeks of training period as pre- and post-tests, respectively. The data were collected statistically analyzed using ANCOVA. To test the obtained results on all variables, the level of significance at 0.05 was chosen and considered as sufficient for the study.

Table 1 shows that the obtained "F" ratio in pre-test ( $F = 0.319$ ,  $P > 0.005$ ) among four groups found to be insignificant in muscular strength endurance. Further, it can be seen that significant differences exist in post-test ( $F = 16.094$ ,  $P < 0.005$ ) and adjusted post-test ( $F = 37.96$ ,  $P < 0.05$ ). Based on the result of the study reveals that three experimental groups significantly improved in muscular strength endurance in cricket due to the 12 weeks of the circuit training group (CTG), plyometric training group (PTG) and resistance training group (RTG) when compare with the CG.

The comparisons showed in Table 2 proved that there existed significant differences between the adjusted means of CTG and PTG, there was no significant difference between the experimental group and CG and there was a significant difference between the CTG and RTG, CTG and CG, PTG and RTG, PTG and CG, and RTG and CG at 0.05 level of confidence. The pre, post, and adjusted means on muscular strength endurance are presented through bar diagram for better understanding of the results of this study in Figure 1.

Table 3 shows that the obtained "F" ratio in pre-test ( $F = 1.32$ ,  $P > 0.005$ ) among four groups found to be insignificant in explosive power. Further, it can be seen that significant differences exist in post-test ( $F = 30.84$ ,  $P < 0.005$ ) and adjusted post-test ( $F = 40.77$ ,  $P < 0.05$ ). Based on the result of the study reveals that three experimental groups significantly improved in explosive power in cricket due to the 12 weeks of the CTG, PTG, and RTG when compare with the CG.

The comparisons showed in Table 4 proved that there existed significant differences between the adjusted means of the CTG and PTG, there was no significant difference between the experimental group and CG and there was a significant difference between the CTG and RTG, CTG and CG, PTG and RTG, PTG and CG, and RTG and CG at 0.05 level of confidence. The pre, post,

**Table 1:** Analysis of covariance on muscular strength endurance (bent knee sit-ups) CTG, PTG, RTG, and CG

Test	Group	CTG	PTG	RTG	CG	SOV	SOS	df	MSOS	"F" ratio
Pre	Mean	24.98	25.86	26.02	24.82	B	9.783	3	3.261	0.319
	S.D	3.28	3.43	2.71	3.22	W	565.2	56	10.09	
Post	Mean	29.20	30.42	32.94	26.50	B	473.5	3	157.8	16.094*
	S.D	3.00	3.02	2.71	3.41	W	519.5	56	9.28	
Adjusted post-test mean	Mean	29.83	29.55	33.27	27.02	B	425.23	3	141.74	37.96*
						W	203.09	55	3.69	

\*Significant at 0.05 level of confidence, F-ratio at 0.05 level of confidence for 3 and 55 (df)=2.77. S.D: Standard deviation, CTG: Circuit training group, PTG: Plyometric training group, RTG: Resistance training group

**Table 2:** Scheffe's *post hoc* test for the differences among paired means of groups on muscular strength endurance (bent knee sit-ups)

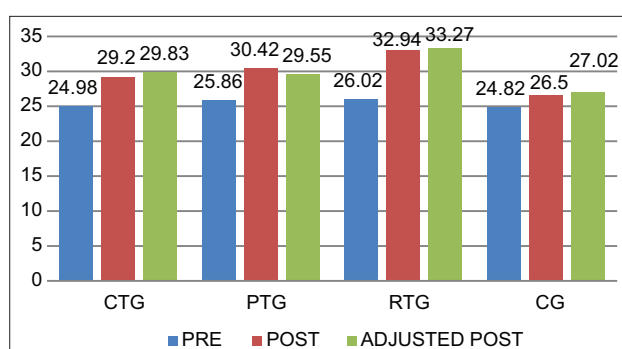
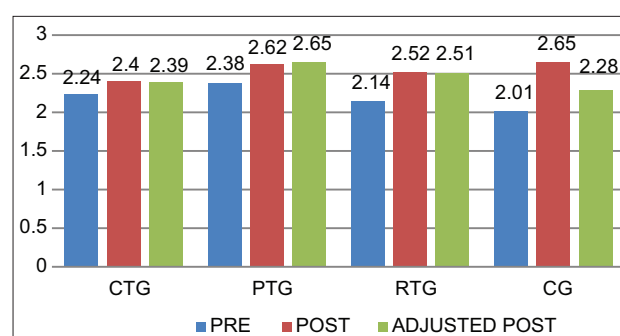
Means of				Paired mean difference	Sig. <i>P</i> -value	Confidence interval value
Circuit training group	Plyometric training group	Resistance training group	Control group			
29.83	29.55			0.28	0.657	2.016
29.83		33.27		3.44	0.000	
29.83			27.02	2.81	0.000	
	29.55	33.27		3.72	0.000	
	29.55		27.02	2.53	0.000	
		33.27	27.02	6.25	0.000	

\*Significant at 0.05 level of confidence

**Table 3:** Analysis of covariance of data on explosive power (standing broad jump) among the CTG, PTG, RTG, and CG

Test	Group	CTG	PTG	RTG	CG	SOV	SOS	df	MSOS	"F" ratio
Pre	Mean	2.24	2.38	2.14	2.01	B	0.30	3	0.10	1.32
	S.D	0.18	0.16	0.50	0.22	W	5.00	56	0.09	
Post	Mean	2.40	2.62	2.52	2.15	B	1.76	5	0.59	30.84*
	S.D	0.14	0.09	0.03	0.21	W	1.09	56	0.20	
Adjusted post-test mean	Mean	2.39	2.65	2.51	2.28	B	1.864	3	0.621	40.77*
						W	0.851	55	0.015	

\*Significant at 0.05 level of confidence, F-ratio at 0.05 level of confidence for 3 and 55 (df)=2.77. S.D: Standard deviation, CTG: Circuit training group, PTG: Plyometric training group, RTG: Resistance training group

**Figure 1:** Graphical illustration showing the pretest-posttest and adjusted post-test mean values of the circuit training group, plyometric training group, resistance training group, and control group on muscular strength endurance**Figure 2:** Graphical illustration showing the pretest-posttest and adjusted post-test mean values of the circuit training group, plyometric training group, resistance training group, and control group on explosive power

and adjusted means on explosive power are presented through bar diagram for better understanding of the results of this study in Figure 2.

Table 5 shows that the obtained "F" ratio in pre-test ( $F=1.179$ ,  $P>0.005$ ) among four groups found to be insignificant in agility. Further, it can be seen that significant differences exist in post-test ( $F=6.612$ ,  $P<0.005$ ) and adjusted post-test ( $F=9.123$ ,  $P<0.05$ ). Based on the result of the

study reveals that three experimental groups significantly improved in agility in cricket due to the 12 weeks of the CTG, PTG, and RTG when compared with the CG.

The comparisons showed in Table 6 proved that there existed significant differences between the adjusted means of the CTG and PTG, CTG and RTG, and PTG and RTG, there was no significant difference between the experimental group and CG and there was a significant difference between the CTG and CG, PTG and CG, and

**Table 4: Scheffe's post hoc test for the differences among paired means of groups on explosive power (standing broad jump)**

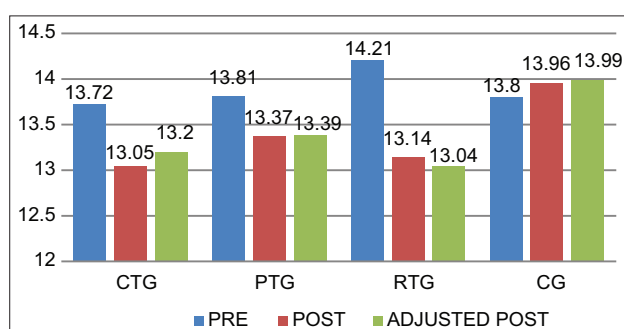
Means of				Paired mean difference	Sig. P-value	Confidence interval value
Circuit training group	Plyometric training group	Resistance training group	Control group			
2.39	2.65			0.12	0.007	0.11
2.39		2.51		0.26	0.000	
2.39			2.28	0.11	0.000	
	2.65	2.51		0.14	0.005	
	2.65		2.28	0.23	0.000	
		2.51	2.28	0.37	0.000	

\*Significant at 0.05 level of confidence

**Table 5: Analysis of covariance of data on agility (Semo agility test) among the CTG, PTG, RTG, and CG**

Test	Group	CTG	PTG	RTG	CG	SOV	SOS	df	MSOS	"F" ratio
Pre	Mean	13.72	13.81	14.21	13.80	B	2.152	3	0.717	1.179
	S.D	0.80	0.97	0.75	0.61	W	35.06	56	0.626	
Post	Mean	13.05	13.37	13.14	13.96	B	6.649	3	2.216	6.612*
	S.D	0.38	0.66	0.65	0.59	W	18.854	56	.337	
Adjusted post-test mean	Mean	13.20	13.39	13.04	13.99	B	7.6	3	2.53	9.123*
						W	15.45	55	0.281	

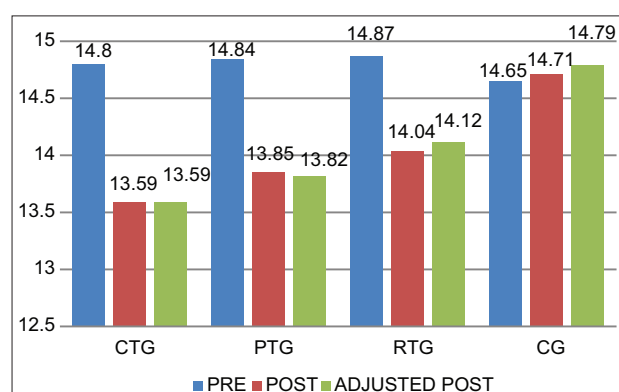
\*Significant at 0.05 level of confidence, F-ratio at 0.05 level of confidence for 3 and 55 (df)=2.77. S.D: Standard deviation, CTG: Circuit training group, PTG: Plyometric training group, RTG: Resistance training group



**Figure 3:** Graphical illustration showing the pretest-posttest and adjusted post-test mean values of the circuit training group, plyometric training group, resistance training group, and control group on agility

RTG and CG at 0.05 level of confidence. The pre, post, and adjusted means on agility are presented through bar diagram for better understanding of the results of this study in Figure 3.

Table 7 shows that the obtained "F" ratio in pre-test ( $F = 0.524$ ,  $P > 0.005$ ) among four groups found to be insignificant in agility coordination. Further, it can be seen that significant differences exist in post-test ( $F = 23.297$ ,  $P < 0.005$ ) and adjusted post-test



**Figure 4:** Graphical illustration showing the pretest-posttest and adjusted post-test mean values of the circuit training group, plyometric training group, resistance training group, and control group on coordination

( $F = 61.098$ ,  $P < 0.05$ ). Based on the result of the study reveals that three experimental groups significantly improved in coordination in cricket due to the 12 weeks of the CTG, PTG, and RTG when compare with the CG.

The comparisons showed in Table 8 proved that there existed significant differences between the adjusted means of the CTG and PTG and PTG and RTG, there

**Table 6: Scheffe's *post hoc* test for the differences among paired means of groups on agility (Semo agility test)**

Means of				Paired mean difference	Sig. <i>P</i> -value	Confidence interval value
Circuit training group	Plyometric training group	Resistance training group	Control group			
13.20	13.39			1.00	0.332	0.48
13.20		13.04		0.16	0.414	
13.20			13.99	0.79	0.000	
	13.39	13.04		1.16	0.079	
	13.39		13.99	0.21	0.003	
		13.04	13.99	0.95	0.000	

\*Significant at 0.05 level of confidence

**Table 7: Analysis of covariance of data on coordination (Scott obstacle race) among the CTG, PTG, RTG, and CG**

Test	Group	CTG	PTG	RTG	CG	SOV	SOS	df	MSOS	"F" ratio
Pre	Mean	14.80	14.84	14.87	14.65	B	0.425	3	0.142	0.524
	S.D	0.50	0.49	0.48	0.66	W	16.00	56	0.29	
Post	Mean	13.59	13.85	14.04	14.71	B	10.24	5	3.414	23.297*
	S.D	0.37	0.39	0.17	0.51	W	8.19	56	0.146	
Adjusted post-test mean	Mean	13.59	13.82	14.12	14.79	B	11.93	3	3.98	61.098*
						W	3.53	55	0.64	

\*Significant at 0.05 level of confidence, F-ratio at 0.05 level of confidence for 3 and 55 (df)=2.77. S.D: Standard deviation, CTG: Circuit training group, PTG: Plyometric training group, RTG: Resistance training group

**Table 8: Scheffe's *post hoc* test for the differences among paired means of groups on coordination (Scott obstacle race)**

Means of				Paired mean difference	Sig. <i>P</i> -value	Confidence interval value
Circuit training group	Plyometric training group	Resistance training group	Control group			
13.59	13.82			0.30	0.056	0.80
13.59		14.12		0.53	0.000	
13.59			14.97	0.85	0.000	
	13.82	14.12		0.23	0.013	
	13.82		14.97	1.15	0.000	
		14.12	14.97	1.38	0.000	

\*Significant at 0.05 level of confidence

was no significant difference between the experimental group and CG and there was a significant difference between the CTG and RTG, CTG and CG, PTG and CG, and RTG and CG at 0.05 level of confidence. The pre, post, and adjusted means on coordination are presented through bar diagram for better understanding of the results of this study in Figure 4.

#### 4. CONCLUSIONS

Based on the result of the study, the following conclusions were drawn:

1. The CTG had shown significantly improvement in all selected biomotor ability variables, namely, muscular strength endurance, explosive power, agility, and coordination of cricket players when compared with the CG
2. The PTG had shown significantly improvement in all selected biomotor ability variables, namely, muscular strength endurance, explosive power, agility, and coordination of cricket players when compared with the CG
3. The RTG had shown significantly improvement in all selected biomotor ability variables, namely, muscular strength endurance, explosive power,



agility, and coordination of cricket players when compared with the CG

4. It was also concluded that the CTG was better than the PTG and RTG improving in coordination
5. The PTG was better than the CTG and RTG improving in explosive power
6. The RTG was better than the CTG and PTG improving in muscular strength endurance and agility.

## REFERENCES

Derenne, C., Ho, K.W., and Murphy, J.C. Effect of general, specific and specific resistance training on throwing

velocity in baseball. *J Strength Cond Res*, 2015, 15(1),148-156.

Dogra, D.K. Effect of 12 weeks specific conditioning program on motor fitness of Tripura cricketers. *Int J Manage*, 2015, 6(1), 706-714.

Fox, E.L. *Sports Physiology*. Philadelphia, PA: Saunders College Publishers; 1984.

Shrivastava, S. Efficacy of specific physical fitness program on agility of male cricketers. *Res J Recent Sci*, 2015, 4, 105-107.

Shrivastava, S., and Dudhale, S. Effect of specific physical fitness program on lower body explosive power among male cricketers. *Res J Phys Educ Sci*, 2015, 3(7), 1-3.

# Effect of Structured Activity Program on Selected Physical Fitness Variables of Juvenile Delinquents

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## ABSTRACT

The research paper deals with the physical fitness of juvenile delinquents. For the purpose of study, 30 children were randomly chosen from government juvenile home situated in Malappuram and Calicut district of Kerala state. Fifteen were chosen from Calicut and 15 were chosen from Malappuram District. The selected subjects were randomly divided into two groups, namely, control group and experimental group. Four physical fitness variables were used for the study – speed, flexibility, agility, and abdominal muscular strength and endurance. Pre-test and post-test were conducted. Six weeks training period was given to the experimental group. After the test results, there was no significant difference in the four variables chosen for the study after the pre-test and post-test of control group and experimental group.

## 1. INTRODUCTION

The research paper deals with the physical fitness of selected juvenile delinquents. Physical fitness is a universally accepted and realized terminology. Physical fitness is a capacity to meet the present and potential physical challenges of life with success. The present concept of physical fitness is not only freedom from disease but also to gain enough strength, agility, flexibility, endurance, and skills to meet the demands of daily life and to build sufficient reserve energy to withstand stress and strain.

Fitness improves general health and it is essential for full and vigorous living (Govindarajulu, 1991). A juvenile delinquent is considered an underage criminal, i.e., one who is between the age of 7 and 16 or 18 years, as prescribed by the law of the land.

### 1.1. Purpose of the Study

- The purpose of the study is to learn about the structured activity programs among juvenile delinquents.
- The main purpose of the study is to determine the effects of structured activity programs on selected physical fitness variables.
- The study may help to understand the differences if existed among different activity programs on juvenile delinquents.

- The study will definitely help to find out suitable activity programs in administrating and rehabilitating juvenile delinquents to attain total well-being.

## 2. METHODOLOGY

This was an experimental study focusing on physical fitness components among the juvenile delinquents. Random sampling technique was used to select the subjects. The selected subjects were randomly divided into two groups, namely, experimental group and control group consisting of 15 juveniles in each. The requirements of the experimental procedures, testing, as well as exercise schedules were explained to them so as to avoid any ambiguity of the effort required on their part.

Taking into consideration of feasibility criteria, availability of instruments and the relevance of the variables of the present study, the following variables were selected. Four physical fitness components were taken as variables: Speed, agility, abdominal muscular strength and endurance, and flexibility. The study was formulated as a true random group design, consisting of a pre-test and post-test. Pre-test was conducted for all the subjects on selected physical fitness such as speed, agility, and abdominal muscular strength. The experimental groups participated in their 25 respective activity programs for 6 weeks, 4 days/week between 4.00 p.m. and 5.00 p.m. The post-test

was conducted on the above said dependent variables after the experimental periods from both groups. The differences between the initial and final means of the selected variables were the effect of structured activities on juveniles selected. The tools used for the physical fitness test are as follows:

1. 40 m sprint (to assess speed).
2. Modified sit-ups (to evaluate abdominal muscular strength and endurance).
3. Sit and reach (to evaluate the flexibility [extensibility] of the low back and posterior thighs).
4. *t*-test (to evaluate the level of quickness of the change of direction).

### 3. RESULTS

The results of the experiment are as follows:

- A. Comparison of speed between control group and experimental group in pre-test and post-test

Group	<i>n</i>	Mean±SD value	<i>t</i> value
Control	15	6.187±0.425	0.014
Experimental	15	6.185±0.320	0.014

SD: Standard deviation

Group	<i>n</i>	Mean±SD value	<i>t</i> value
Control	15	6.182±0.421	0.195
Experimental	15	6.155±0.321	0.195

SD: Standard deviation

- B. Comparison of flexibility between the control group and experimental group in pre-test and post-test

Group	<i>n</i>	Mean±SD value	<i>t</i> value
Control	15	13.673±2.338	0.066
Experimental	15	13.62±2.066	0.066

SD: Standard deviation

Group	<i>n</i>	Mean±SD value	<i>t</i> value
Control	15	13.653±2.352	-0.131
Experimental	15	13.76±2.073	-0.131

SD: Standard deviation

- C. Comparison of agility between control group and experimental group in pre-test and post-test

Group	<i>n</i>	Mean±SD value	<i>t</i> value
Control	15	12.238±0.638	0.416
Experimental	15	12.152±0.480	0.416

SD: Standard deviation

Group	<i>n</i>	Mean±SD value	<i>t</i> value
Control	15	12.225±0.643	0.599
Experimental	15	12.112±0.470	0.599

SD: Standard deviation

- D. Comparison of abdominal strength between control group and experimental group in pre-test and post-test

Group	<i>n</i>	Mean±SD value	<i>t</i> value
Control	15	36.133±10.439	-0.316
Experimental	15	37.266±9.160	-0.316

SD: Standard deviation

Group	<i>n</i>	Mean±SD value	<i>t</i> value
Control	15	35.933±10.298	-1.435
Experimental	15	40.866±8.425	-1.435

SD: Standard deviation

### 4. CONCLUSION

The results show that there is no significant difference in the variables such as speed, flexibility, agility, and abdominal strength, in the pre-test and post-test of control and experimental group. The experimental group was treated with a structured training program; the control group was not given any treatment and was kept strictly under control throughout the experimental period. It was concluded that a structured activity program has no significant improvement in fitness variables, such as speed, flexibility, agility, and abdominal strength among the two groups.

### REFERENCES

1. Singh, A., Gill, J.S., Bains, J., and Brar, R.S. *Essential of Physical Education*. New Delhi: Kalyani Publication; 2005.
2. Alagaonkar, J. *Sports Psychology*. Pune: Vidyarthi Griha Prakashan Publishers; 1997.
3. Ananda, R. *The Complete Book of Yoga Harmony of Body Mind*. New Delhi, India: Orient Paperbacks; 1982.
4. Nichols, B. *Moving and Learning the Elementary School Physical Education Experience*. St. Louis: C. V. Mosby College Publishing; 1986.
5. Clarke, D.H., and Clarke, H.H. *Research Process in Physical Education and Health*. Englewood Cliffs, New Jersey: Prentice Hall; 1970.
6. Cell, D.L. *Psychological Dynamics of Sports*. Illinois: Haman Kinetics Publications; 1972.
7. Weinerb, E.L. *Anatomy and Physiology*. London: Addison Wesley Publishing Company; 1984.
8. Singh, H. *Science of Sports Training*. New Delhi: D. V. S. Publications; 1991.

# The Silent Female Athlete Epidemic: The Female Athlete Triad – A Review

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## ABSTRACT

Female sport participation has increased dramatically over the years. Positive effects of exercise on health have become evident. However, with participation in competitive sport, a set of health problems unique to the female athlete has emerged. The female athlete triad (FAT) (triad) refers to the interrelationships among energy availability, menstrual function, and bone mineral density, which may have clinical manifestations including eating disorders, functional hypothalamic amenorrhea, and osteoporosis. Athletes are distributed along a spectrum between health and disease, and those at the pathological end may not exhibit all these clinical conditions simultaneously. Low energy availability, from either dietary restriction or increased expenditure, plays a pivotal role in the development of the triad. Athletes involved in “lean sports” (weight categories or esthetics, such as gymnastics, or endurance running) are at the highest risk. Thinner is not always better. Too low a body weight will decrease strength, power, and endurance and increase the risk of illness and injury as well as the FAT. Nutrition education based on the concept of food as energy for training and recovery instead of body weight is also important for prevention, and early intervention; education of athletes, parents, coaches, trainers, and administrators is a priority. Athletes should be assessed for the triad at the pre-participation physical and annual health screening. Prevention and early recognition of triad disorders are crucial to ensure timely intervention. All individuals, including coaches and parents, who are working with physically active girls and women, should be educated about these disorders, and they should develop strategies to prevent, recognize, and treat the FAT. Reviews have been summarized for each component of the triad.

**Keywords:** Eating disorder, Female athlete triad, Female athlete, Low bone mineral density.

## 1. INTRODUCTION

Protecting the health of the athlete is one of the goals of the International Olympic Committee (IOC). In the 2005 IOC Consensus Statement, the female athlete triad (FAT) (triad) was defined as “the combination of disordered eating (DE) and irregular menstrual cycles eventually leading to a decrease in endogenous estrogen and other hormones, resulting in low bone mineral density” (BMD) based on the original scientific evidence of Drinkwater *et al.*, 2007. Since 2007, scientific evidence and clinical experience show that the etiological factor underpinning the triad is an energy deficiency relative to the balance between dietary energy intake (EI) and the energy expenditure required to support homeostasis, health, and the activities of daily living, growth, and sporting activities. It is also evident that the clinical phenomenon is not a triad of three entities of EA, menstrual function, and bone health, but rather a syndrome resulting from

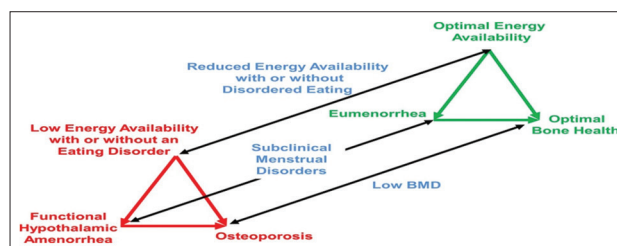
relative energy deficiency that affects many aspects of physiological function, including metabolic rate, menstrual function, bone health, immunity, and protein synthesis, cardiovascular, and psychological health. In addition, it is evident that relative energy deficiency also affects men. Based on its interdisciplinary expertise, the IOC consensus group introduced a more comprehensive, broader term for the overall syndrome, which includes what has so far been called the “FAT:” Relative energy deficiency in sport (RED-S). The syndrome of RED-S refers to impaired physiological function including, but not limited to, metabolic rate, menstrual function, bone health, immunity, protein synthesis, and cardiovascular health caused by relative energy deficiency.

The underlying problem of RED-S is an inadequacy of energy to support the range of body functions involved in optimal health and performance. EA is calculated as EI minus the energy cost of exercise relative to

fat-free mass (FFM), and in healthy adults, a value of 45 kcal/kg FFM/day equates energy balance. Low EA, which occurs with a reduction in EI and/or increased exercise load, causes adjustments to body systems to reduce energy expenditure, leading to disruption of an array of hormonal, metabolic, and functional characteristics. Loucks (2004), DE underpins a large proportion of cases of low EA, but other situations, such as a mismanaged program to quickly reduce body mass/fat or an inability to track EI with an extreme exercise commitment, may occur without such a psychological overlay. Although the literature on low EA has focused on female athletes, it has also been reported to occur in male athletes, Sundgot-Borgen *et al.* (2013).

The FAT starts with low energy availability (with or without eating disorders), which in turn causes amenorrhea and a reduction in estrogen levels that eventually leads to bone loss. An athlete's condition moves between health and disease along the spectrum of these interrelated conditions according to her diet and exercise habits, and FAT should be evaluated as a continuum rather than as a disorder consisting of three concise components. Bradley (2011), each individual component and the full range of the FAT, according to the ACSM, are shown in Figure 1.

More girls than ever are participating in sports. With this increase in participation, there has been an increase in FAT cases. As intensity of youth sports increase, so do the pressures put on young girls playing sports. However, if the approach to sports is not healthy, both physically and mentally, there can be serious consequences. Despite the concerns, many athletes and coaches are either uninformed on or unaware of the triad Brown (2014). In 1992, an association was discovered among low energy availability, disrupted menstrual function, and low bone density in female athletes playing sports that emphasize leanness Nattiv (2007). In 1993, the American College of Sports Medicine Task Force on Women's Issues convened and coined the phrase "FAT" to represent the three pathologies common in female athletes, Brunet (2005). Low energy availability is caused by DE in which exercise (energy expenditure) is greater than dietary EI, whether it be inadvertent or intentional, Nattiv (2007). Disrupted menstrual function and low bone density occur concurrently with the DE because as the energy available decreases, the skeletal and reproductive systems become impaired. The disrupted menstrual function can lead to primary amenorrhea, secondary amenorrhea, and oligomenorrhea, Horn



**Figure 1:** Female athlete triad. The ideal female athlete is to the far right of the spectrum, which defines optimal health spectra of the FAT

(2014). Low bone density can lead to stress fractures and osteoporosis, which can be irreversible, Horn (2014).

The three interrelated components of the FAT are energy availability, menstrual status, and bone health. Energy availability directly affects menstrual status, and in turn, energy availability and menstrual status directly influence bone health. Optimal health is indicated by optimal energy availability, eumenorrhea, and optimal bone health; whereas, at the other end of the spectrum, the most severe presentation of the FAT is characterized by low energy availability with or without an eating disorder, functional hypothalamic amenorrhea, and osteoporosis. An athlete's condition moves along each spectrum at different rates depending on her diet and exercise behaviors.

## 2. ENERGY AVAILABILITY AND EATING DISORDERS

Energy availability is the amount of dietary energy for all physiological functions after accounting for energy expenditure from exercise, that is, the amount of remaining energy available for other body functions after exercise training. Nazem (2012), in young healthy individuals, energy balance occurs at an energy availability of around 45 kcal/kg of free fatty mass per day. When values are under 30 kcal/kg of free fatty mass per day, the reproductive function and bone formation are reduced to restore energy balance, resulting in an impairment of reproductive and skeletal health, Manore (2007).

Low energy availability is a result of an expenditure of energy through exercise without proper replenishment of energy through diet. When the triad was first being defined, the American College of Sports Medicine used the term eating disorder rather than DE, Hergenroeder (2015). Now, the term DE is used because eating disorders are mental illnesses, such as anorexia nervosa and bulimia, and not all athletes with low energy



availability have an eating disorder, Nattiv (2007). Some athletes have low energy availability unintentionally because they may be eating a normal diet, but with exercise, they end up with an energy deficiency. With the pressures to perform and achieve in sports coupled with societal pressures, female athletes are at a higher risk of developing DE than non-athletes. Haase (2011), this is most common in athletes participating in sports that emphasize lean physique, Kong (2015). The sexualizing of female athletes in the media takes the focus off of the athletes' physical ability and onto her physical appearance. Kim (2014), whether the DE resulting in low energy availability is deliberate or unintentional, it is important that it is detected by a coach, parent, or physician before it results in amenorrhea or osteoporosis.

Eating is regulated by the neuroendocrine systems in which the hypothalamus-pituitary-adrenal axis plays a major role. The adipocyte-derived hormone leptin, which has an inhibitory effect on appetite, has been implicated in eating disorders. Barrios (2010), although the responsible mechanism still needs to be elucidated, recent research suggests that leptin level is an important indicator of energy deficiency, reflecting the dietary status and caloric balance, Mantzoros (2011).

### 3. MENSTRUAL STATUS

Menstrual dysfunction in the female athlete includes a wide spectrum of disorders. The most commonly discussed is amenorrhea or absence of menstrual cycle, which can be divided into primary and secondary. Primary amenorrhea, or delayed menarche, may be present in female athletes who begin training before puberty and is defined in an athlete with the absence of menstruation by the age of 15 years. Secondary amenorrhea occurs in postmenarchal athletes who lack three or more consecutive cycles after menarche and is not pregnant. Brunet (2005), in female athletes are also frequent the occurrence of irregular cycles or oligomenorrhea (six or fewer cycles per year). Nazem (2012) anovulation and luteal phase deficiency, with ovulation but inadequate progesterone support for endometrial development, may also occur, Yeager (1993).

Menstrual cycle problems result from the suppression of the pulsatile secretion of hypothalamic gonadotropin-releasing hormone (GnRH), which lead to a reduced secretion of luteinizing hormone (LH) and follicle-stimulating hormone (FSH), thus preventing ovarian stimulation, and causing a fall in the levels of estrogens and progesterone. One of the earliest theories on

menstrual dysfunction in female athletes theorized that the onset of menarche requires a critical threshold on body fat (17% of body weight) to be reached. Under this critical percentage of body fat, the metabolic rate decreases and the sensitivity of the hypothalamus to gonadal steroids would be altered. Psychological stress has also been implicated in the etiology of exercise-related menstrual disturbances, but few data seem to support this hypothesis, and amenorrheic athletes exhibit a similar psychological profile to menstruating athletes, Roupas (2011).

Although specific signals and pathways have yet to be identified, the etiology of functional hypothalamic amenorrhea associated with exercise and stress could be mainly a consequence of the inhibition of GnRH release and the loss of LH pulsatility, dependent on low leptin levels. In addition to regulating appetite and energy availability, leptin is known to centrally act to influence reproduction, exerting its effect over a narrow range of concentrations. Leptin concentration responds to a negative energy balance, and it seems that menstruation is not possible if leptin levels drop under a critical level. Korsten (2011), another hormone that affects GnRH pulsatility is ghrelin, an anorexigenic peptide that may help to explain why women have regained normal weight or who have ceased to exercise, but still show distorted eating patterns, can have prolongation of amenorrhea. Mendelsohn (2010) recent research also suggests a potential role for adiponectin, a hormone whose levels rise with prolonged fasting and weight reduction. It is known that adiponectin reduces basal and GnRH-stimulated LH secretion, Rodríguez (2007), and the high levels of adiponectin present in lean and energy restrained female athletes could contribute to chronic anovulation, Roupas (2011).

Additional hormones which apparently contribute menstrual cycle dysfunction and may influence GnRH release are glucocorticoids and catecholamines, which inhibit gonadal function in response to the stress of exercise. Wheatley (2012), various other hormones, such as corticotrophin-releasing hormone, growth hormone, insulin-like growth factor-1, thyroxine, or melatonin could also play a role, Mendelsohn (2010).

The reproductive organs are the first to be affected by a negative EI because they are not necessary for survival (non-vital). Women enter into a hypometabolic state in which menstrual function is altered to promote energy conservation. Horn (2014) and Hergenroeder (2015), this can manifest as primary or secondary

amenorrhea or oligomenorrhea. Horn (2014) decreased resting expenditure and suppressed triiodothyronine that has been documented as having a correlation with amenorrheic athletic women with and energy deficiency. Hergenroeder (2015), as many as, 69% of female athletes participate in a lean sports experience irregular menses as opposed to 5% of the general population.

Another way the body conserves energy is by increasing bone resorption. The skeletal system is the next to suffer decreased activity after the reproductive system. Horn (2014), osteoporosis is not only caused by bone mineral loss in adulthood but also by not achieving optimal BMD in adolescence. Nattiv (2007), according to Elizabeth Horn in "The FAT," "in healthy menstruating females, estrogen suppresses osteoclastic activity, promoting bone development, and normal BMD." Women acquire almost half of their bone mass from age of 12–16 years and start to lose bone mass in the beginning of the third decade of their life Hergenroeder (2015). Therefore, it is an important to develop the most bone mass possible in women's adolescence to prevent osteoporosis later in life.

#### 4. BONE HEALTH

The last component of the FAT is best described as a spectrum encompassing optimum bone health, low BMD, and osteoporosis [Figure 1]. Osteoporosis in female athletes refers to premature bone loss and inadequate bone formation, resulting in low BMD, microarchitectural deterioration, increased skeletal fragility, and increased risk of stress fractures. Beals (2002) and Ackerman (2011), physical exercise has a positive effect on bone accrual and architecture, and healthy athletes may have a higher BMD than nonathletic individuals. Lambrinoudak (2010), however, it is known that amenorrheic athletes have lower BMD than their eumenorrheic counterparts. Russell (2009), therefore, factors contributing to menstrual dysfunction can put athletes at risk for compromised bone health and for the development of abnormally low BMD (osteopenia) and osteoporosis, Wheatley (2012).

Estrogen helps to the maintenance of BMD by influencing calcium absorption, bone formation, and remodeling. Estrogen has a direct effect on osteoblasts by increasing cell proliferation and proteins that alter bone remodeling and also inhibits the production of cytokines associated with bone reabsorption. Brunet (2005), in addition to, a decrease in hormone concentration, other components of the FAT may directly or indirectly affect bone mass. Thus, low energy availability or restricted

EI may result in an inadequate intake of macronutrients, such as essential amino acids and fatty acids, or mineral, and vitamins, such as calcium and Vitamin D, which are required for bone health. Nazem (2012), low energy availability may also impair bone formation through effects on other hormones such as cortisol and leptin, Nattiv (2007).

Athletes suffering from menstrual cycle disturbances are especially at risk for stress fractures, whose incidence has been reported to be higher among amenorrheic and oligomenorrheic as compared to eumenorrheic athletes, Beals (2002). Feingold (2006), the risk of stress fractures is increased by factors such as age, BMD, prior exercise training, and alcohol, but not by the age of menarche or oral contraceptive use. Shaffer (2006), the most common site of stress fractures in women is the tibia, accounting for 25%–63% of cases.

#### 5. LONG-TERM CONSEQUENCES

The benefits of athletics include better health and higher self-esteem, Thein-Nissenbaum (2013). However, every athlete deals with the pressure that accompanies competitive sports differently. For the select women and girls that develop energy deficiency, amenorrhea, or low BMD, the long-term consequences can be severe. The triad was first identified in the early 1990s, and the young women who had it then are now in their 30s and 40s, Thein-Nissenbaum (2013). Observations of these adult women have shed some light on the consequences of developing symptoms of the triad as an adolescent; the most negative consequences are a result of low bone development in adolescence. By the age of 18 years, 95% of a woman's total bone mass will have been developed, Thein-Nissenbaum (2013). The amount of bone mass acquired in adolescence is the biggest indicator of whether a person will develop osteoporosis and their risk for future stress fractures. Thein-Nissenbaum (2013), even in the absence of amenorrhea, energy deficiency is associated with low BMD. Not acquiring the optimal BMD in adolescents can lead to permanent deficits. Adults that suffered from DE in adolescence are 2–7 time more likely to developing osteoporosis or osteopenia. Thein-Nissenbaum (2013), even if the DE is overcome and the subject returns to healthy body weight, they may never be able to acquire the sufficient levels of bone mass that will take them out of the range of risk for osteoporosis or osteopenia.

Besides developing osteoporosis later in life, adolescent females who suffer from DE also suffer from

psychological problems and premature death. Thein-Nissenbaum (2013), some psychological problems associated with eating disorders are low self-esteem, anxiety, and depression. Nattiv (2007), athletes with eating disorders are 5.4% more likely to attempt suicide than athletes without eating disorders. Nattiv (2007), females that suffered from anorexia nervosa are 6 times more likely to die prematurely. Only 33% of women that recover from an eating disorder record sustained healthy weight, menstrual function, and eating behaviors, Nattiv (2007).

Screening of the athletes for DE and amenorrhea and other patterns of menstrual irregularity, history of stress fractures, training intensity, and lifestyle behaviors, are essential for the prevention of the FAT. Morghental (2002), screening in athletes at risk should take place during pre-participation exams or annual health check-ups. The ACSM recommends an adequate understanding of the relationships among the FAT components, the spectrum within each component, and rates of movement along each spectrum [Figure 1], for correct screening. Nattiv (2007), it should start with a detailed history, including aspects regarding diet and eating behaviors, menstrual history, physical activity, and injuries. Nazem (2012), athletes with a history suggesting one or more components of the FAT should have a physical examination, being alert for signs and symptoms or an eating disorder. Laboratory testing, including a chemistry profile with electrolytes, a complete blood count, thyroid function tests, urinalysis, and hormone levels of LH, FSH, estradiol, prolactin, and TSH, will help to the diagnosis. BMD should be assessed by DXA in athletes with evidence of menstrual dysfunction or a history of stress fractures, Mendelsohn (2010).

Preventive aspects are essential and must involve the entire health-care team. Waldrop (2005), athletes, parents, and coaches should be educated about what the FAT is, how to recognize signs, and how to take steps for prevention before this condition causes irreversible health problems. Miller (2012), all must understand that the body has no mechanisms for automatically adjusting EI to energy expenditure by the working muscle. Loucks (2006), preventive measures should include optimization of energy availability, maximization of bone mineral accrual young athletes, and counseling on nutritional requirements according to age. Moreover, sports administrators should also consider rules to discourage unhealthy weight loss practices.

## 6. DISCUSSION

As societal and sport pressures increase on young athletic women today, it is increasingly important to inform coaches, parents, medical professionals, and athletes about the risk of the FAT. Parents and coaches should pay close attention to the athletes eating habits and training regimen to prevent DE or detect an eating disorder. When medical professionals see young athletes, they should have a thorough discussion regarding the patients' menstrual cycle, eating habits, and previous dual-energy X-ray absorptiometry (DXA) scans. Thein-Nissenbaum (2013) increased that screening for the triad will help identify symptoms earlier and possibly prevent long-term consequences, such as osteoporosis and through treatment.

Treatment for the triad begins with increasing energy availability by increasing EI through diet and decreasing energy expenditure through exercise. Hergenroeder (2015), the result of this weight gain and increased energy is the return of spontaneous menses, and the return of spontaneous menses results in increased BMD.

## 7. CONCLUSIONS

The FAT is an increasingly prevalent condition which involves low energy availability, menstrual cycle disturbances, and decreased BMD. The main element underlying all the aspects of the FAT is low energy availability so that loss of caloric balance results in menstrual dysfunction and, therefore, in inadequate estrogen production and loss of bone health. Because disorders of the FAT associate with serious, potentially life-threatening consequences, prevention, and early treatment are necessary to maintain the athlete's health and to avoid sequelae. A team approach is essential, with each professional given a role in dealing with a particular aspect of the FAT.

## REFERENCES

1. Ackerman, K.E., and Misra, M. Bone health and the female athlete triad in adolescent athletes. *Phys Sportsmed*, 2011, 39, 131-141.
2. Bradley, J.W., and Woolf, K. The female athlete triad: Patients do best with a team approach to care. *JAAPA*, 2011, 24, 505-556.
3. Beals, K.A., and Manore, M.M. Disorders of the female athlete triad among collegiate athletes. *Int J Sport Nutr*, 2002, 12, 281-294.
4. Brown, K.N., Wengreen, H.J., and Beals, K.A.

- Knowledge of the female athlete triad, and prevalence of triad risk factors among female high school athletes and their coaches. *J Pediatr Adolesc Gynecol*, 2014, 27(5), 278-282.
5. Brunet, M., 2<sup>nd</sup>. Female athlete triad. *Clin Sports Med*, 2005, 24(3), 623-636.
  6. De Souza, M.J., Nattiv, A., Joy, E., Misra, M., Williams, N.I., Mallinson, R.J., Gibbs, J.C., Olmsted, M., Goolsby, M., Matheson, G., and Expert Panel. 2014 Female athlete triad coalition consensus statement on treatment and return to play of the female athlete triad. *Br J Sports Med*, 2014, 48, 289.
  7. De Souza, M.J., Williams, N.I., Nattiv, A., Misra, M., Loucks, A.B., Matheson, G., Olmsted, M.P., Barrack, M., Mallinson, R.J., Gibbs, J.C., Goolsby, M., Nichols, J.F., Drinkwater, B., Sanborn, C., Agostini, R., Otis, C.L., Johnson, M.D., Hoch, A.Z., Alleyne, J.M., Wadsworth, L.T., Koehler, K., VanHeest, J., Harvey, P., Kelly, A.K., Fredericson, M., Brooks, G.A., O'Donnell, E., Callahan, L.R., Putukian, M., Costello, L., Hecht, S., Rauh, M.J., and McComb, J. Misunderstanding the female athlete triad: Refuting the IOC consensus statement on relative energy deficiency in sport (RED-S). *Br J Sports Med*, 2014, 48(20), 1461-1465.
  8. Drinkwater, B.L., Nilson, K., and Ott, S. Bone mineral density after resumption of menses in amenorrheic athletes. *JAMA*, 1986, 256, 380-382.
  9. Feingold, D., and Hame, S.L. Female athlete triad and stress fractures. *Orthop Clin North Am*, 2006, 37, 575-583.
  10. Hergenroeder, A.C., De Souza, M.J., and Anding, R.H. The female athlete triad: Energy deficiency, physiologic consequences, and treatment. *Adolesc Med*, 2015, 26, 116-142.
  11. Horn, E., Gergen, N., and McGarry, K.A. The female athlete triad. *R I Med J*, 2014, 97(11), 18-21.
  12. Kong, P., and Harris, L.M. The sporting body: Body image and eating disorder symptomatology among female athletes from leanness focused and nonleanness focused sports. *J Psychol*, 2015, 149(2), 141-160.
  13. Korsten-Rech, U. FIMS position statement. The female athlete triad. *Int Sport Med J*, 2011, 12, 156-159.
  14. Lambrinoudaki, I., and Papadimitriou, D. Pathophysiology of bone loss in the female athlete. *Ann N Y Acad Sci*, 2010, 1205, 45-50.
  15. Lebrun, C.M. The female athlete triad: What's a doctor to do? *Curr Sports Med Rep*, 2007, 6, 397-404.
  16. Loucks, A.B., Stachenfeld, N.S., and DiPietro, L. The female athlete triad: Do female athletes need to take special care to avoid low energy availability? *Med Sci Sports Exerc*, 2006, 38, 1694-1700.
  17. Manore, M.M., Kam, L.C., and Loucks, A.B. The female athlete triad: Components, nutrition issues, and health consequences. *J Sport Sci*, 2007, 25, S67-S71.
  18. Mantzoros, C.S., Magkos, F., Brinkoetter, M., Sienkiewicz, E., Dardeno, T.A., Kim, S.Y., Hamnvik, O.P., and Koniaris, A. Leptin in human physiology and pathophysiology. *Am J Physiol Endocrinol Metab*, 2011, 301, E567-E584.
  19. Mendelsohn, F.A., and Warren, M.P. Anorexia, bulimia, and the female athlete triad: Evaluation and management. *Endocrinol Metab Clin North Am*, 2010, 39, 155-167.
  20. Miller, S.M., Kukuljan, S., Turner, A.I., van der Pligt, P., and Ducher, G. Energy deficiency, menstrual disturbances, and low bone mass: What do exercising Australian women know about the female athlete triad? *Int J Sport Nutr Exerc Metab*, 2012, 22, 131-138.
  21. Nattiv, A., Loucks, A.B., Manore, M.M., Sanborn, C.F., Sundgot-Borgen, J., and Warren, M.P. American college of sports medicine position stand. The female athlete triad. *Med Sci Sports Exerc*, 2007, 39(10), 1867-1882.
  22. Nazem, T.G., and Ackerman, K.E. The female athlete triad. *Sports Health*, 2012, 4, 302-311.
  23. Roupas, N.D., and Georgopoulos, N.A. Menstrual function in sports. *Hormones*, 2011, 10, 104-116.
  24. Rodríguez-Pacheco, F., Martínez-Fuentes, A.J., Tovar, S., Pinilla, L., Tena-Sempere, M., Dieguez, C., Castaño, J.P., and Malagon, M.M. Regulation of pituitary cell function by adiponectin. *Endocrinology*, 2007, 148, 401-410.
  25. Russell, M., Stark, J., Nayak, S., Miller, K.K., Herzog, D.B., Klibanski, A., and Misra, M. Peptide YY in adolescent athletes with amenorrhea, eumenorrheic athletes and non-athletic controls. *Bone*, 2009, 45, 104-109.
  26. Sundgot-Borgen, J., and Torstveit, M.K. Aspects of disordered eating continuum in elite high-intensity sports. *Scand J Med Sci Sports*, 2010, 20 Suppl 2, 112-121.
  27. Thein-Nissenbaum, J. Long term consequences of female athlete triad. *Maturitas*, 2013, 75(2), 107-112.
  28. Waldrop, J. Early identification and interventions for female athlete triad. *J Pediatr Health Care*, 2005, 19, 213-220.
  29. Wheatley, S., Khan, S., Szekely, A.D., Naughton, D.P., and Petroczi, A. Expanding the female athlete triad concept to address a public health issue. *Perform Enhanc Health*, 2012, 1, 10-27.
  30. Yeager, K.K., Agostini, R., Nattiv, A., and Drinkwater, B. The female athlete triad: Disordered eating, amenorrhea, osteoporosis. *Med Sci Sports Exerc*, 1993, 25, 775-777.



# Impliance of Exercise on Mental Health

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## ABSTRACT

Mental disorders are common, and they are a significant contributor to disability in the community. There is growing interest in the effectiveness of exercise interventions for improving mental and physical health in individuals with mental disorders. This paper reviews the evidence for the benefits of exercise for mental health problems and also shown that physical fitness apparently protects the memory centers of the brain. Regular physical exercise helps lower our risk of high blood pressure, high cholesterol, diabetes, and host of other problems. In this paper, we are discuss the effect of physical fitness as a factor influenced by sport and other bodily activities on the mental health of non-patients.

**Keywords:** Exercise, Mental health, Physical fitness, Sports.

## 1. INTRODUCTION

There is a substantial body of evidence that shows a positive relationship between physical activity and mental health and illness. People who are engaged in sports activities have a better feeling about their body image and physical health. Cross-sectional studies show that regular physical activity is associated with better mental health and emotional well-being and lower rates of mental disorders.

Physical fitness exercises help cure panic, reduce depression symptoms, increase emotional responses in depressed people, decrease anxiety, cure psychosomatic disorders, obsession and psychosis, increase life expectancy, and improve the quality of life. Due to today's lifestyle and eating habits, a relaxed work environment rich as well as poor people also are struggling with various mental and physical disorders/sickness, such as high blood pressure, diabetes, cancer, heart diseases, and hypertension. For the betterment and maintaining standard of life, every human being has to maintain his/her mental health sound. Physical fitness and its components are related to mental health. Self-image and life satisfaction are truly responsible for good mental health. It helps to improve a positive approach toward self and others. Moreover, it is been proved that physical activity helps an individual in maintaining his/her mental state.

Research has proved that mental health is improved by regular low and medium level physical activity. People exercising for regular succession find improvement in their self-actualization, self-image, and their physical fitness. In today's generation, lack of exercise has become very serious health issues associated with mental and physical health. Through participation in sports and other physical activities, self-image can be improved and personality becomes dynamic. Furthermore, self-confidence, high social cooperation, and coordination can be achieved. By exercising physical activity, anxiety can be reduced and increases the emotional response of people suffering from anxiety. It helps in making an individual free from physical and mental fitness-related disorders. Furthermore, it helps to improve the quality of lifespan.

Therefore, the aim of this research is to study the effect of physical fitness as a factor influenced by sport and other bodily activities on the mental health of non-patients.

## 2. IMPLIANCE OF EXERCISE ON VARIOUS COMPONENTS OF MENTAL HEALTH

### 2.1. Emotions

As we start with regular exercise of any physical activity, then it becomes our habit with regular exercising any kind



of physical activity. It helps to archive good living standard and good habits. Regular exercising fills our life with a positive attitude and strengthens our emotional attitude.

Physical exercises are related to the continuous positive emotional state of an individual's mind. Research work carried out in this filed proved that physical activity and mental health are closely associated with each other "META" describes that aerobic exercise provides a boost to the mental and physical energy level. Which required performing day-to-day work? In our daily routing sometime, we come across intensive fatigue, partially or complete failure, anxiety depression, etc., throw exercising regular physical activity. We can lower the intensity of such elements. Experimental test promotes the positive effect of medium intensity level exercise in maintaining good mental health.

## **2.2. Value Life**

Physical activity is closely associated with overall physical, mental, spiritual, health, and our quality of life depend on all these aspects. There are a total of 8 components on which quality of life is characterized by vitality, social work, mental health, emotional health pain, physical work, and health limitations. Research has proved that physical activity is benefitted for people suffering from a mental disorder. High-level physical activity helps adolescents to balance their mental health-related state positively.

## **2.3. Individual Image**

As per experts self – assessment is the best index of an individual's mental health. It has been proved from 399 non-clinical tests, the positive impact of regular exercise can be seen as self-image, self-concept can be positively improved, and level of anxiety (depression) can be reduced. Study shows that regular exercise is beneficial for self-awareness and self-image also to change negative self-image into positive and also it has been proved that in less time cluster of aerobic exercise and resistance training method helps to improve self-image. It is been studied in supervisory training program implemented/executed for obese adolescents, they found their improvement in their self-image and also approach of others toward them was positively improved.

## **2.4. Rest**

Research shows that out of the adult population, 30% of people are suffering from a sleep disorder and also

found that exercising physical fitness activity done in the adequate presence of light that it helps in sound sleep. Furthermore, in personal study, it is been observed that through exercise quality and depth of sleep in improved. Therefore, people who are suffering from sleeping disorder by exercising any physical activity regularly can improve their quality of sleep.

## **2.5. Tension and Stress**

The study shows that regular physical activity can minimize or control the anxiety level of stress or tension. To avoid/reduce mental or physical stress, people generally found smoking or drinking, but it will not help. Moreover, its bad reaction can be observed. Exercise is the only healthy way of overcoming any sort of stress and anxiety. By exercising regular physical activity, we will be able to maintain our health sound and can improve positive response to mental stress and control it.

## **2.6. Sickness**

The medical field has proved that mental challenge and stress are the two mild levels of mental disorders and through exercise, one can overcome from it. Research shows that exercise is a perfect way of mental stress healing. Therefore, physical activity is an easier way to keep away sadness rather than smoking, alcohol consumption, taking medical, and or any psychiatric treatment. Furthermore, the study shows that people who are actively doing physical activity from the past two or more years are physically and mentally fit.

# **3. MAINTAIN THE MENTAL HEALTH AND IMPORTANCE OF PHYSICAL EXERCISE**

## **3.1. Fitness**

Various researches being carried out regarding curing various serious physical or mental disorders, a minimum 3 time/week 30 min workout is suggested by the medical practitioners. "DOSE" study suggests 30 min exercise for 5 or more days in a week, it helps in lowering the desperation/mental stress. Aerobic and anaerobic physical training beneficial for overall health.

# **4. CONCLUSION**

In this paper, the relationship between physical activity and mental health is studied. It is also observed that physiology and psychology these two different subjects

are closely related to each other. Furthermore, for curing mental health, physical activity is being suggested. Moreover, high-level physical fitness enables an individual to improve and or maintain his/her mental health and to pursue a good standard of living physical fitness that can be enhanced by regular sporting and other physical moderate activities. Once physical fitness, as a factor influenced by sport, is improved, society's mental health can be expected to be attained. Since sport, as a tool in managing tension, can reduce the effects of tenseness, increase positive emotions and since it can enhance people physical and mental health and, as a result, their happiness in life. As mental disorders increase the risk of chronic physical conditions and tend to recur across the lifespan, exercise can be useful for both mental and physical health and may maintain well-being and prevent recurrences of poor mental health.

## REFERENCES

1. Neeser, K.J. *Aging Studies School of Sport Science*. Bangkok, Thailand: Chulalongkorn University; 2005.
2. Powers, S.K. *Exercise Physiology: Theory and Application to Fitness and Performance*. New York: McGraw-Hill Inc.; 2001.
3. Harris, D.V. *Sports Psychology: Mental Skills for Physical People*; 1987.
4. Straub, O.S. *Health Psychology*. New York: Worth Publisher; 2002.
5. Esfahani, N. The impact of sport on physical, anxiety, sleep disorder, social function and depression components of mental health in Azzahra University students. *Harakat*, 2002, 12, 75-86.
6. Biddle, S.J.H., Fox, K.R., and Boutcher, S.H. *Physical Activity and Psychological Well-Being*. London: Routledge; 2000.
7. Vliet, P.V.D. The effect of fitness training on clinically depressed patients an intra-individual approach. *Psychol Sport Exerc*, 2004, 5, 153-116.
8. Asci, F.H. The effects of physical fitness training on trait anxiety and physical self-concept of female university students. *Psychol Sport Exerc*, 2003, 4, 255-264.
9. Schmitz, N., Kruse, J., and Kugler, J. The association between physical exercises and health-related quality of life in subjects with mental disorders: Results from a cross sectional survey. *Prev Med*, 2004, 39(6), 1200-1207.

# Effect of Physical Exercise and Diet in Reducing Obesity

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## ABSTRACT

According to the World Health Organization in 2020, 2.8 million people are dying from obesity. Obesity is a serious problem for sedentary peoples caused by the accumulation of excessive fat in our body, and it is due to a lack of physical exercise. Obesity is a major risk factors hypertension, diabetes, musculoskeletal disorders, and some cancers. The main treatment for obesity is a controlled diet (calorie restriction strategies), augmenting physical exercise, and cognitive behavioral therapy. Low-calorie diet refers to a diet with a total dietary intake of 800–1500 calories with balanced macronutrients, vitamins, and minerals. About 55% of the dietary calories should come from carbohydrates, 10% from proteins, and 30% from fats, of which 10% of total fat consists of saturated fats. After reaching the desired weight, the amount of dietary calories consumed can be increased gradually to maintain a balanced between calories consumed and calories expended, with regular physical exercises. A meta-analysis by Franz found that by calorie restriction and exercise, weight loss of 5–8.5 kg was observed 6 months after the intervention. After 48 months, a mean of 3–6 kg was maintained. In conclusion, there is evidence that obesity is preventable and treatable, and dieting and physical exercises can produce weight loss that can be maintained.

**Keywords:** Aerobic exercise and resistance training, Body mass index, Diet, Exercise, Non-alcoholic fatty liver disease, Obesity.

## 1. INTRODUCTION

Obesity rate highly increased in America, Mexico, and Hungary and some developing countries, particularly in women due to social inequalities and less education. This review aims to evaluate the present management of obesity and overweight, employing a combination of dietary interventions, exercise, and behavioral modifications.

### 1.1. Definition of Obesity

Obesity can be defined as an excessive amount of fat that increases the risk of medical illness and premature death. A simple and convenient way of defining obesity by the World Health Organization (WHO) and National Institution of Nutrition is based on body mass index (BMI). A BMI between 25 and 29.9 is deemed to be overweight. Obesity is defined as BMI >30 and is further subdivided into Class 1–3.

### 1.2. Health Consequences of Obesity

Obesity is caused by genetic, metabolic, environmental, and psychological factors. Obesity causes serious

health risks such as hypertension, type 2 diabetes, cardiovascular diseases – hypertension, stroke coronary artery disease, venous stasis and deep-vein thrombosis, osteoarthritis, gastrointestinal disease, gastroesophageal reflux disease, cholelithiasis, and non-alcoholic fatty liver disease (NAFLD).

### 1.3. Medical Treatment of Obesity and Overweight

The management of overweight and obesity is lifestyle intervention, consisting of dietary interventions, exercise, and behavioral intervention.

### 1.4. Dietary Intervention

Dietary interventions are the cornerstone of weight loss therapy. Most of the dietary regimens proposed for weight loss focus on energy content and macronutrient composition. It is the energy content that determines the efficiency of the dietary regimens. Obesity treatment guidelines issued by the NIH recommended that persons who are overweight or who have Class 1 obesity and who have two or more risk factors should reduce their energy intake 500 kcal/day reduction. Persons with Class 2 and

Class 3 obesity should strive for 500–1000 kcal/day. With a reduction of 500 kcal/day energy intake, a weight reduction of 0.5 kg/week can be achieved.

### 1.5. Types of Diets

In general, there are four types of dietary regimes used in the treatment of obese persons.

1. Low-calorie diet (LCD).
2. Low-fat diet
3. Low-carbohydrate diet.

The first three diets are 800–1500 kcal/day.

### 1.6. LCD

LCDs are high in carbohydrate (55–60%), low in fat (<30% of energy intake), and high in fiber and have a low glycemic index. Alcohol and energy-dense snacks should be avoided. LCD has been shown in 3–12 months period.

### 1.7. Low-carbohydrate Diet

The carbohydrate content of the diet is an important determinant of short term (<2 weeks) weight loss. Low-carbohydrate (60–150 g of carbohydrate/day) and very low-carbohydrate are more popular for many years. Glycogen utilization occurs when carbohydrate intake is restricted. When the carbohydrate intake is <50 g/day, ketosis will develop from glycogenolysis, resulting in fluid loss.

Each of the three types of diet for weight loss has its proponents. In a meta-analysis of 80 weight loss studies, mean weight loss of 5–8.5 kg (5–9%) was observed during the first 6 months from interventions involving reduced

energy diet and/or weight loss medications with eight plateaus at approximately 6 months, with maintenance of 3–6 kg (3–6%) of weight loss at 48 months. Thus, choosing a diet with a macronutrient composition based on a subject's taste preference can achieve better compliance.

### 1.8. Exercise and Obesity

Sports and recreational activities are vital to sport medicine and treatment for obesity peoples and athletes who participated in sports activities regularly. According to reports of WHO, people who lead an active lifestyle are happier and less stressed as compared with that of inactive peoples. Researchers recommended that taking part regularly in physical fitness programs and avoiding excessive cholesterol food is advisable.

Aerobic exercise brings down the quality of fatty tissues in the body, lose weight, and change physical appearances of individuals. Researchers recommended that moderate-intensity exercising between 159 and 250 min weekly is effective in preventing weight gain. To provide and maintain a clinically significant weight loss, at least 200–300 min/week of moderate-intensity, aerobic exercise is required. Resisting training does not enhance weight loss but may increase fat-free mass. Even in the absence of significant weight loss, regular aerobic and resistance exercise improve cardiovascular fitness and obesity-related comorbidities such as NAFLD. Exercise reduces food intake by increasing the satiating efficiency of a fixed meal.

## 2. METHODOLOGY

The review was conducted from 90 articles and only some important articles, texts are reported from

**Table 1: Comparison of different weight loss diets**

Diet	Daily caloric content /composition	Mean weight loss	Benefits	Disadvantages
Low calorie	800–1500 kcal 55–60% carbohydrate(high fiber) <30% fat	–10% in 3–12 months	Reduction in blood glucose TG, LDL, BP	Compliance difficult in the long term
Low fat	1000–1500 kcal 20–25% fat	–5% in 2–12 months	Reduction in blood glucose. LDL, BP	Less palatable, feel hungry easily increase TG
Low carbohydrate	1000–1500 kcal 60–150 g of carbohydrate	–5% in 2–12 months	Faster initial weight loss. Reduction of blood glucose TG, LDL, BP	Ketosis when carbohydrate intake <50 g/day
Very low-carbohydrate diet	200–800 kcal 55–60% (high fiber, <30% fat)	>10% in 2–8 weeks	Rapid weight loss	Electrolyte imbalance, hypotension, gall stones need medical supervision

LDL: Low-density lipids, TG: Triglycerides, BP: Blood pressure

experimental studies, survey research review and cross-sectional research related to the effect of physical exercise and diet on obesity. In addition, research uses BMI, NIH, and WHO reports.

### 3. DISCUSSION

The study concludes that combined aerobic and resisting training for 12 weeks results in reducing body fat percentage and improves muscular strength capacity. In addition, engaging in regular physical activity reduces the risks of obesity health-related problems. Both high- and low-intensity exercise resulted in reducing systolic blood pressure and serum triglycerides.

### 4. CONCLUSION

Obesity and overweight are increasing at an alarming rate globally and has reached epidemic portions in almost every country. A developing nation like India is also facing this problem due to sedentary lifestyle and blindly following Western food habits, which are not suits for us. Obesity has a significant contribution toward cardiovascular diseases, metabolic disorders, gastrointestinal disorders, and cancers. In the early stages of obesity, it can be arrested through diet, physical exercise. People should participate in aerobic, anaerobic, resisting training, and strength training, etc., these will bring good weight loss effect, increases blood flow, oxygen transmission capacity, consumes body fat, and also improves inner metabolism. Finally, consuming a balanced diet and participating in regular physical exercise will reduce the risks of obesity.

An “ABCDE” approach to obesity:

- A For measurement of cardiovascular risk and comorbidity

- B For blood pressure control
- C For cholesterol management
- D For diet control and test for diabetes
- E For exercise therapy.

### REFERENCES

- Al-Thani, M.H. Dietary and nutritional factors influencing obesity in Qatari adults and the modifying effect of physical activity. *J Obes Weight Loss Mediat*, 2017, 1(2), 1-7.
- Astrup, A., Ryan, L., Grunwald, G.K., Storgaard, M., Saris, W., Melanson, E., and Hill, JO. The role of dietary fat in body fatness: Evidence from a preliminary meta-analysis of randomized controlled trials. *Arch Intern Med*, 2006, 166, 285-293.
- Blaha, M.J., Bansal, S., Rouf, R., Golden, S.H., Blumenthal, R.S., and Defilippis, A.P. A practical “ABCDE” approach to the metabolic syndrome. *Mayo Clin Proc*, 2008, 83, 932-941.
- Chalasani, N., Younossi, Z., Lavine, J.E., Diehl, A.M., Brunt, E.M., Cusi, K., Charlton, M., and Sanyal, A.J. The diagnosis and management of non-alcoholic fatty liver disease: Practice guideline by the American association for the study of liver diseases. American college of gastroenterology, and the American gastroenterological association. *Hepatology*, 2012, 55, 2005-2023.
- Clinical guidelines on the identification, evaluation and treatment of overweight and obesity in adults-the evidence report. National institution of health. *Obes Res*, 1998, 6 Suppl 2, 51S-209S.
- FAO/WHO/UNU. Energy and protein requirements. Report of a joint FAO/WHO/UNU expert consultation. *World Health Organ Tech Rep Ser*, 1985, 724, 1-206.
- Lakdawala, M., and Bhasker, A. Asian consensus meeting on metabolic surgery (ACMOMS). *Obes Surg*, 2010, 20, 929-936.
- WHO Expert Constitution. Appropriate body mass index for Asian population and its implications for the policy and intervention strategies. *Lancet*, 2004, 363, 157-163.



# Relationship of Health-Related Physical Fitness with the Personality Trait of Academic College Students

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## ABSTRACT

The main purpose of the study was to determine the relationship between the health-related physical fitness and personality trait of the students belonging to the academic college. It was hypothesized that a significant relationship would be found between health-related physical fitness components and personality trait of academic college students. The present study was delimited to 250 subjects who were selected from academic colleges of Sidho-Kanho-Birsha University, Purulia, West Bengal. The age of the subjects ranged between 18 and 25 years. The criterion measures of selected variables were muscular strength (pull-ups in numbers), muscular endurance (bent-knee sit-ups in numbers), cardiorespiratory endurance (600-yard run/walk-in seconds), flexibility (sit and reach test in centimeter), weight (weighing machine in kilogram), and body composition (biceps, triceps, subscapular, and suprailiac skinfold caliper in millimeters) and Eysenck personality inventory was used. To describe the nature of data, descriptive statistics were computed. To establish the relationship between a dependent (health-related physical fitness) and independent variables (personality trait), Pearson's product-moment coefficient of correlation statistical technique was employed separately for each selected variable. To test the hypothesis, the level of significance was kept at 0.05. Personality trait showed significantly positive relationship with cardiovascular endurance ( $r = 0.242$ ), whereas insignificant relationships were found with muscular strength ( $r = 0.098$ ), muscular endurance ( $r = 0.009$ ), flexibility ( $r = 0.123$ ), fat weight ( $r = 0.137$ ), lean body weight ( $r = 0.041$ ), and composite score of health-related physical fitness ( $r = 0.107$ ).

**Keywords:** Body composition (lean body weight and fat weight), Cardiovascular endurance, Flexibility, Health-related physical fitness, Muscular endurance, Muscular strength, Personality trait.

## 1. INTRODUCTION

The notion about personality as something fixed as well as dynamic, inherited as well as acquired, and concrete as well as abstract at the same time, has always remained in a flux. It is well known facts that "body is the servant of mind" as well as "sound mind possesses in a sound body." There is also a saying, "health is wealth." It indicates that if an individual keeps himself fit and enjoys sound health, he will be the richest and happiest person in the world. Hence, the present study was undertaken and stated as a "relationship of health-related physical fitness with the personality trait of academic college students."

### 1.1. Purpose of the Study

The main purpose of the study was to determine the relationship between the health-related physical fitness

components and personality trait of college students. The other purpose of the study was to know the status of the health-related physical fitness of male students of academic college.

### 1.2. Hypothesis

On the basis of the literature reviewed, it was hypothesized that a significant relationship would be found between health-related physical fitness components and personality trait of academic college students.

## 2. METHODOLOGY

For the present study, 250 students were selected from the academic colleges of West Bengal by adopting simple random sampling method and the data on selected variables were collected on muscular strength using

**Table 1:** Description of health-related physical fitness components and achievement motivation of academic college students

Health-related physical fitness and its components	Mean	Standard deviation	Minimum score	Maximum score
Muscular strength (pull-ups)	8.720	2.243	5.000	13.000
Muscular endurance (sit-ups)	34.496	5.062	29.000	46.000
Cardiovascular endurance (600-yard run/walk)	141.461	9.436	130.000	179.000
Flexibility (sit and reach test)	12.756	2.427	6.000	25.000
Fat weight	6.206	2.306	3.344	16.296
Lean body weight	49.834	4.882	37.310	67.704
Composite score of health-related physical fitness	250.001	26.893	177.538	311.751
Achievement motivation	19.512	3.930	11.00	31.00

n=250

**Table 2:** Relationship of health-related physical fitness components with the personality trait of academic college students

Variables correlated	Co-efficient of correlation (r)
Muscular strength and personality trait	0.098@
Muscular endurance and personality trait	0.009@
Cardiovascular endurance and personality trait	0.242*
Flexibility and personality trait	0.123@
Fat weight and personality trait	0.137@
Lean body weight and personality trait	0.041@
Health-related physical fitness and personality trait	0.107@

\*Significant at 0.05 level, Tabulated  $r_{0.05}(248)=0.123$ , @Not significant at 0.05 level,  $n=250$

pull-ups (numbers), muscular endurance by bent-knee sit-ups (numbers), cardiorespiratory endurance by 600-yard run/walk (seconds), flexibility by sit and reach test (centimeters), and total body weight by weighing machine (kilogram). Body composition – body fat was measured using four sides skinfold thickness (biceps, triceps, subscapular, and suprailiac) methods with the help of skinfold caliper in millimeters and the lean body weight and fat weight were computed using the developed ready reckoner. Personality trait was assessed by administering the Eysenck personality inventory questionnaire, and the score was recorded in numbers.

### 3. RESULTS AND DISCUSSION

The collected raw data were systematically arranged in the tables for further statistical treatment. To describe the nature of data, descriptive statistics were computed. To establish the relationship between a dependent (health-related physical fitness) and independent variables (personality trait), Pearson's product-moment coefficient of correlation

statistical technique was employed separately for each selected variable. To test the hypothesis, the level of significance was kept at 0.05. The findings of the statistical analysis are shown in the following Table 1.

Table 2 shows that cardiovascular endurance ( $r = 0.242$ ) is significantly correlated to personality trait because the calculated r-value is greater than the tabulated r-value of 0.123, needed to be significant at 0.05 level with 248 degrees of freedom.

The findings of Table 2 also indicate that the fitness components of muscular strength ( $r = 0.098$ ), muscular endurance ( $r = 0.009$ ), flexibility ( $r = 0.123$ ), fat weight ( $r = 0.137$ ), lean body weight ( $r = 0.041$ ), and composite score of health-related physical fitness ( $r = 0.107$ ) do not correlate significantly to personality trait as the calculated r-values are less than that of tabulated  $r = 0.123$ .

### 4. FINDINGS

As the result revealed that only cardiovascular endurance showed significant relationship with personality trait of the college students, it may be attributed to the fact that the personality of an individual depends on varied factors, namely, physical appearance, way of talking, walking, healthy habits, way of behaviors with others, decision-making capacity, emotional intelligence, and interaction with the groups and society. It is observed that all the aforementioned characteristics are possessed by a fit person; hence, such results might have occurred in this study.

### 5. CONCLUSION

Recognizing the limitations of the study and on the basis of statistical findings, it might be concluded

that significant relationships were found between cardiovascular endurance with personality trait, whereas other health-related physical fitness components show insignificant relationship with personality trait.

## REFERENCES

- Bed, G. *Physical Fitness a Way of Life*. New York: John Willey and Sons Inc.; 1979, p. 176.
- Clarke, D., and Harrison, C.H. *Research Process in Physical Education, Recreation and Health*. England Cliffs, New Jersey: Prentice Hall, Inc.; 1970.
- Dwyer, T., James, F.S., Leigh, B., Loss, L., and Kimberlle, D. Relation of academic performance to physical activity and fitness in children. *Pediatr Exerc Sci*, 2001, 13(3), 225-237.
- Shashidhar, H.N., and Madialagan, S. Relationship of health related physical fitness variables to academic achievement of high school boys. *Int J Eng Res Sports Sci*, 2015, 2(10), 144-147.

# Role of Sports Psychology in Physical Education and Sports

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## ABSTRACT

The demand and popularity of sports psychology both as an academic discipline and an applied practice of sports psychology in sports have grown significantly in the past 3 decades. The domain of an academic discipline of sports psychology is an interdisciplinary science that draws on knowledge from many related fields including biomechanics, physiology, kinesiology, and psychology. It involves the study of how psychological factors affect performance and how participation in sports and exercise affects psychological and physiological factors. Sports psychologists teach cognitive and behavioral strategies to athletes to improve their experience and performance in sports. The applied domain of sports psychology to instruction and training of psychological skills for performance improvement applied sports psychology may include work with athletes, coaches, and parents regarding injury rehabilitation, communication, and team building. It is commonly accepted that mental preparation for athletic pursuits is essential for optimal performance and that athletes generally perform better with knowledge and application of psychological principles and strategies. Researches continue to suggest that there is a significant potential to improve performance through mental training. Reasons why people perform differently in sporting activities relate mainly to physical factors including genetic makeup, fitness level, and skill. In the present time, mainly athlete's coaches and sporting administrators are still quite cautious to seek out the services of qualified sports psychologists. However, better understanding of specific psychological influences notably motivation, arousal, and anxiety management is becoming increasingly important as these influences can significantly enhance or inhibit performance depending on the way they are managed. The purpose of this article is to provide the reader with a simple framework depicting how mental skills training translates into improved within competition performance. This framework is intended to help bridge the general understanding gap that is currently being reported by a large number of athletes and coaches while also helping sports psychology practitioner's sell their valuable services to individual athletes and teams.

**Keywords:** Academic sports psychology, Applied sports psychology, Physical education, Sports.

## 1. INTRODUCTION

“According to Morgan, sports psychology is the study of psychological foundations of physical activity.”

According to Robert Nsinger, “Sports psychology explores our behavior in athletics.” According to John Luther, “sports psychology is an area which attempts to apply psychological facts and principles to learning performance and associated human behavior in whole field of sports.” According to Alderman, “sports psychology studies the effects of sports itself on human behavior.”

Sports psychology is a relatively young discipline within psychology. In 1920, Carl Diem founded the

world's first sports psychology laboratory at the Deutsche Sporthochschule in Berlin, Germany. In 1925, two more sports psychology laboratories were established – one by A.Z. Puni at the Institute of Physical Culture in Leningrad and the other by Coleman Griffith at the University of Illinois.

The increased stress of competitions can cause athletes to react both physically and mentally in a manner that can negatively affect their performance abilities. They may become tense, their heart rates race, they break into a cold sweat, they worry about the outcome of the competition, and they find it hard to concentrate on the task in hand. This has led coaches to take an increasing interest in the field of sports psychology and

in particular in the area of competitive anxiety. That interest has focused on techniques that athlete can use in the competitive situation to maintain control and optimize their performance. Once learned, these techniques allow the athlete to relax and to focus his/her attention in a positive manner on the task of preparing for and participating in competition. Psychology is another weapon in the athlete's context in gaining the winning edge. Sports psychology is commonly referred to as "sport and exercise psychology," as it is used for team sports as well as individual fitness endeavors.

### 1.1. Role of Sports Psychology

"Psychology in sports" helps develop a positive attitude, respect for the opponent, killer instinct, and a never give up attitude. Fear of losing adds to stress while stress should be used as a motivating factor. Sports psychologist helps to make sports personality and attitude of never being unduly bothered about consequences, it also helps develop a positive body language.

### 1.2. Role of a Sports Psychologist

Sports psychologist as an integral member of the coaching and health-care teams is widely recognized. Sports psychologists can teach skills to help athletes enhance their learning process and motor skills, cope with competitive pressures, fine-tune the level of awareness needed for optimal performance, and stay focused amid the many distractions of team travel and in the competitive environment. Psychological training should be an integral part of an athlete's holistic training process, carried out in conjunction with other training elements. This is best accomplished by a collaborative effort among the coach, the sports psychologist, and the athlete; however, a knowledgeable and interested coach can learn basic psychological skills and impart them to the athlete, especially during actual practice.

### 1.3. Role of Sports Psychology in Preparing for Competition

Sports psychological training skills help the athlete to manage the competitive performance and environment include;

- Learning relaxation skills (e.g., progressive relaxation, slow, controlled, deep abdominal breathing, or autogenic training)
- Mastering all of the intentional styles types of concentration
- Imagery (both visualization and kinesthetic

- Self-talk
- Developing a precompetition mental routine to be employed immediately before competition on game day.

### 1.4. Role of Sports Psychology in Injury Rehabilitation

The injured athlete commonly experience at least three emotional responses: Isolation, frustration, and disturbances of mood. The sports psychologist in consultation with the medical team must make ready the injured athlete to participate in sports and games. Counseling center to provide counseling services for student-athletes through the counseling and athletic mental performance can help injured exercisers and athletes adjust to their temporary reduction in physical activity. Using skills such as goal setting and imagery can help exercisers and athletes manage pain, adhere to rehabilitation protocols, and increase confidence on return to full participation.

### 1.5. Sports Psychology Motivational Techniques for Coaches and Athletes

#### 1.5.1. Motivation for imagery (or motor imagery)

To help stay motivated along the way. Imagery is also a tool that can help athletes to maintain a vision of what they would like to achieve in their sport. Athletes can also use imagery to assist them in setting their daily goals as well as to stay motivated during tough training sessions. Good imagery, therefore, attempts to create as lifelike an image as possible through the use of multiple senses (e.g., sight, smell), proper timing, perspective, and accurate portrayal of the task. Both anecdotal evidence from athletes and research findings suggest imagery are an effective tool to enhance performance and psychological states relevant to performance (e.g., confidence)

#### 1.5.2. Motivation for goal setting

Essentially, goal setting is a mental training technique that can be used to increase an individual's commitment toward achieving a personal goal and this can be separated into short-, medium-, and long-term goals. The main goal of a sports psychologist is to help athletes and teams perform better or more consistently by learning proven mental training strategies.

According to Dr. Eva V. Monsma, short-term goals should be used to help achieve long-term goals.



Dr. Monsma also states that it is important to “set goals in positive terms by focusing on behaviors that should be present rather than those that should be absent.” Each long-term goal should also have a series of short-term goals that progress in difficulty. For instance, short-term goals should progress from those that are easy to achieve to those that are goals that will remove the repetitiveness of easy goals and more challenging. Having challenging short-term will give one an edge when striving for their long-term goals.

### 1.5.3. Pre-achievement routines

A pre-performance routine is defined as “sequence of task relevant thoughts and actions which an athlete engages in systematically prior to his or her performance of a specific sport skill.” (Moran, 1996. p. 177). This definition highlights that a routine needs to be task specific, systematic, and engaged with. This includes pregame routines, warm-up routines, and actions an athlete will regularly do, mentally and physically, before they execute the performance. These routines help to develop consistency predictability for the player. This allows the muscles and mind to develop better motor control. Research has shown that performers who use routines in closed skill sports have enhanced performance in basketball free throw shooting (Lonsdale and Tam, 2008) and golf putting (Bell *et al.*, 2010).

### 1.5.4. Extrinsic rewards

Athletes compete in and practice sports for a variety of reasons.... Athletes who are intrinsically motivated participate in sports for internal reasons, such as enjoyment, whereas athletes who are extrinsically motivated participate in sports for external reasons, such as mater I. Thus, a reward should be informational in nature rather than controlling. If a reward comes to be controlling, it can significantly undermine intrinsic motivation. For a reward to be informational, it is token reward, such as a woman of the match or “athlete of the tour” title rewards.

## 2. SELF TALK

“Effective use of self-talk can improve your performance by helping you regulate your feelings, thoughts, and energy about those events. Positive self-talk can help you feel confident, improve coordination, control fine motor skills, enhance your focus, and perform better at endurance events too. Most effective and easy to use psychological skills available to any athlete. For example, a softball player may think “release point”

when at bat to direct her attention to the point where the pitcher releases the ball, while a golfer may say “smooth stroke” before putting to stay relaxed. Research suggests either positive or negative self-talk may improve performance, suggesting the effectiveness of self-talk phrases depends on how the phrase is interpreted by the individual. However, the use of positive self-talk is considered to be more efficacious and is consistent with the associative network theory of Gordon Bower and the self-efficacy tenet within the broader social cognitive theory of Albert Bandura.

### 2.1. Motivational Music

Listening to motivational music has become a popular way of enhancing mood, motivation, and positive self-evaluation during sports and exercise. There is an abundance of anecdotal evidence of music being used in this way, such as the famous Maori “Haka” performed by New Zealand’s national rugby team to get into the right mindset before games athlete.

## 3. IMPORTANCE OF SPORTS PSYCHOLOGY IN ENHANCEMENT OF SPORTS PERFORMANCE

### 3.1. Learning the Motor Skills

Sports psychology plays its major role in the learning of motor skills. Motor skills learning depend on the individual’s level of readiness, i.e., physiological readiness and psychological readiness. Physiological readiness in children is the development of the necessary strength, flexibility, and endurance as well as the development of various organ systems so that they may perform motor skills required in the activity. Psychological readiness is related to the learner’s state of mind. It means the desire and willingness to learn the particular skill. In psychological readiness, sports psychology plays an important role. Sports psychology is also helpful in the cognitive stage, the social active stage, and the autonomous stage of motor skill learning.

### 3.2. Enhancement of Physiological Capacities

Sports psychology plays a very unique role in the enhancement of physiological capacities such as strength, speed, and flexibility. Motivation plays a major role in the enhancement of physical capacity of sportspersons. It is well known as well as an established fact that psychological capacities or powers can increase physiological capacities of individuals.

### 3.3. Controlling the Emotions

Sports psychology plays a very important role in controlling the emotions of sportspersons during practice as well as competition. In general, these emotions may bring spontaneous changes in the behavior of sportspersons. These are anger, disgust, gear, negative self-thinking and feeling of ownership, etc. If these emotions are not controlled well in time, the performance may be decreased. Sports psychology plays a key role at such juncture. It helps in balancing the arousal of emotions which further improves the performance.

### 3.4. Role in the Emotional Problems of Sportspersons

Stress, tension, and anxiety are natural during practice period and competitions or tournaments. There may be some other emotional problems such as depression, frustration, anorexia, and panic. The knowledge of sports psychology may be helpful in such situations. Techniques of relaxation and concentration for stress management can be applied on sportspersons who are under such problems. Conclusively, it can be said that sports psychology plays a very key role in enhancing the performance of sportspersons. It deals with various mental qualities such as concentration, confidence, emotional control, and commitment, which are important for successful performance in sports and games.

## 4. DISCUSSION

Success or failure on the field often depends on mental factors as much as physical ones. Sports psychologists recognize the dramatic impact of the athlete's mindset and focus on preparing the mind to overcome obstacles on the field while boosting confidence for optimal performance. Each and every one of us has an untapped energy source that can be drawn on to bring about superior results. Enhancing motivation is fundamentally about a change of attitude, developing a positive "can do" mindset, and engaging in systematic behaviors – the short-term process goals – that facilitate improvement. If you have a leadership role in sport, you will have

considerable influence on how motivated your athletes or team might feel. You can instill a good work ethic, recognize individual effort, and instigate transparent reward structures that reinforce people's sense of competence. To work best, the techniques mentioned in this article need to be molded around specific circumstances and the needs of individual athletes. Always strive to be original and innovative in the application of motivational techniques.

## REFERENCES

1. Csikszentmihalyi, M. *Beyond Boredom and Anxiety*. San Francisco, CA: Josey-Bass; 1975.
2. Deci, E., and Ryan, R. *Intrinsic Motivation and Self-determination in Human Behaviour*. New York: Plenum; 1985.
3. Gould D. Goal setting for peak performance. In: Williams, J.M., (ed). *Applied Sport Psychology: Personal Growth to Peak Performance*. New York: McGraw-Hill; 2006, pp. 240-259.
4. Hamilton, R.A., Scott, D., and MacDougall, M.P. Assessing the effectiveness of self-talk interventions on endurance performance. *J Appl Sport Psychol*, 2007, 19, 226-239.
5. Locke, E., and Latham, G. The application of goal setting to sports. *J Sport Psychol*, 1985, 7, 205-222. Kylo, L., and Landers, D. Goal setting in sport and exercise: A research synthesis to resolve the controversy. *J Sport Exerc Psychol*, 1995, 17, 117-137.
6. Monsma Eva, P.H. *Principles of Effective Goal Setting*. Indianapolis, IN: Association for Applied Sport Psychology; 2007.
7. Marks, D. Mental imagery and consciousness: A theoretical overview. In: Sheikh, A., (ed). *Imagery: Current Theory, Research and Application*. New York: Wiley; 1983, pp. 96-130.
8. Vealey, R.S. Goal mapping. In: Vealey, R.S., (ed). *Coaching for the Inner Edge*. Morgantown, WV: Fitness Information Technology; 2005, pp. 149-177.
9. Vealey, R.S., and Greenleaf, C.A. Seeing is believing: Understanding and using imagery in sport. In: Williams, J.M., (ed). *Applied Sport Psychology: Personal Growth to Peak Performance*. New York: McGraw-Hill; 2006, pp. 306-348.
10. Robert, S.W. *Daniel Gould. Goal Setting. Foundation of Sport and Exercise Psychology*. United States: Myles Schrag, Courier Printing, 2011, pp. 350-351.

# Impact of Psychological Conditioning on Sports Performance among Athletes

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## ABSTRACT

**Objective of the study:** The objective of the study was to find out the impact of psychological conditioning on sports performance. **Hypothesis:** Impact of psychological conditioning would be significantly beneficial for sports performance. Method sample the present research sample belonging to Aurangabad. When was start the game researcher earlier decide the among them one athlete team was experimental group and another was control group athlete researcher was given psychological conditioning on experimental group and control group not given the psychological conditioning. Moreover, ten games were recorded for researcher for the data analysis. For the present study, various sportsmen were selected for the present study. Non-probability accidental sampling was use. Sports performance measure in winning and losing the games. **Results:** Positive effect shows psychological conditioning on sports performance.

**Keywords:** Control group, Experimental group, Psychological conditioning, Sports performance.

## 1. INTRODUCTION

Every good athlete knows it takes more than physical stamina to succeed. Along with developing your muscles, reflexes, and physical capabilities, you need to be able to cultivate the appropriate mindset for competitions and games and learn how mood affects performance. A bad mood can throw off your whole performance, while some days you may feel like you are flying through the field with ease.

Mood has a measurable effect on your athletic performance. A negative mood, anger, frustration, stress, and fear can all have a profoundly harmful effect on your ability to run, to coordinate, to concentrate your energy, and to work in sync with your teammates. The effects range from the physical to the psychological.

Although most people know that over time, athletic activities can have a positive effect on your mood, effectively combatting depression and anxiety, it does not necessarily follow that your individual performance cannot be negatively affected by a sour mood. Although your performance may improve, frustration and anger can have immediate, noticeable effects on your speed, response, quick decision-making, and focus.

Despite the common belief that anger can be channeled into powerful athletic capabilities, multiple studies have found that excitement, joy, and happiness are actually more closely correlated to concentration and capability than negative emotions such as anger and frustration. A positive mood, say from an activity like dating, can improve your psychological performance, help you focus more and assist in rapid problem solving – all critical skills on the field.

Happiness appears to be correlated to better focus, because doing something you enjoy and want to participate in, particularly competitively, more easily allows you to focus all your tasks. A bad mood or depression, on the other hand, can itself serve as a distraction from whatever athletic activity you are participating in.

You are more likely to zone in on the ball on your next step when you are able to focus on the goal of kicking the ball, passing the finish line, or scoring the goal. Your mood and your athletic ability are inherently connected. Whether your activities on the field improve your mood or whether your emotions negatively or positively impact your reaction time and focus, your psychology has a strong and noticeable impact on your athletic skills.

It is widely known that coaches play a critical role in the lives of young athletes and have the potential to influence, positively or negatively, their sporting experiences (Bruner *et al.*, 2011). This is supported by the premises that positive results in sports are associated with the quality of this relation (Rhind and Jowett, 2010), with the capacity of the coaches to effectively promote the sports development of the athletes and its implications on the quality of sports training (Abraham *et al.*, 2006).

Coaching involves a central tenet of improving team or athlete performance that requires a cognitive activity to make decisions on a multitude of dynamic situational factors (Jones *et al.*, 2003). Due to the adverse and unstable conditions of their activity, coaches are required to possess the ability to make dynamic decisions, requiring strategic intervention plans, supported by an intensive activity of reflection, decision, and implementation. However, research has shown that current formal education programs do not adequately prepare coaches for their task (Abraham and Collins, 1998; Nelson *et al.*, 2006).

### 1.1. Objective of the Study

The objective of the study was to find out the impact of psychological conditioning on sports performance.

### 1.2. Hypothesis

Impact of psychological conditioning would be significantly beneficial for sports performance.

## 2. METHOD

### 2.1. Sample and Procedures of Data Collection

The present research sample belonging to Aurangabad. When was start, the game researcher earlier decide the among them, one athlete team was experimental group and another was control group. The athlete researcher was given psychological conditioning on the experimental group and control group not given the psychological conditioning. Moreover, ten games were recorded for researcher for the data analysis. For the present study, various athlete were selected for the present study. Non-probability accidental sampling was used.

#### 2.1.1. Sports performance

Measure in winning and losing the games.

#### 2.1.2. Variable

Independent variable – Types of group (a) experimental ad (b) control.

Dependent variable – (1) Sports performance.

## 3. STATISTICAL INTERPRETATION AND DISCUSSION

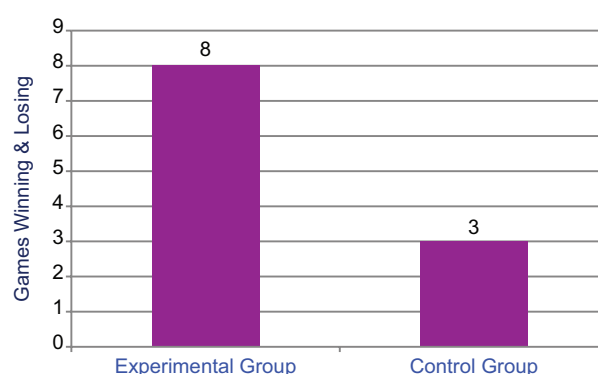


Table 1 shows that at the first mean of experimental group is 8.00 (standard deviation [S.D.] = 2.15) and control group mean is 3.00 (S.D. = 1.85) the difference between the two mean is highly significant " $t$ " = 5.57,  $df$  = 18,  $P$  < 0.01.

It is clear that the experimental group and control group sportsmen differ significantly from each other from the mean scores, and it was found that the experimental group had significantly high sports performance than the control group sportsmen. It means positive effect shows to psychological conditioning on sports performance among athletes.

**Table 1:** Sports performance among experimental and control participants mean SD and " $t$ " value

Experimental group				Control group				t value
Mean	SD	SE	n	Mean	SD	SE	n	
8.00	2.15	0.67	10	3.00	1.85	0.58	10	5.57**

SD: Standard deviation

#### 4. RESULTS

Positive effect shows to psychological conditioning on sports performance.

#### REFERENCES

- Abraham, A., Collins, D., and Martindale, R. The coaching schematic: Validation through expert coach consensus. *J Sports Sci*, 2006, 24(6), 549-564.
- Abraham, A., and Collins, D. Declarative and procedural knowledge assessment in novice and intermediate coaches. *J Sports Sci*, 1998, 16(1), 70.
- Bruner, M., Hall, J., and Côté, J. Influence of sport type and interdependence on the developmental experiences of youth male athletes. *Eur J Sports Sci*, 2011, 11(2), 131-142.
- Jones, R., Armour, K., and Potrac, P. Constructing expert knowledge: A case study of a top-level professional soccer coach. *Sport Educ Soc*, 2003, 8(2), 213-229.
- Nelson, L.J., Cushion, C.J., and Potrac, P. Formal, nonformal and informal coach learning: A holistic conceptualisation. *Int J Sports Sci Coach*, 2006, 1, 247-259.
- Rhind, D., and Jowett, S. Initial evidence for the criterion-related and structural validity of the long versions of the coach-athlete relationship questionnaire. *Eur J Sports Sci*, 2010, 10(6), 359-370.



# “A Comparative Study of Leadership and Aggression among Sportsmen and Non-sportsmen”

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## ABSTRACT

**Aim:** The study was to investigate the leadership and aggression among sportsmen non-sportsmen. **Hypotheses:** First, there is no significant difference between sportsmen and non-sportsmen with respect to leadership. Second, there is no significant difference between sportsmen and non-sportsmen with respect to aggression. **Sample:** For the present study, 120 samples were belongings to and Aurangabad, 60 subjects were sportsmen and non-sportsmen. The age range of subjects was 18–24 years. A purposive non-probability sampling technique was used. **Tools:** (1) MAP series was constructed and standardize by Psycom. (2) Aggression scale was constructed and standardize by Km Roma Pal and Mrs. Tasneem Naqvi. **Results:** (1). Sportsmen have significantly high leadership than the non-sportsmen. (2). Sportsmen have significantly high aggression than the non-sportsmen.

## 1. INTRODUCTION

Social learning theory (Bandura, 1973) proposes that aggression is learned vicariously through observation of and interaction with role models. According to social learning theory, when young people witness role models behaving in certain ways in social situations, they are likely to learn such behaviors. Whether they subsequently choose to enact them or not will depend on the person and environmental cues. The relevance of social learning theory-based predictions has been supported in research on adolescent aggression (e.g., Dishion *et al.*, 1996), family violence (e.g., Brezina, 1999), workplace aggression (e.g., Glomb and Liao, 2003), and athlete aggression (e.g., Kreager, 2007). Aggression can include verbal behavior, non-verbal behavior (e.g., ostracizing), and physical behavior (e.g., physical assaults) (Anderson and Bushman, 2002).

### 1.1. Transformational Leadership and Aggression

Social learning theory is central to theorizing on transformational leadership and prosocial leadership more generally (Brown and Treviño, 2006b). Building on earlier work by Bass (1998) and colleagues (e.g., Bass and Steidlmeier, 1999), Brown and Harrison (2005) argued that “transformational leaders contribute to observational learning about ethical values and ethical conduct by demonstrating ethical behavior and communicating with

about conduct standards and values.” Understanding the nature of the four behaviors comprising transformational leadership may help explain why leaders who consistently engage in these behaviors serve as role models for prosocial behavior (e.g., Bass and Steidlmeier, 1999) and minimize the likelihood of aggressive follower behavior. First, transformational leaders “Do the Right Thing” (i.e., idealized influence) by modeling prosocial behaviors (Avolio, 1999; Simola *et al.*, 2010; and Turner *et al.*, 2002). Second, these leaders set high expectations (i.e., inspirational motivation) for performance and non-aggressive behaviors.

Third, transformational leaders challenge followers to think differently, which would include raising questions as to whether aggressive behavior is appropriate (i.e., intellectual stimulation). Finally, these leaders are mindful of the individual needs of others (i.e., individualized consideration). In sum, transformational leaders adopt a prosocial orientation toward in-group and out-group members. When followers observe and mimic this other-orientation (rather than a self-orientation), they may be less likely to act aggressively and, with respect to a team sport context, aggress against teammates, and opponents. There is some empirical support among adult samples that having a transformational leader is associated with lower levels of follower aggression and more prosocial behavior (Organ *et al.*, 2006). One study found that

after controlling for trait aggression, employees who perceived their supervisor as more charismatic (similar to transformational leadership) used less verbal aggression (Hepworth and Towler, 2004).

More recently, Brown and Treviño (2006a) found that socialized charismatic leadership (defined as charismatic leadership that models ethical conduct) was associated with lower levels of interpersonal and organizational deviance in workgroups, and this relationship was mediated by value congruence among group members. Based on the nature of transformational leadership and existing empirical evidence, we predict that transformational leaders model non-aggressive behavior and that, in turn, this is related to lower levels of follower aggression. Leadership has been studied across a wide array of contexts, including organized team sport (Hopton *et al.*, 2007 and Wolfe *et al.*, 2005). In ice hockey, where aggression is frequent, the behaviors of coaches, peers, and parents can influence player aggression. In the next sections, we develop hypotheses describing how the behavior of these different social influences may be related to player aggression.

## 1.2. Objective of the Study

1. The aim of the study was to investigate the leadership and aggression among sportsmen and non-sportsmen.

## 1.3. Hypotheses

1. There is no significant difference between sportsmen and non-sportsmen with respect to leadership
2. There is no significant difference between sportsmen and non-sportsmen with respect to aggression.

## 2. METHODS

### 2.1. Sample

For the present study, 120 samples were belonging to and Aurangabad, 60 subjects were sportsmen and non-sportsmen. The age range of subjects was 18–24 years. A purposive non-probability sampling technique was used.

### 2.2. Tools

1. MAP series was constructed and standardize by Psycom. Measure for leadership
2. Aggression scale was constructed and standardize by Km Roma Pal and Mrs. Tasneem Naqvi.

### 2.3. Procedures of Data Collection

Both tests administered individuals as well as a small group while collecting the data for the study, the later approaches were adopted. The subjects were called in a small group of 30 subjects, and their seating arrangements were made in a classroom. Before administration of the test, through informal talk, appropriate rapport form. Following the instructions and procedure suggested by the author of the test. The test was administered and a field copy of the test was collected. Following the same procedure, the whole data were collected.

### 2.4. Variable

#### 2.4.1. Independent variable

Type of players

(a) Sportsmen and (b) non-sportsmen

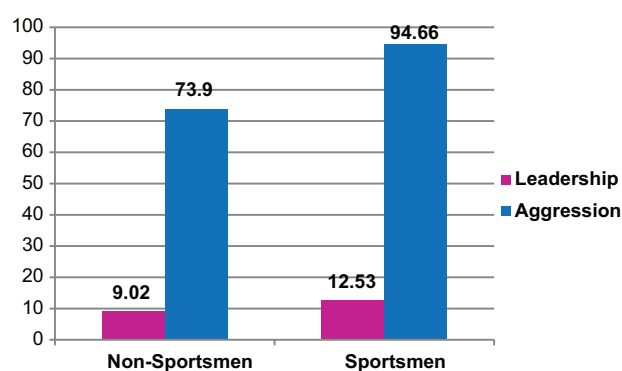
#### 2.4.2. Dependent variable

1. Leadership
2. Aggression.

### 2.5. Statistical Analysis and Discussion

Mean standard deviation and *t*-values of team and sportsmen on dimension leadership and aggression.

Dimension	Non-sportsmen (n=60)		Sportsmen (n=60)		“t”	df	P
	Mean	SD	Mean	SD			
Leadership	9.02	2.45	12.53	2.87	7.20	59	<0.01
Aggression	73.90	9.67	94.66	11.51	9.76	58	<0.01



The result showed that the mean of non-sportsmen on dimension leadership was 9.02 and the mean of sportsmen on dimension leadership was 12.53, the difference between the two means was highly significant  $t(78) = 7.20$ ,  $P < 0.01$ .

Research null hypothesis had been rejecting that there was no significant difference between intercollegiate and sportsmen with respect to leadership. Moreover, the alternative hypothesis was accepted sportsmen that had significantly high leadership than the non-sportsmen.

Second, the result showed that the mean of non-sportsmen on dimension aggression was 73.90 and the mean of sportsmen on dimension aggression was 94.66, the difference between the two means was highly significant  $t(78) = 9.76$ ,  $P < 0.01$ .

Research null hypothesis had been rejecting that there was no significant difference between team and sportsmen with respect to leadership. Moreover, the alternative hypothesis was accepted sportsmen that had significantly high aggression than the non-sportsmen.

### 3. RESULTS

1. Sportsmen have significantly high leadership than the non-sportsmen
2. Sportsmen have significantly high aggression than the non-sportsmen.

### REFERENCES

- Avolio, B.J. *Full Leadership Development: Building the Vital Forces in Organizations*. Thousand Oaks, CA: SAGE; 1999.
- Bass, B.M. The ethics of transformational leadership. In: Ciulla, J., (ed). *Ethics, the Heart of Leadership*. Westport, CT: Praeger; 1998, pp. 169-192.
- Bass, B.M., and Steidlmeier, P. Ethics, character, and authentic transformational leadership behavior. *Leaders Q*, 1999, 10, 181-217.
- Brown, M., and Treviño, L.K. Ethical leadership: A review and future directions. *Leaders Q*, 2006, 17, 595-616.
- Hepworth, W., and Towler, A. The effects of individual differences and charismatic leadership on workplace aggression. *J Occup Health Psychol*, 2004, 9, 176-185.
- Hopton, C., Phelan, J., and Barling, J. Transformational leadership in sport. In: Beauchamp, M.R., and Eys, M.A., (eds). *Group Dynamics in Exercise and Sport Psychology: Contemporary Themes*. New York: Routledge; 2007, pp. 45-60.
- Organ, D.W., Podsakoff, P.M., and MacKenzie, S.B. *Organizational Citizenship Behavior: Its Nature, Antecedents, and Consequences*. Thousand Oaks, CA: SAGE; 2006.

# Assessment of Playing Ability of Urban and Rural Soccer Players of Chhattisgarh in Relation to their Emotional Stability

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## ABSTRACT

This study assessed the playing ability of urban and rural male soccer players of Chhattisgarh in relation to emotional stability. This study took 50 urban male and 50 rural male soccer players of Chhattisgarh as sample. The criteria for selection were participation in intercollegiate soccer tournament and between 18 and 25 years of age. Playing ability of male soccer players was evaluated with the help of Warner Soccer Skill Test. Hindi psychoticism, extraversion, and neuroticism (PEN) inventory constructed by Menon *et al.* who was used to assess emotional stability of selected male soccer players. The playing ability of soccer players was determined by ranking system for each soccer skill test item. The result revealed that male soccer players with high level of emotional stability in the form of low neurotic tendencies exhibited superior soccer playing ability as compared to male soccer players with low level of emotional stability in the form of high neuroticism. The main effect of urban-rural belongingness on playing ability of male soccer players was also observed. The two factors interaction effect of emotional stability and urban-rural belongingness was not observed on playing ability of male soccer players. It was concluded that emotional stability and urban-rural belongingness emerged as potential enough variables that affect playing ability of male soccer players alone.

**Keywords:** Emotional stability, Playing ability, Soccer, Urban-rural background.

## 1. INTRODUCTION

Emotional stability is considered to be one of the most important aspects of sports performance. Emotional stability is given special emphasis by Eysenck while postulating the personality theory. Eysenck (1973) opined that emotional stability/instability is governed by autonomous nervous system. He postulated that emotional stability or neuroticism is a personality trait. It can range from normal to neurotic. The personality theory of Eysenck states that neurotic people are touchy and anxious and they get aroused easily while emotional stable or person at low end of neuroticism scale tend to be emotionally strong and even tempered. The role of neuroticism has been highlighted by number of researchers in terms of sports performance. Notable among them are studies conducted by McKelvie *et al.* (2002), Agashe *et al.* (2010), Agashe *et al.* (2011), Mirzaei *et al.* (2013), and Saroha and Pathak (2016).

Despite extensive literature, no study yet has been carried out, in which the effect of neuroticism along with urban-rural belongingness on playing ability of soccer players has been assessed. Hence, the present study was planned.

### 1.1. Objective

The objective of the present study is to assess the main and interaction effect of neuroticism and urban-rural belongingness alone and in interaction with others, on playing ability of male soccer players.

### 1.2. Hypothesis

It was hypothesized that low neurotic urban male soccer players will show significantly superior playing ability as compared to high neurotic rural male soccer players.

## 2. METHODOLOGY

### 2.1. Sample

To conduct the study, 50 intercollegiate urban male soccer players (ave. age 20.12 years) were selected from the state of Chhattisgarh. To fulfill the objectives of the present study, 50 intercollegiate rural male soccer players (ave. age 21.11 years) were also selected from Chhattisgarh. Purposive sampling method was used for the selection of sample.

### 2.2. Tools

Hindi version of Eysenck's PEN inventory prepared by Menon *et al.* (1978) who was used. This inventory measures PEN by a questionnaire method. The test-retest reliability coefficients have been found as 0.630, 0.888, 0.687, and 0.337 for P, E, N, and L scales, respectively. Only neuroticism dimension was evaluated.

To measure the fundamental skills of soccer, selected items, namely, kicking for distance, left and right foot, throw in for distance, dribbling the ball, kicking for accuracy, and the Warner's Soccer Skill Test were used.

### 2.3. Procedure

PENL inventory was administered to male soccer players and the response of N dimension was scored as per scoring key. Soccer skill performance has been observed by five items, namely, kicking (left and right), throwing, dribbling, and kicking for accuracy. To assess the total soccer playing ability, linear transformation method was adopted. Maximum numerical weightage

was given to soccer players who performed maximum in kicking, throwing, and accurate kicking, while maximum numerical weightage was given who took less time in performing dribbling ability. Mean  $\pm$   $\frac{1}{2}$ S.D. as the cutting point was used to identify the high and low neurotic subjects. A  $2 \times 2$  factorial ANOVA treatment as applied to unequal cell frequencies was used for data analysis. The obtained results are depicted in Table 1.

## 3. RESULTS

Table 1 reveals the following facts:

The F of 14.26, an indicator of the main effect of neuroticism is statistically significant at 0.01 level. It thereby reveals that playing ability (M=24.01) of the low neurotic male soccer players is significantly superior as compared to high neurotic male soccer players (M=30.89). The F of 3.91, an indicator of the main effect of urban-rural belongingness turned out to be statistically significant. The playing ability of urban male soccer players (M=25.64) was found to be significantly superior as compared to rural male soccer players (M=29.25). The F of 0.009, an indicator of A  $\times$  B interaction turned out to be statistically insignificant.

## 4. DISCUSSION

Finding related to the main effect neuroticism is logical because soccer player who is emotionally stable, least anxious, and confident is more likely to execute skills in better ways. The superior playing ability of urban male soccer players may be due to training facilities they get as compared to rural male soccer players. Since two independent factors are statistically significant,

**Table 1: 2 $\times$ 2 ANOVA: Examining the impact of neuroticism and urban-rural belongingness on soccer playing ability**

		Urban-rural belongingness (B)		Total
		Urban male soccer players (b <sub>1</sub> )	Rural male soccer players (b <sub>2</sub> )	
Neuroticism (A)	High (a <sub>1</sub> )	n=12 M=29.00	n=14 M=32.78	30.89
	Low (a <sub>2</sub> )	n=38 M=22.28	n=36 M=25.72	24.01
Total		25.64	29.25	
Source of variation	SS	df	MS	F
A	908.397	1	908.397	14.26**
B	249.485	1	249.485	3.91*
AB	0.597	1	0.597	0.009 (NS)
Within treatment (error)	6113.395	96	63.681	

\*\*Significant at 0.01 level, NS: Not significant



naturally, the interaction effect is more likely to be statistically insignificant.

## 5. CONCLUSION

On the basis of results, the following conclusions are drawn:

1. Emotional stability affects the playing ability of male soccer players
2. Urban-rural belongingness affects the playing ability of male soccer players
3. Emotional stability and urban-rural belongingness jointly unable to influence the playing ability of male soccer players.

## REFERENCES

Agashe, C.D., Thakur, R.K., and Kurre, M. Personality profile of junior and sub-junior elite male fencers. *J Psychol*

*Appl Life Work*, 2010, 2.

Agashe, C.D., Bajpai, S., and Kashyap, S. Padak vijeta tairako ke vyaktitva ka tulnatmak aadhayan. *J Health Sports Sci*, 2011, 3(1), 68-70.

Eysenck, H. J. The questionnaire measurement of neuroticism and extraversion. In: Eysenck, H.J., (ed.), *Readings in Extroversion-Introversion*. Vol. 1. London: Staples Press; 1970.

McKelvie, S.J., Patrice, L., and Dale, S. Extraversion and neuroticism in contact athletes, no contact athletes and non-athletes. *Athl Insight Online J Sports Psychol*, 2002, 5, 19-27.

Mirzaei, A., Nikbakhsh, R., and Sharififar, F. The relationship between personality traits and sport performance. *Pelagia Res Library Eur J Exp Biol*, 2013, 3(3), 439-442.

Saroha, P., and Pathak, M. Comparison of selected psychological and anthropometric characteristics between successful and unsuccessful volleyball players. *IOSR J Sports Phys Educ*, 2016, 3(6), 38-42.

# A Comparative Study of Male Athletic and Basketball Players in Relation to Psychological Health

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## ABSTRACT

The goal of this investigation was “To analyze emotional wellness measurements between athletic players and basketball players.” Scientist took 48 athletic players and 48 basketball players from 18 to 25 years for the examination. In the present investigation, sort of sex and players have been dealt with as autonomous variables and psychological well-being as reliant variable. The individual gatherings of athletic players and basketball players were controlled the emotional wellness stock by Jagdish and Srivastava (1983). It was watched that athletic players subjects are discovered more constructive self-assessment, mix of identity, independence, and natural authority than male non-player subject, and overall psychological wellness, there is critical distinction between male player and male non-player subjects. Basketball player subjects are discovered more constructive self-assessment, mix of identity, independence, and bunch arranged states of mind and natural dominance than female non-player subjects, and overall emotional well-being, there is a critical distinction between athletic players and basket non-athletic players player subjects.

**Keywords:** Athletic players, Basketball players, Mental health.

## 1. INTRODUCTION

For quite a while, it has been normal information that activity is beneficial for one's physical well-being. It has just been lately, nonetheless, that it has turned out to be typical to peruse in magazines and well-being bulletins that activity can likewise be of an incentive in advancing sound emotional well-being.

Carcach and Huntley (2002), an audit of current writing demonstrates that individuals who take an interest in sports and sorted out recreational movement appreciate better emotional wellness, are more ready, and stronger against the worries of present-day living. Investment in recreational gatherings and socially bolstered physical movement is appeared to diminish stress, uneasiness, and discouragement, and lessen side effects of Alzheimer's illness.

Hassmen *et al.* (2000) [3], neither mental nor physical well-being can exist alone. Mental, physical, and social working is related. As of late, there has been proof of exasperatingly high rates of mental sick well-being considers to have

discovered that more elevated amounts of movement were identified with bring down rates of sadness.

Stephen *et al.* (2005) [13], the World Health Organization characterizes psychological well-being as “a condition of prosperity in which the individual understands his or her own particular capacities, can adapt to the typical worries of life, can work beneficially and productively, and can make a commitment to his or her group.”

Singer (1992) [12], a position articulation of the International Society of Sport Psychology drew out various emotional wellness advantages of physical movement from the examination writing, including diminished state tension, neuroticism and uneasiness, mellow to direct discouragement, and different sorts of stress.

### 1.1. Hypotheses

There will be no significant difference in the level of mental health between athletic players and non-athletic players.

## 2. MATERIALS AND METHODS

### 2.1. Sample Selection

The present investigation was led on 48 athletic players and 48 basketball players running in age from 18 to 25 years. An aggregate of 96 subjects (College level Students) was chosen for the present research examine. The example choice strategy was utilized as an arbitrary inspecting procedure. The territory is constrained to Shekhawati Region. The point by point separation of the example is given underneath:

Area	Athletic players	Basketball players	Total
Male player	24	24	48
Female player	24	24	48
Total	48	48	96

Autonomous variables: Sex, athletics, and basketball player.

Subordinate variables: Mental health. Choice of research device: Mental well-being stock (Jagdish and Srivastava, 1983) [7].

The information was gathered from the different universities and games preparing focuses. The subjects were first clarified about the point of the examination consider, from there on emotional wellness stock. The subjects were guaranteed the classification of their reactions.

## 3. RESULTS AND DISCUSSION

Comparison of mental health inventory segments between male athletic players and male basketball players.

Table demonstrates the contrast between the gatherings of male player and male non-player subjects on the different components of mental health inventory. Just four components are indicating the noteworthy distinction between the two gatherings at the 0.05 and 0.01 levels on 48 df review. It is presumed that player subjects are discovered more constructive in self-assessment ( $t = 2.19, P < 0.05$ ), coordination of identity ( $t = 3.50, P < 0.01$ ), self-sufficiency ( $t = 2.32, P < 0.01$ ), and ecological dominance ( $t = 4.04, P < 0.01$ ), than the non-player subjects, and overall emotional wellness, there is huge contrast between male player and male non-player subjects. They got “*t*” estimations of these gatherings are 5.50. Keeping in mind the end goal to be critical at 0.05, the base required estimation of “*t*” is 2.02. While at 0.01 level, it is 2.70. Since then, got esteem is bigger than which is required to be huge at 0.01 levels?

Measurable comparison of mental health inventory segments between female athletic players and female basketball players.

Table 2 demonstrates the distinction between the gatherings of female athletic players and female basketball players subjects on the different components

Area	Group	<i>n</i>	Mean	SD	<i>t</i> -value	Significance
Positive self-evaluation	Athletic players	24	33.12	3.72	2.19	0.05
	Basketball Players	24	31.08	2.81		
Perception of reality	Athletic players	24	25.88	2.86	0.72	NS
	Basketball players	24	25.20	3.78		
Integration of personality	Athletic players	24	39.32	3.66	3.50	0.01
	Basketball players	24	35.36	4.31		
Autonomy	Athletic players	24	20.52	1.96	2.32	0.01
	Basketball players	24	19.32	2.44		
Group oriented attitudes	Athletic players	24	34.68	4.34	0.64	NS
	Basketball players	24	33.96	3.55		
Environmental Mastery	Athletic players	24	33.96	2.52	4.04	0.01
	Basketball players	24	30.68	3.17		
Overall	Athletic players	24	187.48	7.14	5.50	0.01
	Basketball players	24	175.40	8.35		

SD: Standard deviation

Area	Group	<i>n</i>	Mean	SD	<i>t</i> -value	Significance
Positive self-evaluation	Athletic players	24	32.19	2.97	3.02	0.01
	Basketball players	24	29.31	3.54		
Perception of reality	Athletic players	24	24.75	3.79	0.54	NS
	Basketball players	24	24.07	4.53		
Integration of personality	Athletic players	24	37.07	5.53	2.01	0.05
	Basketball players	24	33.79	5.59		
Autonomy	Athletic players	24	18.31	2.55	3.14	0.01
	Basketball players	24	16.19	1.93		
Group oriented attitudes	Athletic players	24	35.15	3.80	2.83	0.01
	Basketball players	24	31.79	4.32		
Environmental mastery	Athletic players	24	33.07	3.97	2.11	0.05
	Basketball players	24	30.79	3.34		
Overall	Athletic players	24	179.96	8.29	4.84	0.01
	Basketball players	24	166.75	10.60		

SD: Standard deviation

of M. H. Stock. Five factors out of six are demonstrating noteworthy contrast between two gatherings at the 0.05 and 0.01 levels on 48 df review. It is inferred that player subjects are discovered more constructive self-assessment ( $t = 3.02$ ,  $P < 0.01$ ), combination of identity ( $t = 2.01$ ,  $P < 0.05$ ), independence ( $t = 3.14$ ), assemble situated states of mind ( $t = 2.83$ ,  $P < 0.01$ ), and natural authority ( $t = 2.11$ ,  $P < 0.05$ ) than non-player subjects, and overall psychological well-being there is noteworthy contrast between female player and female non-player subjects. They got “*t*” value of these gatherings is 5.27. With a specific end goal to be critical at 0.05, the base required estimation of “*t*” is 2.02. While at 0.01 level, it is 2.65. Since they got esteem is bigger than which is required to be critical at 0.01 levels.

#### 4. DISCUSSION

The point of the present investigation was to look at psychological well-being measurements among athletic player and basketball player understudies. It was speculated that there exists a huge distinction in the level of emotional well-being between the male athletic player understudies and the male basketball players understudies. It was additionally conjectured that there exists huge distinction in the level of emotional well-being between the female athletic player understudies and the female basketball player understudies. Discoveries of the present investigation plainly demonstrated that male athletic player subjects are discovered more constructive in self-assessment, joining of identity, independence, and natural authority than male basketball player subjects, and in finished all

emotional wellness, there is a huge distinction between male athletic player and male basketball player subjects. These outcomes are additionally in concurrence with the conclusions come to by Morgan (1984) [10], Humphrey *et al.* (2000) [6], and Stephen *et al.* (2005) [13]. Female athletic player subjects are discovered more constructive in self-assessment, combination of identity, self-governance, gather situated demeanors, and natural authority than female basketball player subjects, and overall psychological well-being, there is a huge distinction between female athletic player and female basketball player subjects. The consequences of the present examination are somewhat bolstered by the discoveries of McKelvie *et al.* (1981) [9], Bailey *et al.* (1999) [1], and Hossein *et al.* (2011) [5]. The exploration writing proposes that for some factors there is currently abundant proof that a distinct relationship exists amongst practice and enhanced emotional well-being. This is especially apparent on account of a decrease of uneasiness and sorrow. For these themes, there is presently significant confirmation gotten from more than several examinations with a huge number of subjects to help the claim that exercise is identified with alleviation in manifestations of misery and anxiety. Sports and physical exercise is connected not exclusively to a help in side effects of discouragement and uneasiness yet it additionally is by all accounts advantageous in improving self-idea, self-viability, certainty, sentiment worth-wellness, capacity to comprehend, capacity to coexist with others, work with others, and capacity to take duties and limit with respect to change. None of these connections is the aftereffect of a solitary report. They depend on most, if not all, of

the accessible research in the English dialect at the time the meta-scientific survey was distributed. The general positive examples of the meta-logical discoveries for these factors loans more noteworthy certainty that activity has an imperative part to play in advancing sound emotional wellness.

## 5. CONCLUSION

Male player subjects are discovered more constructive self-assessment, incorporation of identity, self-sufficiency, and ecological dominance than basketball player's subjects, and overall emotional wellness, there is huge distinction between male athletic player and male basket players subjects.

Female player subjects are discovered more constructive self-assessment, mix of identity, independence, aggregate arranged states of mind and natural dominance than basketball player subjects and overall emotional wellness; there is a critical distinction between female athletic player and female basketball player subjects.

## REFERENCES

1. Bailey, K., Moulton, M., and Moulton, P. Athletics as a predictor of self-esteem and approval motivation. *Sport J*, 1999, 2(2), 1-5.
2. Dimeo, F., Bauer, M., Varahram, I., Proest, G. and Halter, U. Benefits of aerobic exercise in patients with major depression: A pilot study. *Br J Sports Med*, 2001, 35, 114-117.
3. Hassmen, P., Koivula, N. and Uutela, A. Physical exercise and psychological well being: A population study in Finland. *Prev. Med*, 2000, 30(1), 17-25.
4. Taylor, M., Pietrobon, R., Pan, D., Huff, M. and Higgins, L. Healthy people 2010 physical activity guidelines and psychological symptoms: Evidence from a large nationwide database. *J Phys Act Health*, 2004, 1, 114-130.
5. Hossein, P.Z., Farhad, R., and Fatemeh, M. Comparing the mental health of the athletic and non-athletic physically-disabled people. *Int J Hydrogen Prod Appl*, 2011, 2(1), 6-10.
6. Humphrey, J.H., Yow, D.A., and Bowden, W.W. *Stress in College Athletics: Causes, Consequences, Coping*. Binghamton, NY: The Haworth Half-Court Press; 2000.
7. Jagdish, and Srivastava, A.K. *Mental Health Inventory*. Varanasi: Varanasi Manavaigyanik Sansthan; 1983.
8. Martinsen, E. Physical activity and depression: Clinical experience. *Acta Psychiatr Scand*, 1994, 377, 23-27.
9. McKelvie, S.J., Simpson-Housley, P., and Valliant, P.M. Personality in athletic and non-athletic college groups. *Percept Motor Skills*, 1981, 52(3), 963-966.
10. Morgan, W.P. *Selected Psychological Factors Limiting Performance: A Mental Health Model*. Vol. 18. United States: American Academy of Physical Education; 1984, pp. 70-80.
11. Sallis, J., and Owen, N. *Physical Activity and Behavioral Medicine*. Thousand Oaks, US: SAGE; 1999.
12. Singer, R. Physical activity and psychological benefits: A position statement of the International Society of Sport Psychology (ISSP). *Sports Psychol*, 1992, 6, 199-203.
13. Stephen, D.E., Humphrey, S.B., Ngcobo, D.J., Edwards and Palavar, K. Exploring the relationship between physical activity, Psychological well-being and physical self-perception in different exercise groups. *S Afr J Res Sport Phys Educ Recreation*, 2005, 27(1), 75-90.
14. World Health Organization. *Promoting Mental Health: Concepts, Emerging Evidence, Practice: A Report of the WHO, Department of Mental Health and Substance Abuse in Collaboration with the Victorian Health Promotion Foundation and the University of Melbourne*. Geneva: World Health Organization; 2005.



# Effects of Yogic Exercises and Physical Fitness on the Performance of Back Pain of Gulbarga University Employees

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## ABSTRACT

Back pain is one of the most common powerful conditions affects the modern man and is related to insufficient physical activity, i.e., contemporary sedentary lifestyle (employees) back pain is almost evenly distributed among the sexes (58% of women and 45% of men suffer from it), which about 75% of the population have suffered and episode of back pain syndrome. The majority of people with back pain syndrome recover completely as a result of suitable medical treatment and body exercise; however, in a certain percentage of people, the acute phase turns into the chronic condition. Chronic back pain is a limiting condition which impacts individual efficacy but is also correlated with social and economic effects. In the treatment of alleviating the pain, physical movement and different types of body exercises play an important role the goal of this paper are to select certain yoga postures/asanas on the basis of research done so far, as a possible mode of kinesiological operator in the treatment of back pain. Yoga exercises can lead to the increase in muscle strength, muscular, and cardiorespiratory endurance, range of movement, and general flexibility. However, it is very important to make the correct choice and the sequence of yoga asanas (exercises), which can be applied as an adequate kinesiological treatment of back pain taking into account the health status and physical shape of the patient/person. Based on the biomechanical laws and kinesiological knowledge, yoga instructors can position themselves in all programs aiming to prevent and treat back pain.

## 1. INTRODUCTION

Incomplete functioning of the locomotive system is frequently caused by limited movement and locomotion, resulting in pain in acute and chronic conditions of back pain is defined as pain or discomfort located below the 12<sup>th</sup> rib and above the gluteal crease, with or without the presence of leg pain. In people over 50 years of age, the symptoms of back pain syndrome are significantly more intense than in the younger population. Speaking of the younger population, a rise in back pain has been identified in the school population, 20–51%. The pain which appears sporadically or recurring pain, and can be of very strong intensity, has been identified in the population between the ages of 20 and 40. Evidently, the pain appears during the most productive period of a person's life and its accompanied by reduced work capacity. The appearance of acute back pain is subject to physical therapy treatments and physical exercises, which aim to eliminate the symptoms (pain and limited movement); however, in a certain percentage of the population, the pain turns into a chronic condition.

## 2. METHODOLOGY

### 2.1. Yoga as a Method of Physical Exercise

A multidisciplinary team of experts participates in the treatment of back pain (physiatrist, neurologist, neurosurgeon, psychologist, physical therapist, physical therapy technician, occupational therapist, and social worker), however, in addition to medication therapy, surgical treatment, and physical therapy, the central place is occupied by the method of kinesiotherapy which contributes to pain reduction and the improvement of the overall condition.

It is recommended that the patients diagnosed with back pain use the other types of physical activity, which would contribute to the improvement of the condition of their locomotive system, especially the back segment. One of the alternative therapeutic methods which can be applied in the treatment of back pain is yoga practice. Connection and similarity between body exercises (movement and locomotion) in kinesiotherapy and

yoga have been identified. Kinesiological operator for therapeutic purposes, hatha yoga is characterized by postures of asanas, is practiced to reduce pain, increases the range of movement and flexibility, strengthens muscles and improves the overall physical condition, improve equilibrium, and developmental focus. It has been proven that practicing certain asanas – Swastikasana, Mayurasana, Matsyendrasana, Paschimottanasana, and Gomukhasana – leads to significant increase in the range of movement and flexibility that yoga exercises have sufficient impact on increased flexibility, muscular strength, and cardiorespiratory endurance, which is important for maintaining good physical condition and associates state that the exercises of segmentary stabilization and stretching exercises have significant effect on reduction of pain and physical disability.

The example of conditionally contraindicated postures forms the angle of kinesiological science: (1) Urdhva, (2)UrdhvaDhanurasana,(3)Ustrasana,(4)Dhanurasana, and (5) Matsyasana. In all of the mentioned asanas, there is a pronounced hyperextension of the trunk and a pronounced lordosis in the given position. Deviation from the lordotic curvature (the normal curvature is between 15 and 30 degrees) is one of the causes of back pain as well as insufficiently developed abdominal musculature, shortening of the back muscles and the retroflexion of the mentioned positions worsens the condition and causes pain, especially in the acute phase of the back pain.

**Table 1: Yoga kinesiological operator in back pain therapy**

Respondents age	Kinesiological treatment/ program (the duration of one treatment)	Program duration
30–65	Hatha yoga 60 min 2 times/week with the instructor asanas has not been named	6 weeks
20–64	Exercise/75 min 7 aerobic exercises ten stretching exercises	26 weeks
23–67	Iyengar once a week, 90 min with the instructor and 5 times 30 min at home/individually 29 asanas	16 weeks
18–70	Iyengar 31 asanas	24 weeks
18–65	Viniyoga 75 min 17 postures	12 weeks
18–65	Iyengar 75 min does not state the asanas	12 weeks

### 3. RESULTS

Table 1 summarizes the results of the studies treating back pain whose aim was the application of yoga exercise. This work also shows the method, the kinesiological treatment based on which the initial/final condition of the respondents was determined the age of the sample, kinesiological operator applied, and the duration of the program.

### 4. CONCLUSION

According to the research performed so far, the use of yoga in treating back pain indicates the possibility of pain reduction and elimination. Yoga exercises may increase muscular strength, muscular and cardiorespiratory endurance, and the range of motion and general flexibility. The studies cited in this paper indicate that practicing yoga is more efficient than any medication and standard medical treatments. However, the correct selection and the sequence of the yoga exercises are of vital importance in using yoga as a kinesiological operator, and this should be done taking into account the general health status and physical condition of the patient/person. Yoga instructors can find their place in all programs aiming to prevent and treat back pain. However, it needs to be emphasized that they need to undergo advanced training in correct postural status and deviations from it. The knowledge of biomechanical laws and kinesiology principles contributes to the right choice of the asanas, physical postures, and good selection of exercise combinations, with the goal of eliminating and alleviating back pain. During the acute phase of back pain, the choice and the use of asanas contribute to relief in the lumbar segment. The asanas which are present in almost all systems of yoga exercises and are the most significant for the patients in the acute phase of back pain are: Supta Padangusthasana, Paschimottanasana, Halasana, Pawanmuktasana, Apanasana, Upavistha Konasana, Balasana, and Makarasana (initial position bending backward and hands bent in elbows and head resting on them).

### REFERENCES

- Almeida, I.C.G., Sa, K.N., Silva, M., Baptista, A., Matos, M.A., and Lessa, I. Prevalência de dor lombar crônica na população da cidade de Salvador. *Rev Bras Ortop*, 2008, 43(3), 96-102.

- Andersson, G.B.J. Epidemiological feature of chronic bak pain. *Lancet*, 1999, 354(9178), 581-585.
- Bal, B.S., and Kaur, P.J. Effects of selected asanas in hatha yoga on agility and flexibility level. *J Sport Health Res*, 2009, 1(2), 75-87.
- Chou, R., and Huffman, L.H. Nonpharmacologic therapies for acute and chronic back pain a review of the evidence for an American Pain Society/American College of Physicians clinical practice guideline. *Ann Intern Med*, 2007, 147(7), 492-504.

# Technology used for Training in Athletics

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## ABSTRACT

Before, sports preparing required broad desk work and post-practice exertion from both the mentor and the competitor. While the competitor rehearsed, notes and video were determinedly taken and afterward gathered into outlines and charts speaking to that competitor's presentation. After training, coach and competitor would cooperate, examining throbs, agonies, and musings about physical developments that happened a lot before. The framework was tiring, however, filled into the extent competitors and mentors knew. That is until late innovation changed the field of sports preparing. Trendsetting innovation has decreased, stronger, and less oppressive over ongoing years, preparing for new chances, and particularly in games. At present, competitors wear sensors that pass on continuous data to a coach's tablet, global positioning system precisely pinpoints movement, cell phones keep everybody present, and wearable tech can forestall wounds. Contrasted with whiteboards and post-practice surveys, innovation has significantly expanded athletic potential. Innovation is reforming sports preparing by live-following exhibitions, consummating athletic developments, upgrading correspondence, and basically disposing of wounds.

## 1. INTRODUCTION

Before athletic coaches were known for taping lower legs and icing wounds, yet new innovation headways are helping allow these industry experts to be a piece of a competitor's physical issue avoidance, treatment, and recovery process.

Athletic mentors would now be able to recognize blackouts, control neurocognitive tests, perform particular recovery, and treat heat-related sicknesses. Athletic coaches use to invest loads of energy watching recordings, taking notes, and afterward diagramming outcomes to outline the competitor's presentation, yet now wearable gadgets are changing the game.

New innovation is decreasing, stronger, and less awkward for competitors to wear, so mentors can get constant information. Here are four different ways; innovation is reforming sports preparing.

## 2. DISCUSSION

Assistive innovation in sport is a region of innovation plan that is developing. Assistive innovation is the variety of new gadgets made to empower sports aficionados who

have incapacities to play. Assistive innovation might be utilized in incapacitated games, where a current game is adjusted to empower players with a handicap to take an interest; or, assistive innovation might be utilized to develop totally new games in light of competitors with inabilities only.

An expanding number of individuals with handicaps is taking an interest in sports, prompting the improvement of new assistive technology. Assistive innovation gadgets can be basic, "low-tech," or they may utilize profoundly trendsetting innovation, with some in any event, utilizing personal computers (PCs). Assistive innovation for sports may likewise be straightforward or advanced. Accordingly, assistive innovation can be found in sports going from neighborhood network entertainment to first-class paralympic games. Progressively unpredictable assistive innovation gadgets have been created after some time, and subsequently, sports for individuals with inabilities "have changed from being a clinical remedial apparatus to an inexorably rivalry arranged movement."

### 2.1. Tracking Performance

Utilizing sensors set on the body or in "savvy garments" (dynamic wear with detecting strands woven in),



Lasers and global positioning systems have been fused into different parts of the games preparing world. Rather than depending on times and parts, coaches can quantify the specific position, separation, speed, and increasing speed of competitors to all the more likely comprehend where they can improve. Distinguishing progressively complex information prompts improved execution with less pressure and chance for injury.



For instance, cyclists can wear heads-up show (HUD) glasses that impeccably convey heart rate, speed, slant, and other pertinent cycling data. Measurements, for example, these can enable the cyclist to center and improve in light of the fact that they can make alterations mid-ride.



How technology is helping to improve sports performance

Correspondence has been additionally improved by different applications, for example, My Fitness Pal, individual computerized well-being, diet, and exercise diary that can be gotten to on a cell phone or PC. Mentors can monitor competitors by checking their everyday diet by means of My Fitness Pal, and competitors will have individual responsibility for their preparation. It is like a web-based life website aside from that it is particular to exercise and competitors, mentors, and coaches can communicate with their info well-being data.





## 2.4. Eliminating Injuries

Maybe the most significant side-effect of innovation in sports preparing is that wounds have been seriously diminished and now can be distinguished a lot before. Following execution, culminating developments, and improving correspondence are not just advantages; they really help make less injury-inclined situations.

Preparing the executives programming can help mentors and coaches in observing all parts of preparing: Diet, vitality, rest, and so on. At the point when mentors and coaches can characterize singular practice for ideal outcomes, they are forestalling exhaustion and self-made wounds. Other than outside factors that cannot be represented, the future may some time or another see without injury games.

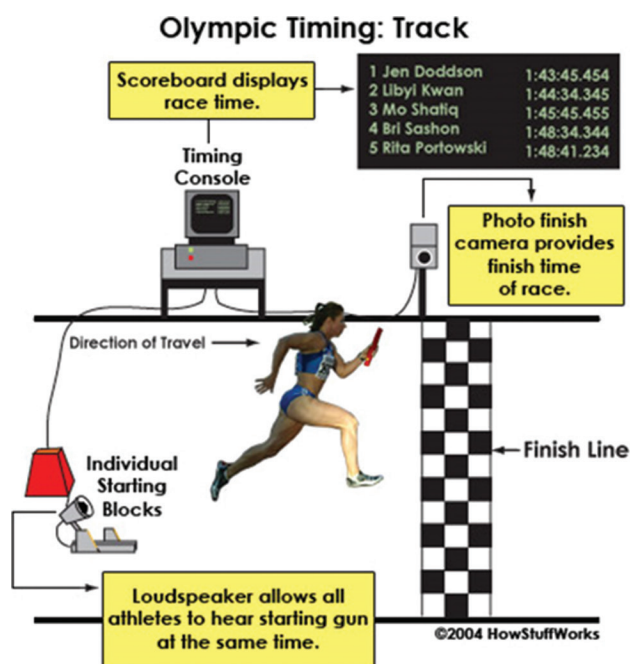


## 2.5. Radiofrequency identification (RFID) chip

RFID is an acronym for “radio-frequency identification” and refers to a technology whereby digital data encoded in RFID tags or smart labels (defined below) are captured by a reader through radio waves. RFID is similar to barcoding in that data from a tag or label are captured by a device that stores the data in a database. RFID, however, has several advantages over systems that use barcode asset tracking software. The most notable is that RFID tag data can be read outside the line-of-sight, whereas barcodes must be aligned with an optical scanner. If you are considering implementing an RFID solution, take the next step and contact the RFID experts at AB and R® (American Barcode and RFID).

RFID belongs to a group of technologies referred to as automatic identification and data capture (AIDC). AIDC methods automatically identify objects, collect data about them, and enter those data directly into computer

systems with little or no human intervention. RFID methods utilize radio waves to accomplish this. At a simple level, RFID systems consist of three components: An RFID tag or smart label, an RFID reader, and an antenna. RFID tags contain an integrated circuit and an antenna, which are used to transmit data to the RFID reader (also called an interrogator). The reader then converts the radio waves to a more usable form of data. Information collected from the tags is then transferred through a communications interface to a host computer system, where the data can be stored in a database and analyzed at a later time.



## 2.6. Injury Rehabilitation

When a player is harmed or experiences the medical procedure to fix a physical issue, athletic mentors assist them with returning to top playing performance. How to get ready for your game’s pursuit of employment digital book.

Athletic coaches use body execution estimations to test a competitor and ensure they are prepared to get back on the field. On the off chance that a competitor returns to rehearsing at full quality, or playing in a game too soon, it can bring about irritating the injury or aggravating it.

Today, competitors rehabbing lower furthest points can utilize repulsive force treadmills to get them up and moving snappier. These machines go about as a prop around the midsection of the competitor and have a vacuum fixed skirt that can decrease 20–80% of the

competitor's weight, limiting the measure of pressure applied on the body.

Numerous coaches are additionally utilizing pneumatic recuperation units which fold over the legs and are expanded with air. The competitors feel a rubbing sensation as blood and lymph's are circled all through the legs.

While ice and tape will consistently be utilized by athletic coaches, innovation has changed the manner in which they do nearly everything, from forestalling wounds to rehabbing after medical procedure.



## 2.7. Objective of Study

The following are the objectives of the study:

- To study the awareness about technology used in athletics
- To study how the use of technology has changed performance of an athlete
- To examine computer access, training, and inclination of computer in the field of athletics.

## 2.8. Hypothesis

$H_0$ : There is minimum usage of technology used in field of athletics.

$H_1$ : There is maximum usage of technology used in field of athletics.

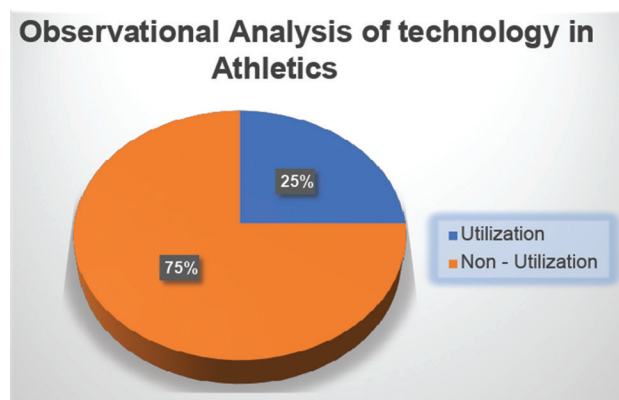
## 2.9. Significance of Study

The result of the study should be significant for technology and sports in the following ways:

- From the result, players will have more detailed statistics about their performance, which will help them improve and learn from their mistakes
- The practice sessions will be improved with the modern and different level of technology used for enhancing their performance for future games
- The recording facility of technology is the most amazing role that technology plays in the field of sports
- This study will also be beneficial for future studies related to this area.

## 3. RESULTS

The graphical representation of the information collected on the bases of the observational method where it clearly shows that there is not much usage about the technologies used in the field of athletics to the maximum extends and people are slowly getting the awareness about the usage of the various technologies used in the field of athletics.



## 4. CONCLUSION

From the above result, it is clear that there is no complete utilization of technology by the people. We need to showcase that different technologies are used in athletics for injury rehabilitation, minimizing injuries, improving communication, and analysis done with the use of modern technology in the field of athletics. The entire event management, through the usage of technology, should be presented to the audience and the coaches.

# Analysis of Competition Anxiety and Achievement Motivation among Pondicherry University Cricket Players (Men)

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## ABSTRACT

The aim of this study was to analyze the relationship between and to compare competition anxiety and achievement motivation level of intercollegiate level cricket players (men) of Pondicherry University. Sixty respondents were selected for this study. The respondents were chosen on the basis of their qualification to the semi-final round of a recently concluded intercollegiate tournament organized by the Directorate of Higher and Technical Education, Government of Puducherry. The selected respondents' age ranged from 19 to 25 years. To collect the required data, the Sports Competition Anxiety Test (SCAT) (Martens, 1977), commonly known as SCAT, and the Sports Achievement Motivation Test (Dr. M.L. Kamlesh, 1990) were chosen and used by the researcher. Pearson's correlation two-tailed test, and descriptive statistics were used to analyze the collected data statistically. Based on the statistical analysis, the results of the study were concluded as follows: (1) The team with lower Sports Competition Anxiety and a better Sports Achievement Motivation Level was able to perform better than the rest; (2) the Sports Competition Anxiety Level was found to be moderate; and (3) the Sports Achievement Motivation Level was also found to be moderate.

**Keywords:** Achievement motivation, Competition anxiety, Cricket players (Men), Pondicherry University.

## 1. INTRODUCTION

Sports are a social activity that exists from time immemorial. It brings people together as an individual, a group, a community, a nation, and indeed as a world. There are various forms of sports that are played all around the world, some requires only physical exertion, mental exertion, or sometimes both; some played individually and others as a team; and some played for fun or recreation and others as a competition. It attracts all sort of people, from young to old, all the sexes, and even different socioeconomic classes. When people engage in various forms of sports, they come across a wide range of psychological feelings and experience such as joy, anguish, success, failure, exhaustion, pain, relief, disappointment, a sense of belonging, and so on. While playing sports, people not only need mastery in the techniques to perform various skills but also strong psychological factors, such as motivation, arousal, aggression, stress, anxiety, patience, and so on, attribute to the outcome of the game. Cricket, a team sport, due to the longer duration of play, makes

it one such sport that requires a great deal of these psychological strengths. Anxiety is a psychological condition that has an impact on the readiness of a person to perform a specific activity. It is a state that nearly every sportspersons come across at some point of time in his career. When the demands of the training and/or competition exceed a players anticipated performance level, their anxiety level elevates. Motivation is something which everyone has to develop within oneself to achieve some goal. Achievement motivation may be characterized as the tendency to maintain and increase individual proficiency in all areas, in which a standard or quality is taken as a binding. It determines the goal that an athlete sets to be achieved and on which he works on day-to-day basis. Cricket, being a team as well as competitive sport, requires a lot of composure as well as great amount of motivation, due to the nature of longer duration of play. The game has gained lot of fame and importance due to the achievement of the national cricket team at the international events in the recent past after their successful run to win the Cricket World Cup in the year 1983.

Statement of the problem from the above surface of literature and background, the researcher had generated interest to study whether is there any relationship exist between sports competition anxiety and sports achievement motivation over the performance level and also to find out their prevailing level among various intercollegiate cricket teams (men) of Pondicherry University.

Objective of the problem: The purpose of the study was to analyze the relationship between the sports competition anxiety and sports achievement motivation among various intercollegiate level men cricket players of Pondicherry University.

Delimitations: In this study, 60 players were selected based on their qualification to the semi-final round of intercollegiate tournament organized by the Directorate of Higher and Technical Education, Government of Puducherry. The selected respondents' age ranged from 19 to 25 years. The researcher selected the following psychological variables for this study: Competition anxiety and achievement motivation. To collect the required data, the Sports Competition Anxiety Test (SCAT) (Martens, 1977), commonly known as SCAT, and the Sports Achievement Motivation Test (SAMT) (Dr. M.L. Kamlesh, 1990) were chosen and used by the researcher.

Limitations: Socioeconomic, cultural, diet, and training aspects of these college men were not taken into consideration. Hereditary and environmental factors, which contribute to the mental ability, were also not taken into consideration. The general mood and other environmental factors that might influence the response of the subjects to the questionnaire were not taken into consideration, too.

Hypothesis: it was hypothesized that (1) the team with a better motivation and lower anxiety level will be able to perform better than the rest; (2) there will be moderate level of sports competition anxiety among the teams; and (3) there will be moderate level of Sports Achievement Motivation among the teams.

## 2. METHODOLOGY

For this study, 60 male cricket players were selected based on their qualification to the semi-final round of intercollegiate tournament organized by the Directorate of Higher and Technical Education, Government of Puducherry. The teams those lost in the semi-finals

were designated as Team-A and Team-B; the team that lost the final was designated as Team-C; and the team that won the tournament was designated as Team-D. Selection of variables: The criterion measure to evaluate and collect the data of sports competition anxiety and sports achievement motivation was chosen as the SCAT (Martens, 1977) and the SAMT (Dr. M.L. Kamlesh, 1990), respectively.

### 2.1. Statistical Analysis

To achieve the desired outcome of the study, Pearson's correlation two-tailed test was used to analyze the relationship between sports competition anxiety and sports achievement motivation and descriptive statistics – mean and standard deviation (SD) to determine their level.

### 2.2. Findings

The data were collected by administering the selected questionnaire. The researcher explained the subjects about the content as well as the how to give their response to each and every questions. From the collected data, the scores were calculated according to SCAT and SAMT score analysis norms, and the following results were drawn statistically: Table 1: Pearson's correlation between SAMT and SCAT of various intercollegiate cricket teams (men) of Pondicherry University, correlations TEAM A TEAM B TEAM C TEAM D SAMT SCAT SAMT SCAT SAMT SCAT SAMT SCAT S A M T Pearson correlation 1 -0.381 1 -0.073 1 -0.571\* 1 0.558\* Sig. (2-tailed) 0.162 0.797 0.026 0.031 N 15 15 15 15 15 15 15 S C A T Pearson correlation -0.381 1 -0.073 1 -0.571\* 1 0.558\* 1 Sig. (2-tailed) 0.162 0.797 0.026 0.031 N 15 15 15 15 15 15 15 \*. Correlation is significant at the 0.05 level (two tailed). Table 1 shows the Pearson's correlation coefficient (r) between SAMT and SCAT of various intercollegiate cricket teams (men) of Pondicherry University. The Pearson's correlation values of Team A, Team B, Team C, and Team D are -0.381, -0.073, -0.571\*, and 0.558\*, respectively, at 0.05 level of significance. Table 2: Mean and SD of SCAT scores of various intercollegiate cricket teams (men) of Pondicherry University SCAT TEAM – A TEAM – B TEAM – C TEAM – D Mean 17.2000 20.2000 19.2667 18.6667 SD 4.24601 3.70714 3.30512 4.43471. Table 2 shows the mean and SD of SCAT of various intercollegiate cricket teams (men) of Pondicherry University. The mean and SD of SCAT scores of Team A, Team B, Team C, and Team D are 17.200, 20.200, 19.2667, and 18.667, respectively.



Table 3: Mean and SD of SAMT scores of various intercollegiate cricket teams (Men) of Pondicherry University SAMT TEAM – A TEAM – B TEAM – C TEAM – D Mean 23.4667 27.3333 28.4000 29.7333 SD 4.43793 6.35460 4.22239 3.76955. Table 3 shows the mean and SD of SAMT of various intercollegiate cricket teams (men) of Pondicherry University. The mean and SD of SAMT scores of Team A, Team B, Team C, and Team D are 23.4667, 27.3333, 28.4000, and 29.7333, respectively.

Discussion on the findings from the table value, it is evident that the Pearson's correlation coefficient (r) values obtained showed that the team with lower Sports Competition Anxiety Level and higher Sports Achievement Motivation Level is able to perform better than the other teams. The mean and SD of SCAT scores of various intercollegiate cricket teams (men) of Pondicherry University exhibited moderate level of sports competition anxiety. A single variable questionnaire used for this study where a cumulative score of <17, 17–24, and above 24 indicates a low, moderate, and high level of sports competition anxiety, respectively. The mean and SD of SAMT scores of various intercollegiate cricket teams (men) of Pondicherry University exhibited moderate level of sports achievement motivation, the classification criteria for which were determined as a score of <24, 24–30, and above 30 indicates a low, moderate, and high level of sports competition anxiety, respectively.

### 3. CONCLUSION

From the above results, the researcher came to the following conclusions: (1) There is a relation between the level of sports competition anxiety and sports achievement motivation, with the performance level of cricket players of Pondicherry University. (2) Sports competition anxiety exists at moderate level among various intercollegiate cricket teams (men) of Pondicherry University. (3) Sports achievement motivation exists at moderate level among various intercollegiate cricket teams (men) of Pondicherry University.

### REFERENCES

- Halder, A.K., and Phulkar, A. A data mining approach of sports achievement motivation and sports competition anxiety of inter university swimmers. *Eur J Fitness Nut Sport Med Stud*, 2019, 1(1), 1-7.
- Yadav, A. *An Insight into the Psychology of Basketball Players*. Solapur: Lulu Publication.
- Kar, S. Measurement of Competition Level Anxiety of College Level Athletes by using SCAT. *Int J Eng Sci Innov Technol*, 2013, 2(3), 367-75.
- Kamlesh, M.L. Manual of sports achievement motivation test. *NIS Sci J*, 1990, 13(3), 28-39.
- Sandhu, G.S. *Psychology in Sports*. New Delhi: Friends Publication; 1992. p. 92-94.
- Devi, S.S. *Study of Psychological Profiles for Field Hockey Players*. International Congress on Renaissance in Sports; 2019. p. 292-295.



# **“Resistance Band Training as a Superior Tool for Enhancing Sports Performance in Volleyball Players: A Review”**

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## **1. INTRODUCTION**

Volleyball is one of the most popular sports that are simple and affordable. It is a great team sport that can be played between two teams. This sport helps to develop quick reactions, flexibility, team spirit, and good physical shape. Volleyball has a positive effect on the nervous system, helps to maintain a good mood, fights depression, and stress. The International Volleyball Federation is the largest sports organization which includes about 195 countries. The basic skills in volleyball center around serving, blocking, passing, setting, hitting, and digging. To excel in these skills, a player needs exceptional lower body, upper body, and core strengths to get great jump height for spiking, blocking, serving, setting, and diving. Effective volleyball training should include all aspects of physical conditioning, skill development, flexibility, cardio endurance, muscle strength, and endurance.

Resistance bands are essentially elastic bands that can be used for strength training. During an exercise, it adds “progressive” resistance implying more the band is stretched, the more resistance it provides. On the other hand, the resistance provided by the traditionally used free weights remains constant as governed by gravity. If you put 100 kg on the bench press, it remains 100 kg of resistance/load throughout the movement. The term “strength curve” is used in the field of kinetics (the study of the human body’s motion) and looks at how the strength of the muscles themselves will differ depending on the range of motion. In bench press example, you are stronger during the top part of the concentric movement (upward part of the lift) and your “strength curve” is at its most “powerful.” Furthermore, at the bottom of the lift (the lowest part of the eccentric contraction), you are at the weakest part of the “strength curve.”

When you perform a free weight bench press, your training would be limited by how much weight you can

lift during the lower, weaker part of your strength curve. However, if you added some “progressive resistance” in the form of a resistance band, you would add more resistance at the strongest point in your range of motion, therefore, adding more resistance to better stimulate strength adaptations. Essentially, you would make the bodywork harder during the entire range of motion which ultimately means greater improvements.

Resistance bands are a great workout tool not only because they are super affordable, transportable, and versatile but also because they can help target larger muscles as well as smaller stabilizing muscles. Research shows that engaging in elastic band resistance training improves balance, gait function, and flexibility and may induce greater neuromuscular fatigue than exercises with isometric contractions.

## **2. ADVANTAGES OF USING RESISTANCE BANDS AS SUPERIOR TRAINING TOOL COMPARED TO FREE WEIGHTS**

1. Builds “whole body ” strength: Band training permits to train the whole body by applying multiple vector forces, variable training speeds, and variable repetitions in any posture or position unlike weight training that results in joint stiffness as well as soft tissue pain
2. Makes it harder to get injured: Band training is easier to learn, more adaptable to any strength level while challenging the body to be equally balanced throughout the joints. This allows the forces on the joints to be evenly dispersed, decreasing joint breakdown
3. Improves your balance: Balance is all about keeping your base of support over your center of gravity. Resistance band training was designed to strength train in an upright standing posture and does not

**Table 1: Types of resistance bands**

Type of resistance band	Description	Recommended to use for
Therapy band	Band with no handles	Rehabilitation
Compact resistance band	Plastic handles attached to the end of the band	Upper and lower body
Fit loop band	Continuous flat loop band	Lower body
Figure 8 band	Short bands in the shape of an eight with two handles	Upper body
Ring resistance band	Circular band with two soft handles	Lower body
Lateral resistance band	Velcro ankle cuffs connected by band	Lower body

require lying down or sitting to strength train your feet

4. Strengthens the core with every movement: Training on your feet 90% of the time allows you to activate your core by taking advantage of upper and lower extremities having to work simultaneously. This forces your core to be on call all the time as a dynamic stabilizer
5. Improves flexibility while building strength: A band's elastic qualities function just like a muscle. As the band lengthens, the muscle is shortening and as the band is shortening, the muscle is forced to lengthening as long as tension remains on the system.

### 3. IMPROVING VOLLEYBALL SKILLS AND DRILLS WITH RESISTANCE TRAINING

Resistance band trainings are great exercises for volleyball players. They are safe and very easy to incorporate into the training program. No weight room is required for these bands.

The first resistance band exercise is called the banded face pull. This exercise focuses on the building strength in the upper back and back of the shoulder. This exercise also improves the mobility of the shoulder blade. When performing the pull, the athlete should have their palms facing the ground. The band should be pulled towards the eyes. The shoulder blades should be pulled down and toward each other. Pause for one second with the shoulder blades pulled together. The elbows should finish slightly higher than the shoulders when pulling the band back. The athlete should concentrate on keeping their abs and glutes contracted while they are pulling the band back.

The next two exercises are designed to help volleyball players effectively cover a large amount of the court by helping them maintain a good defensive posture and

developing a strong first step. Both exercises utilize two green (high resistance) bands interlocked and attached to a pole.

The second resistance band exercise is banded turn and sprint. The athlete will wrap the band around their waist and forward with the pole (point of attachment of the resistance band to their side). The athlete will start in volleyball posture. With their knees bent, hands in front of the body, and shoulders in front of the knees, the athlete will drive off the leg closest to the pole and accelerate forward.

The third resistance band exercise is the banded lateral drive step. The setup is the same as the previous exercise. The athlete will drive off the leg that is close to the pole and shuffle to the side while maintaining a good volleyball posture.

Volleyball players can mimic the exact movements needed during a game while wearing the resistance bands to build quick and strong muscle fibers that contract quickly and explosively for greater flexibility, mobility, and power in the execution of those targeted game-time skills. Although volleyball is considered a non-contact game, injury often occurs due to the act of continuous jumping, diving, and high volume of movements. Therefore, volleyball players must strength train properly to protect the lower back, shoulders, legs, and knees. The kinetic bands were made to aid volleyball players gain strength quickly but more importantly safely. Warming up and stretching with these unique resistance bands helps players protect their joints and reduce the risk of injury as they build explosive power, move more freely, and achieve a greater range of motion.

### 4. CONCLUSIONS

Training volleyball players by employing various types of resistance bands are a superior choice and a great tool when compared to conventional free weights. The

bands offer “progressive resistance” unlike traditional free weights that are constant throughout the movement. Resistance bands are a great workout tool not only because they are super affordable, transportable, and versatile but also because they can help target larger muscles as well as smaller stabilizing muscles. Research shows that engaging in elastic band resistance training improves balance, gait function, and flexibility and may induce greater neuromuscular fatigue than exercises with isometric contractions. Elastic resistance offers several benefits that outweigh those of free weights. The advantages include functional strength, injury prevention, greater gains in muscular power and explosiveness, and convenience of use, particularly at home or when traveling. Adding more resistance through the use of resistance bands stimulates better strength adaptations and makes the bodywork harder, resulting in greater movements and enhanced performance, leading the volleyball players to the next level.

## REFERENCES

1. Add Resistance Bands to Your Strength Training-NPTI Fitness. Available from: <http://www.nationalpti.edu>. Retrieved on 2016-04-08.
2. Anderson, C.E., Sforzo, G.A., and Sigg, J.A. The effects of combining elastic and free weight resistance on strength and power in athletes. *J Strength Cond Res*, 2008, 22(2), 567-574.
3. Baker, D.G., and Newton, RU. Effect of kinetically altering a repetition via the use of chain resistance on velocity during the bench press. *J Strength Cond Res*, 2009, 23(7):1941-1946.
4. Kennett, J.E. *The Resistance Band Workout*. California: Paragon Inc.; 2006.
5. McNeely, E., and Sandler, D. *The Resistance Band Workout Book*. New York: Burford Books; 2006.
6. Mina, M.A., Blazevich, A.J., Giakas, G., and Kay, A.D. The influence of variable resistance loading on subsequent free weight maximal back squat performance. *J Strength Cond Res*, 2014, 28(10), 2988-95.

# The Effect of Slow and Rhythmic Surya Namaskar on Body Mass Index of Sedentary Behavior Female Youths

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## ABSTRACT

Indian system of physical and mental involved yogic practices was effective for sedentary behavior change. The purpose of this study was the effect of slow and rhythmic Surya Namaskar on body mass index (BMI) in sedentary behavior female youths. The subjects were selected 23 female youths and training load principle was applying FITT principle. The data were collected before and after 6 weeks yogic training. The data obtained were analyzed for the statistical significance using a paired “*t*” test and  $P < 0.05$  was considered the level of significance. The significant result was found the effect of slow and rhythmic Surya Namaskar on BMI of sedentary behavior female youths.

**Keywords:** FITT, Sedentary, Surya Namaskar, *t*-test, Yogic, Youths.

## 1. INTRODUCTION

“Youth” as persons whose ages ranged between 15 and 24. Such period of youth age is ladder for develop for their physical and mental. But now, most of the whole world youth living with sedentary behavior. The termed sedentary is characterized by little of physical activity and their low expenditure of energy, i.e.,  $\leq 1.5$  METs. Now, maximum youths of world spend their daily time are watching TV, sitting activity with eating habit, and also resting along with android mobile phone and screen touch. Such living with no activity is known as sedentary lifestyle and also known as slob or couch potato. Now, yoga is spread whole world originally home of yoga is India. Yoga is a philosophical termed, but hatha yoga and Patanjali yoga are maximum practice all over the world. Hatha and Patanjali yoga are popular for asanas, pranayama, kriya, etc. This practicing of yoga may provide many physical and mental health benefits. Hence, Indian system of physical and mental involved yogic practices will effective for sedentary behavior change.

### 1.1. Purpose of the Study

The purpose of this study was the effect of slow and rhythmic Surya Namaskar on body mass index (BMI) of sedentary behavior female youths.

## 2. METHODS

This study was conducted at the Department of Physical Education and Sports Science, Manipur University, Imphal, west district Manipur. After an informed and written consent from all the participants, the training was started. The data were collected before and after 6 weeks yogic training. The training load principle was applied FITT principle and between training was done from 5:30 to 6:30 am morning and duration of training time was 1 h. The yoga class was done under the direct supervision of the trained yoga expert. The subjects were selected 23 female youths who stayed inside the university hostels. Dependent variables of this research study were used the “BMI.” Some selected yogic exercises were selected as an independent variable for this study and training was administration based on FITT principle as given below:

### 2.1. Statistical Analysis

The data obtained were analyzed for the statistical significance using a paired *t*-test using Statistical Package for the Social Sciences (SPSS) version 20 and  $P < 0.05$  was considered the level of significance.

Frequency	Intensity		Time	Type
Frequency of stimulus	Intensity of stimulus	Density of stimulus (rest)	Duration of stimulus	Yoga
3 times/6 days	8 s×3 times=24 s.	2×3 = 6 s	24+6 = 30 s	Om
12 times/6 days	10 s (hold) × 12=120 s 120 s×12 (Rep.)= 1440 s	10 s×12 (Rep.)=120	1440+120=1560 s=26 min	Surya Namaskar

Paired samples statistics	Mean	n	Standard deviation	Standard error mean
Pair 1				
Pre-test of yoga on BMI	22.5780	20	1.01141	0.22616
Post-test of yoga on BMI	22.0925	20	0.85896	0.19207

BMI: Body mass index

Pre-test of yoga on BMI-post- test of yoga on BMI	Paired differences					t	df	Sig. (two tailed)
	Mean	Standard deviation	Standard error mean	95% confidence interval of the difference				
				Lower	Upper			
Pair 1	0.48550	0.33919	0.07584	0.32676	0.64424	6.401	19	0.000

## 2. RESULTS

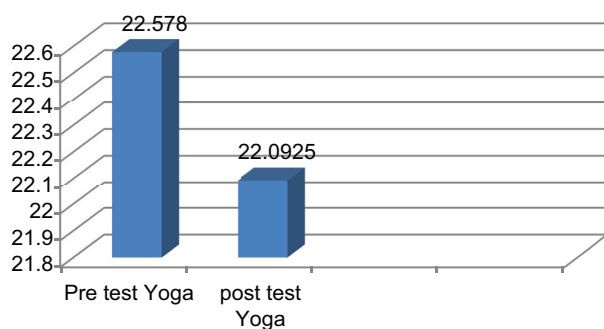


Figure: Pre-test and post-test body mass index

The following interpretation can be made on the basis of result shows in the above output:

- After 6 weeks yogic training, BMI is 22.5780. It is lesser than pre-test mean score 22.0925
- It is shown from Table 2. That the value of *t*-statistic is 6.401. This *t*-value is significant as  $P = 0.000$ , which is  $<0.05$ . The calculated value of *t* is 6.401 which is greater than tabulated value 2.093. Thus, 6 weeks yogic training has the significant effect.

## 3. DISCUSSION OF FINDING

It has been observed from the result of this study that yogic training has the effect on BMI on sedentary female behavior. We know, BMI below 18.5 is underweight, 18.5–24.9 is normal, 25.0–29.9 is overweight, and 30.0

and above is obese. BMI 23.5150 is better than 24.2150. Some of individuals may have more weight, it may be due to not control their diet during training. In this case, yogic practice may enhance better digestion so they love more food. However, carbohydrate could not burnt by the training what they had ate. In general, yogic training is effective to control body fat.

## 4. CONCLUSION

A significant result was found the effect of slow and rhythmic Surya Namaskar on BMI of sedentary behavior female youths.

## REFERENCES

1. Singh, I. "II/3 Yoga" *The Glimpses of Sahaja Yoga*. Babupara, Imphal: C.T Offset Printing Press; 2013. p. 20-21.
2. Chauhan, A., Deepak, K., Satyendra, P.M., and Ruchi, B.S. Yoga practice improves the body mass index and blood pressure. *Int J Yoga*, 2017, 10(2), 103-6.
3. Central Council for Research in Yoga and Naturopathy Basic Principles and Concepts Yoga. New Delhi: Government of India, Ministry of Health and Family Welfare, Department of AYUSH. Available from: <http://www.ccryn.org>.
4. Tomar, A. Effects of Surya namaskar (sun salutations) on the selected physiological variable on active sportsman. *Int Multidiscip Res J*, 2014, 4(3), 1-3.
5. Gharote, M.L. *Yogic Techniques Application of Asana*. Lonavla: The Lonvla Yoga Institute; 1999. p. 41.



6. Rajkumar, B. Effect of yogic practices for weight control for obese men students. *Recent Treads Yoga Phys Educ*, 2011, 1, 66.
7. Shireen, J., and Santhya, K.G. Youth in India: Situation and Needs Study. Available from: <http://www.popcouncil.org>. [Last accessed on 2015 12].
8. Hancock, J., and Inchley, J. Sedentary Behaviour Physical Activity Focus Group Produced by HBSC's International Coordinating Centre. Available from: <http://www.hbsc.org>. [Last access on 2019 Jan].

# Role of Therapeutic Exercise for the Quality Life and Rehabilitation of Athlete

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## 1. INTRODUCTION

Everyone, regardless of age, values the ability to function as independently as possible during everyday live. Health-care consumers typically seek out or are referred for physical injury, disease, or disorders that interfere with their ability to perform any number of activities that are necessary or important to them. Physical therapy services may also be sought by those individuals without any impairment who wish to improve their overall level of fitness or reduce the risk of injury or disease.

An individually designed therapeutic exercise program is always a fundamental component because the ultimate goal of a therapeutic exercise program is the achievement of an optimal level of symptom-free movement during basic to complex physical activities.

Therapeutic exercise takes its place as one of the key elements that lie at the center of programs designed to enhance an individual's function or prevent dysfunction.

## 2. DEFINITION

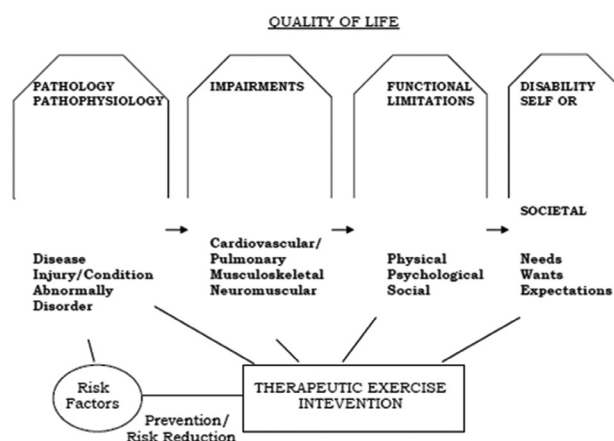
Therapeutic exercise is the systematic and planned performance of bodily movements, postures, or physical activities to provide a client with the means to.

- Prevent impairments
  - Improve, restore, or enhance physical function
  - Prevent or reduce health-related risk factors
  - Optimize overall health status, fitness, or sense of well-being.

## 3. TYPES OF THERAPEUTIC EXERCISE INTERVENTIONS

- Aerobic conditioning and reconditioning
- Muscle performance exercises: Strength, power, and endurance training

- Stretching techniques including muscle lengthening procedures and joint mobilization techniques
- Neuromuscular control and posture awareness training
  - Postural control, body mechanics, and stabilization exercises
  - Balance exercises and agility training
  - Breathing exercises and ventilatory muscle training
  - Task-specific functional training.



## 4. BENEFITS

Common physical impairments managed with therapeutic exercise.

1. Musculoskeletal
  - Pain
  - Muscle weakness
  - Decreased muscular endurance
  - Limited range of motion due to
    - Restriction of the joint capsule
    - Restriction of particular connective tissue
    - Decreased muscle length.
  - Joint hypermobility
  - Muscle imbalances.

2. Neuromuscular
  - Pain
  - Impaired balance, postural stability, or control
  - Incoordination
  - Abnormal tone (hypotonic, hypertonia, and dystonia).
3. Cardiovascular/pulmonary.
  - Decreased aerobic capacity (cardiopulmonary endurance)
  - Impaired circulation (lymphatic, venous, and arterial)
    - Pain with sustained physical activity (intermittent claudication).

### **5. THERAPEUTIC EXERCISES FOLLOWING THE INJURY FOR AN ATHLETE**

1. Passive
2. Assistive
3. Active
4. Resistive.

#### **1. Passive exercises**

Passive exercises are those movements that are performed by an external force (or) by the physiotherapist. There will be no contribution from the patient.

Passive movements are those which are performed accurately smoothly within the

available range by the physiotherapist and in the direction as normal active exercises.

#### **2. Assistive exercises**

An external force or support is provided to produce the desired movement when the muscular action is insufficient to produce or control the movement.

The assistance can be given either by the means of manual support or reeducation board or by the means of water.

#### **3. Active exercises**

The exercises are performed by one's own muscular effort (actively) without the assistance or resistance of any external force except the force of gravity.

#### **4. Resistive exercises.**

Resisted exercises are those forms of active exercises, in which the muscular contraction is resisted by an external force.

Resistance may be manual or mechanical.

### **6. CONCLUSION**

Therapeutic exercises play an important role in the quality of life and in the rehabilitation of an athlete following injury.

By performing maximal resistive exercises, an athlete can reenter into the playing arena.

# Effect of Yoga in Stress Management and High Performance in Sports

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## ABSTRACT

Nowadays, while playing sports sportsmen feel more stress. Hence, to overcome that stress players should perform yoga, then they will be relaxed from the stress. Nowadays, all sports are competitive in nature and all players are playing with winning perception due to that they feel nervous and will get stress; with this stress, players would not give their best performance. Yoga works on strength flexibility, balance capacity endurance like that motor skills. Yoga helps the muscles tendons and ligaments more through a full range of motion, thus cultivating balance and core strength, which is huge benefits to the athletes in their respective sports. In addition, yoga helps you to relax not just tight muscles but also anxious and overstressed minds. Hence, yoga helps in stress management and to give high performance in sports.

## 1. INTRODUCTION

Yoga is art and science that developed from the core of Sanatana Dharma longevity and spiritual evolution. Yoga is a group of physical, mental, and spiritual practices and disciplines which originated in ancient India. Yoga is one of the six (Orthodox) schools of Hindu philosophical traditions. Yoga is a discipline to improve or develop one's inherent power in a balanced manner. It offers the means to attain complete self-realization. The literal meaning of the Sanskrit word yoga is "YOKE." According to Mohan Sri Patanjali, yoga is the suppression of modifications of the mind. Yoga is the systematic practice of physical exercise, breath control, relaxation, diet control, and positive thinking and meditation aimed at developing harmony in the body-mind environment. Most people are familiar with the physical sizes or yoga positions but do not know the yoga involves so much more. Yoga is essentially a spiritual discipline based on an extremely subtle science which focuses on bringing harmony between mind and body. It is an art and science of healthy living. The yoga is derived from the Sanskrit root Yuj meaning to join or yoke or to unite.

## 2. IMPORTANCE OF YOGA

- Yoga is useful for balancing mind and body
- Yoga improves body strength and stamina

- Increases the flexibility
- Improves the physical and mental and spiritual health
- It helps in healing and preventing injuries in sports.

## 3. BENEFITS OF YOGA IN SPORTS PERFORMANCE

### 3.1. Mental Health

Here, we start with benefits of yoga on mental health. Good mental health is more important for being healthy and physically well. Breathing technique forms an integral part of yoga. A common practice in yoga is to breathe only from one nostril at a time while holding the other one closed with the tip of your finger. Medical research has shown that this boosts increased activity of the opposite side of the brain leading to better cognitive performance and tasks associated with the other side of the brain. Regular practice of yoga helps in keeping mind calm and reduces depression and anxiety and increases general well-being of person.

### 3.2. Strength

After a full day of hard work, we tired so much due to the lack of certain asanas of yoga help to generate inner

strength. Inner strength is essential in doing day to day activities and preventing you from injuries, so yoga asanas are more useful in generating inner strength.

### 3.3. Flexibility

The popular notion that you need to be flexible to do yoga is in correct. If you have a flexible body you find it is easy to do tasks. A lot of poses in yoga concentrate on stretching and improving your flexibility with yoga not only muscles of the body but also soft tissues of your body worked out resulting in accumulation of lactic acid so reduces fatigue. By doing yoga asanas body turn to more flexible and perform all tasks easily.

Yoga is for every one athletes included yoga works on strength, flexibility, balance, agility, endurance, core, and overall strength among other things.

Any athlete could benefit hugely by adding yoga to her or his training program.

### 3.4. Yoga in Stress Management

Yoga relieves performance anxiety and stress and free athletes from mental distractions.

- It develops determination and self-discipline
- Teaches athletes to challenge themselves to go outside of their comfort zone
- It reduces stress and provides the method of relaxation
- It helps the athletes to understand the importance of relaxing resting and recovering.

## 4. RECOMMENDATIONS

Yoga gives physical, mental, and spiritual well-being to the players so that yoga should a part of our training program for better result.

## 5. CONCLUSION

By practicing yoga, our strength, stamina, and flexibility will be increase so that we can give our better performance

so that our sports performance also is increased at the same time by practicing yoga our mental strength will be improved anxiety and stress will be reduced so that automatically it will be help full in sports performance in team games also team coordination will be improved player to player relationship will be developed so that it leads to better performance, so there is a definitely effect of yoga in stress management and sports performance.

## REFERENCES

1. Jantos, M. In: Editors: Cobb, M., Puchalski, C.M., and Rumbold, BD. *Oxford Textbook of Spirituality in Healthcare*. Oxford: Oxford University Press; 2012.
2. Cramer, H., Lauche, R., Langhorst, J., and Dobos, G. Yoga for depression: A systematic review and meta-analysis. *Depress Anxiety*, 2013, 30(11), 1068-1083.
3. Riley, K.E., and Park, C.L. How does yoga reduce stress? A systematic review of mechanisms of change and guide to future inquiry. *Health Psychol Rev*, 2015, 9(3), 379-396.
4. Sharma, U., and Sharma, S.K. *Indian Political Thought*. Washington, DC: Atlantic Publishers; 2018, p. 19.
5. Rosselli, J. The self-Image of effeteness: Physical education and nationalism in nineteenth-century Bengal. *Past Present*, 1980, 86, 121-148.
6. Silverberg, D.S. Non-pharmacological treatment of hypertension. *J Hypertens Suppl*, 1990, 8(4), S21-S26.
7. Labarthe, D., and Ayala, C. Nondrug interventions in hypertension prevention and control. *Cardiol Clin*, 2002, 20(2), 249-263.
8. Louie, L. The effectiveness of yoga for depression: A critical literature review. *Issues Ment Health Nurs*, 2014, 35(4), 265-276.
9. Pascoe, M.C., and Bauer, I.E. A systematic review of randomised control trials on the effects of yoga on stress measures and mood. *J Psychiatr Res*, 2015, 68, 270-282.
10. Riley, K.E., and Park, C.L. How does yoga reduce stress? A systematic review of mechanisms of change and guide to future inquiry. *Health Psychol Rev*, 2015, 9(3), 379-396.
11. Adiswarananda, S. *Meditation and its Practices: A Definitive Guide to Techniques and Traditions of Meditation in Yoga and Vedanta*. United States: SkyLight Paths Publishing; 2007.



# The Athlete: Recognition and Management of Sports Injuries in the Young Athlete

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## ABSTRACT

**Aim:** The aim of the study was to identify and manage common sports injuries in the young athlete.

**Materials and Methods:** Retrospective data of 84 young athletes involved in sports at various levels were obtained from hospital records. The data of history, clinical examination, investigation, and the type of intervention (surgical or non-surgical) were analyzed and charted. Injury events were classified into “acute” and “overuse” injuries based on the presence or absence of a specific identifiable traumatic event. **Results:** A higher proportion of injury was reported in male athletes 61 (72.6%) than in females 23 (27.4%). The most frequently reported injured area was lower extremity (66.6%) followed by upper extremity (26.2%) and spine (7.2%). Acute injuries were significantly higher in the lower extremity (77.4%) and overuse injuries were predominantly higher in the upper extremity (45.3%). Surgical intervention was needed only in 36 (42.8%) of athletes and the rest 48 (57.2) needed platelet-rich plasma, bone marrow aspirate concentrate, or cortisone injections.

**Conclusions:** The young athlete involved in sports poses special challenges for the caregiver due to growth, development, psychology, and physiology. Knowledge of common injuries and its treatment is essential to help them have a long sporting career.

**Key words:** Athletes, Acute injuries, Upper extremity.

## 1. INTRODUCTION

The most common sports injuries are:

1. Knee injuries,
2. Sprains and strains,
3. Swollen muscles,
4. Achilles tendon injuries,
5. Pain along the shin bone, and
6. Fractures and dislocations.

14 Olympic sports are involved in the study, each with their own set of data on injury incidence, illness prevalence, and associated risk factors. Moreover, each sport has a specific set of recommendations for reducing the risk of injury or illness.

Injury-related results from the project show that since 2009:

- 67% of interruptions to training for British athletes from Olympic sports have been because of injury.
- 43% of athletes will get at least one injury per season, some will have several.
- On average, each injury results in a loss of 17 days of training and 1 missed competition.

- The rate and severity of injury during training are lower than during competition.

## 2. MATERIALS AND METHODS

Retrospective data of 84 young athletes involved in sports at various levels were obtained from hospital records. The data of history, clinical examination, investigation, and the type of intervention (surgical or non-surgical) were analyzed and charted. Injury events were classified into “acute” and “overuse” injuries based on the presence or absence of a specific identifiable traumatic event.

## 3. RESULTS

A higher proportion of injury was reported in male athletes 61 (72.6%) than in females 23 (27.4%). The most frequently reported injured area was lower extremity (66.6%) followed by upper extremity (26.2%) and spine (7.2%). Acute injuries were significantly higher in the lower extremity (77.4%) and overuse injuries were predominantly higher in the upper extremity (45.3%).

Surgical intervention was needed only in 36 (42.8%) of athletes and the rest 48 (57.2%) needed Prp, BMAC, or cortisone injections.

#### 4. CONCLUSIONS

The young athlete involved in sports poses special challenges for the caregiver due to growth, development,

psychology, and physiology. Knowledge of common injuries and its treatment is essential to help them have a long sporting career.

#### REFERENCES

<https://www.medicalnewstoday.com/articles/248796#Common-Sport-Injuries>

# Women's Sports Branding: A Review-based Study

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## ABSTRACT

Many sports fans argue those women's sports are boring compared to men's sports. Simultaneously, women's sports, compared to men's sports, are rarely broadcasted in the media. Therefore, could the media be making sports fans believe that women's sports are less desirable by giving them less coverage? Using the Agenda-setting theory, framing theory, and mere exposure effect, an intervention was developed to promote women's sports to sports fans. The purpose of this study was to explore the gaps in the branding literature as it pertains to women's sports. The review included 11 articles from sport management and business journals, investigating personal branding, team branding, and media coverage. In addition, the review explored the practical implications as well as avenues of future research (i.e., conceptual model).

**Keywords:** Branding, Media, Women's sports.

## 1. INTRODUCTION

Enthusiasm is emerging; for instance, in the WNBA's Nineteenth season, average attendance was over 7000 (seven thousand); more than the NBA in its nineteenth season (Griffin, 2016). Moreover, the 2018 NCAA Women's Basketball Championship game was the most-watched basketball game broadcast on ESPN since the NBA playoffs ("Women's title game," 2018).

Conversely, only 2–3% of network and cable television coverage of sports is dedicated to women's sports (Fink, 2015). In addition, women's sports accounted for only 0.4% of total sport sponsorships between 2011 and 2013 (Rogers, 2018). Considering the purchasing power of women, this untapped market is prime from a spectator and consumer outlook (Fink, 2015).

Pursuing brand management strategies are one way to set your business apart in a competitive service brand industry. Women's sports brands are in competition with the dominant men's sports industry. An improved understanding of branding in women's sports is needed in order to develop awareness and ultimately brand equity. The present study aims to explore the literature relative to branding in women's sports as a foundation for a proposed conceptual model. Thus, providing another avenue for more empirical research in this context while

exploring a solution to the minimal consumption of women's sports.

For the purpose of this study, women's sports are defined as individual and team sports played by females at the collegiate and professional level, nationally and internationally.

## 2. LITERATURE REVIEW

As the chief branding concept, brand equity is the set of assets and liabilities linked to a brand that adds or subtracts from the value of the brand in the minds of consumers (Aaker, 1991). According to the research, consumer perception is paramount for developing brand equity with service entities (Berry, 2000; Green *et al.*, 2013).

Developing service brand equity suggests that an organization has a recognized brand and brand meaning due to the internal promotion of the brands' message, external brand communications, and customer experiences (Berry, 2000). This study will be the first to explore brand equity in a women's sports context. Although there are multiple conceptualizations of brand equity, consumer-based brand equity will be applied to the current study. Consumer-based brand equity is "the differential effect of brand knowledge

on consumer response to the marketing of a brand” (Keller, 1993).

Consumer-based brand equity occurs when a consumer is aware of a brand and holds some favorable, strong, and unique brand associations in their mind (Keller).

Brand equity has been conceptualized in the sport and participatory sport segments. Gladden *et al.* (1998) developed the first brand equity model in sport. Their model was designed based on Aaker’s (1991) framework of brand equity assets.

Ross (2006) developed a spectator-based brand equity model based on Keller’s (1993) conceptualization of consumer-based brand equity and emphasized the service-oriented nature of spectator sport.

Brand-related studies in participatory sport (i.e., health clubs and campus recreational sports) have utilized previous brand association scales to examine consumer behavior (Alexandris *et al.*, 2008; Williams and Pedersen, 2012; Williams *et al.*, 2012) and have conceptualized brand equity in campus recreational sports (Robinson and Gladden, 2003; Mills and Williams, 2016).

Although Keller and Aaker’s models have been utilized as the theoretical framework for previous brand equity models in sport, Berry (2000) argued that this conceptualization may not be appropriate for service-oriented brands because the core product is intangible and inherently difficult to differentiate. Therefore, future studies should consider applying Berry’s brand equity framework to women’s sports.

### 3. METHODS

Primary and secondary channels of information were accessed through a review of sport management journals. Seven journals were identified. Shilbury’s (2011a; 2011b) bibliometric analysis of the field of sport management which identified these outlets as the leading publications in terms of quality and longevity. In addition, Google Scholar was used to search for relevant publications. Search terms included branding and women’s sports, brand equity, and women’s sports. The use of primary and secondary channels of information to identify articles for review aligns with Cornwell and Maignan’s (1998) approach. In total, eleven articles were included in the review with publication dates ranging from 2008 to 2018.

### 4. RESULTS

Three categories of research were identified: Personal branding, team branding, and media coverage. Personal branding relates to professional female athletes while research related to team branding has investigated brand equity among professional women’s sports teams (i.e., netball and soccer). The final category of research examined the relationship between media coverage and branding opportunities for women’s sports.

Specifically, personal branding pertains to studies that have examined the tactics and barriers that female athletes face (Lobpries *et al.*, 2018; Parris *et al.*, 2014). This includes how female athletes represent themselves on social media as well as the products and corporations they endorse (Cortsen, 2013; Toffoleti and Thorpe, 2018).

The next category relates to branding in professional women’s sports teams includes a rebranding case that implies increases in team brand equity due to the introduction of a new product (Cortsen, 2017), as well as marketing trends and image perceptions (Mårtensson, 2010). In addition, this category of research investigates brand equity constructs such as brand personality or associations of a professional women’s netball team (Heere, 2017).

Moreover, this particular research explores connections between gendered brands (i.e., WNBA), self-brand connections, and attitude strength (Moore and Homer, 2008).

The last category addresses research that analyzes media coverage of intercollegiate sport teams. The research examined the amount of coverage dedicated to women’s teams on athletic department websites (Cooper, 2008; 2009). Moreover, the authors of this research allude to the importance of media coverage as an opportunity for branding women’s sports.

The primary research methods employed in the review include surveys, questionnaires, interviews, focus groups, case studies, and thought listing. The secondary research methods employed in the review include content analysis. Finally, conceptual research included articles in which scholars advance their ideas based on theory, trends, and concepts without presentation of empirical data. The following table provides a summary of the research assessed in the study.

Author(s), year	Theoretical/ conceptual framework	Context	Research type
Cooper, 2008; 2009	NA	Women's collegiate team sports	Secondary
Cortsen, 2013	NA	Women's golf	Primary
Cortsen, 2017	Brand management	Women's soccer	Primary
Heere, 2017	Brand personality	Women's netball	Primary
Lobpries <i>et al.</i> , 2018	Brand identity	Elite female athletes	Primary
Mårtensson, 2010	Discourse theory brand management/ hegemonic masculinity	Women's football (soccer)	Secondary
Moore and Homer, 2008	Social identity	Women's professional sport	Primary
O'Reilly and Braedley, 2008	Athlete-clothing relationship	Women's tennis	Conceptual
Parris <i>et al.</i> , 2014	NA	Female wakeboarder	Primary
Toffoleti and Thorpe, 2018	Athletic labor of femininity	Professional female athletes	Conceptual

## 5. CONCLUSION AND FUTURE RESEARCH

This review reflects an initial exploration branding in women's sports. Within the research selection process, the search for journal articles was initially limited to sport journals. Although an expansive search of mainstream business journals was employed, findings were minimal. This furthers the assertion that more substantial research in this context is needed. In addition, the researcher only examined literature published in English, which does not account for knowledge developed in other languages.

The purpose of this review was to provide a summary of sport management research conducted on branding in women's sport. The current review analyzed prior research insights regarding the branding endeavors of individual female athletes, women's team sports, and the role of media coverage in relation to building brands for women's sports. The categories provide directions for future branding research as it pertains to women's sports from the perspective of sport managers and stakeholders of women's sports.

Moreover, opportunities exist to build upon this research in scope. Specifically, research regarding

branding women's sports can benefit from variation in terms of the theoretical frameworks applied, methods used, and research contexts examined. For instance, a large portion of the articles in this review pertains to individual athlete brands rather than team sports brands.

The current study illuminates the need for more conceptual and empirical examinations of brand equity in women's sports. With minimal literature available related to brand equity in this context, the foundational work must be conceptual. Therefore, developing a conceptual model is optimal. Furthermore, as practitioners look for ways to improve consumption and overall revenue regarding women's sports, continued research may provide a basis for improving the overall marketing of women's sports. Hopefully, this review and the subsequent suggestions for future research provide a foundation for sport management researchers with interest and expertise in this continually developing context.

## REFERENCES

- Aaker, D. *Managing Brand Equity*. New York: The Free Press; 1991.
- Alexandris, K., Douka, S., Papadopoulos, P., and Kaltsatou, A. Testing the role of service quality on the development of brand associations and brand loyalty. *Manag Serv Qual*, 2008, 18(3), 239-254.
- Berry, L. Cultivating service brand equity. *J Acad Mark Sci*, 2000, 28(1), 128-137.
- Cornwell, T. B., and Maignan, I. An international review of sponsorship research. *J Advert*, 1998, 27, 1-21.
- Cooper, C. NCAA website coverage: An analysis of similar sport team gender coverage on athletic department's home web page. *J Intercol Sports*, 2008, 1, 227-241.
- Cortsen, K. Annika sorenstam-a hybrid personal brand. *Sport Bus Manage*, 2013, 3(1), 37-62.
- Cortsen, K. Re-branding women's football by means of a new sports product: A case study of women's football in Denmark. *Soccer Soc*, 2017, 18(7), 1058-1079.
- Fink, J. Sponsorship for women's sports presents untapped opportunity. *Sports Bus J*, 2015, 15.
- Gladden, J., Milne, G., and Sutton, W. A conceptual framework for evaluating brand equity in Division I college athletics. *J Sport Manag*, 1998, 12(1), 1-19.
- Griffin, M. Time to hit the reset, not panic, button for women's sports. *Sports Bus J*, 2016, 18-24(13).
- Heere, B. A new approach to measure perceived brand personality associations among consumers. *Sport Mark Q*, 2010, 19(1), 17-24.
- Lobpries, J., Bennett, G., and Brison, N. How i perform is not enough: Exploring branding barriers faced by elite female athletes. *Sport Mark Q*, 2018, 27(1), 5-17.



- Mårtensson, S. Branding women's football in a field of hegemonic masculinity. *Entertain Sports Law J*, 2010, 8(1), 5.
- Mills, I., and Williams, A. Understanding brand equity in campus recreational sports: A conceptual framework. *Recreation Sport J*, 2016, 40(2), 120-132.
- Moore, D., and Homer, P. Self-brand connections: The role of attitude strength and autobiographical memory primes. *J Bus Res*, 2008, 61, 707-714.
- Nielsen. *The Rise of Women's Sports 2018*. The Nielsen Company; 2018. Available from: <https://www.nielsen.com/us/en/insights/reports/2018/the-rise-of-womens-sports.html>.
- O'Reilly, N., and Braedley, L. Celebrity athletes and athletic clothing design: Branding female tennis players. *Int J Sport Manag Mark*, 2008, 3(1/2), 119-139.
- Parris, D., Troilo, M., Bouchet, A., and Peachy, J. Action sports athletes as entrepreneurs: Female professional wakeboarders, sponsorship, and branding. *Sport Manag Rev*, 2014, 17, 530-545.
- Robinson, M., and Gladden, J. Think strategically about marketing: A conceptual framework for understanding brand equity in recreation and intramural sports. *Recreation Sport J*, 2003, 27(2), 7-19.
- Rogers, C. *Why brands must rethink their approach to women's sports sponsorship*, *Marketing Week*; 2018. Available from: <https://www.marketingweek.com/2018/02/08/brands-neglecting-womens-sports-sponsorship>.
- Ross, S. A conceptual framework for understanding spectator-based brand equity. *J Sport Manag*, 2006, 20(1), 22-38.
- Shilbury, D. A bibliometric analysis of four sport management journals. *Sport Manag Rev*, 2011a, 14, 434-452.
- Shilbury, D. A bibliometric study of citations to sport management and marketing journals. *J Sport Manag*, 2011b, 25, 423-444.
- Toffoleti, K., and Thorpe, H. The athletic labour of femininity: The branding and consumption of global celebrity sportswomen on Instagram. *J Consum Cult*, 2018, 18(2), 298-316.
- Williams, A., and Pedersen, P. Investigating antecedents of brand equity in the fitness segment of the sport industry: An exploratory study of the role that direct experiences have on the development of brand associations. *Int J Sport Manag*, 2012, 13(1), 104-114.
- Williams, A., Pedersen, P., and Walsh, P. Brand associations in the fitness segment of the sport industry in the United States: Extending spectator sports brandings conceptualizations and dimensions to participatory sports. *Int J Sport Mark Sponsorship*, 2012, 14(1), 34-50.
- Women's Title Game Holds up in Final Tally*; 2018. Available from: <http://www.sportsmediawatch.com/2018/04/womens-national-championship-ratings-espn>.

# Studies on Development of Energy Nutri Bar as a Sports Food

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## ABSTRACT

Sports food market has been rapidly growing for the past years, but the development of new products is still imperative due to the increasing demand for high energy, healthy, and high-quality sports foods associated to changes lifestyle. In general, the carbohydrate need for more exercise includes daily meals. A demanding exercise regime will use up stored energy from carbohydrate quickly, so include some carbohydrate in meals. A diet low in carbohydrate can lead to a lack of energy during exercise, loss of concentration, and delayed recovery. Energy nutri bars are mostly made using a base of grains, such as rice or oats and proteins such as legumes. The proximate composition of nutri bar prepared using different levels of jaggery also studied. The result shows the variations in chemical composition. The most acceptable nutri bar contained the highest amount of protein (8.67%), crude fiber (11.52%), and ash (2.84%). The sensory evaluation of nutri bar using different levels of jaggery was carried out using the 9-point hedonic scale. It is observed from the results that the sample  $T_{1\text{ sec}}$  secured a maximum score (8.1) for overall acceptability. The highest sensory score of the  $T_{1\text{ sample}}$  for each sensory attributes was color (7.4), flavor (8.2), taste (8.7), and texture (8.1). The energy value of the sample ( $T_1$ ) was estimated to be (347.89 kcal/100 g) on the basis of the percent chemical composition of nutri bar. The experimental data were analyzed using analysis of variance for different treatments.

## 1. INTRODUCTION

The sports food market has been rapidly growing for the past years, but the development of new products is still imperative due to the increasing demand for high energy, healthy, and high-quality sports foods associated to changes lifestyle. Sports foods are specially formulated to help people achieve specific nutritional or sporting performance goals. They are intended to supplement the diet of sportspeople rather than be the only or main source of nutrition. In general, the carbohydrate need for more exercise includes daily meals. A demanding exercise regime will use up stored energy from carbohydrate quickly, so include some carbohydrate in meals. A diet low in carbohydrate can lead to a lack of energy during exercise, loss of concentration, and delayed recovery. Energy nutri bars are mostly made using a base of grains, such as rice or oats and proteins such as legumes (Gutkoski *et al.*, 2007). The bars may be fortified using a wide range of vitamins, minerals, herbs, and other nutrients or energy-rich ingredients (Gonzales and Draganchuk, 2003).

### 1.1. Purpose of the Study

The purpose of this study was to prepare natural based high-energy food with low weight and low cost with a high shelf life as a sports food.

## 2. METHODOLOGY

Raw materials such as jaggery, groundnuts, finger millet, moth bean, Bengal gram, carrot and beetroot, sesame, and acacia gum were purchased from the local market.

Nutri bar was prepared by the addition of jaggery at the rate of 50, 62.5, and 75%. Similarly, the other ingredients groundnut, finger millet, moth bean, Bengal gram, carrot, beetroot, sesame, acacia gum, cardamom, butter, and liquid glucose incorporated at the rate of 50, 37.5, and 25%, respectively. Nutri bar was prepared by the addition of jaggery in increasing order and other ingredients in decreasing order. However, other required ingredients were to be kept constant in all three variations of nutri bar. Organoleptic evaluations of different varying levels of nutri bar with a control sample were carried out. The

formulation is done the method used by Izzo *et al.*, (2001) and Padmashree *et al.*, (2013).

### 2.1. Preparation of Energy Nutri Bar

The selected nutritionally rich ingredients such as finger millet, moth bean, and Bengal gram were ground into flour and prepared the carrot and beetroot powder; whereas groundnuts were roasted to improve their aroma profile mixed them all powdered and other ingredients thoroughly. Further, prepared thin jaggery syrup and added cardamom and butter into jaggery syrup. The jaggery syrup mixture was heated to 104°C temperature for 8–10 min and mixed the above added ingredients. In the above syrup, acacia gum and liquid glucose were added as stabilizer and thickener. The prepared hot syrup stirred continuously to have a homogenous mixture. The hot mixture was immediately poured on the molder tray and pressed it to form a uniform shape. Cooled nutri bar at 27°C temperature for 10–13 min and cut into 6 × 3 cm size was packed in butter paper and aluminum foil and stored at ambient temperature (27–32°C). The experimental data were analyzed using analysis of variance for different treatments. The analysis of variance revealed at a significant difference of ( $P < 0.05$ ) level, standard error and critical difference at 5% level were mentioned.

## 3. RESULTS AND DISCUSSION

### 3.1. Proximate Composition of Nutri Bar

The moisture content of sample T<sub>2</sub> and T<sub>3</sub> was found as 8.06 and 8.13%, respectively. The T<sub>0</sub> sample shows the lowest amount of fat content (7.70%), whereas T<sub>2</sub> (8.89%) and T<sub>3</sub> (8.41%) were found to be a rich source of fat content that these results are par with Grosso *et al.*, (1997). The protein content of nutri bar increased due to the use of sprouted moth bean flour, sprouted Bengal gram flour, groundnut, and sesame, whereas the lowest protein content was found in sample T<sub>3</sub> (7.23%) due to gradually increasing the quantity of jaggery and decreasing other ingredients quantity and similar results are found with Gupta *et al.*, (2006). The protein content in T<sub>2</sub> was observed (7.58%). The crude fiber content of sample T<sub>1</sub> was found to be highest (11.52%) and these results are par with Zahra *et al.*, (2014).

### 3.2. Organoleptic Evaluation of Energy Nutri Bar

The organoleptic evaluation of energy nutri bar was carried out by ten semi-trained panel members and the sensory attributes for nutri bar were taken into consideration include color, flavor, taste, texture, and overall acceptability.

**Table 1: Proximate composition of nutri bar**

Formulations	Proximate composition (%)					
	Moisture	Fat	Protein	Crude fiber	Carbohydrate	Ash
T <sub>0</sub>	8.52	9.02	7.63	9.84	61.87	2.52
T <sub>1</sub>	7.70	8.09	8.67	11.52	61.10	2.84
T <sub>2</sub>	8.06	8.89	7.58	10.71	61.75	2.61
T <sub>3</sub>	8.13	8.41	7.23	10.54	62.17	2.52
SE±	0.038	0.077	0.023	0.068	0.016	0.044
C.D at 5%	0.125	0.253	0.077	0.222	0.052	0.134

\*Each value is average of three determinations. Where T<sub>0</sub> – Control sample; T<sub>1</sub> – Nutri bar with 50 % jaggery; T<sub>2</sub> – Nutri bar with 62.5 % jaggery; T<sub>3</sub> – Nutri bar with 75 % jaggery. SE: Standard error

**Table 2: Organoleptic evaluation of energy nutri bar**

Formulation	Sensory score of nutri bar				
	Color	Flavor	Taste	Texture	Overall Acceptability
T <sub>0</sub>	7.5	8.0	7.8	8.0	7.8
T <sub>1</sub>	7.4	8.2	8.7	8.1	8.1
T <sub>2</sub>	7.2	7.7	7.7	7.8	7.6
T <sub>3</sub>	7.1	7.6	7.4	7.5	7.4
SE±	0.04472	0.03651	0.08556	0.00894	0.04472
C.D at 5%	0.13462	0.10992	0.25755	0.02692	0.13462

\*Each value is average of three determinations. T<sub>0</sub> – Control sample; T<sub>1</sub> – Nutri bar with 50 % jaggery; T<sub>2</sub> – Nutri bar with 62.5 % jaggery; T<sub>3</sub> – Nutri bar with 75 % jaggery. SE: Standard error

#### 4. SUMMARY

The proximate composition of nutri bar prepared using different levels of jaggery also studied. The result shows the variations in chemical composition. The most acceptable nutri bar contained the highest amount of protein (8.67%), crude fiber (11.52%), and ash (2.84%). The sensory evaluation of nutri bar using different levels of jaggery was carried out using the 9-point hedonic scale. It is observed from the results that the sample T<sub>1</sub> secured a maximum score (8.1) for overall acceptability. The highest sensory score of the T<sub>1</sub> sample for each sensory attributes was color (7.4), flavor (8.2), taste (8.7), and texture (8.1). The energy value of sample (T<sub>1</sub>) was estimated to be (347.89 kcal/100 g) on the basis of the percent chemical composition of nutri bar.

#### 5. CONCLUSION

It is concluded from the results of the present findings that the quality nutri bar (T<sub>1</sub>) can be prepared using 50% jaggery and 50% other ingredients. This nutri bar is rich in protein, crude fiber, and minerals provided energy about 347.89 kcal. Moreover, the product yields 88% of the raw material and it has an economical feasible and shelf life of 75 days under room temperature with good

overall acceptability. Due to high energy, it could serve as sports food.

#### REFERENCES

- Gonzales, E., and Draganchuk, M. Flavoring nutrition bars. *Cereal Food World*, 2003, 48, 250-251.
- Grosso, N.R., Zygadlo, J.A., Lamarque, A.L., Maestri, D.M., and Guzman, C.A. Proximate, fatty acid and sterol compositions of aboriginal peanut (*Arachis hypogaea* L) seeds from Bolivia. *J Sci Food Agric*, 1997, 73, 249-356.
- Gupta, A.K., Srivastava, A.K., Samsher, and Srivastav, P.K. Qualitative studies on jaggery based soy sweet meat bars. *Prog Agric*, 2006, 6(2), 171-174.
- Gutkoski, L.C., Bonamigo, J.M.A., Teixeira, M.F., and Pêdo, I. Development of the cereal bars based on oats with high content of dietary fiber. *Food Sci Technol*, 2007, 27, 355-363.
- Izzo, M., and Niness, K. Formulating nutrition bars with inulin and oligofructose. *Cereal Foods World*, 2001, 46(3), 102-106.
- Ananthan, P., Kumar, S.G., and Thimma, G. Development and evaluation of shelf stability of flaxoat nutty bar in different packaging materials. *Food Nutr Sci*, 2013, 4, 538-546.
- Zahra, S.M., Nadeem, M., Hussain, S., Qureshi, T.M., Ahmad, D., and Rashid, F. Development and evaluation of nutri-bars for internally displaced people in humanitarian emergencies. *J Agric Res*, 2014, 52(2), 217-227.

# Practices and Challenges of Implementing Psychological Skill Training in Ethiopian Youth Sport Academy and Athlete Tirunesh Dibaba Sports Training Center

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## ABSTRACT

The purpose of this study was to investigate the practices and challenges of implementing psychological skill training in Ethiopian Youth Sport Academy and Athlete Tirunesh Dibaba Sports Training Center. Mixed concurrent research method was employed. Questionnaire, interview, and document analysis were used as a data collecting instruments and census as a sampling technique. All 18 athletics coaches (100%) and for technical staffs (100%) who had direct contact with the training center were selected as a respondent. The finding of this study revealed that the implementation of psychological skill training was very poor. The major challenges those affected in implementing psychological skill training in these two centers were: There was no sport psychologist, the existed coaches' lack practical knowledge, there was no awareness about its importance. Accordingly, the study suggests: to be geared up awareness creation programs for athletes, coaches, and technical staffs; continuous training for coaches; provision of special emphasis in higher education institutes; and preparation of Psychological skill training manuals as a long term solution.

**Keywords:** Academy, Athletics, Psychological skill training, Training center.

## 1. INTRODUCTION

Athlete Tirunesh Dibaba Sport Training Center (ATDSTC), which is named after the renowned female athlete, is established in 2009 G.C in Assela town. The primary aim of the center is to produce elite athletes who can successfully represent the country in all athletics events. Similarly, Ethiopian Youth Sport Academy (EYSA) is established in 2014 G.C with the same mission. Both organizations identify talented athletes from all parts of the country and provide scientific training to produce elite athletes.

### 1.1. Statement of the Problem

These two sport training centers assumed to provide modern and scientific training. However, one of the major components, which are psychological skill training, is not incorporated in their training programs. Coaches are not teaching mental skill to their athletes and devote much of their time on physical, technical,

and tactical aspect of the training. The psychological skill training is mostly neglected; consequently, it costs both coaches and athletes in general and the country particularly. Based on the stated problem, this study was designed to answer the following research questions:

- What are the current practices of psychological skill training in ATDSTC and EYSA?
- What are the major challenges that affect its implementation?
- To what extent the level of coaches knowledge about psychological skill training?
- What is the perception of the coaches towards psychological skill training?

### 1.2. Research Method

This research was employed concurrent mixed research methods, more specifically quantitative and qualitative. Questionnaire, interviews, and document analyses were used for the purpose of collecting relevant data and triangulated to test its validity through the convergence



of information from different sources: Athletics coaches, technical staffs, and documents (training manual, annual, and weekly training plans). Data were collected using census. All 18 athletics coaches (100%) and four technical staffs (100%) who had direct contact with the training center were selected as a respondent. To determine the validity of the data expertise, opinion was taken into consideration. Moreover, to check the reliability, the instrument was pilot tested on six coaches who were selected randomly from former coaches of the training centers. All responses of the participants on items that measure each category of variables were scored and computed using Cronbach's alpha, by the help of SPSS version 25. The result showed that the reliability index of the items that were supposed to measure the coaches rating on the challenges of parents skills training (PST) implementation was 0.83. On the other hand, items on the perception of coaches were 0.68, items on assessing the knowledge of coaches were 0.69, and items on the planning and implementation of PST are 0.71. Based on the results of the pilot test, the instrument with minor modification was used to collect the required data for the main study.

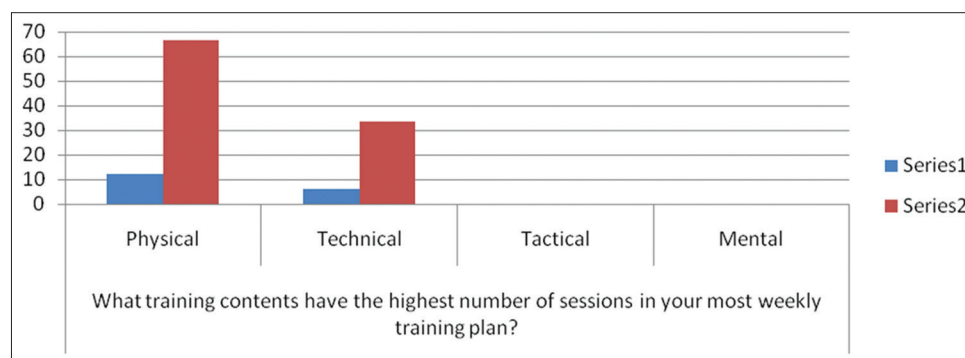
### 1.3. Data Analysis

In most training plans, psychological skill training is not included. Only a few training plans include

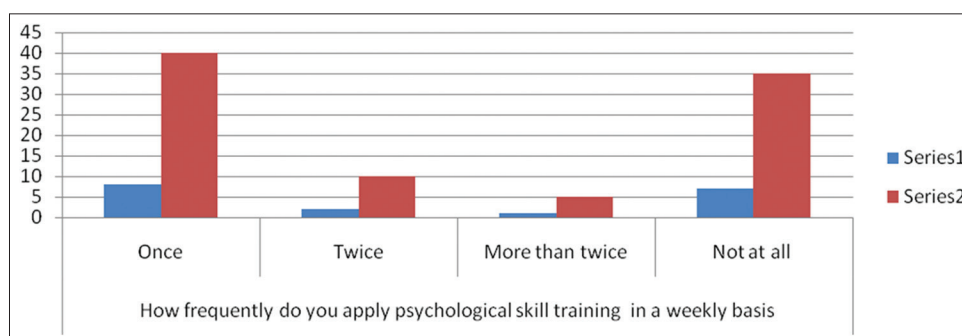
psychological skill training. However, these plans by themselves are not complete and lack clarity and consistency regarding the skills to be taught. It is also observed that the teaching of these psychological skills is only limited to the competition period. It is against the reality that psychological skill training should be learned and practiced throughout all the training periods, just like physical skills. From the above discussion and presentation, it is clearly shown that the problem of implementing psychological skill training starts at the planning phase.

About 66.6% (12) of the respondents said most of their training is composed of physical training, while the rest 33.4% (6) technical training have the highest composition. Tactical and mental aspects of training are given less emphasis. The data show that most of the coaches are not giving time on their training for the mental part. The document analysis result supports the data presented in Graph 1.

Graph 2 presents the frequency and time allotted for psychological skill training in a weekly basis, accordingly, 35% (7) of coach respondents said not at all, 40% (8) of the respondents said once a week, 10% (2) of the respondents was answered twice, and the rest 10% (2) said more than twice. Regarding the



**Graph 1:** The implementation of psychological skill training



**Graph 2:** Frequency and time allotted for parents skills training

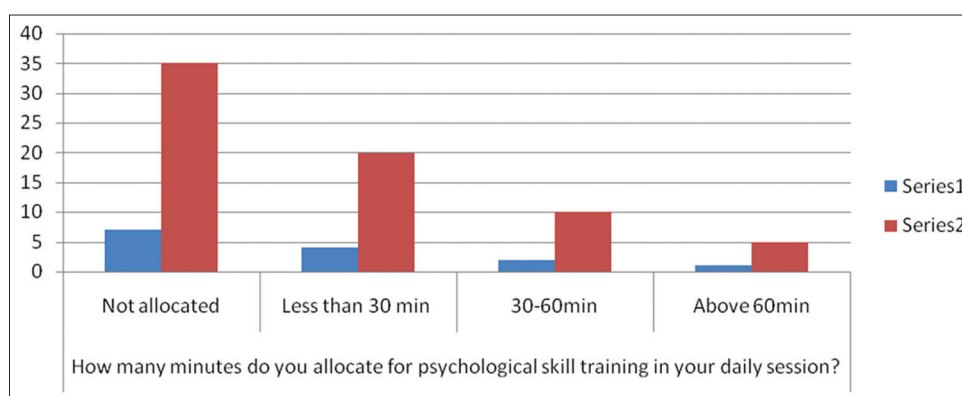
time allotted 35% (7) of the respondents said not time allocated for teaching psychological skill training, 20% (4) of the respondents said 30 min less, 10% (2) of them responded 30–60 min, and the rest 5% (1) responded above 60 min.

Graph 3 presentation shows that most coaches are not implementing psychological skill training in their formal training schedule; most coaches allocated much of their time for coaching other components. It clearly shows that psychological skill training is neglected by coaches and not given the deserved place in the training program.

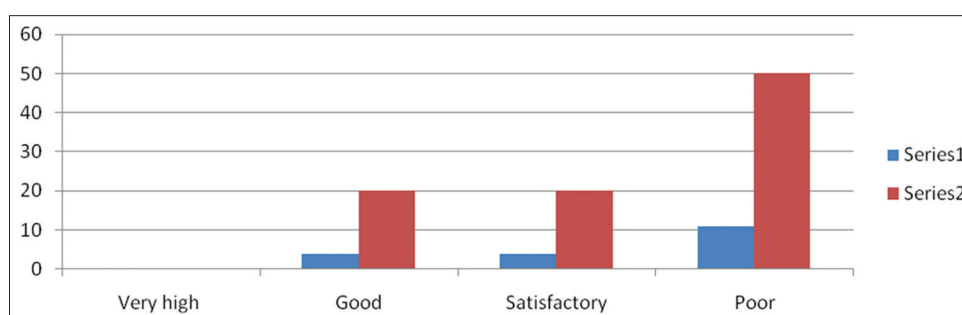
Graph 4 presents the rating of coaches regarding the implementation of psychological skill training; consequently, 50% (11) of respondents rate poor and 10% (3) respondents rate very poor, whereas 20% (4) of the respondents rate the implementation as satisfactory and the same number 20% (4) rate as good.

As the above data shows, the implementation of psychological skill training in the two training centers is not good. As the majority responded, 70% labeled the implementation as satisfactory, poor, and very poor. When we look back at the data regarding planning, it is not surprising that coaches labeled the implementation as poor.

Respondents were asked to rate the extent to which that affects its implementation. Accordingly, the responses were calculated using mean scores (weighted mean) as statistical tools. In this regard, problems such as shortage of coaches to involve in all coaching activities ( $\bar{x} = 4.22$ ), lack of practical teaching method in higher education institutes ( $\bar{x} = 4.18$ ), lack of qualified sport psychologist ( $\bar{x} = 4.09$ ), insufficient emphasis given for psychological skill training in higher education institutes ( $\bar{x} = 4.00$ ), and lack of trained coaches to implement psychological skill training ( $\bar{x} = 4.00$ ) were found to be high factors that affected the implementation of psychological skill training in EYSA and ATDSTC. Moreover, lack of necessary awareness from athletes ( $\bar{x} = 3.77$ ), lack of necessary awareness from sport administrators ( $\bar{x} = 3.36$ ), resistance of psychological skill training from athletes ( $\bar{x} = 3.40$ ), and limited support from the center administrators ( $\bar{x} = 3.63$ ) were identified to be moderate factors. This shows that the major challenges that affect the implementation of psychological skill training in EYSA and ATDSTC were lack of trained coaches to implement psychological skill training, shortage of coaches to involve in all coaching activities, lack of insufficient emphasis given for psychological skill training in higher education institutes, lack of qualified sport psychologist, limited support from the center



**Graph 3:** Implementation of psychological skill training



**Graph 4:** Rating of coaches

administrators, and lack of necessary awareness and practical involvement of athletes in the implementation.

The same challenges are mentioned by the respondents in the open-ended questioner and in the interview session. Moreover, some emphasis was given by the respondents as shortage of coaches to involve in all coaching activities, lack of practical knowledge to apply psychological skill training, absence of sport psychologist in the training centers and limited support from the center, lack of special trainings based on the need of the coaches, unavailability of teaching aids as books, audiovisual aids, and others as the major challenges in the implementation of psychological skill training.

#### 1.4. Major Findings

EYSA does not have a leading training manual, whereas Athlete Tirunish Dibaba Athletics Training Center has its own training manual. All coaches prepared annual, weekly, and session training plans but no plans incorporate PST. Most coaches lack the practical knowledge to implement psychological skill training. The overall implementation of psychological skill training in the two academies is very poor. Most coaches have a misperception to teach psychological skill training requires more time than physical fitness and sport skill training.

Challenges to implement psychological skill training: Insufficient emphasis given for psychological skill training in higher education institutes, shortage of sport psychologist, and shortage of coaches to involve in all coaching activities, lack of awareness from athletes, coaches, and stakeholders. Limited support from the centers administrators is the challenges coaches facing in implementing psychological skill training.

## 2. CONCLUSION

In light of the findings stated above, the following conclusions are drawn: It is observed that only one of the sport academies has a training manual which is introduced to the center in 2009. The training manual was prepared by fitness consultancy group. However, the training manual main emphasis was the fitness, technique, and tactical aspects of training, but it lacks psychological skill training; consequently, it caused poor implementation.

A few coaches have a better understanding about psychological skill training. However, the majority of coaches' understanding about psychological skill training is very low; they clearly mention that they did

not know how to apply it. Although they have taken sport psychology courses in their stay at the university at different levels, most coaches agree that it is not practical enough to implement it in training. Moreover, the emphasis given to psychological skill training is very low in higher education institutes and by the training centers.

In general, the knowledge gap of the coaches regarding psychological skill training is the main challenge in the implementation of psychological skill training.

Based on the findings, the most challenging factors for neglecting the implementation of psychological skill training are:

Coaches are expected to carry out all the athletes' related jobs and assigned to manage a relatively large number of athletes. Therefore, they prefer to neglect psychological skill training to have more time for the other tasks.

Psychological skill training knowledge is the most challenging roadblock for the implementation of psychological skill training by coaches. Coaches, athletes, and center administrators lack awareness about the importance of psychological skill training. Furthermore, they are not willing to give time for the practice of psychological skill training. They simply think that it is a waste of time. Limited support from the centers administrators is also among the challenges coaches facing in implementing psychological skill training. Shortage of qualified sport psychologist, lack of necessary material, and facility for psychological skill training implementation such as audiovisual aids, books, and favorable training areas were challenges to implement psychological skill training.

## 3. RECOMMENDATION

All stakeholders and specifically coaches should be convinced that unless they devote the necessary time to train the mental side of the athletes, they are letting their athletes compete half armed. Therefore, sport leaders, coaches, and athletes have to realize that although an athlete's success comes from physical talents, mental factors also play a hugely important role. Moreover, they should understand that psychological training should be an integral part of an athlete's training process carried out in combination with other training elements like sport skill and physical fitness.

Coaches are suggested to be convinced that teaching PST is not the only responsibility of the sport psychologist,

but they should learn and conduct PST in their formal training schedules to prepare their athletes to reach the highest performance level.

As the findings of the study revealed that one of the major challenges in the implementation of psychological skill training is lack of necessary awareness and the subsequent resistance from athletes. Hence, the academy leadership and the coaches are expected to organize consistent awareness creation programs to effectively change the attitude and perception of athletes toward psychological skill training.

As the finding indicates, the biggest problem that coaches have in PST is the lack of scientific knowledge to conduct the process. Therefore, the sport academy is expected to organize in service training based on the need of the coaches. In this regard, the sport academy should work closely with higher education institutes and the national federation to organize an effective training program that can provide the coaches with the necessary knowledge to conduct PST in their training centers.

As a long-term solution for alleviating the challenges, it suggested that the sport academy to prepare its own training manual specifically designed for teaching psychological skills. It can be achieved by collaborated effort and communication with scholars in the field of sport psychology.

## REFERENCES

- Alison White and Lew Hardy. *University of Bath, University of Wales: An in Depth Analysis of Imagery*. Darien, IL: J. and CW Publishers; 1998.
- Amanda A. Mental Toughness Training Intervention for Colligate Track and Field Athletes. Electronic Thesis and Dissertation Repository; 2014. Available from: <https://www.ir.lib.uwo.ca/etd/2303>.
- Birrer, D., and Morgan, G. Psychological skills training as a way to enhance an athlete's performance in high-intensity sports. *Scand J Med Sci Sports*, 2010, 20(2), 78-87.
- Blumenstein, B., Lidor, R., and Tenenbaum, G. *Psychology of Sport Training: Perspectives on Sport and Exercise Psychology*. Vol.2. United Kingdom: Meyer and Meyer Sport; 2007.
- Brookfield, D. *Psychological Skills Training*. BrianMac Sports Coach; 2009.
- Bull, S., and Shambrook, C. Soccer the mind game. In: *Seven Steps to Achieving Mental Toughness*. Great Britain: The Crowood Press Ltd.; 2004.
- Cox, R. *Sport Psychology: Concepts and Application*. 4<sup>th</sup> ed. Boston: McGraw-Hill; 1998.
- Creswell, J.W. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 3<sup>rd</sup> ed. United States: Sage Publication; 2009.
- Connaughton, D., Wadey, R., Hanton, S., and Jones, G. The development and maintenance of mental toughness: Perceptions of elite performers. *J Sports Sci*, 2008, 26(1), 83-95.

# Perspectives on Sociology of Sports

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## 1. INTRODUCTION

Recognizing the sociology of sport can also change one's life – if you are a student in sport, and/or an athlete or in the study of sports science. It can help you to understand the social forces that affect your involvement in sport and physical activity and that knowledge may help you to exert more control over your participation. This paper is concerned with the primary feature of understanding sociology – social theory. It starts with an extensive case in point, a display of the way in which an investigation of the relationship between sport and social class discloses the two major schools of thought in sociology. The example sketches the potency and weaknesses of these two approaches and shows how they are associated with political decisions that are made about health, sport, and physical activity. This is pursued by an amalgamation of the two schools of thought, showing how, in blend, they provide a much clearer understanding of the ways in which social forces manipulate participation. The latter part of the study presents a short history of the development of sociological thought in the sociology of sport, and a short scrutiny of the methods used in research in the sociology of sport. The paper concludes with some ideas about the future of this field of study.

One of the most important bodies of research in the sociology of sport concerns the relationships between sport and social inequality – how does social inequality affect access to and participation in sports and physical activity? How can reduction in inequality in sports help enhance the skills in physical education? Research time and again shows not only that in multicultural societies, ethnic minorities enjoy more limited access to sports and physical activity than the racial majority population but also that racial minority participation tends to be limited to specific sports that are stereotypically associated with particular racial minorities. Similarly, research consistently shows that girls and women have poorer rates of participation in sports and physical activity than

boys and men and that the higher a person's income and/or level of education (social class), the more likely he, and increasingly she, is to participate in sport and physical activity. This leads to the first point to be made about such relationships: No one is characterized only by their race/ethnicity, their gender, or their social class: "Each of us has a gender, a social class background, a racial/ethnic affiliation, and a variety of other social characteristics that serve as advantages or disadvantages in the various structural and cultural circumstances of our lives, and we relate to each other on the basis of ours and theirs" (Donnelly, 1995). Thus, any examples of research accounting for only one of these characteristics must be seen as partial. Second, deducing statistical relationships is complicated. They show that *a* is related to *b*; they do not show that *a* caused *b*. Thus, we need to be cautious before assuming that and interpreting the reasons why there are relationships between sport and social inequality.

The explanation of such relations is referred to in science (as well as the social sciences) as a theory. It is the best, presently accepted, explanation of the obtainable evidence of a relationship or a natural happening – why the apple fell from the tree; why the bathwater rises when you get in; why everyone is soon aware that there is a flatulent person in the seminar room. New evidence may confirm the theory or lead to newer explanations – the theory of creation becomes the theory of evolution; Newtonian physics is supplemented by the theory of relativity. In the natural sciences, the process of explanation is continual, and in many cases, relatively straightforward. The process of explanation in the social sciences – social theory – is not nearly so straightforward. As Giddens notes:

- We cannot approach society, or "social facts," as we do objects or events in the natural world, because societies only exist in so far as they are created and re-created in our own actions as human beings ...
- ... Atoms cannot get to know what scientists say about them, or change their behavior in light of that



knowledge. Human beings can do so. Thus, the relationship between sociology and its “subject-matter” is necessarily different from that involved in the natural sciences. (1982: 13–15).

## 2. THE TWO SOCIOLOGIES

To go back to the link between social class and participation, sociological elucidation tend to fall into one of the two main historical approaches to social theory – what we refer to here as agency theories and structure theories (sometimes called social action theories and social system theories). Our clarification is easier if we place partaking in sport and physical activity in the larger context of health, and if we start with the idea of agency. A main reason for participation – for the existence of public and private health centers and for government expenses on sport and physical activity – is that we are supposed to be responsible for our own health. A number of neo-liberal governments now claim that they can no longer afford public funding for health care for a population that does not take some responsibility for its own health. Thus, we find a whole catalog of suggestions, demands, and moral suasion designed to encourage people to become more active and take better care of themselves. The following is a recent example, from the British Chief Medical Officer, Liam Donaldson:

### 2.1. Ten Tips for Better Health

- Do not smoke. If you can, stop. If you cannot, cut down
- Follow a balanced diet with plenty of fruit and vegetables
- Keep physically active
- Manage stress: For example, talk things through and make time to relax
- If you drink alcohol, do so in moderation
- Cover up in the sun, and protect children from sunburn
- Practice safer sex
- Take up cancer screening opportunities
- Be safe on the roads follow the highway code
- Learn the first aid ABC – airways, breathing, and circulation (Cited in Raphael, 2001a: A8).

None of these “tips” is new to us. We have heard alike messages often, in the media, in government statements, in health and physical education classes. The messages take many of the well-known causes of sickness, injury, and premature death and suggest how to avoid them.

And what they all have in common is the supposition of individual liability and choice with regard to lifestyle decisions.

### 2.2. Alternative Ten Tips for Better Health

- Do not be poor. If you can, stop. If you cannot, try not to be poor for long
- Do not have poor parents
- Own a car
- Do not work in a stressful, low-paid manual job
- Do not live in damp, low-quality housing
- Be able to afford to go on a foreign holiday and sunbathe
- Practice not losing your job and do not become unemployed
- Take up all benefits you are entitled to if you are unemployed, retired, or sick, or disabled
- Do not live next to a busy major road or near a polluting factory
- Learn how to fill in the complex housing benefit/asylum forms before you become homeless and destitute (Cited in Raphael, 2001a: A8).

Agency, or action, refers to the autonomy that persons take pleasure in to act in a style of their own choosing. It refers to behavior that is not thought to be determined by exterior forces, and it leans to be associated with individualism, voluntarism, and free will. At its extreme, it leads to statements such as Margaret Thatcher’s view of “society:” “There is no such thing as society, only individuals.” Sportspeople, and students of sport, often concur with this view of society. They produce, observe, and are impressed by individual efforts; some even tend to see team sports only as a collection of individuals temporarily working together. They are frequently overwhelmed by psychological explanations of inspiration, individual attempt, and success or failure. Furthermore, they are likely to be won over that individuals ought to be energetic and live healthy lifestyles because people are, or ought to be, responsible for their own health; and they are likely to attribute ill health or overweight to personal inadequacies and failures on the part of the individual. In sociological terms, agency theories tend to focus more on the ways in which individuals create and give meaning to their world. Sociological theories emphasizing this approach include: Ethnomethodology, methodological individualism, phenomenology, and some of the other interpretive sociologies (cf. Donnelly, 2000). The association between social class and involvement in sport and physical activity is much more intricate than

it is possible to explain by either agency or structure interpretations alone. Individuals do choose whether to participate or not if the circumstances of their lives allow such a choice. Moreover, even if the choice is existing to an individual, a whole host of circumstances from that person's past (e.g., whether his/her family had been involved in sport, or had encouraged participation; and the person's experiences in school physical education classes) and present (e.g., whether transportation and child care are available; whether they are safe; and whether people are made to feel welcome and comfortable participating) may affect his/her decision. Donnelly and Harvey (1996: 23–4) outline the structural barriers to participation in sport and physical activity, which they classify as:

- Infrastructural barriers – associated with the material means of access (e.g., cost, available transportation, and time)
- Superstructural barriers – associated with ideas about the access (e.g., policies, knowledge, and prejudice); and
- Procedural barriers – associated with the course of action available to individuals to attain access (e.g., social support, citizens' rights, organizational structure, and management style).

In addition, two types of access are identified:

- Participational access – when individuals have information; when they are able to cope with procedures associated with access (e.g., registration); and when they meet the competent staff who are sensitive to diversity; and
- Representational access – when participants (i.e., those with participational access) are also present in the structure and decision-making process.

### 3. ANOTHER INSTANCE

An added instance, involving athletes' use of performance-enhancing drugs, shows, first, how agency and structure interpretations have become a part of our everyday lives and, second, how social theory helps to resolve these overly simplified interpretations of human behavior. An athlete has to decide to ingest or inject a banned substance; it is a conscious act, and the athlete is almost always aware that it is an illegal act in the world of sport. Thus, given the assumption of agency, it is appropriate to blame the athlete, who is attempting to win by illegal means and to impose what sanctions there are available. This would be fine if athletes lived alone in a vacuum, but they are also

a part of society and act within and are influenced by its structures. Those defending rather than blaming athletes for taking banned substances may point to the larger cultural and structural context in which athletes now live:

The “culture of excellence” which only values winning;

The medicalization of society, in which drugs are developed and sold for a whole range of conditions that were not previously defined as “medical;”

The rationalization of the body, in which athletes' bodies are treated and trained as “objects” somehow removed from the personhood of the athletes;

The professionalization of sport, which has added income to the prestige of winning (in a culture of excellence) – a dangerous combination encouraging individuals to take risks to be the best; and

Public demand for records, and for more spectacular athletic performances.

In addition, they might consider the subculture of sport, and look at drug use from an athlete's perspective. In 1991, after the Ben Johnson scandal and the exposures of the Dubin Inquiry, Canadian sprinter Angella Issajenko made the following statement: “Athletes will do whatever they have to win. They know that random testing is introduced in Canada as a result of the Dubin Inquiry and they are still prepared to take the risk.” The elements that help to explain such risk taking from an athlete's perspective include:

Positive deviance – athletes over conforming to the norms of sport (Hughes and Coakley, 1991), which includes taking such risks to win;

The social relations of sport, which often involve controlling relationships between coaches and athletes, and may extend to a coach's implicit or explicit condoning of drug use;

An athlete's commitment to the sport, which involves so much time, cost, and sacrifice on the part of the athlete, and his/her family, and which may lead to an athlete seeking an “edge” to justify their sacrifices;

The structure of sport, in which government and sponsor funding, and a place on national teams, are only available to athletes who achieve and maintain a certain level of performance;

The abusive nature of the sport, which always includes punishing one's body, and which may include abusive dietary practices, a variety of therapies (some ethically questionable) for the rapid rehabilitation of injured athletes, and "psychodoping" (Coakley, 1992), creates a context in which the use of "natural" chemicals (e.g., testosterone, and HGH) seems normal; and

the athlete information network, in which information is informally and easily shared among athletes competing internationally – information concerning drugs and "supplements," who is using drugs, what they are using and in what dosages, and how they are getting away with it.

Hence, is it the athlete's fault? Is it society's fault? Or is the fault in the system of sport that we have created? Of course, the "fault" (a word which implies that we have already judged the situation, so "cause" might be a better term) lies in all three. The society in which the athlete lives, and the social formations and networks in which the athlete trains and competes, exist in a dialectical relationship with the athlete. Decisions made by the athlete cannot be independent of those contexts; the athlete will make a decision about the use of banned substances, but that decision can only be understood in light of the circumstances in which it is made.

#### **4. THE DEVELOPMENT OF THE SOCIOLOGY OF SPORT**

A separate subdiscipline of sociology recognized as the sociology of sport began to emerge in the mid-1960s in the United States (Kenyon and Loy, 1965; Loy and Kenyon, 1969). Its origins were in both sociology and physical education, its practitioners were often advocates for, and fans of, sport and, as a consequence, little of the early work was critical in nature. This is problematic since sociology is often considered to be a "critical" science – everyday assumptions about social relations, and aspects of social life that is considered to be "common sense," are exposed to analysis to determine whether such assumptions and aspects of common sense are supported by evidence. The development of the sociology of sport can be traced through three relatively distinct phases of theory, interpretation, and explanation, namely, reflection, reproduction, and resistance.

##### **4.1. Reflection**

The early, uncritical work in the sociology of sport was rooted in the assumption that "sport reflects society" or,

to put it another way, "sport is a mirror (or microcosm) of society" (the reflection thesis). This view is not incorrect; in fact, it is quite obvious. How could a major cultural institution such as sport not reflect the societies in which it is practiced?

##### **4.2. Reproduction**

It soon became evident that the reflection thesis did not explain the relationship between sport and society. However, although it only served to describe a status quo, it was an important initial stage for the sociology of sport. It helped to overcome the view that sport was a distinct sphere, somehow separate from, and perhaps even transcending, social life (e.g., Novak, 1976). The European neo-Marxist critique of sport argued that sport socialized individuals into work discipline, hyper-competitiveness, and assertive individualism. In other words, sport not only reflected capitalist society but also helped to reproduce it, to reproduce dominant social and cultural relations in society as a whole (Hargreaves, 1986).

##### **4.3. Resistance**

The reproduction thesis characterizes a dynamic but one-way relationship between sport and society. If the status quo is effectively reproduced from generation to generation, then no changes in the relative power of social groups, and their social and cultural relations, will occur. Individuals are rendered as passive agents: either as falsely conscious consumers of the new "opiate of the masses" (namely, sport), unaware of the forces involved in producing and reproducing inequality and maintaining their subordinate status; or as passive learners "molded" and "shaped" by "society" (Coakley, 1993: 170). If individuals are to play some part in understanding, giving meaning to and shaping their destiny, then it is necessary to reintroduce agency. Despite the overwhelming differences in social power that exist between a wealthy ruling elite and everyone else, we are not powerless. The resistance thesis attempts to capture the two-way process in which reproductive forces are resisted – in which agency confronts structure.

#### **5. SUMMARY**

There are two main schools of thought in the sociology of sport, one which emphasizes agency, the freedom of individuals to act in a manner of their own choosing, and the other, which emphasizes structure, the extent

to which individual actions are constrained by social forces and social structures.

A synthesis of these two schools of thought is possible whereby variation in participation in sport, for example, maybe explained in terms of the involvement of participants as agents in creating and recreating the structural circumstances of their participation.

Sociology of sport has moved through a number of phases of analysis – reflection, reproduction, and, most recently, resistance.

Future concerns within the sociology of sport include globalization, critical analysis of commercialization, the tension between health and injury in sport, mega-events, and social exclusion.

### 5.1. Important Subtexts

While the focus of this chapter is on sociology and sociological theory, it should be pointed out that social thought regarding the structure and agency dilemma is evident in all of the social sciences – anthropology, political economy, history, and even economics

Parts of this section are drawn from Donnelly (1996), who develops reflection, reproduction, and resistance theses from Alan Ingham and John Loy, and Ingham

and Donnelly (1997). The section provides a simplified description of the development of this field of study.

It is interesting to note, however, that focus on the reproduction of social class had a far more significant impact on the sociology of education than the sociology of sport.

## REFERENCES

- Donnelly, P. Interpretive approaches to the sociology of sport. In: Coakley, J., Dunning, E., (eds). *Handbook of Sports Studies*. London: SAGE; 2000. p. 77-91.
- Coakley, J. Sport and socialization. *Exerc Sport Sci Rev*, 1993, 21, 169-200.
- Dawe, A. The two sociologies. *Br J Sociol*, 1970, 21, 207-218.
- Donnelly, P. *The Culture of Excellence: Drug Use by High Performance Athletes*. Tallin, Estonia: Paper at the Annual Conference of International Committee for the Sociology of Sport; 1991. p. 26-29.
- Giddens, A. *Sociology: A Brief but Critical Introduction*. London: Macmillan; 1982.
- Hughes, R., and Coakley, J. Positive deviance among athletes: The implications of overconformity to the sport ethic. *Sociol Sport J*, 1991, 8(4), 307-325.
- Raphael, D. *Inequality is Bad for Our Hearts: Why Low Income and Social Exclusion are Major Causes of Heart Disease*. Toronto, Canada: Report Prepared for the North York Heart Health Network; 2001. Available from: <http://www.yorku.ca/wellness/heart>.



# Things of Internet in Basketball

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## ABSTRACT

Technology is revolutionizing the world of sports in every way, from the experience of fans to the making and customizing of training plans and even refereeing. Inertial sensors are now being used in many sports as they allow effective tracking of metrics that were previously not “within reach” without affecting the performance of players, due to the improvement of their size and “durability.” However, it is not just the technological component that is evolving; new strategies and tactical displays are being increasingly seen in several sports such as basketball. Indeed, in the NBA, in recent years a new trend has emerged as teams are shooting more 3 point shots, and the center position is progressing as taller players are asked to be more skilled than ever. However, although the game of basketball is changing, a gain in efficiency is not being observed in jump shooting since the percentages of 3 point shots made in the NBA are not increasing as it would be expected from the increase in 3 point shot attempts. The purpose of this study was thus to analyze and make recommendations concerning the use of current technology for tracking shooting performance, as well as the use of new sensors. To do so, the main factors behind shooting success were taken into account to guarantee that the recommendations were as well-founded as possible. The chosen methodology was design science research, where the proposed artefacts were submitted to validation through interviews, and according to received feedback, the proposed artefacts were updated.

## 1. INTRODUCTION

The internet of things (IoT) is an arrangement of interrelated processing gadgets, mechanical, and advanced machines that are furnished with remarkable unique identifiers and the capacity to move information over a system without expecting human-to-human or human-to-PC communication.

The meaning of the IoT has advanced due to the combination of various innovations, ongoing investigation, artificial intelligence (AI), ware sensors, and installed frameworks. Conventional fields of installed frameworks, remote sensor systems, control frameworks, computerization (counting home and building robotization), and others all add to empowering the IoT. In the buyer showcase, IoT innovation is generally synonymous with items relating to the idea of the “brilliant home,” covering gadgets, and apparatuses (e.g., lighting installations, indoor regulators, home security frameworks and cameras, and other home machines) that help at least one regular biological systems and can be controlled by means of gadgets

related with that environment, for example, cell phones and keen speakers.

There are various genuine worries about risks in the development of IoT, particularly in the territories of protection and security, and thus industry and legislative moves to start to address these.

The idea of a system of shrewd gadgets was talked about as ahead of schedule as 1982, with an altered Coca-Cola candy machine at Carnegie Mellon University turning into the principal Internet-associated apparatus, ready to report its stock and whether recently stacked beverages were cold or not. Imprint Weiser’s 1991 paper on pervasive processing, “The Computer of the 21<sup>st</sup> Century,” just as scholarly scenes, for example, UbiComp and PerCom delivered the contemporary vision of the IoT. In 1994, Reza Raji depicted the idea in IEEE Spectrum as “[moving] little bundles of information to a huge arrangement of hubs, to coordinate and mechanize everything from home machines to whole processing plants.” Somewhere in the range of 1993 and 1997, a few organizations



proposed arrangements such as Microsoft's at Work or Novell's NEST. The field picked up force when Bill Joy imagined gadget to-gadget correspondence as a piece of his "Six Webs" system, exhibited at the World Economic Forum at Davos in 1999.

The expression "Web of things" was likely instituted by Kevin Ashton of Procter and Gamble, later MIT's Auto-ID Center, in 1999; however, he lean toward the expression "Web for things." By then, he saw radio-recurrence recognizable proof as fundamental to the IoT, which would permit PCs to deal with every individual thing.

Characterizing the IoT as "just the point in time when more "things or items" were associated with the Internet than individuals," Cisco Systems assessed that the IoT was "conceived" somewhere in the range of 2008 and 2009, with the things/individuals proportion developing from 0.08 in 2003 to 1.84 in 2010.

The key main impetus behind the IoT is the (metal-oxide-semiconductor field-effect transistor [MOSFET], or MOS transistor), which was initially developed by Mohamed M. Atalla and Dawon Kahng at Bell Labs in 1959. The MOSFET is the essential structure square of most current gadgets, including PCs, cell phones, tablets, and Internet administrations. MOSFET scaling down at a pace anticipated by Dennard scaling and Moore's law has been the main impetus behind innovative advances in the gadgets business since the late 20<sup>th</sup> century. MOSFET scaling has been stretched out into the mid-21<sup>st</sup> century with advances, for example, decreasing force utilization, silicon-on-cover semiconductor gadget manufacture, and multi-center processor innovation, paving the way to the IoT, which is being driven by MOSFETs downsizing to nano-electronic levels with lessening vitality utilization.

## 2. BASKETBALL

Basketball's first stage is definitely more crude than what it has become today. At first, it was fastened to a lift track with a peach container until Mr. Naismith chose to cut open the bin as the individual needed to climb and take the ball out after the group has scored the point. B-ball had become the spic and span sport around then and no particular ball was determined for playing the game. At the underlying phase of b-ball, it was played with the soccer ball with which spilling was impractical. Today, the orange pebbled ball that we as a

whole know and love as a b-ball was designed in 1950's. Since those days from peach bushel to the clumsy soccer ball and now to the orange pebbled ball, b-ball has seen and experienced heaps of changes.

## 3. INTERNET

The Internet is worldwide wide zone organize that associates PC frameworks over the world. It incorporates a few high-transmission capacity information lines that involve the Internet "spine." These lines are associated with significant Internet center points that convey information to different areas, for example, web servers and ISPs.

So as to interface with the Internet, you should approach an Internet specialist co-op (ISP), which acts the agent among you and the Internet. Most ISPs offer broadband Internet get to through a link, DSL, or fiber association. At the point when you associate with the Internet utilizing an open Wi-Fi signal, the Wi-Fi switch is as yet associated with an ISP that gives Internet get to. Indeed, even cell information towers must associate with an Internet specialist organization to give associated gadgets access to the Internet.

The Internet offers diverse online types of assistance. A few models include:

- Web – an assortment of billions of website pages that you can see with an internet browser
- Email – the most widely recognized technique for sending and accepting messages on the web
- Social media – sites and applications that permit individuals to share remarks, photographs, and recordings
- Online gaming – games that permit individuals to play with and against one another over the Internet
- Software refreshes – working framework and application updates can ordinarily downloaded from the Internet.

In the beginning of the Internet, a great many people associated with the Internet utilizing a home PC and a dial-up modem. DSL and link modems in the end furnished clients with "consistently on" associations. At present, cell phones, for example, tablets and cell phones, cause it feasible for individuals to be associated with the Internet consistently. The IoT has transformed basic apparatuses and home frameworks into "keen" gadgets that can be observed and controlled over the Internet. As the Internet keeps on developing and advance, you can anticipate that it should turn into a much increasingly indispensable piece of everyday life.

## 4. DISCUSSION

Like any cutting edge sport, ball is consistently developing. Regardless of whether it is expert, minor, or rec alliance, ball is an exciting leisure activity for player and onlooker the same. Furthermore, one could contend, the best is yet to come. As b-ball turns out to be increasingly more drenched in present day innovation, the advancements that are being made could change how we watch and play the game. Wearables, movement catching cameras and progressed biometric information are as of now moving the scene of this game, however, that could simply be the start.

As of late, mechanical headways inside the IoT and sensor innovation have given ball players a huge number of brilliant approaches to improve the manner in which they practice and train, giving them an upper hand. Truly, a ball shot had two results – a make or a miss. By putting vibration sensors on the b-ball edge or backboard, players would now be able to consider the particular points and directions of those makes and misses. The vibration sensors joined with IoT innovation can send continuous information to an application or brilliant gadget, where players can perceive how they have performed and improve their shot. Players would now be able to concentrate on more complicated subtleties of a shot endeavor than only in-or-out, empowering them to put more shots in an “ensured make zone.”

### 4.1. Vibration Sensors

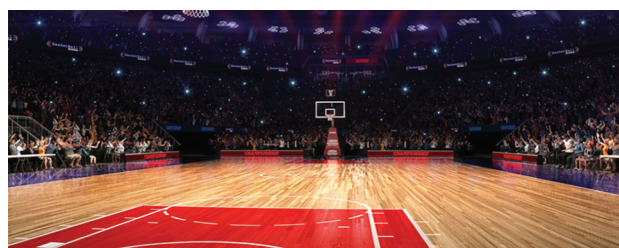
Anyhow shooting aptitudes, running pace, and bouncing capacity are additionally key elements to scoring in ball. Your feet are not moving quick enough to make the play. Or then again your legs and center cannot exactly get you sufficiently high to dunk. In any case, imagine a scenario where innovation could disclose to you precisely how much more distant you expected to go to get it going. B-ball is a round of steady goes back and forth developments. Hence, b-ball players should have the option to begin, stop, and restart rapidly and viably. Altimeters appended to a player’s shoe could quantify speed to enable the player to improve their footwork, parity, and readiness. Accelerometers installed into the texture of a player’s uniform could quantify bounce rate, vertical hop stature, and revolution over the length of a training or game. Accelerometers in a wearable wristband gadget could quantify a player’s speed, dissect movement, perceive a shot, and send moment input to a savvy gadget the minute the ball leaves the player’s hands. Sound and obvious prompts on the wristband let

the player know precisely what they have to take a shot at and what their shortcomings are. The information could all be put away and got to progressively through a cell phone application or web dashboard by both the mentor and the player.



### 4.2. Altimeters

With regards to the round of guideline ball, officials are the same amount of a piece of the game as players and mentors. They face their own novel desires and weight each time they set foot on the court, including the inescapable errors. In any case, the times of terrible calls may before long reach a conclusion. By implanting piezo film sensors into the b-ball court’s hardwood surface, officials will have the option to precisely govern if a player hits the 3-point line or in the event that he/she is outside the allotted boundaries. Piezo sensor innovation could decide the specific minute the ball goes too far to consider a score and hand-off the constant information to a PC or brilliant gadget to sufficiently approve the refs’ decisions.



### 4.3. Piezo Film Sensors

As innovation advances and capacities to focus abbreviate, sports groups, and properties should reexamine methodologies and channels to improve fan understanding. Computer generated reality (virtual reality [VR]) and man-made reasoning (AI) are key developing advancements with the possibility to do only that. Computer generated reality can place fans in the

activity in any case in the event that they are sitting in an arena seat or in the solace of their home; however, it additionally offers remarkable power over how they devour the game. 5G VR Goggles worn by the b-ball players can permit fans to see their perspective of the b-ball game progressively. The headset would block out outside incitement and spot the fan really courtside, giving 360-degree close-up perspectives on the players, arbitrators, and fans through a 5G organize. Man-made brainpower innovation is likewise advancing onto the court to change the avid supporter experience. Computer-based intelligence tech goes past shortsighted examination and can accumulate explicit information focuses that assess a player's interesting details to give a more extravagant view into likely player execution. B-ball fans in a virtual courtside seat could have a superior, more vivid experience than in the arena plastic seats. Blending both VR and AI innovation with spatial registering could bring b-ball fans a totally new, redid, and close understanding – anyplace, whenever. Fans could approach screens of data and the constant point of view of being on the court and other at no other time seen edges of the court. They can make the most of their most loved details, replays, and critique – all without missing any of the game activity.



#### 4.3.1. I – Disrupted commentary

Savvy and astute thought, yet have they missed the huge information stunt? This sharp preparing gadget enables a client to sharpen their baseball shooting abilities by interfacing a transmitter in the ball to an iPhone – which offers contrasting degrees of preparing.

Associated outdoor supplies are the same old thing, and Wilson's a savvy b-ball that tracks each shot you take on the court is adding to the fight. The Wilson X, which was first declared a year ago, utilizes an installed sensor to count makes and misses continuously close by a friend application for iOS gadgets. While it will just

get along with Apple contraption at the present time, it will be accessible for Android this fall. The versatile programming likewise offers four modes for shooting drills. There is a Buzzer Beater mode that offers the test of making the match dominating shot as the clock slows down, for instance. Wilson says that this cutting edge ball and application combo is made for shooters as it is not intended to follow shots inside seven feet of the bushel.

IoT-empowered balls, similar to the Wilson X Connected Basketball, advantage players and mentors by social occasion and following information with respect to shots taken and shots made. By understanding the reaches in which a player exceeds expectations (and those in which they do not), guided practice is simpler to actualize – with more prominent proficiency, precision, and identifiability. The Wilson X ball likewise accompanies worked in game modes that can make practice all the more captivating and energizing for players.

A comparative framework, called ShotTracker, can be utilized to follow details for a whole group, keeping up information on shot separation and area so as to figure out which regions of training would most profit singular partners.

## 5. OBJECTIVE OF STUDY

Cutting edge sports arenas are getting a ton of press of late; however, it is not simply the fans who are profiting by the most up to date developments and progressions; the present competitors are additionally more associated than any time in recent memory.

Competitors and mentors the same are using innovation in different manners to upgrade player wellbeing and support execution both on and off the field. Sensors, which are associated by means of the IoT, are presently ready to gather information about competitor execution in manners that have never been conceivable. This earth shattering innovation has even prompted various new world records.

As per Deloitte, IoT can be utilized by the two competitors and mentors to amplify productivity, distinguish execution designs, and anticipate and forestall wounds.

## 6. HYPOTHESIS

H<sub>0</sub>: There is significance in addition toward of technology used in field basketball.



$H_1$ : There is no significance in addition toward of technology used in field basketball.

## 7. SIGNIFICANCE OF STUDY

Basketball would seem like a natural sport for IoT to be integrated as data analysis is becoming heavily relied upon in the sport. Having players take more efficient shots, plus/minus on a player, offensive/defense efficiency, player efficiency rating – all of these data points can have plenty of insight on a player.

IoT can help players and coaches with feedback on how the player is performing in real-time or as data to analyze at the end of practice or games.

### 7.1. Using IoT to Improve Shooting

One incredible model is having vibration sensors on edges and backboards. It can give input on makes and misses and their particular edges and directions for the player to alter their shot progressively. This gives a more clear image of the shots rather than a basic make/miss shot.

Another comparable innovation is utilizing accelerometers that are inserted in wristbands. This can quantify the speed and movement of the shot of the ball the minute that it leaves the hand. It might assist players with taking a shot at their shooting movement and shooting contact.

Wilson has made a X Connected Basketball that resembles the X Connected Football. It monitors the shots taken and how productively the ball has been shot in various pieces of the court, making it simple to recognize the problem areas.

Ref help while this does not straightforwardly enable competitors to improve, it can improve the game. Sensors can assist officials with making the right bring in urgent circumstances. Regardless of whether an arbitrator is not sure if a player ventured outside the field of play or if the shot was a three-pointer or two-pointer, sensors can assist them with making the right approach the abandon surveying the play.

### 7.2. Overall IoT Fitness

While the earlier IoT technology caters to the specific sports mentioned, there are general ways that athletes use IoT to improve their athletic abilities.



### 7.3. Shoe Sensors

With almost every sport, footwork is essential. Sensors on athletes' shoes can give valuable data on their performance. It can track the speed, stamina, and footwork of the athlete, giving a clearer picture of how they perform as the game goes on – when their peak speed is, when they tend to slow down or what part of their feet has the most pressure.

### 7.4. Clothing Sensor

Skin-tight sportswear with sensors will allow the athlete to see how their muscles are performing and check on overall fitness. This means that these sensors can keep track of the heart rate and breathing rate to pinpoint when they can perform at the highest peaks. You will always be rotating with other players in certain sports, and this can give coaches the best times to rotate players.

These sensors can also help athletes pinpoint what muscles they are using for weight training and resistance training to be efficient in their workouts and not overwork themselves.

## 8. DATA ANALYSIS TECHNIQUE

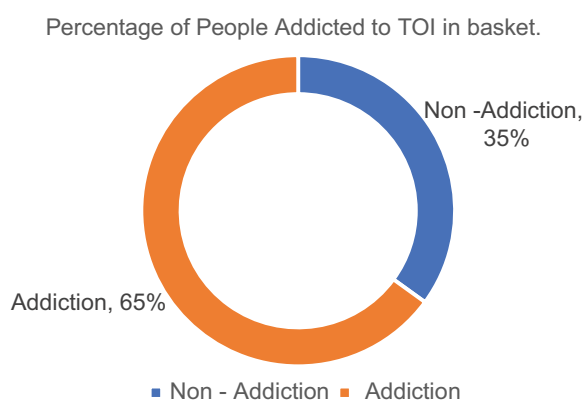
Data are being collected with the help of a questionnaire. The questionnaire and the interview are essentially the same except for the method of questioning. Questionnaires are usually answered in writing, whereas interviews are usually conducted orally.

Data are the collection of raw facts and figures which are collected together for analysis of the research, the reliability of the data collected plays a key role in making an accurate decision depending on the data collected from the targeted population of the study.

## 9. CONCLUSION

Hence, what's next for sensors in the fast-moving field of sports tech and basketball? While difficult to

definitively say as the possibilities are endless, one thing is certain – with so many new resources and technologies becoming available to athletes and spectators, the key to success on and off the court becomes smart connectivity, data, and perseverance. As technologies continue to develop, improve in accuracy, shrink in size, and become more cost-effective, it is likely that sensors will continue to find their way into sports like basketball and take us beyond the traditions we know today. Rest assured, the days of tracking scores and stats with pencils and notepads are quickly becoming as antiquated as it sounds – and tomorrow's games have endless awesome possibilities.



## 10. RECOMMENDATIONS

The future of IoT in sports while these are impressive technologies that are being integrated into sports, it is

only the surface of the potential help that it can create for athletes and coaches.

The aforementioned technology will keep on improving and give players more accurate data about how their game is progressing.

There will eventually be an AI in which can evaluate a player's playing style, stats, and other types of data that can accurately predict if the player is a great fit for the team or simply have an AI give feedback to a player on what needs to be improved and what playing style can fit their athletic ability.

Given the immense popularity of major sports as well as the time and money invested in the players, it is certain that we will soon begin to see an increased use of IoT technology among athletes.

## REFERENCES

- Available from: <https://www.thomasnet.com/insights/how-the-iot-is-changing-the-way-athletes-are-coached>.
- Available from: <https://www.iot.eetimes.com/new-iot-connectivity-portfolio-cuts-wi-fi-power-consumption-in-half-compared-to-competitive-offerings>.
- Available from: <https://www.disruptionhub.com/disrupted-sport-internet-of-things-comes-to-basketball>.
- Available from: <https://www.te.com/usa-en/trends/connected-life-health-tech/sensors-in-sports/sensors-in-basketball.html>.



# A Critical Analysis on the Effect of Physical Exercise on Shooting Ability of Basketball Players of Hyderabad

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## 1. INTRODUCTION

Basketball is a sport generally played by two teams of five players on a rectangular court. The objective is to shoot a ball through a hoop 18" (46 cm) in diameter and mounted at a height of 10 feet (3.048 m) to backboards at each end of the court. The game was invented by Dr. James Naismith, who would be the first basketball coach of the Kansas Jayhawks, one of the most successful programs in the game's history.

A team can score a field goal by shooting the ball through the basket being defended by the opposition team during regular play. A field goal scores three points for the shooting team if the player shoots from behind the three-point line, and two points if shot from in front of the line. A team can also score through free throws, which are worth one point after the other team is assessed with certain fouls. The team with the most points at the end of the game wins, but additional time (overtime) is issued when the score is tied at the end of regulation. The ball can be advanced on the court by throwing it to a teammate, or by bouncing it while walking or running (dribbling). It is a violation to lift or drag, one's pivot foot without dribbling the ball, to carry it or to hold the ball with both hands then resume dribbling.

### 1.1. Components of Physical Exercise

- Agility
- Balance body composition cardiovascular endurance coordination
- Muscular endurance
- Explosive power/Strength
- Reaction time
- Speed.

### 1.2. Importance of Physical Exercise

- Helps prevent diseases
- Improves stamina
- Strengthens and tones
- Enhances flexibility

- Controls weight
- Improves quality of life.

### 1.3. 7 Benefits of Regular Physical Activity/Exercise

- Exercise controls weight
- Exercise combats health conditions and diseases
- Exercise improves mood
- Exercise boosts energy
- Exercise promotes better sleep
- Exercise puts the spark back into your sex life
- Exercise can be fun... and social!

## 2. METHODOLOGY

To find out the shooting ability of the basketball player, Johnson basketball test was conducted. The sample for the present study consists of 100 male basketball players of Hyderabad. In which 50 are experimental group and 50 are control group.

## 3. JOHNSON BASKETBALL TEST

### 3.1. Bounce and Shoot

#### 3.1.1. Purpose

To assess the shooting skills and accuracy.

#### 3.1.2. Test administration

Two balls are to be kept on each side of the chair helper standing close to it. The subject on the command "Start" he has to collect the ball bounce for 1 time and shoot and collect the ball and throw toward the helper then he goes to another chair and adopts same procedure. At each side, he has to execute the skill for 5 times so totally  $5 + 5 = 10$  times without rest.

#### 3.1.3. Scoring

The number of successful baskets is counted. If the ball touches the ring, one point should be given. If it is a basket, then 2 points should be given.

### 3.2. Half-minute Shooting

#### 3.2.1. Material required

- Basketball
- Stopwatch
- Score sheet.

#### 3.2.2. Test administration

The subject holding the ball stands for the command. When he is supposed to start, he should shoot for 30 s. Then, the scorer should give the score, number of points scored in 30 s. The ball enters the basket then he will be given 2 points if the ball touches the ring he will be given 1 point.

### 3.3. Throwing Ball for the Accuracy

#### 3.3.1. Material required

- Basketball
- Lime
- Basketball ring.

#### 3.3.2. Test administration

The subject is asked to stand on the free-throw line. He will be given 20 shots. In that 20 shots on the command of ready “go,” he should start shooting. After completing the 20 shoots, he should stop shooting and the observer will write down the score.

#### 3.3.3. Score

The score should be given if the basket is converted. For each converted basket, 2 points to be given.

## 4. RESULTS AND DISCUSSION

### 4.1. Bounce and Shoot

Experimental group					
Paired samples statistics <sup>a</sup>					
		Mean	n	Standard deviation	Standard error mean
Pair 1	Pre	7.1400	50	1.85175	0.26188
	Post	11.9800	50	2.05526	0.29066
<sup>a</sup> Test=Bounce and shoot, Group=Experimental					
Paired samples test <sup>a</sup>					
		t	df	Sig. (2-tailed)	-
Pair 1	Pre - Post	-22.976	49	0.000	-
<sup>a</sup> Test=Bounce and shoot, Group=Experimental					

Control group					
Paired samples statistics <sup>a</sup>					
		Mean	n	Standard deviation	Standard error mean
Pair 1	Pre	5.1000	50	1.24949	0.17670
	Post	6.8400	50	1.20136	0.16990
<sup>a</sup> Test=Bounce and shoot, Group=Control					
Paired samples test <sup>a</sup>					
		t	df	Sig. (2-tailed)	-
Pair 1	Pre-post	-17.721	49	0.000	-
<sup>a</sup> Test=Bounce and shoot, Group=Control					

### 4.2. Half-minute Shooting

Experimental group					
Paired samples statistics <sup>a</sup>					
		Mean	n	Standard deviation	Standard error mean
Pair 1	Pre	16.2400	50	1.95417	0.27636
	Post	22.7400	50	2.89835	0.40989
<sup>a</sup> Test=Half-minute shooting, Group=Experimental					
Paired samples test <sup>a</sup>					
		t	df	Sig. (2-tailed)	-
Pair 1	Pre - Post	-26.581	49	0.000	-
<sup>a</sup> Test=Half-minute shooting, Group=Experimental					
Control group					
Paired samples statistics <sup>a</sup>					
		Mean	n	Standard deviation	Standard error mean
Pair 1	Pre	14.1600	50	1.68256	0.23795
	Post	16.7000	50	1.46036	0.20653
<sup>a</sup> Test=Half-minute shooting, Group=Control					
Paired samples test <sup>a</sup>					
		t	df	Sig. (2-tailed)	-
Pair 1	Pre - Post	-17.043	49	0.000	-
<sup>a</sup> Test=Half-minute shooting, Group=Control					

### 4.3. Shooting for Accuracy

Experimental group					
Paired samples statistics <sup>a</sup>					
		Mean	n	Standard deviation	Standard error mean
Pair 1	Pre	16.1600	50	2.41897	0.34209
	Post	21.7800	50	3.10556	0.43919
<sup>a</sup> Test=Shooting for accuracy, Group=Experimental					
Paired samples test <sup>a</sup>					
		t	df	Sig. (2-tailed)	-
Pair 1	Pre-post	-21.476	49	0.000	-
<sup>a</sup> Test=Shooting for accuracy, Group=Experimental					

Control group					
Paired samples statistics <sup>a</sup>					
		Mean	n	Standard deviation	Standard error mean
Pair 1	Pre	10.6800	50	1.43484	0.20292
	Post	12.8600	50	1.57804	0.22317
<sup>a</sup> Test=Shooting for accuracy, Group=Control					
Paired samples test <sup>a</sup>					
		t	df	Sig. (2-tailed)	-
Pair 1	Pre - Post	-16.774	49	0.000	-
<sup>a</sup> Test=Shooting for accuracy, Group=Control					

## 5. CONCLUSION

Hence, it is concluded that basketball players of Hyderabad are good shooting skills compared to the control group by the 12 weeks of training schedule of physical exercise.

## 6. RECOMMENDATIONS

Similar studies can be conducted on male and female players and other team game players and individual game players.

# A Comparative Study of Health Status between Residential and Non-residential School

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## ABSTRACT

The purpose of the study is to compare the impact of health status that is different psychological and personality tendencies on physical health of the residential and non-residential school students. Fifteen students each, i.e., total 30 students have been selected as a subject of the study. The age of subject range from 14 to 18 years. Health orientation scale developed by William E Snell has been used as a tool. Data analysis is done using – descriptive analysis and *t*-test statistics. This study signifies that personality and psychological tendencies play a major role in promoting physical health and this study also signifies that capability and capacity are more in residential school students than in non-residential students.

**Keywords:** Health anxiety, Health esteem and confidence, Health expectations, Health external control, Health image concern, Health internal control, Health orientation scale, Health status, Motivation for healthiness, Motivation to avoid unhealthiness, Personal health consciousness.

## 1. INTRODUCTION

It is well-known fact that for the well-being of an individual, every aspect of health is necessary, i.e., physical, intellectual, social, emotional, spiritual, and occupational. Nowadays, everyone seems to be very much conscious about one's own health. Educating people from the grass wood level is important and necessary. Hence, school health becomes an important issue over here because educating children about health promotion and disease prevention is a must. Our health also largely depends on the environmental factors too. What our surrounding gives to us as a great impact on our psychological balance and it directly reflects to our physical health. In this study, major emphasis is given on one side of emotional and psychological wellness which requires understanding emotions and coping with problems that arise in everyday life and its reflection on physical wellness. Ten major subcategories are being studied, i.e., personal health consciousness, health image concern, health anxiety, health-esteem and confidence, motivation to avoid unhealthiness, health internal control, health external control, health-expectations, and health status.

### 1.1. Purpose of the Study

The purpose of the present study was to compare the different psychological and personality tendencies on physical health of school students.

## 2. METHODOLOGY

The study was carried out with 30 students as a sample of the study, i.e., 15 students from residential background and 15 from non-residential background. Health orientation scale (HOS) developed by William E Snell has been used as a tool. With prior permission from the school principal, students were made to assemble at hall and were given instructions how to fill up the questionnaire and then the questionnaire was distributed and students were made to fill up on the spot so that if there is any confusion or doubt, the I could clear it. After 30 min, all the questionnaires were collected and brought back. For the analysis of data, *t*-test was employed on the ratio of 0.05 level of significance.

### 2.1. Interpretation of Data

The mean difference of residential school students and non-residential school students in personal health

consciousness, health image concern, health anxiety, health-esteem and confidence, motivation to avoid unhealthiness, motivation for healthiness, health internal control, health external control, health-expectations, and health status:

From Table 1, it is observed that the mean of residential school is 14.53 and non-residential school is 10.53. After applying *t*-test, it is found that the *t*-ratio is 3.02 and the tabulated value at 0.05 level is 2.145 that is statistically significant. Therefore, it can be concluded that there can be significant difference in personal health consciousness between residential and non-residential school students.

From Table 2, it is observed that the mean of residential school is 14.07 and non-residential school is 11.73. After applying *t*-test, it is found that the *t*-ratio is 2.865 and the tabulated value at 0.05 level is 2.145 that is statistically significant. Therefore, it can be concluded that there can be a significant difference in health image concern between residential and non-residential school students.

From Table 3, it is observed that the mean of residential school is 13.67 and non-residential school is 9.67. After applying *t*-test, it is found that the *t*-ratio is 2.71 and the tabulated value at 0.05 level is 2.145 that is statistically significant. Therefore, it can be concluded that there can be a significant difference in health anxiety between residential and non-residential school students.

From Table 4, it is observed that the mean of residential school is 13.60 and non-residential school is 9.33. After applying *t*-test, it is found that the *t*-ratio is 2.75 and the tabulated value at 0.05 level is 2.145 that is

**Table 1:** Statistical comparison of personal health consciousness between residential and non-residential school students

Group	Mean	<i>n</i>	Standard deviation	<i>t</i> -ratio
Residential school	14.53	15	3.54	3.02
Non-residential school	10.53	15	3.52	

**Table 2:** Statistical comparison of health image concern between residential and non-residential school students

Group	Mean	<i>n</i>	Standard deviation	<i>t</i> -ratio
Residential school	14.07	15	2.46	
Non-residential school	11.73	15	1.79	2.865

statistically significant. Therefore, it can be concluded that there can be significant difference in health -esteem and confidence between residential and non-residential school students.

From Table 5, it is observed that the mean of residential school is 14.93 and non-residential school is 11.33. After applying *t*-test, it is found that the *t*-ratio is 2.46 and the tabulated value at 0.05 level is 2.145 that is statistically significant. Therefore, it can be concluded that there can be significance difference in motivation to avoid unhealthiness between residential and non-residential school students.

From Table 6, it is observed that the mean of residential school is 15.00 and non-residential school is 10.87. After applying *t*-test, it is found that the *t*-ratio is 3.16 and the tabulated value at 0.05 level is 2.145 that is statistically significant. Therefore, it can be concluded that there can be significance difference in health status between residential and non-residential school students.

From Table 7, it is observed that the mean of residential school is 15.20 and non-residential school is 9.67. After applying *t*-test, it is found that the *t*-ratio is 3.25 and the tabulated value at 0.05 level is 2.145 that is statistically

**Table 3:** Statistical comparison health anxiety between residential and non-residential school students

Group	Mean	<i>n</i>	Standard deviation	<i>t</i> -ratio
Residential school	13.67	15	3.31	2.71
Non-residential school	9.67	15	4.13	

**Table 4:** Statistical comparison of health-esteem and confidence between residential and non-residential school students

Group	Mean	<i>n</i>	Standard deviation	<i>t</i> -ratio
Residential school	13.60	15	4.07	2.75
Non-residential school	9.33	15	3.92	

**Table 5:** Statistical comparison of motivation to avoid unhealthiness between residential and non-residential school students

Group	Mean	<i>n</i>	Standard deviation	<i>t</i> -ratio
Residential school	14.93	15	3.51	2.46
Non-residential school	11.33	15	3.85	



**Table 6:** Statistical comparison of motivation for healthiness between residential and non-residential school students

Group	Mean	<i>n</i>	Standard deviation	t-ratio
Residential school	15.00	15	3.85	3.16
Non-residential school	10.87	15	3.60	

**Table 7:** Statistical comparison of health internal control between residential and non-residential school students

Group	Mean	<i>n</i>	Standard deviation	t-ratio
Residential school	15.20	15	3.29	3.25
Non-residential school	9.67	15	4.75	

**Table 8:** Statistical comparison of health external control between residential and non-residential school students

Group	Mean	<i>n</i>	Standard deviation	t-ratio
Residential school	15.07	15	3.06	2.94
Non-residential school	12.27	15	1.83	

significant. Therefore, it can be concluded that there can be a significant difference in health status between residential and non-residential school students.

From Table 8, it is observed that the mean of residential school is 15.07 and non-residential school is 12.27. After applying *t*-test, it is found that the t-ratio is 2.94 and the tabulated value at 0.05 level is 2.145 that is statistically significant. Therefore, it can be concluded that there can be significant difference in health status between residential and non-residential school students.

From Table 9, it is observed that the mean of residential school is 13.27 and non-residential school is 10.13. After applying *t*-test, it is found that the t-ratio is 3.85 and the tabulated value at 0.05 level is 2.145 that is statistically not significant. Therefore, it can be concluded that there can be no significance difference in health status between residential and non-residential school students.

From Table 10, it is observed that the mean of residential school is 15.27 and non-residential school

**Table 9:** Statistical comparison of health-expectations between residential and non-residential school students

Group	Mean	<i>n</i>	Standard deviation	t-ratio
Residential school	13.27	15	2.19	3.89
Non-residential school	10.13	15	2.59	

**Table 10:** Statistical comparison of health status between residential and non-residential school students

Group	Mean	<i>n</i>	Standard deviation	t-ratio
Residential school	15.27	15	3.39	2.23
Non-residential school	12.53	15	2.72	

is 12.53. After applying *t*-test, it is found that the t-ratio is 2.23 and the tabulated value at 0.05 level is 2.145 that is statistically significant. Therefore, it can be concluded that there can be significance difference in health status between residential and non-residential school students.

### 3. CONCLUSION

It is evident that there is significant difference in each and every subscales of the HOS that is personal health consciousness, health image concern, health anxiety, health-esteem and confidence, motivation to avoid unhealthiness, motivation for healthiness, health internal control, health external control, health-expectations, and health status between residential and non-residential school students. It can also be concluded that if a student has good psychological and personality tendencies then it is sure to have a good physique.

### REFERENCES

1. Dutta-Bergman, M.J. Primary sources of health information: Comparisons in the domain of health attitudes, health cognitions, and health behaviors. *Health Commun*, 2004, 16(3), 273-288.
2. Abedian, A., Mesbah, N., and Peyravi, H. Comparative study of mental health status of new students entering the year 2004 and 2006 University of Tehran. *Proc Soc Behav Sci*, 2011, 30, 2112-2116.

# Evaluation of Muscular Fitness among the Mahatma Gandhi University Engineering Students

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## ABSTRACT

Muscular fitness denotes the functional efficiency of the muscular system and it encompasses the components of muscular strength, muscular power, muscular endurance, and muscular flexibility. Muscular strength is described as the ability of the maximum amount of resistance that can be overcome by a muscle group or groups of muscles in a single maximum effort. Muscular power represents the capacity of the explosive nature of a particular muscle group or groups of muscles and represents the capacity of overcoming resistance in terms of time. Muscular endurance refers to the ability of overcoming the lighter amount of resistance over a number of times in a sustainable manner by the muscles or groups of muscles without being fatigued quickly. Muscular flexibility refers to the ability of having higher elasticity in the muscles or groups of muscles leading to higher tonus for the muscles or groups of muscles and thereby allowing a higher range of motion of the proximal joint of such muscles. Although muscular strength is not identified as a component of health fitness, the muscular endurance and the muscular flexibility are included as components of health fitness. In terms of physical performance and sports performances, all four are included as fitness components and to excel in sports all the four muscular components are essential in different proportions keeping in view of the sporting activity involved. Even sports participation also is viewed as a means of enhancing health to individuals, whereas the concept of excellence in sports leads to the concept of recreation to human beings. In terms of sports performance, the muscular power component is highly valued. It would be ideal to possess the attitude of physical fitness and if the attitude of physical fitness can be inculcated in the adolescents and youth, it would serve excellent benefits to the society and to nation. Although physical fitness comes by involvement in physical exercises scientifically designed, it can also happen due to the type of lifestyle and the physical activity requirements of the regular life that could also influence this attitude. Technology students are one important student population with a specific study pattern. The technology students study different streams of study or branches of study and would require different kinds of physical movements during their study period, which could cause lasting influence on their lifestyle and on the physical fitness attitude also.

**Keywords:** Endurance, Flexibility, Muscular strength, Power, Technology.

## 1. BACKGROUND OF THE STUDY

Physical fitness and health are interrelated as confirmed by many studies in fitness studies across globe. Higher physical fitness, higher the health status of an individual, though physical fitness may not be a single component, whereas there are several subcomponents in it. Although physical fitness is essential, it would be highly necessary that individuals need to engage in regular exercises or physical activities to see that the

necessary cytokines are regularly secreted in the muscle to prevent the occurrence of several noncommunicable diseases. Student life is very significant in terms of imbibing positive lifestyle behaviors, which will make the individuals highly productive throughout the lifetime. One such lifestyle behavior is physical activity behavior, which significantly influences the health status of the individuals. Hence, exposure to physical activities or to exercise routines during the student days would help individuals to gain a positive attitude toward active

life and keep themselves healthy. This exposure may even be through the kind of workload the students face during their study period and higher physical workload during the student period because of academics could also make such individuals to be more inclined toward a physically active life. Since the muscular fitness is the primary factor in determining an individual's fitness, whether it be sports fitness or health fitness, more research is now revolves around the muscular fitness and muscular contraction derived chemical substances. The difference in academic requirements could also cause for differences in their physical fitness. Due to involvement in physical activities make the students to differ in their muscular fitness and muscular fitness needs to be measured with its subcomponents. Since the muscular fitness is a more appropriate and feasible form of fitness component that would help to understand the general physical fitness standards of the students, the present study envisaged to study the differences in the muscular fitness subcomponents among the different selected streams of engineering students and to find out the reason for such differences if exist. The present study envisaged to find out whether there were any differences in the muscular fitness (muscular power) levels of the civil engineering, mechanical engineering, electronics and communication (ECE), computer science, and biotechnology engineering students of technology colleges and to find out if there were differences exist, whether these differences were significant.

## 2. METHODOLOGY

A total of 250 male engineering students in the age range of 18–22 years from two engineering colleges of Warangal town participated in this research project. Fifty students for each of the five selected streams of the engineering study were included in the study. The included streams of the study were civil engineering, mechanical engineering, ECE, computer science, and biotechnology. The written acknowledgments were obtained from all individuals. Muscular power of the individuals of the study was measured through the vertical jump performance test and also through the Margaria-Kalamen power step test. The set up for the Margaria-Kalamen test protocols is as follows. The individual has to run from six meters into a flight of 12 stairs with a height of 17.5 cm of each stair. There would be marking on third, sixth, and ninth steps. The individual has to run fast and step up the stairs with maximum speed to the twelfth and beyond each time, covering three steps in each stride. Hence, on touch of the first step, the individual has to jump to the third

and then to the sixth and then to the ninth and then to the twelfth steps. Time in seconds is recorded between the third and ninth stairs and is applied in the following equation to obtain the muscular power in watts. The distance of height for the six stairs between the third and ninth would be 1.05 m. The equation to obtain the muscular power:

$$P=(M \times D) \times 9.8/t$$

$P$  = Power in watts,  $M$  = Mass of the individual, i.e., weight in kg,  $D$  = Distance of height between the 3<sup>rd</sup> and 9<sup>th</sup> stairs, i.e., 1.05 m, 9.8 = Gravity constant and  $t$  = Time in seconds. The obtained  $P$  was used for comparison and statistical analysis. Analysis of variance was used to find out whether the selected five streams of engineering students of the study differ significantly in their four muscular fitness components. The level of significance used was 0.05. Tukey's honestly significant difference (HSD) *post-hoc* test was conducted to find out the source of the significant difference, i.e., among the group differences.

## 3. RESULTS AND DISCUSSION

### 3.1. Analysis on the Muscular Power Measured by Vertical Jump Test Protocol

Table 1 analysis clearly indicates that there is significant difference among the five groups of the study with respect to their muscular power measured through the vertical jump test protocol as indicated in the table ( $F = 23.18$  at  $P < 0.0001$ ). Tukey's HSD *post-hoc* test [Table 6] is applied to find out group-wise comparisons among all the groups of the study. Mechanical engineering students group of the study possess significantly higher muscular power measured through the vertical jump test when compared to the biotech students group (7.47, significant at 0.05 for HSD of 3.72), ECE students group (8.27, significant at 0.05 for HSD of 3.72), and CS students group (9.75, significant at 0.05 for HSD of 3.72) but not when compared to the civil engineering students group (0.45, not significant at 0.05 for HSD

**Table 1:** Analysis of variance for muscular power (vertical jump test)

Source	SS	df	MS	F	P
Treatment (between groups)	4249.29	4	1062.32	23.18	<0.0001
Error	11228.18	245	45.82		
Total	15477.47	249			

**Table 2: Tukey's honestly significant difference test (at 0.05 the significant difference=3.72)**

Groups/means	Civil 47.3	Biotech 40.28	ECE 39.48	CS 38
Mechanical	0.45	7.47	8.27	9.75
47.75	N. Sig.	Sig.	Sig.	Sig.
Civil	-	7.02	7.82	9.3
47.3		Sig.	Sig.	Sig.
Biotech	-	-	0.8	2.28
40.28			N. Sig.	N. Sig.
ECE	-	-	-	1.48
39.48				N. Sig.

ECE: Electronics and communication

**Table 3: Analysis of variance for muscular power (Margaria-Kalamen test)**

Source	SS	df	MS	F	P
Treatment (between groups)	85053.87	4	21263.46	6.05	<0.00011
Error	860523.86	245	3512.34		
Total	945577.73	249			

**Table 4: Tukey's honestly significant difference test (at 0.05 the significant difference=32.58)**

Groups/means	Mechanical 472.65	CS 445.86	ECE 442.18	Biotech 440.51
Civil	13.36	40.15	43.83	45.5
486.01	N. Sig.	Sig.	Sig.	Sig.
Mechanical	-	26.79	30.47	32.14
472.65		N. Sig.	N. Sig.	N. Sig.
CS	-	-	3.68	5.36
445.86			N. Sig.	N. Sig.
ECE	-	-	-	1.67
442.18				N. Sig.

ECE: Electronics and communication

of 3.72). Furthermore, the civil engineering students group showed significantly higher muscular power measured through the vertical jump test when compared to the biotech students group (7.02, significant at 0.05 for HSD of 3.72), ECE students group (7.82, significant at 0.05 for HSD of 3.72), and CS students group (9.3, significant at 0.05 for HSD of 3.72). The biotech students group, ECE students group, and CS students groups of the study did not show any significant difference among themselves in terms of the muscular power measured through the vertical jump test protocol.

### 3.2. Analysis on the Muscular Power Measured by Margaria-Kalamen Test Protocol

Table 7 analysis clearly indicates that there is significant difference among the five groups of the study with respect to their muscular power measured through the Margaria-Kalamen test protocol, as indicated in the table ( $F = 6.05$  at  $P < 0.00011$ ). Tukey's HSD *post-hoc* test (Table 8) is applied to find out group-wise comparisons among all the groups of the study. The civil engineering students group of the study possess significantly higher muscular power as measured by Margaria-Kalamen test protocol when compared to the CS students group (40.15, significant at 0.05 level of HSD of 32.58), ECE students group (43.83, significant at 0.05 level of HSD of 32.58), and biotechnology students group (45.5, significant at 0.05 level of HSD of 32.58) but not when compared to the mechanical engineering students group of the study (13.36, not significant at 0.05 level of HSD of 32.58). Mechanical engineering students group did not show any significant difference when compared to CS students group (26.79, not significant at 0.05 level of HSD of 32.58), ECE students group (30.47, not significant at 0.05 level of HSD of 32.58), and biotechnology students group (32.14, not significant at 0.05 level of HSD of 32.58). Furthermore, the CS students group did not show a significant difference when compared to the ECE students group (3.68, not significant at 0.05 level of HSD of 32.58) and biotechnology students group (5.36, not significant at 0.05 level of HSD of 32.58). There is no significant difference between ECE and Biotech student groups of the study (1.67, not significant at 0.05 level of HSD of 32.58). Muscular power indicates the ability of a group of muscles or muscles belonging to a body segment like the upper body or lower body of overcoming resistance in terms of time. Although the strength of the muscles is more primary and a prerequisite for the muscle power, for functional physical activities power element of muscular fitness is more important. The possibility is that muscular power enhances with the more robust and reactive kind of physical activities. In terms of the muscular power measured through the vertical jump performance test protocol, both the civil engineering and mechanical engineering streams groups of the study showed significantly higher when compared to the other three groups (ECE, computer science, and biotechnology) of the engineering streams of the study. Whereas with respect to the muscular power measured through the Margaria-Kalamen power test protocol, only the civil engineering group of the study showed significantly higher when compared to the other four groups of the study.



## 4. CONCLUSION

Civil engineering and mechanical engineering student groups of the study with the advantage of being exposed to the various kinds of physical activities during their study or academic requirements, showed significantly higher muscular power of the upper body measured through pushups, when compared to the ECE group, computer science group, and biotechnology student groups of the study. Only the civil engineering students group of the study showed significantly higher muscular power of the lower body measured by Margaria-Kalamen power test when compared to the other four groups of the study.

## REFERENCES

- Moller, A., Reventlow, S., Hansen, A.M., Andersen, A.L., Siersma, V., Lund R., Avlund, K., Andersen, J.H., and Mortensen, O.S. Does physical exposure throughout working life influence chair-rise performance in midlife? A retrospective cohort study of associations between work and physical function in Denmark, *BMJ Open*, 2015, 5(11), e009873.
- Behrens, T.K., Miller, D.J., Schuna, J.M. Jr., and Liebert, M.L. Physical activity intensity, lesson context, and teacher interactions during an unstructured after school physical activity program. *J Sch Health*, 2015, 85(12), 880-885.
- Bopp, M., Bopp, C., and Schuchert, M. Active transportation to and on campus is associated with objectively measured fitness outcomes among college students. *J Phys Act Health*, 2015, 12(3), 418-423.
- Deforche, B., Van Dyck, D., Deliëns, T., and Bourdeaudhuij, I. Changes in weight, physical activity, sedentary behaviour and dietary intake during the transition to higher education: A prospective study. *Int J Behav Nutr Phys Act*, 2015, 12, 16.
- Fenton, S.A., Duda, J.L., and Barrett, T. Inter-participant variability in daily physical activity and sedentary time among male youth sport footballers: Independent associations with indicators of adiposity and cardiorespiratory fitness. *J Sports Sci*, 2016, 34(3), 239-251.
- Imhof, K., Faude, O., Donath, L., Bean-Eisenhut, S., Hanssen, H., and Zahner, L. The association of socio-economic factors with physical fitness and activity behaviours, spinal posture and retinal vessel parameters in first graders in urban Switzerland. *J Sports Sci*, 2015, 1, 1-10.
- Marques, A., Ekelund, U., and Sardinha, L.B. Associations between organized sports participation and objectively measured physical activity, sedentary time and weight status in youth. *J Sci Med Sport*, 2016, 19(2), 154-157.
- Myers, J., McAuley, P., Lavi, C.J., Despres, J.P., Arena, R., and Kokkinos, P. Physical activity and cardiorespiratory fitness as major markers of cardiovascular risk: Their independent and interwoven importance to health status. *Prog Cardiovasc Dis*, 2015, 57(4), 306-314.
- Pedisić, Z., Greblo, Z., Phongsavan, P., Milton, K., and Bauman, A.E. Are total, intensity and domain-specific physical activity levels associated with life satisfaction among university students? *PLoS One*, 2015, 10(2), e0118137.
- Silva, D.A., Tremblay, M., Pelegrini, A., Dos Santos Silva RJ, de Oliveira, A.C.C., and Petroski, E.L. Association between aerobic fitness and high blood pressure in adolescents in Brazil: Evidence for criterion-referenced cut-points. *Pediatr Exerc Sci*, 2016, 28(2), 312-320.
- Zhi, X., Xi, W., Gao, L., Huang, J., Yang, X., Dai, W., Deng, Y., and Zhang, X. Physical fitness status of children and adolescents in Tianjin of China during past three decades: A cross-sectional study. *Int J Clin Exp Med*, 2015, 8(6), 9306-9312.



# Minimum Muscular Strength for Male Technical Education Students

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## ABSTRACT

Muscular fitness denotes the functional efficiency of the muscular system and it encompasses the components of muscular strength. Muscular strength is described as the ability of maximum amount of resistance that can be overcome by a muscle group or groups of muscles in a single maximum effort. Though muscular strength is not identified as a component of health fitness. In terms of physical performance and sports performances the one are included as fitness components and to excel in sports the entire muscular component are essential in different proportions keeping in view of the sporting activity involved. Even sports participation also is viewed as a means of enhancing health to individuals, whereas the concept of excellence in sports leads to the concept of recreation to human beings. In terms of sports performance, the muscular strength component is highly valued. It would be ideal to possess the attitude of physical fitness and if the attitude of physical fitness can be inculcated in the adolescents and youth, it would serve excellent benefits to the society and to nation. Although the physical fitness comes by involvement in physical exercises scientifically designed, it can also happen due to the type of lifestyle and the physical activity requirements of the regular life could also influence this attitude. Technology students are one important student population with a specific study pattern. The technology students study different streams of study or branches of study and would require different kinds of physical movements during their study period, which could cause lasting influence on their lifestyle and on the physical fitness attitude also.

**Keywords:** Health fitness, Muscular strength, Performance, Resistance, Technology.

## 1. INTRODUCTION AND BACKGROUND OF THE STUDY

Student life is very significant in terms of imbibing positive lifestyle behaviors, which will make the individuals highly productive throughout the life time. One such lifestyle behavior is physical activity behavior. Exposure may even be through the kind of workload the students face during their study period and higher physical workload during the student period because of academics could also make such individuals to be more inclined toward physically active life. The muscular fitness is the primary factor in determining an individual's fitness, whether it is sports fitness or health fitness. Difference in academic requirement could also cause for differences in their physical fitness

### 1.1. Objective of the Study

The present study envisaged to find out whether there were any differences in the muscular fitness levels of civil engineering, mechanical engineering, ECE, computer science, and biotechnology engineering students of technology colleges and to find out if there were differences exist, whether these differences were significant.

## 2. STATEMENT OF THE PROBLEM

The study was to measure the muscular strength of the selected five streams of engineering students of the technology colleges and to compare in analysis to find out whether the five groups of the engineering students differ in their muscular fitness components.

### 3. SELECTION OF INDIVIDUALS

A total of 250 male engineering students in the age range of 18–22 years from two engineering colleges of Nalgonda town participated in this research project. Fifty students for each of the five selected streams of the engineering study were included in the study. The included streams of the study were civil engineering, mechanical engineering, ECE, computer science, and biotechnology.

### 4. CRITERION VARIABLES

One muscular fitness components were included for the study, they are

- Muscular strength.

#### 4.1. Hypotheses

1. The selected five streams of engineering students of the technology colleges would show a significant difference in their muscular fitness components.
2. Mechanical engineering and civil engineering stream students of the technology colleges would show significantly higher in their muscular fitness components when compared to the ECE, computer science, and biotechnology stream students of the technology colleges of the study.
3. Mechanical engineering stream students of the study would show significantly higher muscular strength when compared to the other four streams of the engineering students of the study.

### 5. STATISTICAL TECHNIQUE

Analysis of variance was used to find out whether the selected five streams of engineering students of the study differ significantly in their one muscular fitness component. The level of significance used was 0.05. Tukey's HSD *post hoc* test was conducted to find out the source of the significant difference, i.e., among the group differences.

### 6. DELIMITATIONS

1. Only men students of the two engineering colleges in Hyderabad were included for the study. The researcher has direct access to these two engineering colleges.
2. Five streams of the engineering students were compared. The five streams included were

civil, mechanical, ECE, computer science, and biotechnology.

3. Age of the subjects ranged between 18 and 22 years.
4. Fifty students were included for each of the selected stream on written acceptance only. Hence, a total of 250 students participated in this study.
5. Only one muscular fitness component was studied in this study and no other fitness component was included for the study.
6. Those who never involved in regular physical activity such as sports participation were only included into the study.

#### 6.1. Limitations

1. Socioeconomic status was not considered in selection of the subjects.
2. One muscular fitness component test was done by physical education directors of the concerned colleges from which the students were included for the study.
3. Individuals included for the study were not regular players or they were never engaged in any kind of regular physical activities.

#### 6.2. Inclusion Criteria

1. Random inclusion of the students was done with the help of the physical directors of the two engineering colleges.
2. Those with no recorded health problem to the date of commencement of the research were only included into the study.
3. Those who do not have certain specific muscular problems and joint problems such as general back pain were only included for the study since the muscular fitness test protocols are to be met physically.
4. Those who did not have cardiovascular problems during 6 months before the commencement of the study were only included into the study.
5. Those who could be able to grasp the muscular fitness test protocols upon orientation were only included for the study.
6. Those who were willing to undergo the muscular fitness test of the study with written acceptance were only included into the study.

#### 6.3. Exclusion Criteria

1. Those who were previously players or those who had regular physical activity practice or involvement in

regular physical exercises were excluded from the study.

2. Those with frequent general illnesses such as common cold and fever were also excluded from the study.
3. Those who had cardiovascular disease symptoms during the 6 months period before the commencement of the study were also excluded from the study.
4. Those who were living in hostels and could not obtain the written parental permission for the muscular fitness tests were also not included into the study.
5. Those who had the hereditary link to the cardiorespiratory illnesses were also excluded from the study.
6. Those who could not perform the muscular fitness test protocols after orientation during their initial testing were also excluded from the study and new persons were included in their place.

## 7. COLLECTION OF DATA

### 7.1. Muscular Strength



Muscular strength was measured for both lower body and also for upper body. Upper body muscular strength was measured through 1 repetition maximum (1RM) protocol for bench press activity adopting the Brzycki's equation of  $1\text{ RM} = \text{Weight (in kg)} / (1.0278 - (0.0278 \times \text{number of repetitions at the selected weight}))$ . In the same way, 1RM for the back squat physical activity was also conducted for measuring the lower body muscular strength.

### 7.2. Analysis of Data

Analysis on the muscular strength (upper body) measured by 1 RM bench press test:

Table 1 analysis clearly indicates that there is a significant difference among the five groups of the study with respect to their upper body strength measured through the 1 RM bench press protocol as indicated in the table ( $F = 20.33$  at  $P < 0.0001$ ).

Analysis on the muscular strength (lower body) measured by 1 RM back squat test:

Table 3 analysis clearly indicates that there is a significant difference among the five groups of the study with respect to their lower body strength measured through

**Table 1:** Analysis of variance for bench press test protocol

Source	SS	df	MS	F	P
Treatment (between Groups)	896.7	4	224.17	20.33	<0.0001
Error	2701.7	245	11.03		
Total	3598.41	249			

**Table 2:** Tukey's HSD test (at 0.05 the significant difference = 1.83)

Groups/ means	Civil 83.26	Biotech 81.07	ECE 79.87	CS 78.77
Mechanical 83.67	0.41 N. Sig.	2.6 Sig.	3.8 Sig.	4.9 Sig.
Civil 83.26	-	2.19 Sig.	3.39 Sig.	4.49 Sig.
Biotech 81.07	-	-	1.2 N. Sig.	2.3 Sig.
ECE 79.87	-	-	-	1.1 N. Sig.

**Table 3:** Analysis of variance for 1 RM back squat test protocol

Source	SS	df	MS	F	P
Treatment (between groups)	1217.39	4	304.34	20.66	<0.0001
Error	3608.43	245	14.72		
Total	4825.82	249			

**Table 4:** Tukey's HSD test (at 0.05 the significant difference = 2.11)

Groups/means	Mechanical 83.26	Biotech 82.44	ECE 81.98	CS 79.29
Civil 85.46	2.2 Sig.	3.02 Sig.	3.48 Sig.	6.17 Sig.
Mechanical 84.83	-	1.99 N. Sig.	2.85 Sig.	5.54 Sig.
Biotech 82.44	-	-	0.46 N. Sig.	3.15 Sig.
ECE 81.98	-	-	-	2.69 Sig.

the 1 RM back squat protocol as indicated in the table ( $F = 20.66$  at  $P < 0.0001$ ).

## 8. CONCLUSION FROM THE STUDY

Civil engineering and mechanical engineering student groups of the study with the advantage of being exposed to the various kinds of physical activities during their study or academic requirements showed significantly higher muscular strength of the upper body when compared to the ECE group, computer science group, and biotechnology student groups of the study. Only the civil engineering students group of the study showed significantly higher muscular strength of the lower body when compared to the other four groups of the study.

## REFERENCES

Marques, A., Ekelund, U., and Sardinha, L.B. Associations between organized sports participation and objectively

measured physical activity, sedentary time and weight status in youth. *J Sci Med Sport*, 2016, 19(2),154-157.

Myers, J., McAuley, P., Lavie, C.J., Despres, J.P., Arena, R., and Kokkinos, P. Physical activity and cardiorespiratory fitness as major markers of cardiovascular risk: Their independent and interwoven importance to health status. *Prog Cardiovasc Dis*, 2015, 57(4), 306-314.

Pedisic, Z., Greblo, Z., Phongsavan, P., Milton, K., and Bauman, A.E. Are total, intensity and domain-specific physical activity levels associated with life satisfaction among university students? *PLoS One*, 2015, 10(2), e0118137.

Silva, D.A., Tremblay, M., Pelegrini, A., Dos Santos Silva, R.J., de Oliveira, A.C.C., and Petroski, E.L. Association between aerobic fitness and high blood pressure in adolescents in brazil: Evidence for criterion-referenced cut-points. *Pediatr Exerc Sci*, 2016, 28(2), 312-320.

Zhi, X., Xi, W., Gao, L., Huang, J., Yang, X., Dai, W., Deng, Y., and Zhang, X. Physical fitness status of children and adolescents in Tianjin of China during past three decades: a cross-sectional study. *Int J Clin Exp Med*, 2015, 8(6), 9306-9312.

# A Comparative Study of Aggression between Cricket and Basketball Intercollegiate Women Players

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## ABSTRACT

The purpose of this study was to assess the aggression between cricket and basketball intercollegiate women players of Dr. Babasaheb Ambedkar Marathwada University. The study was conducted on 50 samples, consisting of 25 cricket and 25 basketball women players of different colleges affiliated to Dr. Babasaheb Ambedkar Marathwada University. Aggression was measured by administering Dr. G. C. Pati's aggression scale. The data collected through aforesaid tests were analyzed with respect to aggression. The t-test was applied to compute the significances between cricket and basketball intercollegiate women players. The significance of data was judged at 0.05 levels. The result of the study indicates that the aggression of basketball women players was higher than cricket women intercollegiate players.

## 1. INTRODUCTION

Aggression is a behavior and not a desire to or fantasy of harming someone. There must be intent to harm the victim either psychologically or physically. According to Baron and Richardson (1994), who defined aggression as, "Any form of behavior directed toward the goal of harming or injuring another living being who is motivated to avoid such treatment.

Lorenz (1981), aggression can be considered as instinctive and an inherent part of human nature.

### 1.1. Delimitations

The study has been delimited to cricket and basketball intercollegiate women players. The players in the age group of 18–25 years were drawn from Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, and colleges affiliated to them.

### 1.2. Purpose of the Study

The purpose of this study was as follows:

1. To study the aggression of intercollegiate cricket women players of Dr. Babasaheb Ambedkar Marathwada University.
2. To study the aggression of intercollegiate basketball women players of Dr. Babasaheb Ambedkar Marathwada University.

## 2. METHODOLOGY

### 2.1. Objectives of the Study

The objectives of the study are stated as follows:

1. To study the aggression of intercollegiate cricket women players of Dr. Babasaheb Ambedkar Marathwada University.
2. To study the aggression of intercollegiate basketball women players of Dr. Babasaheb Ambedkar Marathwada University.
3. To compare the aggression between cricket and basketball intercollegiate women players of Dr. Babasaheb Ambedkar Marathwada University.

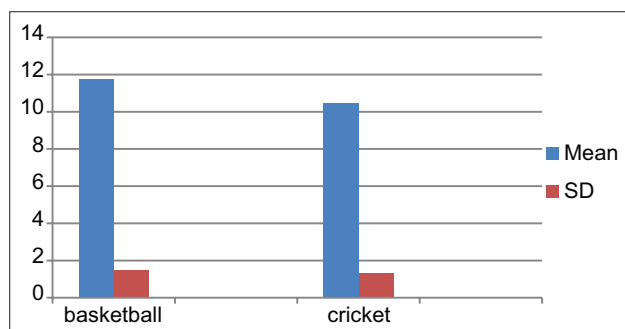
### 2.2. Hypotheses

1. There would be no significant difference between cricket and basketball intercollegiate women players on aggression.
2. There would be a significant difference between cricket and basketball intercollegiate women players on aggression.

### 2.3. Selection of Sample

The sample consists of 50 women players from Dr. Babasaheb Ambedkar Marathwada University. The subjects were drawn from the colleges affiliated to Dr. Babasaheb Ambedkar Marathwada University,





**Figure 1:** Histograms showing mean and SD scores of aggression of basketball and cricket intercollegiate women players

**Table 1:** Mean SDs and t-ratio of Aggression between cricket and basketball intercollegiate women players

Variable	Group	n	Mean	SD	t-ratio
Aggression	Cricket	25	10.44	1.31	0.73
	Basketball	25	11.76	1.50	

\*Insignificant at 0.05 level

Aurangabad. The purposive sampling technique was employed to select the subjects. The data were collected from basketball and cricket intercollegiate women players. The researcher will use the survey research methodology for the study.

#### 2.4. Tools Used

Dr. G. C. Pati's aggression questionnaire has been taken to assess aggression. This questionnaire consisted of 16 statements.

#### 2.5. Method for Analysis

A Student's *t*-test has been applied to find out the significant differences among the two groups at 0.05

level of significance. The collected data were tabulated to find out the difference of aggression among cricket and basketball intercollegiate women players.

### 3. RESULTS AND DISCUSSION

Table 1 reveals that there is an insignificance difference between cricket and basketball intercollegiate women players on aggression. Thus, it may be concluded that aggression of cricket and basketball intercollegiate women players is the same

The aggression of basketball intercollegiate women players has been higher than cricket intercollegiate women players. The result of the study indicates that the aggression of basketball intercollegiate players was higher than cricket intercollegiate players. Hence, the first hypothesis is rejected and the second hypothesis is accepted.

### 4. CONCLUSIONS

1. There is a significant difference between cricket and basketball intercollegiate women players on aggression.
2. The aggression of basketball intercollegiate players has been higher than cricket intercollegiate women players.

### REFERENCES

1. Raj, B.H. *Elements of Social Psychology*. Bombay: Somaiya Publications; 1976.
2. Buch, M.B. *A Survey of Research Education*. Baroda: Center for Advanced Study in Education.
3. Hall, C.S., and Lindzey, G. *Theories of Personality*. New Delhi: Wiley Eastern Limited; 1985.

# Comparison of Stress of Indoor Game and Outdoor Game Players

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## ABSTRACT

The purpose of this study was to compare the stress between indoor games and outdoor games of M.S.P. Mandal's Deogiri College, Aurangabad. The study was conducted on 50 samples, consisting of 25 indoor games and 25 outdoor games. Achievement pressure and achievement anxiety were obtained by administering Bisht's Battery of Stress Scale. The data collected through aforesaid tests were analyzed with respect to achievement pressure and achievement anxiety. The "t"-test was applied to compute the significances among the two groups. The significance of data was judged at .05 levels. The result of the study indicates that achievement pressure and achievement anxiety of indoor games and outdoor games were the same.

**Keywords:** Achievement pressure, Achievement Anxiety, Stress.

## 1. INTRODUCTION

According to Seyle, "Stress is the non-specific response of the body to any demands made on it." Stress is a state to which the natural body equilibrium is disrupted caused by any threat to the organism. Stress relates to the force applied to a system that invariably brings about some changes or modifications. Mc Grath (1970) suggested that stress results when there is a substantial imbalance between demand and response capacity under conditions where failure to meet the demands has important consequences. Selye (1975) defined stress as the demands placed on a person in relation to his or her resources. When the demands are greater than the person's resources, stress is experienced.

### 1.1. Purpose of the Study

The purpose of this study was as follows:

1. To study the achievement pressure among indoor and outdoor game players of M. S. P. Mandal's Deogiri College, Aurangabad.
2. To study the achievement anxiety among indoor and outdoor game players of M. S. P. Mandal's Deogiri College, Aurangabad.

## 2. METHODOLOGY

### 2.1. Scope and Limitations

The research scope area is limited only for M. S. P. Mandal's Deogiri College, Aurangabad. After considering the scope of the research subject, the researcher has observed some major limitations.

1. All indoor games from the M. S. P. Mandal's Deogiri College, Aurangabad, were included.
2. The college subjects were between 18 and 25 years of age.
3. The subject for the researcher is limited only for the intercollegiate indoor game and outdoor game players of M. S. P. Mandal's Deogiri College, Aurangabad
4. Only table tennis, judo, wrestling, boxing, badminton, softball, basketball, cricket, football, and kabaddi intercollegiate indoor game and outdoor game players were selected.

### 2.2. Objectives of the Study

The objectives of the study are stated as follows:

1. To study the achievement pressure among indoor and outdoor game players of M. S. P. Mandal's Deogiri College, Aurangabad.

- To study the achievement anxiety among indoor and outdoor game players of M. S. P. Mandal's Deogiri College, Aurangabad.

### 2.3. Hypothesis

- There would be no significant difference between indoor and outdoor game players on achievement pressure.
- There would be no significant difference between indoor and outdoor game players on achievement anxiety.

### 2.4. Selection of Sample

The sample consists of 50 players of M. S. P. Mandal's Deogiri College, Aurangabad. The subjects were drawn from the M. S. P. Mandal's Deogiri College, Aurangabad. A random sampling technique was employed to select the subjects. The data were collected from table tennis, judo, wrestling, boxing, badminton, softball, basketball, cricket, football, and kabaddi intercollegiate players during training, coaching camp, and during intramural tournaments. The present study is based on the survey method.

### 2.5. Tools Used

Abha Rani Bisht's Battery of Stress Scale has been taken to assess the stress. This questionnaire consisted of 52 statements.

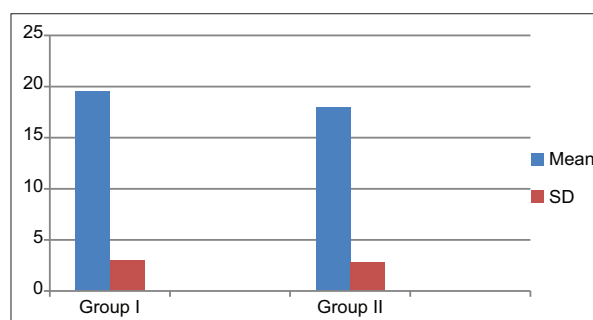
### 2.6. Statistics Used

Since the samples were small containing only 32 students, in each group, the testing for the difference between the means of the two groups, the t-ratio was computed. The student's t-test has been applied to find out the significant differences among the two groups at 0.05 levels of significance. The collected data were tabulated to find out the difference in achievement pressure and achievement anxiety among the two groups.

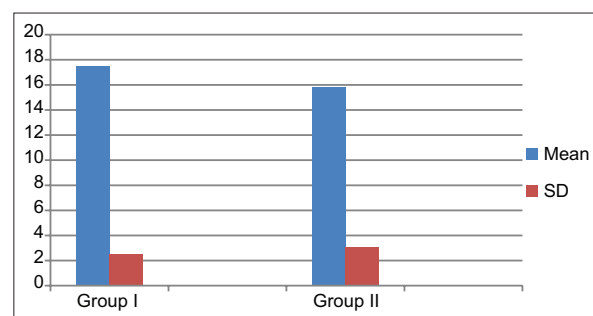
## 3. RESULTS AND DISCUSSION

The means of achievement pressure for Group I were 19.54, and Group II was 17.91. The calculation of mean, standard deviation, and t-ratio of Group I and Group II on achievement pressure is presented in Table 1.

Table 1 reveals that there is an insignificance difference between Group I and Group II on achievement pressure. Thus, it may be concluded that the achievement pressure



**Figure 1:** The mean of the achievement pressure of Group I and Group II



**Figure 2:** The mean of the achievement anxiety of Group I and Group II

**Table 1:** Mean SDs and t-ratio of achievement pressure between Group I and Group II

Variable	Group	n	Mean	SD	t-ratio
Achievement Pressure	I	25	19.54	3.02	1.96*
	II	25	17.91	2.84	

\*Insignificant at 0.05 levels

**Table 2:** Mean SDs and t-ratio of achievement anxiety between Group I and Group II

Variable	Group	n	Mean	SD	t-ratio
Achievement Anxiety	I	25	17.48	2.52	2.08*
	II	25	15.83	3.05	

\*Significant at 0.05 levels

of both the indoor game and non-indoor game male is the same.

The means of achievement pressure of Group I and Group II were 19.54 and 17.91, respectively. The t-ratio obtained is insignificant at 0.05 level of confidence. Hence, the hypothesis I that Group I and Group II players had not to differ on achievement pressure is accepted.

The means of achievement anxiety for Group I were 17.48 and for Group II 15.83. The calculation of mean, standard deviation, and t-ratio of Group I and Group II

on achievement anxiety is presented in Table 2. Table 2 reveals that there is a significant difference between Group I and Group II on achievement anxiety. Thus, it may be concluded that the achievement anxiety of both indoor and outdoor game players is not the same.

The means of achievement anxiety of Group I and Group II players were 17.48 and 15.83, respectively. The t-ratio obtained is significant at 0.05 level of confidence. Hence, hypothesis II that Group I and Group II players had not to differ on achievement anxiety is rejected.

#### 4. CONCLUSIONS

On the basis of the study, the following conclusions were drawn:

1. No significant difference is found on achievement pressure between indoor and outdoor game players.
2. There is a significant difference in achievement anxiety between indoor and outdoor game players.

#### REFERENCES

1. Bryant, J.C., *Social Psychology in Athletics*. United States: Library of Congress Cataloging in Publishing Publications Data; 1981.
2. Dandekar, W.N. In: Wasani, S.G. *Psychological Foundations of Education*. Madras: Macmillan India Limited; 1985.
3. Jain, D. *Foundation of Physical Education*. New Delhi: Lokesh Thani Sports Publications; 1999.

# Exercise Improves – Sex Life

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## ABSTRACT

What do you know and your normally do after a long day it works cure up the Netflix, gets the snacks ready, snuggles, and eventually makes your way to the bedroom. Ever hit up the gym together. Studies show what the easiest way to improve your sex life is through exercise – confidence and libido are instantly heightened. Read on for more benefits of exercise for your bedroom experience. For decades, sports physiologists pondered the following question does sex, especially the night before a big competition, hinder athletic performance. While the answer might be of interest to coaches and Olympiads trolling the Beijing streets the night before their long jump, it has little relevance for the rest of us, who are not competitive athletes. As recreational runner or pickup basketball player is not likely to be setting world records. They are, however, likely to be having (or wanting to have) sex. Therefore, a more relevant question for the masses is the corollary; how does exercise affect your sex life.

## 1. INTRODUCTION

Not surprisingly, research indicates that exercisers have more and better sex than couch potatoes. The agility and flexibility garden during sports can help during sex, an athletic endeavor in its own right. However, exercise has implications beyond just the physical. It affects our mental, emotional, and psychological state of being; this is turning positively affects our sex lives.

One benefit of exercise has to do with perceived body image. A study published in the electronic journal of human sexuality questioned 400 college students and found that regular exercisers had higher levels of self-confidence, perceived themselves to be more sexually desirable, and had higher levels of sexual satisfaction than their non-exercising peers. Feeling sexy can help stimulate sexual desire, so it makes sense that those with improved body image would be inclined toward more sex.

Exercisers also tend to be more aware of their bodies and feel more comfortable with them. And because exercise can reduce stress and elevate mood, it helps us relax – all attributes which help out in the bedroom.

Similarly, physically active people rate their own sexual performance higher than sedentary peers. This could be because of perceived body image or increased self-confidence (or narcissism) but also because of improved muscle tone, endurance, or body composition.

The benefits of exercise are not just reserved for those in their youth, who tend to be both healthier and hornier than older populations. A Harvard University study looked at 160 swimmers in their 40s and 60s and found a positive relationship between regular exercise and in their 40s indicating that if you move it, you do not have to lose it.

Moreover, exercise-induced good sex is not just for those already on the team. A study from the archives of sexual behavior should that previously inactive men who participated in three 5 h long workouts a week had significantly improve sex lives.

## 2. METHODS

In addition to feeling good, moving around helps keep our sexual parts running like well-oiled machines. Exercise activates the sympathetic nervous system, which increases blood flow to the genital region. A study found that women were more sexually responsive following 20 min of cycling. Not only did exercise increase arousal but it also seemed to prime the pump: The women were able to get aroused quicker after exercise.

And one of the biggest bedroom problems for older men erectile dysfunction (ED) can be greatly improved with exercise.

ED is a problem of blood flow to the penis, so exercise, which improves cardiovascular health, can also reduce



impotence problems. A study published in the journal *Urology* followed 600 men for 9 years and found that men who maintained or started exercising in middle age reduced their risk of impotence compared to sedentary men. A study in the *Annals of Internal Medicine* had similar results, showing that active men had a 30% lower risk of impotence than men who were inactive. And those already experiencing ED can possibly improve their situation with exercise. A study published in the *Journal of the American Medical Association* found that regular exercise and reduced-calorie diets improved ED in obese men. Although certainly, the makers of Viagra do not want to hear it, getting the heart pumping may get you off the blue pills.

### 2.1. Hard, But Not too Hard

Yet, as someone who is in the midst of training for a half iron man triathlon, it seems that there is an obvious drawback to clocking numerous hours of athletics when you hit the hay, sometimes sleep, not sex, takes precedence. And in fact, overtraining can reduce sexual desire and testosterone levels. But let's face it, most Americans are not overtraining; the majority of people do not even get the recommended 30 min of exercise a day.

A most of us, even those who do train a lot, would like to get both sleep and sex. But if you had to view for one, which would it be. This takes us back to the original question. For the competitive athlete or the recreational competitors, does have sex before an event boost or bust our game day showing.

### 2.2. An Extended Warm-up

For decades, the common theory was the abstaining from sex before a big event is a good idea. Muhammad Ali supposedly went so far as to abstain for weeks before big matches. Sexual frustration was thought to increase aggressiveness, especially important in power sports like boxing.

But remember Bob Beamon, the longer jumper. The only time he supposedly had sex before an event was in the 1968 Mexico City Olympics, when he destroyed the world record in the long jump by feet not inches and won the gold medal.

Anecdotal accounts will support either theory, but research indicates that Beamon's method is the best. Italian researchers have shown that sex actually

increases testosterone levels, which can presumably help with game-day aggression.

Research also indicates that sex can stimulate a pain blocking chemical in women, the results of which can last for days.

Another small study done in recreational marathoners showed that athletic performance did not vary depending on whether the athletes had sex in the previous 2 days, but rather their caloric intake and amount of sleep.

### 2.3. Who Do not We Do it in the Gym

Having sex will not necessarily increase performance, but cannot hurt either, unless it's hours of sleep you are sacrificing to do the deed. Sex can help you relax, which might help you get a good's night rest before a big event or sex might just help you reach a desired goal for the evening climax.

Exercise is not the cure for sex-related problems, nor is sex the problem for your poor athletic performing. But one this for sure. Exercise and sex are beneficial to and beneficiaries of each other. My running shoes never looked so hot.

## 3. RESULTS

We all know that the exercise is good for you it keeps your heart healthy and adds years to your life. However, exercise does something else it makes your sex life better. By exercising several times a week, you will not only be increasing your health but also improving your sex life. Sound good? Find out more.

### 3.1. Exercise Makes You Feel Sexy

A big part of sex is sexy. People who exercise have improved body image over people who not exercise. Being more comfortable with your body leads to better and more relaxed sex. A study showed that more physically fit men and women rated their own sexual desirability higher than less active men and women the same age. About 80% of males and 60% of females who exercised 2–3 times weekly rated their own sexual desirability as above average. As the number of days of exercise per week increased, so did the rating of sexual desirability.

### 3.2. Exercise Improves Sexual Performance

Another study showed that men/women who were more physically fit rated their own sexual performance higher.

Among people who exercised 4–5 days/week, 88% of the women and 69% of the men reported their own sexual performance as above average or much above average. The reason for this could simply be increased in confidence because of an improved body image or a physiological reason (such as better circulation and blood flow).

### 3.3. Exercise Means More Sex

People who exercise more have sex. The reason for this is complicated. People who exercise more are generally healthier, younger and have more attractive bodies than the non-exercisers. Frequent exercisers may also be more physically oriented people who seek out activities and sensations. Whatever the case, research does show that the more a person exercise, the more sex he or she tends to have.

### 3.4. Exercise Help Sexual Aging

A 60 years old who exercise frequently report having the same amount of sex and sexual pleasure as people decades younger. One study examined the sexual frequency and satisfaction ratings of swimmers aged 60 and found that they were the same as those 20 years younger. If you exercise a lot, your “sexual age” will be years younger than your chronological age.

### 3.5. Reduces ED

There is a saying in the ED world that “penis health is heart health.” Erectile dysfunction is often caused by circulatory problems. To have an erection, the penis must swell with blood. Blocked arteries, high blood pressure, and other cardiovascular issues can interfere with that process. Exercise keeps the heart and arteries healthy, reducing the risk of ED. Researchers looked at men over the age of 50 and found that those who were physically active reported better erections and 30% lower risk of impotence than men who were inactive.

### 3.6. Endorphin Release

Exercise releases endorphin that gives a feeling of pleasure. The classic “runner’s high” is an example. In a “runner’s high,” a seasoned runner may experience a feeling of bliss and contentment during exercise caused by a release of endorphins. Your sex drive and feelings of sexual pleasure also use an endorphin release system. Each time you exercise (or have sex), your body releases these endorphins. The more frequent and intense the

releases the easier it is for sexual arousal and pleasure in future. In fact, studies have shown that women who frequently exercise become aroused more quickly and are able to reach an orgasm faster and more intensely.

### 3.7. Exercise Adds Options

If you are physically fit, you may have more options for sex. Sex itself is an intense physical activity requiring strength and endurance. As you exercise, both your strength and endurance will increase, opening the possibility for more varied sexual positions that require greater physical control.

### 3.8. The Bottom Line

If better health is not enough motivation to get you into the gym or out for a run, maybe better sex will be. Use the information here to in spite of yourself to increase your fitness and just watch what may happen to your sex life.

## 4. CONCLUSION

- Much less is known about the psychological effects of sex on athletic performance.
- Some experts say coaches may be favoring the abstinence theory simply because they want to make sure young athletes get enough sleep before a big game.
- Psychologists have shown that there is an optimal level of alertness and anxiety that is necessary to produce the best possible performance. Too much anxiety or too much aggression may result in poor performance.
- If athletes are too anxious and restless the night before an event, then sex may be a relaxing distraction.
- If they are already relaxed or like some athletes have little interest in sex, the night before a big competition then a good night’s sleep is all they need.
- The results will depend on individual preferences and routines, Shrier said adding that consistency is key.
- In general, an athlete should never try something before an important competition that they have not already tried in lesser competitions or practice.
- Jannini, the Italian researcher, says that the effects of sex vary among athletes.
- Some personalities need more concentration. In this case, sex may be bad idea.

- For other athletes, a bit of extra aggression could be the difference between winning and losing, Jannini said, in this case, I would suggest a complete and satisfactory sexual intercourse the evening before the game.

## REFERENCES

- Bedimo-Rung, A.L., Mowen, A., and Cohen, D. The significance of parks to physical activity and public health; a conceptual model. *Am J Prev Med*, 2003, 28(2), 159-168.
- Alexandar. Personality, disease and morality among PVC workers: A longitudinal study. 1950, 25(3), 495-503.
- Marshall, S.J., Sarkin, J.A., Sallis, J.F., and McKenzie, T.L. Tracking of health related fitness components in youth ages 9 to 12. *Med Sci Sports Exerc*, 1998, 30(6), 910-916.
- Asikainen, T.M., Millunpalo, S., Oja, P., Rinne, M., Pasanen, M., Usui-Rasi, K., and Vuori, L. Randomized controlled walking trails in postmenopausal women; the minimum dose to improve aerobic fitness? *Br J Sports Med*, 2002, 36(3), 189-94.

# “Mental Toughness among Pencak Silat”

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## ABSTRACT

Mental toughness means the ability to balance in one's daily living. In other words, toughness is a complex phenomenon that depends on a set of familiarly personal, psychological, and social variables. Mental toughness is an important feature as the physical health of a person to make him complex with balance mental disposition of the children to cope with life more effectively and productively. Good mental toughness depends on the good state of both mind and body. Each exerts a direct influence on the other, but due to the power of matter, good mental toughness is of supreme importance according to Hadfield (1952) mental toughness is the harmonious functioning of the whole personality.

## 1. INTRODUCTION

### 1.1. Mental Toughness

Seller R, Birrer D. The roles of mental toughness increasingly recognized in the discussion about health. In this article, health is considered to be a dynamic balance between resources and potential risk factors. Sports and physical activity may represent resources that do not only contribute to increased well-being but also an improved self-concept as a cognitive representation of one's health status.

To study the most important aspect of players a means of promoting interpersonal, national, and international understanding. It would provide a clue whether players are truly fulfilling this much-publicized purpose or the difference in their mental toughness status, which are defeating the fundamental purpose of players' promotion.

### 1.2. Objectives

The objective of this study was as follows:

- To examine the level of mental toughness between the pencak silat and non-pencak silat players of Gulbarga University, Kalaburagi.
- To know the age factors influence on the mental toughness of pencak silat and non-pencak silat players.

### 1.3. Hypothesis

- There would be a significant difference between the mental toughness level of pencak silat and non-pencak silat players of Gulbarga University, Kalaburagi.
- There would be a significant difference in the level of mental toughness between pencak silat and non-pencak silat players on age factor.

### 1.4. Factors

- Independent: Mental toughness.
- Dependent: Level of mental toughness age.

## 2. METHODOLOGY

The present investigation pertaining to “Mental Toughness among Pencak Silat Sports” is in the framework of ex-post facto research. The particulars of samples, tools, collection of data, and statistical techniques are given as under:

### 2.1. Sample

Keeping the objectives in view, an appropriate research design is adopted. The sample for the study is drawn from the pencak silat and non-pencak silat players of Gulbarga University, Kalaburagi, 50 pencak silat players and 50 non-pencak silat players were administered

mental toughness scale to assess the differences in their mental toughness. The sample design is as under.

## 2.2. Distribution of Sample

S. No.	Pencak silat players	Non-pencak silat players	Total
1	25	25	50

## 2.3. Tools

1. Personal data schedule: This is framed to collect information regarding the personal and sociodemographic status of the sample.
2. Mental toughness scale developed by Dr. Jagadish and Dr. A.K. Srivastava was used in the present study. The inventory contains 54 questions. The responses are scored with the help of the manual.

## 2.4. Collection of Data

The data were collected from the pencak silat and non-pencak silat players of Gulbarga University, Kalaburagi, who were administered the mental toughness scale during the level of competitions.

## 2.5. Analysis of Data

Table 1 and graph show the mean, SD, and  $t$ -value of pencak silat and non-pencak silat players in relation to their level of mental toughness. The mean and SD of pencak silat players is 63.60 and 7.77, respectively, and the mean and SD of non-pencak silat players is 72.55 and 5.5, respectively.

The mean score of pencak silat players is higher than the non-pencak silat players. It shows that the pencak silat players have high mental toughness and non-pencak silat players have low mental toughness. Because pencak silat players involve in sports and physical activity that may represent resources that do not only contribute to increased well-being but also to an improved self-confidence as a cognitive representation of pencak silat players mental toughness status. When  $t$ -value is 3.27, so it indicates the significant difference between these two groups, statistically significant at 0.05 level.

Table 2 and graph show the mean, SD, and  $t$ -value of age groups of pencak silat and non-pencak silat players in relation to their level of mental toughness. The mean and SD of below 25 age pencak silat players is 130.20 and 16.70, respectively, and the mean and SD of above 25 age pencak silat players is 125.44 and 18.53, respectively.

**Table 1: Mental toughness level of pencak silat and non-pencak silat players**

	M	SD	$t$ -value
Pencak silat players	63.60	7.77	3.27**
Non-pencak silat players	72.55	5.5	

**Table 2: Mental toughness level of pencak silat and non-pencak silat players on age factor**

Sources	Age	Mean	SD	$t$ -value
Pencak silat players	<25	130.20	16.70	1.61*
	>25	125.44	18.43	
Non-pencak silat players	<25	145.23	10.55	0.53
	>25	144.12	9.88	

The mean score of below 25 age pencak silat players is higher than the above 25 age pencak silat players. It shows the above 25 age pencak silat players the better mental toughness than the below 25 age pencak silat players. Because the above 25 age pencak silat players have more experiences, mentally matured in the game, and also well settled in their life. When  $t$ -value was applied to know the significant difference, it was found that the obtained  $t$ -value is 1.61, so it indicates the significant difference between these two age groups of pencak silat players, statistically significant at 0.05 level.

## 3. CONCLUSIONS

- The pencak silat players have high mental toughness and non-pencak silat players have low mental toughness.
- The above 25 age pencak silat players have better mental toughness than the below 25 age pencak silat players.

## REFERENCES

1. Calfas, K.J., and Taylor, W.C. Effects of physical activity on psychological variables in adolescents. *Pediatr Exerc Sci*, 1984, 6, 406-423.
2. Corbin, C., and Pangrazi, B. Surgeon general's report on physical activity and health. *Phys Act Fit Res Dig*, 1996, 2(6), 4.
3. Crust, L. The relationship between mental toughness and affect intensity. *Pers Individ Dif*, 2009, 47, 959-963.
4. Dalaney, P.F., Goldman, J.A., King, J.S., and Gray, R.O.N. Mental toughness, reinforcement sensitivity theory and the five factor model Personality and directed forgetting. *Pers Individ Dif*, 2015, 83, 180-184.



# Effect of Strength Training and Endurance Training on Anxiety Stress and Vital Capacity

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## ABSTRACT

The purpose of the study was to find out the effect of resistance training and endurance training on anxiety, stress, and vital capacity. Forty-five female students aged between 17 and 22 years were selected for the study. They were divided into three equal groups, each group consisting of 15 subjects, in which three experimental groups and one control group, in which the Group I ( $n = 15$ ) underwent resistance training, Group II ( $n = 15$ ) underwent endurance training for 3 days (alternative days) per week for 12 weeks, and Group III ( $n = 15$ ) acted as control, which did not participate in any training. The subjects were tested on selected criterion variables such as anxiety, stress, and vital capacity before and immediately after the training period. For testing the anxiety, Taylor Manifest Anxiety Scale was used to measure the aggression, the Buss and Perry aggression questionnaire was used, and vital capacity was assessed using expirograph. The analysis of covariance was used to find out the significant difference, if any, between the experimental groups and control group on selected criterion variables separately. Since there were three groups involved in the present study, the Scheffé's test was used as *post hoc* test. The selected criterion variables such as anxiety and aggression were decreased and the vital capacity was increased significantly for the training groups when compared with the control group.

**Keywords:** Aggression, Anxiety, Endurance training, Physical fitness, Resistance training, Vital capacity.

## 1. INTRODUCTION

Physical training is focused on mechanistic goals. The overall muscles and some specific skills will develop within a particular period of time after the physical training. Psychological will be improved by the most of the physical training program [1]. Beach [2] defines training as "the organized procedure by which people learn knowledge and/or skill for a definite purpose." It is a process of teaching a particular skill to somebody, either human or animal, and the aim is to improve the capacity, performance capacity, or productivity of an individual [3].

Physical training is the most important ingredient to achieve a high level of performance of an athlete. It is objectives that are to increase the highest standards of athletes' physiological potential and biomotor abilities [4]. Physical training should be given to the athlete on the basis of scientific principles and which, through the systematic development of mental and

physical efficiency, capacity, and motivation, which help the athlete to produce outstanding and record-breaking performances [5].

During a specific period of time, an organized training which involves an increasing cycle of the training program which enhances the performance of an individual is called periodization [6]. During the periodization, the competitor gets optimum adaptation before an important event. Instead of performing the regular routing workouts month after month, the athlete changes his or her program with regular periods or interval to work harder with adequate rest [7]. A study was conducted at Human Performance Laboratory, Ball State University shown that there was a significant improvement in muscular performance that was found in favor of periodized strength training program than the non-periodized program [8].

The strength training also refers to a type of physical exercise, uses of resistance which enhances the muscular

contraction which contributes the strength, increase the size of skeletal muscle, and anaerobic endurance. It can improve the overall health and well-being, including the size of muscle, tendon, and strengthen and improves the toughness of ligament and joint function, reduced for injury [9], increased bone density, fitness, metabolism, and cardiac function [10,11].

Training the aerobic system is called endurance training which is opposed to the anaerobic system, which is divided into two categories, general and specific endurance [12]. Anxiety could be an advanced emotion, characterized by a general concern or fore binding, sometimes in the course of tension. There are two wide categories of aggression that embraces emotive or retributory aggression, hostile and instrumental, predatory, or goal-oriented aggression [13].

Anatomy and physiology are intimately related area of study: Anatomy, the study of the structure of human bones, and physiology, the study of function of internal organs, are essentially tied and are studied in tandem as part of a medical program [17].

## 2. METHODS

In this study, it was aimed to find out the effect of resistance training and endurance training on anxiety and aggression. To achieve this purpose, 45 female students from various faculties of Annamalai University, Annamalai Nagar, Tamil Nadu, were selected as subjects at random from the total population of 143 students. They were divided into three equal groups of 15 each and further divided as two experimental groups and one control group, in which the Group I ( $n = 15$ ) underwent

resistance training, Group II ( $n = 15$ ) underwent endurance training for 3 days (alternative days) per week for 12 weeks, and Group III ( $n = 15$ ) acted as control which did not participate in any special training apart from the regular curricular activities. For every training program, there would be a change in various structures and systems in the human body. Hence, the researchers consulted with the experts and then selected the following variables as criterion variables: (1) Anxiety and (2) aggression.

### 2.1. Analysis of the Data

Analysis of covariance (ANCOVA) was used to determine the differences, if any, among the adjusted post-test means on selected criterion variables separately. Whenever the “F”-ratio for adjusted post-test mean was found to be significant, the Scheffé’s test was applied as *post hoc* test. The level of significance was fixed at 0.05 level of confidence to test the “F”-ratio obtained by ANCOVA.

Table 1 shows that pre- and post-test means that the “F”-ratio of resistance training group, endurance training group, and control group on anxiety was 0.929, which is insignificant at 0.05 level of confidence. The post-test and adjusted post-test means that the “F”-ratio value of experimental groups and control group was 21.05 and 65.96, which was significant at 0.05 level of confidence. The pre- and post-test means that the “F”-ratio of resistance training group, endurance training group, and control group on aggression was 0.61 and 1.73, which is insignificant at 0.05 level of confidence. The adjusted post-test means that the “F”-ratio value of the experimental groups and control

**Table 1:** Analysis of covariance and “F”-ratio for anxiety and aggression of resistance training group, endurance training group, and control group

Variable name	Group name	Resistance training group	Endurance training group	Control group	“F”-ratio
Anxiety (in points)	Pre-test mean±SD	10.53±1.25	10.00±1.51	10.60±1.18	0.929
	Post-test mean±SD	8.07±1.22	8.73±1.39	10.67±1.45	21.05*
	Adj. post-test mean	7.928	8.071	10.468	65.96*
Aggression (in points)	Pre-test mean±SD	20.00±3.12	21.07±3.67	19.87±2.97	0.61
	Post-test mean±SD	18.13±3.38	19.07±3.43	20.27±2.55	1.73
	Adj. post-test mean	18.419	18.374	20.674	27.54*
Vital capacity (in L)	Pre-test mean±SD	2.56±0.06	2.53±0.07	2.55±0.12	0.392
	Post-test mean±SD	2.76±0.07	2.92±0.07	2.54±0.10	80.19*
	Adj. post-test mean	2.749	2.930	2.535	331.7*

\*Significant at 0.05 level of confidence. (the table value required for significance at 0.05 level of confidence with df 2 and 42 and 2 and 41 were 3.22 and 3.23, respectively). SD: Standard deviation

**Table 2:** Scheffé's test for the difference between the adjusted post-test means of anxiety, aggression, and vital capacity

Resistance training group	Endurance training group	Control group	Mean difference	Confidence interval at 0.05 level
<b>Adjusted post-test mean difference in anxiety</b>				
7.928	-	10.468	2.54*	0.63
7.928	8.071	-	0.143	0.63
-	8.071	10.468	2.397*	0.63
<b>Adjusted post-test mean difference on aggression</b>				
18.419	-	20.674	2.255*	0.89
18.419	18.374	-	0.045	0.89
-	18.374	20.674	2.30*	0.89
<b>Adjusted post-test mean difference in vital capacity</b>				
2.749	-	2.535	0.214*	0.039
2.749	2.930	-	0.181*	0.039
-	2.930	2.535	0.395*	0.039

\*Significant at 0.05 level of confidence

group was 27.54, which was significant at 0.05 level of confidence. The pre-test means that the "F"-ratio of resistance training group, endurance training group, and control group on vital capacity was 0.392 and 1.73, which is insignificant at 0.05 level of confidence. The post-test and adjusted post-test means that the "F"-ratio value of the experimental groups and control group was 80.19 and 331.7, which was significant at 0.05 level of confidence. The overall study shows that there was a significant decrease in anxiety and aggression and an increase in vital capacity. Further, to find out which of the paired mean significantly differ, the Scheffé's test was applied and presented below.

Table 2 shows the Scheffé's test for the difference between adjusted post-test mean on the anxiety of resistance training group and control group (2.54) and endurance training group and control group (2.397) which were significant at 0.05 level of confidence. However, there was no significant difference between resistance training group and endurance training group (0.143) on anxiety after the respective training program.

Table 2 shows the Scheffé's test for the difference between adjusted post-test mean difference in aggression between resistance training group and control group (2.255) and endurance training group and control group (2.30) which were significant at 0.05 level of confidence in favor of endurance training group. However, there was no significant difference between resistance training group and endurance training group (0.045) on aggression after the respective training program.

Table 2 also shows that the Scheffé's test for the difference between adjusted post-test mean difference in vital capacity between resistance training group and control group (0.214), resistance training group and endurance training group (2.30) and endurance training group and control group (0.395) which were significant at 0.05 level of confidence in favor of endurance training group.

### 3. CONCLUSIONS

The result of the present study shows that anxiety has decreased both the training groups. The findings of Gordon *et al.* [15], Spanos *et al.* [18], and Khorvash *et al.* [16] found that there was a significant decrease in aggression after the continuous running. The results of the study also revealed that there was a significant increase in vital capacity for both the training groups. Khorvash *et al.* (2013) [19] have found that there was a significant improvement in inspiratory reserve volume, expiratory reserve volume, tidal volume, and vital capacity after the resistance training and endurance training. Moradians *et al.* (2016) [20] found that aerobic exercise has enhanced the vital capacity.

### REFERENCES

- [1] Available from: <https://www.en.wikipedia.org/wiki/Training>. Retrieved on 10-06-2019.
- [2] Available from: <http://www.yourarticlelibrary.com/human-resource-development/training-meaning-definition-and-types-of-training/32374>. Retrieved on 10-06-2019.

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- [3] What is Training? Definition and Examples. Available from: <https://www.marketbusinessnews.com/financial-glossary/training>. Retrieved on 11-06-2019.
- [4] Bompa, T.O. *Periodization: Theory and Methodology of Training*. 4<sup>th</sup> ed. Champaign, Illinois: Human Kinetics Publishers; 1999. p. 54.
- [5] Harre, D. *Principles of Sports Training*. Berlin: Sportverlag; 1982. p. 10.
- [6] Available from: <https://www.unm.edu/~lkravitz/Exercise%20Phys/periodizationexpl.html>. Retrieved on 22-06-2019.
- [7] American Council of Exercise. *Periodized Training and why it is Important?* United States: American Council of Exercise. Available from: <https://www.acefitness.org/education-and-resources/lifestyle/blog/6660/periodized-training-and-why-it-is-important>. Retrieved on 18-06-2019.
- [8] Marx, J.O., Ratamess, N.A., Nindl, B.C., Gotshalk, L.A., Volek, J.S., Dohi, K., Bush, J.A., Gómez, A.L., Mazzetti, S.A., Fleck, S.J., Häkkinen, K., Newton, R.U., and Kraemer, W.J. Low volume circuit versus high-volume periodized resistance training in women. *Med Sci Sports Exerc*, 2001, 33, 635-643.
- [9] Shaw, I., and Shaw, B.S. Resistance training and the prevention of sports injuries. In: Hopkins, G., (ed). *Sports Injuries: Prevention, Management and Risk Factors*. Hauppauge, NY: Nova Science Publishers; 2014.
- [10] Shaw, B.S., and Shaw, I. Effect of resistance training on cardiorespiratory endurance and coronary artery disease risk. *Cardiovasc J S Afr*, 2005, 16(5), 256-59.
- [11] Shaw, B.S., and Shaw, I. Compatibility of concurrent aerobic and resistance training on maximal aerobic capacity in sedentary males. *Cardiovasc J Afr*, 2009, 20(2), 104-106.
- [12] Available from: [https://www.en.wikipedia.org/wiki/Endurance\\_training#cite\\_note-1](https://www.en.wikipedia.org/wiki/Endurance_training#cite_note-1). Retrieved on 10-06-2019.
- [13] Bushman, B.J., and Anderson, C.A. Is it time to pull the plug on the hostile versus instrumental aggression dichotomy? *Psychol Rev*, 2001, 108, 273-279.
- [14] Available from: <https://www.busywomensfitness.com/exercise-benefits.html>. Retrieved on 09-03-2016.
- [15] Gordon, B.R., McDowell, C.P., Lyons, M., and Herring, M.P. The effects of resistance exercise training on anxiety: A meta-analysis and meta-regression analysis of randomized controlled trials. *J Sports Med*, 2017, 47(12), 2521-2532.
- [16] Khorvash, M., Askari, A., Rafiemanzelat, F., Botshekan, M., and Khorvash, F. An investigation on the effect of strength and endurance training on depression, anxiety, and C-reactive protein's inflammatory biomarker changes. *J Res Med Sci*, 2012, 14(1).
- [17] Available from: [https://www.en.wikipedia.org/wiki/Human\\_body](https://www.en.wikipedia.org/wiki/Human_body). Retrieved on 21-06-2016.
- [18] Spanos, K.L., Karaikos, E.Z., and Portokalis, C. The effects of two resistance training programs in maximum strength and muscular endurance of male adults. *Phys Train*, 2007.
- [19] Khorvash, M., Askari, A., Rafiemanzelat, F., Botshekan, M., and Khorvash, F. An investigation on the effect of strength and endurance training on depression, anxiety, and C-reactive protein's inflammatory biomarker changes. *J Res Med Sci*, 2012, 14(1).
- [20] Moradians, V., Rahimi, A., Moosavi, S.A., Khorasani, F.S., Mazaherinejad, A., Mortezaade, M., and Raji, H. Effect of eight-week aerobic, resistive, and interval exercise routines on respiratory parameters in non-athlete women. *Tanaffos*, 2016, 15(2), 96-100.

# The Effect of Pranayama on Selected Physiological Variables among Boxers of Mahatma Gandhi University, Nalgonda, Telangana, India

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## ABSTRACT

This study was conducted to find out the effect of pranayama on selected physiological variables among boxers of Mahatma Gandhi University, Nalgonda, Telangana. Twenty male boxers were selected and considered as the experimental group. Data were considered before and after 6-week training program of pranayama that the collected data were statistically analyzed dependent “t”-test, it was found that there was a significant development on breath-holding time and pulse rate due to practice of pranayama.

**Keywords:** Boxer's, Pranayama.

## 1. INTRODUCTION

Pranayama has toward Prana + Ayama “Prana” stands for life energy, “Ayama” stands for expansion. Pranayama is the practice of breath control in yoga in modern yoga as exercise, it consists of synchronizing the breath with movements between asanas but it also a distinct breathing exercise on its own usually practiced after as a healthy person normally breathes in and out 15 times in a minute by regular practice of pranayama a person can gradually slow down breathing rate a regular pranayama practitioner can reduce 15 cycles for minutes to 12, 10, 8, 4, 2, or even less in gradually human lifespan considered 100 years based on the normal breathing condition and so many research studies say slow breathing rate persons live longer than a person with faster breathing rate the object of yoga and pranayama is the control of the mind and its avacations chitta vrittis to control the mind we use pranayama to tie or control the mind; similarly, pranayama is possible by the controlled regulation of inhalation, exhalation, and retention; thus, it is a tricycle consisting of breath, life force, and the mind, there are many types of pranayama they are (1) Ujjayee, (2) Surya Bheda, (3) Bhastrika, (4) Shitali, (5) Seetkari, (6) Bhramari, (7) Moorcha, and (8) Plavani.

### 1.1. Boxing

Boxing is a deceptively difficult sports at the first glance boxing looks like it entails merrily moving around and

throwing punches quite the contrary boxing requires absolute control of the body, mind, breath emotions, and surrounding atmosphere; it demands deep concentration excellent mind-body coordination and exceptional physical and cardiovascular strength.

### 1.2. Pranayama Benefits for Boxer's

“Breathing” others breathing patterns might not seem like they matter in the middle of the fight, but pranayama practitioner breath has a profound impact on his performance, during vigorous physical activity most people breath just enough to stay alive yogic breathing; however, focuses on long deep breathes throughout each moment once they have got their breath under control their heart rate slows and body relaxes and their mind becomes more clear and able to make quick decisions by focusing on the breath on the moment and their body in space yoga teaches you to be present in the moment caring that mindfulness into the boxing ring, pranayama improves intuition heightens their awareness of their self and their surroundings and pranayama helps to control boxer's mental and emotional state.

## 2. METHODOLOGY

Twenty male boxers of 18–23 years of age from Mahatma Gandhi University were selected as the



**Table 1**

Physiological variables	Test	Mean	SD	SE	"t" ratio
Resting pulse rate	Pre	65.1	2.07491	0.46396	1
	Post	57.45	2.08945	0.46721	

**Table 2**

Physiological variables	Test	Mean	SD	SE	"t" ratio
Breath-holding time	Pre	34.0025	3.37496	0.75466	1.697
	Post	71.226	3.12513	0.6988	

selected subjects were gone under 6 weeks pranayama practice(Puraka, Rechaka, Kumbhaka, Pranabandanam, and Himanah); the following physiological variables such as breath-holding time and resting pulse rate were selected, the breath-holding time and resting pulse rating were tested through nose holding and pulse beats counting method, the pre-test data were collected before the training program, and both the cases and the data were collected in single day the same day.

### 3. RESULTS AND DISCUSSION

The mean, standard deviation, standard error, and "t"-ratio of resting pulse rate and breath-holding time pre-test and post-test are presented in the following tables.

From Table 1, the dependent "t"-value of resting pulse rate between the pre- and post-test means of the

experimental group was greater than the table value of "1" level due to the effect of pranayama practice; the experimental group had significant development (decreases) on resting pulse rate.

From Table 2, the dependent "t"-test value of breath-holding time between the pre- and post-test mean of the experimental group was greater than the table value of "1.697" due to the effect of pranayama practice, the experimental group had significant improvement on breath-holding time.

### 4. CONCLUSION

- Six weeks of training pranayama practice improves (Reduce) male boxers resting pulse rate
- Six weeks of training pranayama practice improves male boxers breath-holding time
- Six weeks of training pranayama practice improves male boxers concentration on fight and performance in the ring.

### REFERENCES

1. Available from: <http://www.en.m.wikipedia.org-boxing-pranayama>.
2. Available from: <http://www.glovework.com>.
3. Vibhaami, M.N. Impact of Pranayama on Selected Physiological Variables Among Inter College Women Cricket Players. 2015.
4. *Yoga-a Complete Guide to the Physical Posture Breathing for Life Cleansing Techniques Meditation Deep Relaxation and Cure of Diseases*. P Sudarshan Reddy; 2002.

# A Survey on Fitness Awareness among Men and Women of Hyderabad District

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## 1. INTRODUCTION

Fitness is not about being better than someone else; it is about being better than oneself in the past. Fitness may be through any means such as walking, jogging, gym, fitness centers, and dancing. There are several components of physical fitness: Cardiorespiratory endurance, muscle strength, muscle endurance, flexibility, and body composition.

### 1.1. Fitness

In a nutshell, fitness is defined as the state of being physically fit and healthy. "Fitness" is a broad term which means something different to each person, but it refers to your own optimal health and overall well-being. Being fit does not only mean physical health; it also means emotional and mental health as well.

### 1.2. Objective of the Survey

The purpose of this survey is to measure the understanding and awareness on fitness and health among the men and women of Hyderabad district.

### 1.3. Scope of the Survey

Conduct a survey using a close-ended questionnaire on fitness awareness among men and women in Hyderabad district.

### 1.4. Significance of the Survey

By conducting this survey, we will have fairly good understanding of awareness among men and women for health and fitness. Based on the results, we shall plan an awareness session for the larger population of Hyderabad. This will also help us in drawing conclusions about the importance of fitness.

## 1.5. Delimitations

This survey delimited stay fit among the men and women of Hyderabad district. For the present study, 72 men and women were considered in which 43 are men and 29 are women. Age group ranged from 29 to 45 years.

## 1.6. Limitation

- Their nutrition conditions were not considered
- This study limited to men and women in Hyderabad district.

## 2. REVEIW OF LETERATURE

**64% Indians do not exercise: Study by surveymonkey.com:**

The research also studied the growth in sports nutrition product launches in 2018; of the total launches seen in the sports nutrition category between 2015 and 2018 in India, 65% happened in 2018. Of the sports nutrition products launched in India in 2018, 93% carried functional claims. Specifically, "weight and muscle gain" (69%), "energy" (45%), and "immunity" (22%) are some of the top functional claims in India's sports nutrition product category. However, there seems to be a lack of awareness as 13% of Indians claim that they do not know enough about sports nutrition products and 11% believe that these products are harmful if consumed without rigorous exercise, reveals Mintel research

**HT youth survey: No yoga, no exercise for India's young study by timesofindia. indiatimes.com**

In Part 3 of HT's youth survey 2017, does India's youth take its health seriously? Most youngsters in India do not exercise regularly or monitor their diet. India's ancient tradition of yoga also does not have many takers, the India youth Survey 2017 reveals. Statistics point to a health crisis in the making. About 70% of people do not exercise regularly and 62.5% say that they do not monitor their diet

### 3. SURVEY METHODOLOGY

We have prepared a close-ended questionnaire which can be used to get the information from selected men and women. The questionnaire consists of 13 questions. We have printed shared these questionnaires to the selected men and women and have asked them to fill the detail and send them back to us. We have analyzed the responses for various patterns to come up with the conclusion.

#### 3.1. Sample

We have targeted to get 72 responses for which we had to connect with 150 men and women with various professions.

#### 3.2. Tools Used

- Close-ended survey questionnaire
- Microsoft Excel for analyzing the data.

Enclosed is the questionnaire used for the survey:

A survey on fitness awareness among men and women of Hyderabad district		
Name:		Age:
Designation:		Gender:
Working:		Mobile#
S. No.	Question	Answer
1.	Do you go to do Fitness every day?	
2.	If yes, how many days do you go per week?	
3.	How much time do you use for stretching and warm-up?	
4.	How much time do you workout for strength and endurance?	
5.	Since how long are you doing fitness?	
6.	Do you have a personalized trainer for fitness	
7.	What kind of fitness do you do? (walking, jogging, gym, fitness centers, and dancing)	
8.	Do you follow dietary requirements	
9.	Did you go to fitness to keep yourself healthy	
10.	Do you think fitness is important	
11.	Are you happy with the level of fitness you do to achieve your goals	
12.	What is the objective of fitness for you	
	Blood pressure	
	Sugar	
	To stay fit,	
	Heart problems	
	Thyroid levels	
	Lose weight	
	Gain weight	
	PCOD	
	Any other	
13.	Do you go for fitness because your friends/family going?	
		Signature

#### 3.3. Data Collection Procedure

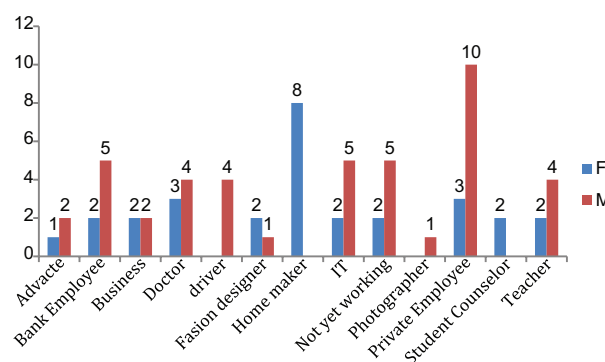
We have given the survey questionnaire to the selected men and women in Hyderabad and have requested them to fill and hand it over to us.

#### 3.4. Data Analysis

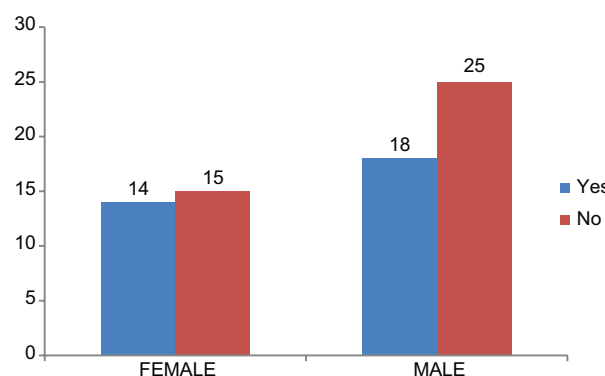
We have received a response from 72 men and women out of 150 forms distributed. We have chosen a mix of professions for this survey of 72 responses.

- 43 Men have responded
- 29 Women have responded
- People who have responded are in the age group of 25–40 years.

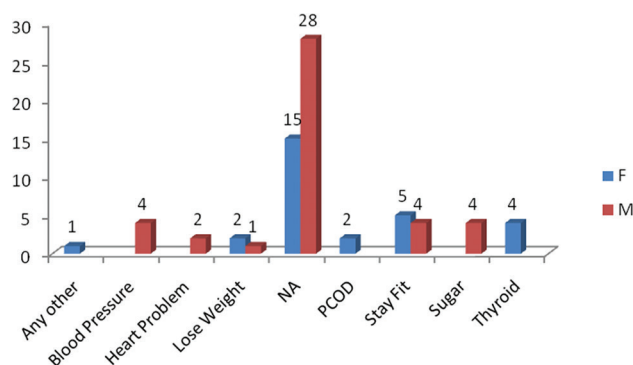
Fitness awareness among men and women in the distribution of the sample by profession and gender: Split by profession gender-wise.



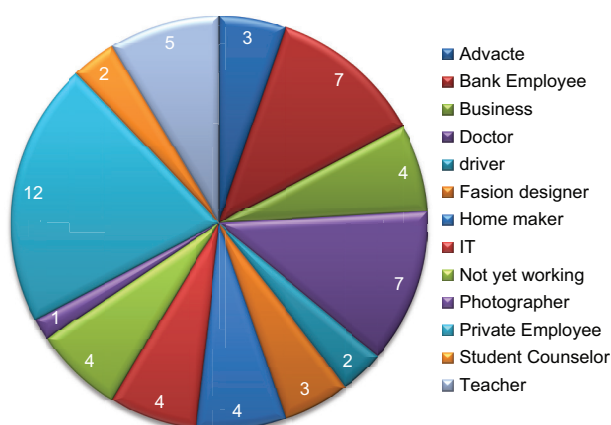
Fitness awareness among men and women because of friends/family Hyderabad district: Distribution of people who are doing fitness because of their friends and family by gender.



Fitness awareness among men and women in Hyderabad district: Split by objective of fitness gender-wise.



Awareness and importance of fitness among men and women of different fields in Hyderabad district: Split by profession on awareness of fitness.



#### 4. SUMMARY

Of the received responses, we have observed that there is less awareness of fitness and people are spending little amount of time for fitness while its the most important one should not afford to miss. Some people aware of fitness, however, are not performing till they visit the hospital for any reason and the doctor advises them to do fitness.

#### 5. CONCLUSION

Based on received responses, it is concluded that many people among our sample have less awareness is fitness is for being well. Till the situation comes like without physical activity, he cannot survive any more than only they are going for fitness. While we conclude that awareness is low, we would like to reserve our comments as the sample and responses are too low. "HEALTHY PEOPLE will have HEALTHY MINDS = HEALTHY COUNTRY." It's important that everyone should spend 20–30 min for their own body. We shall use these survey results to increase awareness of fitness among other people who are not using any fitness means and are aspiring to be fit.

#### 6. RECOMMENDATIONS

Further study can be conducted in large samples and covering other fitness means used by individuals.

#### REFERENCES

- World Health Organization. *Oral Health Survey: Basic Methods*. Geneva: World Health Organization; 2013.
- Available from: [https://www.surveymonkey.com/mp/survey-templates/?program=7013A000000mweBQAQ&utm\\_bu=CR&utm\\_campaign](https://www.surveymonkey.com/mp/survey-templates/?program=7013A000000mweBQAQ&utm_bu=CR&utm_campaign).
- Available from: <https://www.timesofindia.indiatimes.com/life-style/health-fitness/health-news/64-per-cent-indians-dont-exercise-study/articleshow/70038656.cms>.
- Available from: <https://www.study.com/academy/lesson/what-is-physical-fitness-definition-importance.html>.
- Australian Health and Fitness Survey. *Psychology*. Australian Health and Fitness Survey; 1985.
- Centers for Disease Control and Prevention. *National Youth Fitness Survey Mobile Centre Operations Manual*. California: Createspace Independent.
- Shephard, R.J. School of physical and health education. In: *Fitness of a Nation: Lessons the Canada Fitness Survey*. Canada: University of Toronto St. George Campus.

# The Effect of Plyometric Training on Physical, Physiological, Hematological Variables, and on Selected Skills of Volleyball Players

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## ABSTRACT

The purpose of this study was to find out the study, the effect of plyometric training on physical, physiological, hematological variables, and selected skills of volleyball players. A total of 120 male volleyball players are randomly selected from different colleges in Tirupati, and their age ranged from 19 to 25 years. They were divided into two equal groups, i.e., plyometric training group (PTG) and control group (CG), on a random basis. Each group consisted of 60 volleyball players. The study was designed as a true random group figure comprising of a pre-test and post-test. The subjects ( $n = 120$ ) were randomly assigned to two groups of 60 male volleyball players. The groups were designed as experimental Group I – PTG, and CG. Pre-test was conducted for all the 120 subjects on selected physical, physiological, hematological, and skill variables such as flexibility,  $VO_2$  max, hemoglobin, and spiking. The fact-finding assists in plyometric training for 12 weeks. The CG did not participate in any of the training programs. The post-test was conducted on the above said dependent variables after the experimental period for both the groups. The difference between initial and final mean scores of the groups was the effect of respective experimental treatment on the subjects. The differences in the mean scores were subjected to statistical treatment using analysis of covariance in all cases 0.05 level which was fixed test the hypothesis of the study. Within the limitations and delimitations of the study, the following conclusions were drawn. It was concluded that 12 weeks plyometric training protocols experimented in this research significantly improved flexibility,  $VO_2$  max, hemoglobin, and spiking of the volleyball players compared to CG.

## 1. INTRODUCTION

*Sports is an universal language that can bring people together no matter what their origin, background, religious belief or economic status.*

- Kofi Annan

In today's age of scientific knowledge, man is making rapid progress in all walks of life and it is true in the area of games and sports.

Sports are a unique activity that infuses the best qualities of our human being. A sports field is considered a laboratory where sports activities groom the individuals physically, mentally, and morally with the important values of life to face the world confidently.

### 1.1. Fitness

The term fitness is the capacity of the individual to live and function effectively and purposefully. Fitness is a state of health and well-being ability to perform sports activities through proper nutrition, exercise, and rest. Ability to function depends on the physical, mental, emotional, social, and spiritual components as fitness, all of which are related to each other and are mentally independent. This may be referred to as total fitness (Uppal, 2004).

- Boris Becker

### 1.2. Statement of the Problem

The aim of this study is to analyze the effect of plyometric training on selected physical, physiological,



hematological, and selected skills criterion variables of volleyball players.

### 1.3. Hypothesis

It was hypothesized that the plyometric training would significantly improve physical fitness physiological, hematological, and skill variables such as flexibility, VO<sub>2</sub> Max, hemoglobin, and spiking among volleyball players.

## 2. METHODOLOGY

To facilitate the study, 120 male volleyball players are randomly selected from different colleges in Tirupati, and their age ranged from 19 to 25 years. They were divided into two equal groups, i.e. plyometric training group (PTG) and control group (CG), on a random basis. Each group consisted of 60 volleyball players.

### 2.1. Dependent Variables

#### 2.1.1. Physical variables

1. Flexibility.

#### 2.1.2. Physiological variables

1. VO<sub>2</sub> max.

#### 2.1.3. Hematological variables

1. Hemoglobin.

#### 2.1.4. Skill performance

1. Spiking.

### 2.2. Independent Variable

#### 2.2.1. PTG

##### 2.2.1.1. Experimental design of the study

The study was designed as a true random group figure comprising of a pre-test and post-test. The subjects ( $n = 120$ ) were randomly assigned to two groups of 60 male volleyball players. The groups were designed as experimental Group I – PTG, and CG. Pre-test was conducted for all the 120 subjects on selected physical, physiological, hematological, and skill variables such as flexibility, VO<sub>2</sub> max, hemoglobin, and spiking. The fact-finding assists in plyometric training for 12 weeks. The CG did not participate in any of the training programs. The post-test was conducted on the above said dependent variables after the experimental period for both the groups. The difference between initial and final mean scores of the groups was the effect of respective experimental treatment on the subjects. The differences in the mean scores were subjected to statistical treatment using analysis of covariance (ANCOVA) in all cases 0.05 level which was fixed test the hypothesis of the study.

## 3. RESULTS

The initial and final means on PTG and CG on flexibility, VO<sub>2</sub> MAX, hemoglobin, and spiking among volleyball players and the obtained results on ANCOVA is presented in Tables.

### 3.1. Results on Flexibility

The pre-test mean on the experimental group was 24.72 and CG was 25.18, and the obtained F value was 2.76,

**Table 1: Computation of analysis of covariance on flexibility**

Experimental group	Control	Source of variance	Sum of squares	Df	Mean squares	Obtained F
Pre-test mean						
24.72	25.18	Between	6.53	1	6.53	2.76
		Within	279.17	118	2.37	
Post-test mean						
27.98	25.87	Between	134.41	1	134.41	32.24*
		Within	491.92	118	4.17	
Adjusted post-test mean						
28.18	25.67	Between	186.13	1	186.13	76.80*
		Within	283.55	117	2.42	
Mean diff.						
3.27	0.68					

Table F-ratio at 0.05 level of significance for 1 and 118 (df)=3.9, 1 and 117(df)=3.9. \*Significant

**Table 2: Computation of analysis of covariance on VO2 Max**

Experimental group	Control	Source of variance	Sum of squares	Df	Mean squares	Obtained F
Pre-test mean						
41.04	41.80	Between	17.29	1	17.29	0.86
		Within	2380.24	118	20.17	
Post-test mean						
45.95	42.09	Between	448.53	1	448.53	27.39*
		Within	1932.07	118	16.37	
Adjusted post-test mean						
46.24	41.80	Between	588.00	1	588.00	122.96*
		Within	559.49	117	4.78	
Mean diff						
4.91	0.28					

Table F-ratio at 0.05 level of significance for 1 and 118 (df) =3.9, 1 and 117(df) =3.9. \*Significant

**Table 3: Computation of analysis of covariance on hemoglobin**

Experimental group	Control	Source of variance	Sum of squares	Df	Mean squares	Obtained F
Pre-test mean						
14.73	14.60	Between	0.48	1	0.48	1.01
		Within	56.37	118	0.48	
Post-test mean						
15.98	14.76	Between	44.53	1	44.53	95.95*
		Within	54.77	118	0.46	
Adjusted post-test mean						
15.92	14.81	Between	36.67	1	36.67	312.25*
		Within	13.74	117	0.12	
Mean diff						
1.25	0.16					

Table F-ratio at 0.05 level of significance for 1 and 118 (df)=3.9, 1 and 117(df)=3.9. \*Significant

**Table 4: Computation of analysis of covariance on spiking**

Experimental group	Control	Source of variance	Sum of squares	Df	Mean squares	Obtained F
Pre-test mean						
8.77	8.88	Between	0.41	1	0.41	0.50
		Within	96.92	118	0.82	
Post-test mean						
10.18	8.85	Between	53.33	1	53.33	66.50*
		Within	94.63	118	0.80	
Adjusted post-test mean						
10.23	8.81	Between	60.29	1	60.29	174.72*
		Within	40.37	117	0.35	
Mean diff						
1.42	-0.03					

Table F-ratio at 0.05 level of significance for 1 and 118 (df) =3.9, 1 and 117(df) =3.9. \*Significant

which was less than the required F value of 3.9 to be significant. Hence, it was not significant and the groups

were equal at the initial stage. The comparison of post-test means, experimental group 27.98 and CG 25.87 proved

to be significant at 0.05 level as the obtained F value 32.24 was greater than the required table F value of 3.9 to be significant at 0.05 level. Taking into consideration, the initial and final mean values, adjusted post-test means were calculated, and the obtained F value of 76.80 was greater than the required F value to be significant 3.9, and hence, there was a significant difference. Thus, it was proved that the experimental group gained a mean difference in flexibility 3.27 was due to plyometric training given to volleyball players, and the difference was found to be significant at 0.05 level.

### 3.2. Results on VO<sub>2</sub> Max

The pre-test mean on the experimental group was 41.04 and CG was 41.80, and the obtained F value was 0.86, which was less than the required F value of 3.9 to be significant. Hence, it was not significant and the groups were equal at the initial stage. The comparison of post-test means, the experimental group 45.95 and CG 42.09 proved to be significant at 0.05 level as the obtained F value 27.39 was greater than the required table F value of 3.9 to be significant at 0.05 level. Taking into consideration the initial and final mean values, adjusted post-test means were calculated, and the obtained F value of 122.96 was greater than the required F value to be significant 3.9, and hence, there was a significant difference. Thus, it was proved that the experimental group gained a mean difference in VO<sub>2</sub> max 4.91 was due to plyometric training given to volleyball players, and the difference was found to be significant at 0.05 level.

### 3.3. Results on hemoglobin

The pre-test mean on the experimental group was 14.73 and CG was 14.60, and the obtained F value was 1.01, which was less than the required F value of 3.9 to be significant. Hence, it was not significant and the groups were equal at the initial stage. The comparison of post-test means, the experimental group 15.98 and CG 14.76 proved to be significant at 0.05 level as the obtained F value 95.95 was greater than the required table F value of 3.9 to be significant at 0.05 level. Taking into consideration the initial and final mean values, adjusted post-test means were calculated, and the obtained F value of 312.25 was greater than the required F value to be significant 3.9, and hence, there was a significant difference. Thus, it was proved that the experimental group gained a mean difference in hemoglobin 1.25 was due to plyometric training given to volleyball players, and the difference was found to be significant at 0.05 level.

### 3.4. Results on Spiking

The pre-test mean on the experimental group was 8.77 and CG was 8.88, and the obtained F value was 0.50, which was less than the required F value of 3.9 to be significant. Hence, it was not significant and the groups were equal at the initial stage. The comparison of post-test means, the experimental group 10.18 and CG 8.85 proved to be significant at 0.05 level as the obtained F value 66.50 was greater than the required table F value of 3.9 to be significant at 0.05 level. Taking into consideration the initial and final mean values, adjusted post-test means were calculated, and the obtained F value of 174.72 was greater than the required F value to be significant 3.9, and hence, there was a significant difference. Thus, it was proved that the experimental group gained a mean difference in attack hit 1.42 was due to plyometric training given to volleyball players, and the difference was found to be significant at 0.05 level.

## 4. CONCLUSIONS

Within the limitations and delimitations of the study, the following conclusions were drawn. It was concluded that 12 weeks plyometric training protocols experimented in this research significantly improved flexibility, VO<sub>2</sub> max, hemoglobin, and spiking of the volleyball players compared to CG.

## REFERENCES

1. Alis, R., Sanchis-Gomar, F., Lippi, G., and Roamgnoli, M. Microcentrifuge or automated hematological analyzer to assess hematocrit in exercise? Effect on plasma volume loss calculations. *J Lab Autom*, 2015, 21(3), 470-477.
2. Anthony, A.A. *Development Condition for Physical Education and Athletes*. St. Louis: The C.V. Mosby Company; 1972. p. 33.
3. Anderson, K.G., and Behm, B.G. Maintenance of EMG activity and loss of force output with instability. *J Strength Cond Res*, 2004, 18(3), 637-640.
4. Johnson, B.L., and Nelson, J.K. *Practical Measurement for Evaluation in Physical Education*. 3<sup>rd</sup> ed. New York: Macmillan; 1973. p. 367-368.
5. Baumgartner, T., and Jackson, A. *Measurement for Evaluation in Physical Education and Exercise Science*. Dubuque: Brown; 1987.
6. Biddle, S.J., Seos, I., and Chatzisarantis, N. Predicting physical activity intentions using a goal perspectives approach: a study of Hungarian youth. *Scand J Med Sci Sports*, 1999, 9(6), 353-357.
7. Burnham, T.R., and Wilcox, A. Effects of exercise on physiological and psychological variables in cancer

- survivors. *Med Sci Sports Exrec*, 2002, 34(12), 1863-1867.
8. Fletcher, I.M., and Hartwell, M. Effect of 8 week combined weights and plyometrics training program on golf drive performance. *J Strength Cond Res*, 2002, 18(1), 54-62.
  9. Singh, H. *Sports Training General Theory and Method*. Patiala: Netaji Subas National Institute of Sports; 1984. p. 148.
  10. Bookwalter, K.A. *Foundations and Principles of Physical Education*. Philadelphia, PA: W.B. Saunders Company; 1969.
  11. Mathews, D.K. *Measurement in Physical Education*. 3<sup>rd</sup> ed. 1981.
  12. Ross, A., and Leveritt, M. Long-term metabolic and skeletal muscle adaptations to short-sprint training: Implications for sprint training and tapering. *Sports Med*, 2001, 31(15), 1063-1082.
  13. Uppal, A.K. *Physical Fitness and Wellness*. New Delhi: Friends Publications; 2004. p. 3.
  14. William, C.A. *Children's and Adolescents Anaerobic Performance During Cycle Ergometry*. Brighton: Unpublished Master Thesis University of Brighton; 2003.
  15. Williams, A.G., and Wilkinson, M. Simple anthropometric and physical performance tests to predict maximal box-lifting ability. *J Strength Cond Res*, 2007, 1(2), 638-642.

# Comparison of State Anxiety between Soccer and Basketball Players

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## ABSTRACT

The purpose of the study was to compare state anxiety between soccer and basketball players. For this study, total 40 ( $n = 40$ ) players, 20 soccer players, and 20 basketball players each between 18 and 25 years of age who have participated at least inter-collegiate competitions were selected randomly. Sports competition anxiety test questionnaire by Martens (1977) was administered to obtain the data. To find out the characteristics and mean the difference between the two groups, descriptive analysis, independent  $t$ -test was employed and tested at 0.05 level of confidence. The finding of the data reveals that there was no significant difference in the mean comparison between soccer and basketball players as the obtained value " $t$ " = 0.88 was less than the tabulated " $t$ " = 2.02 at 0.05 level of confidence.

**Keywords:** Basketball, Soccer, Sports competition anxiety test, State anxiety.

## 1. INTRODUCTION

A sport is also a major source of entertainment for non-participants, with spectator sports drawing large crowds to sports venues and reaching wider audiences through broadcasting. Sports' betting is in some cases severely regulated and in some cases is central to the sports [1]. Anxiety is the state of mind in which the individual responds with discomfort to some event that has occurred or is going to occur. The person's worries about events, their occurrence, and consequences, in general, are the sources of anxiety; however, the anxiety can be either somatic or cognitive in nature [2]. Anxiety is a natural reaction to threats in the environment and part of the preparation for the "fight or flight" response [3]. Anxiety may be a motivating force, or it may interfere with successful athlete performance [4]. When an individual's desire to achieve success is stronger than the failure, he tries to select activities of intermediate difficulty which are within his capacity [5].

### 1.1. Objective of the Study

The objective of the study was to investigate the comparison of state anxiety between soccer and basketball players.

### 1.2. Hypotheses

It was hypothesized that there might be significant differences in state anxiety between soccer and basketball players.

## 2. METHODOLOGY

For this study, forty (40) subjects, 20 soccer players, and 20 basketball players each. The age of the subjects was ranged between 18 and 25 years were selected randomly as subjects of this study those were participated at least intercollegiate competitions. The pertaining data were collected by administering the Sports Competition Anxiety Test Questionnaire by Martens, (1977). Descriptive, independent " $t$ "-test statistical techniques were employed to find out the characteristics of data and significant differences of state anxiety between soccer and basketball players. The level of significance was set at  $P < 0.05$ .

## 3. RESULTS

The pertaining data of state anxiety were treated using the descriptive analysis to find out the means (M), standard deviations (SD) further, independent " $t$ " test was employed to find out the significant difference of



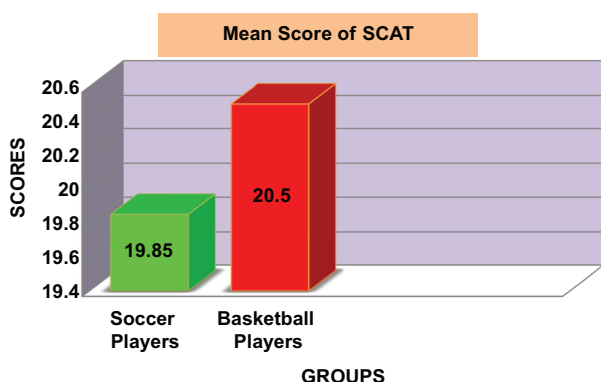
state anxiety between soccer and basketball players, as shown in table.

Comparison of mean difference between Soccer and Basketball players on state anxiety					
Experimental group	n	Mean	SD	df	t-value
Soccer players	20	19.85	2.77	38	0.884
Basketball players	20	20.5	1.76		

Tabulated value of “t” value at 0.05 level of significance with 38 df = 2.02. Tabulation  $t_{0.05}$  for SD df = 2.02. SD: Standard deviation

From the finding of the above table, soccer players mean is 19.85 and basketball players mean is 20.5 and SD is 2.77 and 1.76, respectively. After analysis of the data “t” ratio is not = 0.884 at 0.05 level of significance. Here, there is no significant exists between soccer and basketball players.

The graphical representation of means comparison is shown at figure.



#### 4. DISCUSSION OF FINDING

The finding of the study reveals that there is no significant difference in the state anxiety level between soccer and basketball players.

The significant difference was not found on this study because the age of all the players of soccer and basketball for this study was range in between 18 and 25 ages. At these ages, most of people have thinking abilities and manage his/her situation.

#### 4.1. Testing of Hypothesis

The above findings of the study reveal that statistically, there was no significant difference in state anxiety level between soccer and basketball players. Hence, the hypothesis stated earlier is rejected and the null hypothesis is accepted.

#### 5. CONCLUSION

The results of the study indicated that there was insignificant in the state anxiety level of soccer and basketball players.

#### REFERENCES

1. Kaerney, A.T. A Consultancy, The Global Sporting Industry is Worth up to \$620 Billion as of 2013.
2. Keith, B. *Championship Thinking: The Athletics Guide to Winning Performance in All Sports*. London: Prentice Hall; 1983. p. 12.
3. Kocher, K.C., and Pratap, V. *Anxiety Level and Yogic Practice, Yoga Mimansa*. 1972. p. 25.
4. Zumerchik, J. Individual adjustment to social practices and characteristics. In: *Encyclopedia of Sports Science and Medical*. Macmillan Library Reference; 1971.
5. Sindhu, L.S., Punia, B.S., and Kamlesh, M.L. *Sports Science*. IASSPE Publication; 1987. p. 243-244.
6. Kanji. Auto Training Reduces Anxiety After Coronary Angioplasty. A Randomized Clinical Trial. Available from: <http://www.eric.in>. Retrieved on 27-12-2009.
7. Smith, B.K. The effects of anxiety on Shooting proficiency among college women basketball players. *Completed Res Health Phys Educ Recreation*, 1980, 22, 133-134.
8. Raja, S. *Comparative Study of Aggression and Anxiety Among Blind and Normal School Kabaddi Players in Tamil Nadu*. Tamil Nadu: Alagappa University; 1992.
9. Mamassis, G. The effect of a mental training program on competitive anxiety, self-confidence, and tennis performance. *J Appl Sports*, 2008, 16(2), 118.
10. Cheng, K., Hardy, L., and Markland, D. *Toward a Three-dimensional Conceptualization of Performance Anxiety: Rational and Initial Measurement Development*. Taipei: Taiwan Phys Education College; 2009. Retrieved on 20-1-2009.

# Role of Yoga in Health and Fitness of School Education

D. Hari, S. Swetha, D. Sudharani

## 1. INTRODUCTION

The word “yoga” means “to join or yoke together.” It brings the body and mind together to become a harmonious experience. Yoga is a method of learning that aims at balancing “Mind, Body, and Spirit.” Yoga is a practice with historical origins in ancient Indian philosophy.

## 2. HEALTH BENEFITS OF YOGA IN DAILY LIFE

Weight loss, a strong and flexible body, glowing beautiful skin, peaceful mind, good health – whatever you may be looking for, yoga has it on offer. However, very often, yoga is only partially understood as being limited to asanas (yoga poses). As such, its benefits are only perceived to be at the body level and we fail to realize the immense benefits yoga offers in uniting the body, mind, and breath. When you are in harmony, the journey through life is calmer, happier, and more fulfilling. “Health is not a mere absence of disease. It is a dynamic expression of life – in terms of how joyful, loving, and enthusiastic you are.” This is where yoga helps: Postures, pranayama (breathing techniques), and meditation are a holistic fitness package. The benefits accrued by being a regular practitioner are numerous. Some very discernible ones are as follows:

## 3. THE BASICS OF YOGA

The philosophy and practice in all forms of yoga are embedded in the following eight principles:

- Yama control of the mind
- Niyama follows rules
- Asana postures
- Pranayama controlled breathing
- Pratyahara complete relaxation
- Dharana attain consciousness of the body
- Dhyana concentration and awareness
- Samadhi state of absolute awareness.

## 4. VARIOUS FORMS OF YOGA PRACTICE

- Health yoga is the path of physical fitness or yoga of postures

- Bhakti yoga is the path of the heart or the yoga of devotion
- Dhyana yoga is the path of meditation and contemplation
- Jnana yoga is the path of learning and knowledge
- Karma yoga is the path of action or selfless service
- Nada yoga is the yoga of inner sound. The sound of the universe
- Yoga nidra is the yoga to achieve perfect sleep.

## 5. WHY YOGA

To make diseases and a medicine through a scientific approach on the knowledge base of our great saints and sage and more on yoga.

## 6. YOGA AND HEALTH

- Yoga views the human body as a composite of mind, body, and spirit
- “Health is the state of complete physical, mental, spiritual, and social well-being and not merely the absence of disease or infirmity” (WHO).

## 7. HOW YOGA RELATES TO HEALTH

### 7.1. Physical Well-being

Yoga improves blood circulation and overall organ functioning

### 7.2. Mental Well-being

Brings down stress, enhances power of relaxation and stamina, and bestows greater power of concentration and self-control.

### 7.3. Spiritual Wellbeing

Regulation and transformation of blood chemistry through proper synthesization of neuroendocrine secretions, dispassionate internal vibrations lead one to attain the power to control the mind and to become free from the effect of external forces compelling one to lose to equanimity.

#### 7.4. Social Well-being

Yoga practitioner becomes cheerful, enjoys talking to people, shares problems with friends, and can realize that there are others also who are sailing in same boat so that one can easily mix-up in group by happier nature.

### 8. HOW YOGA WORKS IN OUR BODY – A SCIENTIFIC SCENARIO

Blood flow and oxygen supply of whole body increase through yoga, thus every part of body gets more energy.

### 9. ROLE OF YOGA IN WOMEN HEALTH AND FITNESS

Yoga takes place the main role in three areas that are

- Physical
- Psychological and
- Spiritual.

#### 9.1. Physical

- Flexibility: Yoga helps the body to become more flexible, bringing greater range of motion to muscles and joints, flexibility in hamstrings, back, shoulders, and hips
- Strength: Many yoga poses support the weight of own body in new ways, including balancing on one leg (such as in tree pose) or supporting with arms increases strength
- Better breathing: Most of us breathe very shallowly into the lungs and do not give much thought to how we breathe. Yoga breathing exercises, called pranayama, focus the attention on the breath and improve lung capacity and posture, and harmonize body and mind which benefits the entire body. Certain types of breath can also help clear the nasal passages and even calm the central nervous system, which has both physical and mental benefits
- Disease eliminator: Yoga has the power to prevent and eliminate various chronic health conditions in women similar to men
- Heart disease: With less stress and blood pressure chances of cardiovascular diseases are prevented. Increasing blood circulation and fat burning result in lowering cholesterol
- Diabetes: Yoga stimulates insulin production and reduces glucose to prevent diabetes
- Gastrointestinal: Yoga improves the gastrointestinal functions in women effectively

- Metabolism: Yoga helps women to stay healthy by balancing metabolism results by controlling hunger and weight
- Pain prevention: Increased flexibility and strength can help prevent the various instances of back pain, chronic pain, and neck pain which can be lessened with yoga practice
- Blood circulation: Yoga postures can help improve circulation and eliminate toxic waste substances from the body.

#### 9.2. Psychological

- Mental calmness: Yoga asana practice is intensely physical. Concentrating so intently on what body is doing has the effect of bringing calmness to the mind
- Stress reduction: Physical activity is good for relieving stress, and this is particularly true of yoga. Yoga provides a much-needed break from stressors as well as helping put things into perspective. Yoga controls breathing, which reduces anxiety. It also clears all the negative feelings and thoughts from mind, leading to the reduction of depression
- Concentration: Yoga increases concentration and motivation in quick time. This is why women from all aspects of life practice yoga since better concentration can result in better focus on life and profession
- Memory: Yoga stimulates better blood circulation especially to the brain, which reduces stress and improves concentration, leading to better memory
- Body awareness: Doing yoga will give an increased awareness of own body. It increase level of comfort in own body. This can lead to improved posture and greater self-confidence.

#### 9.3. Spiritual

- Inner connection: Yoga can help to create a bond, a relation between body and mind apart from all other benefits
- Inner peace: Yoga is the only method known to us for better and quicker inner peace. The inner peace generated increases and improves our capability in making effective decisions even at serious circumstances
- Purpose of life: Yoga is a simple exercise method that has numerous benefits, psychologically and physically apart from allowing us to attain inner. It helps to find the purpose of life and secrets to healthy longer life.

## 10. OTHER ROLES OF YOGA IN HEALTH AND FITNESS

- Surya Namaskar is a complete body exercise. It keeps all internal organs, stomach, intestines, pancreas, spleen, heart, and lungs, healthy and strong and also muscles of external body parts, chest, shoulders, hands, thighs, and legs become healthy and strong
- It makes spine and waist flexible by removing disorders. It improves blood circulation in the body which removes skin diseases
- These are the best 12 steps of Surya Namaskar yoga positions in sequence to burn calories, weight loss, and complete health fitness.

## 11. PREVENTION OF DISEASE

- Scientific studies have shown that the practice of yoga has curative abilities and can prevent disease by promoting energy and health. That is why more and more professionals have started using yoga techniques in patients with different mental and physical symptoms, such as psychosomatic stresses and different diseases
- Our bodies have a tendency to build up and accumulate poisons such as uric acid and calcium crystals, just to mention a few. The accumulation of these poisons manifests in diseases and makes our bodies stiff
- A regular yoga practice can cleanse the tissues through muscle stretching and massaging of the internal organs and bring the waste back into circulation so that the lungs, intestines, kidneys, and skin are able to remove toxins in a natural way.

## 12. BLOOD PRESSURE

- Yoga asana is recommended for the treatment of both high and low blood pressure

- Yoga provides exercise to all the organs of the body so as to regulate the overall metabolism rate in the body
- There are several causes of high blood pressure such as increased stress, anger, and anxiety or other mental and cognitive disorders
- Yoga helps to free one's mind from the negative thoughts and provides complete rest to the mind and the body. This increases the metabolism of the body and brings the mind at rest. Excessive thinking about something also increases the pressure with which the blood flows in various organs of the body.

## 13. GLOWING SKIN AND BEAUTY

- There is no specific yoga for beautiful skin. The practice of yoga helps the individual achieve a sense of balance and relaxation in life. Yoga works on physical and mental aspects of the individual. Thus, yoga for strength also helps individual's live healthy lives that will show on the skin
- The overall improvements in the body of an individual will lead to the improvement in the skin quality as the skin will be well nourished
- The same applies to yoga for hair
- This is simply because improved circulation of blood will nourish the hair follicles better.

## REFERENCES

1. Available from: <http://www.yogaabhyas.com>.
2. Available from: <http://www.drsohanrajtater.com/articles/article17.pdf>.
3. Available from: <http://www.anandamarga.org/articles/yoga-health-secrets.htm>.
4. Available from: <http://www.yahooyoga.com>.
5. Available from: <http://www.abc-of-yoga.com/yoga-and-health/yoga-for-women.asp>.
6. Available from: <http://www.nccam.nih.gov/health/yoga/introduction.htm>.

# Comparison of Mental Toughness between Paramilitary Force Sportsperson and Civilian Sportsman

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## ABSTRACT

The primary aim of the study was to compare the mental toughness between paramilitary force sportsperson and civilian sportsman. For the purpose of this study, a total of 50 male players, 25 each of paramilitary force sportsperson and civilian sportsman, were selected. The age of the selected players ranges between 20 and 35 years. Out of the 50 players, five players each from the game of football, basketball, volleyball, badminton, and judo were chosen for the study. To compare between the groups and obtain the data, mental toughness questionnaire by Dr. Alan Goldberg (1998) was administered and independent *t*-test was used to analyze the data at 0.05 level of significance. The finding of the data reveals that there was a significant difference in mean score between paramilitary force sportsperson and civilian sportsman.

**Keywords:** Mental toughness, Paramilitary force, *t*-test.

## 1. INTRODUCTION

Throughout the world, the concept of sports psychology has changed. Today, athletes face acute and unique challenges; the standard is higher and the competition is tougher. Psychological component is becoming far more important than ever before in today's elite competition. Having mental strength is nearly as important for players as physical fitness. "When the going gets tough, the tough gets going" is one way to say it. Lack of mental toughness is the biggest enemy of an athlete; lacking mental toughness causes athletes to give up, give in, tank the match, and give less. The level of our athlete's success is in direct proportion to our level of mental toughness.

Mental toughness is the ability to constantly sustain over ideal performance state during an adversity in competition and coping with adversity is a key component of mental toughness. Mental toughness is an attitude and attitudes are constructed by you and no one else. Mentally tough athletes possess qualities such as:

- Find a way, not an excuse – Instead of playing blame game, they take responsibility for their performance
- Adapt – Athlete finds new way of pushing themselves to outer limit of their potential

- Take risk – Athlete seeks out opportunities to move out of their comfort zone
- Remain persistent despite of failure – Mentally tough athletes understand that failure is another step to success
- Concern themselves with their talents and abilities – They focus on themselves, their talents, improving themselves, achieving the goals they set for themselves
- See the past as valuable information and nothing more – Mentally tough athletes learn from their mistakes and move forward.

All sports are psychological as well as physical; they involve mental images, thought patterns. One's psyche and physical condition. It will, however, allow one to draw the most from the conditioning/training one had. If one trained more and better, his present capacity will be higher than the one who trained less. As the importance of winning continues to be stressed in competitive sports, the pressure and anxiety of performing well will continue to increase.

According to Simon Middleton, "Mental toughness is defined as that unshakable perseverance and conviction toward some goal despite pressure or adversities."



### 1.1. Purpose of the Study

The purpose of the study is to compare the mental toughness between paramilitary force sportsperson and civilian sportsman.

## 2. METHODOLOGY

Fifty male players, 25 each of paramilitary force sportsperson and civilian sportsman who had least participated at inter-university competition, were chosen as subjects for this study. The data were obtained by administering mental toughness questionnaire by Dr. Alan Goldberg to the subjects which consist of 30 items. The questionnaire measures the following five dimensions rebound ability, ability to handle pressure, concentration, motivation, and confidence. To find out the significant differences between the two groups, independent *t*-test was used at 0.05 level of significance.

## 3. RESULTS

Variable	Group	n	Mean	SD	Df	t-value
Paramilitary Mental Toughness	Force	25	19.8	2.36	48	2.47*
	Civilian	25	17.44	3.37		

\*Significant at 0.05 level. Tab t.05 (48)=1.671

From the above table, it reveals that  $t = 2.47$  is significant at 0.05 level with  $df = 48$ . It indicates that the mean score of mental toughness of paramilitary force sportsperson and civilian sportsman differs significantly.

## 4. DISCUSSION OF FINDING

The study revealed that there was a significant difference on mental toughness between paramilitary force sportsperson and civilian sportsman. This clearly shows that the task of the paramilitary force differs from the civilian sportsman, due to the reason that the paramilitary force is required to train themselves to the nature of their job which required vigorous physical training and to overcome it the forces required strong mental toughness. The observation that paramilitary force sportsperson indifferent than civilian sportsman can be attributed to very fact that paramilitary forces sportsperson are basically meant for tough profession. Their primary job is to defend the nation against every

possible intruders and adversity in addition to this, their success is frequently asked for national crisis situation such as saving for flood victims, natural calamity, and riots. Hence, it is obvious that they were trained as tough task to tackle every kind of worst situation. They are also trained for battles and endure every kind of possible hazard that are associated with warfare. Hence, it is quite obvious that the paramilitary force will be always tougher than the civilian sportsman. For this reason, the mental toughness of paramilitary forces is higher as compare to civilian, was civilian sportsman only perform the required training of the games, which is much different from paramilitary force sportsperson.

## 5. CONCLUSION

On the basis of the finding, the following conclusions are made:

- The players of both the paramilitary force sportsperson and civilian sportsman have a significant difference in mental toughness
- It is also observed that to achieve better performance in sports, strong mental strength is required
- Furthermore, the paramilitary force sportsperson are highly motivated, more confidence than their counterpart in handling pressure at any given situation.

## REFERENCES

- Cockerill, I.M. *Soution in Sports Psychology*. 1<sup>st</sup> ed. Thomson Publishing; 2002. p. 32-43.
- Jones, G. What is this things called mental toughness? An investigation of elite sports performance. *J Appl Sports Psychol*, 2002, 14(3), 205.
- Silva, J.M., and Weinberg, R.S. *Psychological Foundation of Sports*. Champaign, Illinois: Human Kinematic Publisher Inc.;1984. p. 1.
- Scarnati, J.T. Beyond technical competence: Developing mental toughness. *Career Dev Int*, 2000, 5(3), 171.
- Crust, L., and Clough, P.J. Relationship between mental toughness and physical endurance. *Percept Mot Skills*, 2005, 100(1), 192.
- Cohn, P. *Mental Toughness training for Athletes*. Peak Performance in Sports.
- Haton, S., and Connaught, D. Mental toughness in sports: Conceptual and practical issues. *Adv Appl Sports Psychol*, 2008, 327.
- Middleton, S.C. *Discovering Mental Toughness: A Qualitative study of Mental Toughness in Elite Athletes*. Australia: Self-research Center, University of Central Sydney, Australia Online Internet. p. 22.

# Effect of Weight Training on Muscular Strength and Muscular Endurance of High School Kabaddi Players

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## 1. INTRODUCTION

Sports in the present world have become extremely competitive. It is not the mere participation or practice that brings out victory to an individual. Therefore, sports life is affected by various factors such as physiology, biomechanics, sports training, sports medicine, sociology, and psychology etcetera. All the coaches, trainers, physical educational personals, and doctors are doing their best to improve the performance of the players of their country. Athlete players of all the countries are also trying hard to bring laurels, medals for their countries in international competitions.

## 2. WEIGHT TRAINING

Weight training is a common type of strength training for developing the strength and size of the skeletal muscle. It uses the force of gravity in the form of weighted bars, dumbbells, or weight sticks to oppose the force generated by muscle through concentric or eccentric muscle contraction. Weight training uses a variety of specialized equipment to target specific muscle groups and types of movements.

## 3. STATEMENT OF THE PROBLEM

The purpose of the study was to find out the effect of weight training on muscular strength and muscular endurance of high school boys kabaddi players.

### 3.1. Hypotheses

In light of the preceding discussion and for the purpose of the present investigation, the following were hypothesized.

1. It was hypothesized that weight training would significantly improve muscular strength of high school boys kabaddi players.
2. It was hypothesized that weight training would significantly improve muscular endurance of high school boys kabaddi players.

## 3.2. Delimitations

The study was delimited in the following aspects while interpreting the results. It should be taken into consideration.

1. The study was delimited to 60 boys kabaddi players of Z.P. High School, Polakala, Irala Mandal, Chittoor District (A.P.).
2. The age of the subjects ranged from 13 to 15 years as per the school records.
3. In this study, the following variables were selected for the study.
  - Muscular strength.
  - Muscular endurance.

## 4. METHODOLOGY

### 4.1. Selection of Subjects

The purpose of the study was to find out the effect of weight training on selected motor ability components, muscular strength, and muscular endurance among school level kabaddi players. To achieve the purpose of this study, 60 school kabaddi players of Z.P. High School, Polakala, Irala Mandal, Chittoor District (A.P.), were randomly selected. The age of the subjects ranged from 13 to 15 years as per the school records. The randomly selected subjects were divided into three groups, namely, experimental Group I (low frequency – 3 days/week), experimental Group II (medium frequency – 4 days/week), and control group. Thus, in each group, 20 school level kabaddi players were selected.

## 5. SELECTION OF VARIABLES

Based on the experiences gained through a review of related literature and in consultation with experts in the field, the following dependent and independent variables were selected for this study.

### 5.1. Dependent Variables

1. Muscular strength
2. Muscular endurance.

### 5.2. Independent Variables

1. Twelve weeks low-frequency weight training – 3 days/weeks.
2. Twelve weeks medium-frequency weight training – 4 days/week.

## 6. TRAINING PROGRAM

The interventional treatment for experimental Group I, low-frequency weight training 3 days/week and experimental Group II medium-frequency weight training 4 days/week for 12 weeks. The following weight training exercises were given.

- i. Military press
- ii. Barbell curls
- iii. Bench press
- iv. Lying triceps extension
- v. Barbell rows
- vi. Squats
- vii. Standing calf raises
- viii. Leg press.

## 7. STATISTICAL TECHNIQUE

To find out the effects of low-frequency and medium-frequency weight training on muscular strength and muscular endurance, the pre- and post-test scores were analyzed using ANCOVA statistical technique. When the F ratio was found to be significant, Scheffe's *post hoc* test was to find out the paired mean significant difference.

## 8. CONCLUSIONS

Within the limitations and delimitations of the study, the following conclusions were drawn.

1. It was concluded that 12 weeks low-frequency weight training and 12 weeks medium-frequency weight training significantly improved muscular strength of the school kabaddi boys player compared to the control group.
2. It was concluded that comparing low-frequency weight training and medium-frequency weight training, medium-frequency weight training was significantly better than low-frequency weight training in improving muscular strength of school level kabaddi boys player.
3. It was concluded that 12 weeks low-frequency weight training and 12 weeks medium-frequency weight training significantly improved muscular endurance of the school kabaddi boys player compared to the control group.
4. It was concluded that comparing low-frequency weight training and medium-frequency weight training, there was an insignificant difference in improving muscular endurance of school level kabaddi boys player.

## 9. RECOMMENDATIONS

The findings of this study proved that 12 weeks low-frequency weight training and 12 weeks medium-frequency weight training were significantly contributed for improving muscular strength and muscular endurance of school level kabaddi boys player. In view of these findings of the study, the following recommendations were made.

1. Efforts may be made to include weight training exercises practiced in this study for the improvement of muscular strength and muscular endurance of kabaddi boys player.
2. Similar researches may be undertaken among school level girls to find out the influence of weight training on selected physical fitness variables.
3. A research with more number of subjects would throw more light on the findings of this study.

# Influence of Heart Rate-based Exercises on Cardiopulmonary and Speed Endurance Variables among College Men

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## 1. INTRODUCTION

Exercise represents one of the greatest stresses that an organism encounters. It is well recognized that optimum performance in any game/sport is a multifactorial condition that is the result of an appropriate level of training with proper rest and recovery. Scientific training is the most pivotal component of total performance and therefore has long been the target of heart rate-based training interventions to decrease or control under training or overtraining.

Under training leads to poor athletic performance. Overtraining causes symptoms such as persistent fatigue, muscle soreness, reduced coordination, and mood changes and which may accompany performance decrements (Wyatt *et al.*, 2013).

Therefore, planned training is an ideal model for training the athletes that to heart rate-based training is an art and science for athletic peak performance.

Submaximal and maximal heart rate training monitor the right intensity and frequency and duration (volume). Periodized training brings optimum performance along with a balanced diet and proper rest and recovery periods (Furlan *et al.*, 2014).

### 1.1. Aim

This study aims to evaluate the relationship between heart rate-based exercises on selected cardiorespiratory and motor/skill-related physical fitness in young degree college male students who were not having previous medical illnesses or musculoskeletal injuries.

- To understand cardiorespiratory functional changes
- To know physical performance anaerobic capacities
- To study heart rate-based training effects on physical and physiological adaptations

## 2. OBJECTIVES

The objective of this study was as follows:

- To find out if specific heart rate-based training would improve physical fitness and performance.
- To set ideal target heart rate training zones to athletes to avoid over/under training stimuli.
- To know individualized optimum load patterns and the effect of planned training on physiological and motor fitness variables.

### 2.1. Hypotheses

1. There were significant changes in Cooper 12 min running distance and 3 min recovery heart rate followed by 12 weeks of submaximal heart rate exercises for experimental Group I.
2. Mean power output and lactate level will change significantly in maximal heart rate-based exercises Group II after following 12 weeks of training.

### 2.2. Significance of the Problem

1. This study would be helpful to identify the significant improvement in selected cardiopulmonary variables due to the influence of submaximal HR-based exercises among college students.
2. This work would be helpful to identify the improvement in selected skill-related variables due to the effect of maximal HR-based exercises among college students.
3. This research would be helpful for the athletes to make awareness of HR-based training on selected variables to improve their capacities to optimize performance.
4. This study was also helpful for conditioning experts, physical education teachers, personal trainers, and coaches to adopt the combined training as one of the training programs to improve the physiological and physical fitness aspects of day-to-day activities of runners.

### 2.3. Delimitations and Limitations

- For this study, 90 degree college students were volunteered as subjects (age:  $20 \pm 2$  years; height:  $170 \pm 9$  cm; and body mass:  $65 \pm 6$  kg) from Nizam College, Telangana state. Further, they were divided into three equal groups.
- The investigator assumes that the following factors may influence the study as they are limited in this study, such as genetics, training age of athlete, environment, nutrition, medication, and psychology of an individual.

## 3. METHODOLOGY

### 3.1. Selection of Sample

To achieve the purpose of the study, 90 degree college students (age:  $20 \pm 2$  years; height:  $170 \pm 6$  cm; and body mass:  $65 \pm 3$  kg) were selected from Nizam College, Hyderabad, Telangana State, India. They were randomly divided into three equal groups and each group consists of 30 subjects. Experimental Group I undergo submaximal HR-based exercises for 12 weeks and experimental Group II undergo maximal HR-based exercises for 12 weeks.

### 3.2. Selection of Variables

The following variables were selected for this study.

### 3.3. Dependent Variables

#### 3.3.1. Cardiopulmonary variables

- Cooper 12 min run distance – Aerobic fitness
- 3 min Recovery heart rate.

#### 3.3.2. Skill-related physical fitness variables

- Mean anaerobic power
- Lactate levels.

#### 3.3.3. Independent variables

Experimental Group I: Submaximal HR-based exercises  
Experimental Group II: Maximal HR-based exercises.

### 3.4. Experimental Design

The study was formulated as a random group design consisting of pre- and post-test. Ninety male college students randomly divided into three equal groups. The groups were assigned as experimental Group I, experimental Group II, and control group.

Variables and test methods			
S. No.	Variables	Tests	Units of measurement
1	Running distance	Cooper's 12 min run test	Meters
2	3 min recovery	Pulse	Per minute
3	Mean anaerobic power output	RAST test	Watts
4	Lactate levels	Lacto meter	mmol/dl

### 3.5. Administration of Tests

- Cooper's 12 min run in standard 400 meters track test
- Three minutes of recovery heart rate
- Running based anaerobic sprint test (RAST) for
- Lactate meter – lactate analysis

### 3.6. Statistical Procedure

The Student's *t*-test statistical techniques were used to find out the effects of submaximal and maximal heart rate-based exercises on selected cardiopulmonary and skill-related physical fitness variables of students.

### 3.7. Results on 12 Min Run Distance (Meters) and 3 Min Recovery hr (bpm) of Experimental Group I

Results						
Mean (M), standard deviation (SD), and t-scores of pre-test and post-test						
Variable	Pre-test		Post-test		t (89)	Tabulated value
	Mean	SD	Mean	SD		
12 min run distance (meters)	2517	52	2799	76	7.50*	2.05
3 min recovery HR (bpm)	49	6	71	6	5.49*	2.05

### 3.8. Results on Cooper 12 Min Run Distance (Meters)





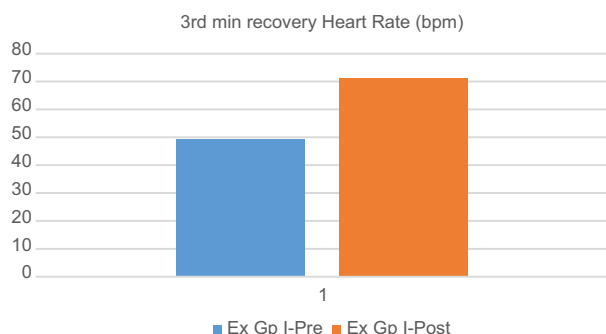
Bar diagram on ordered adjusted means of Cooper 12 min run distance (meters).

#### 4. DISCUSSION ON THE FINDINGS OF COOPER 12 MIN RUN DISTANCE

The distance was measured through Cooper 12 min run test. The results presented in Table showed a significant difference in means and SD values after 12 weeks of training intervention on experimental Group I.

The calculated  $t$ -value was higher than tabulated value, which reveals that there were significant training effects on the distance covered in 12 mi run.

##### 4.1. Results on 3 Min Recovery Heart Rate (bpm)



Bar diagram on ordered adjusted means of 3 min recovery heart rate (bpm).

#### 5. DISCUSSION ON THE FINDINGS OF 3 MIN RECOVERY HR (BPM)

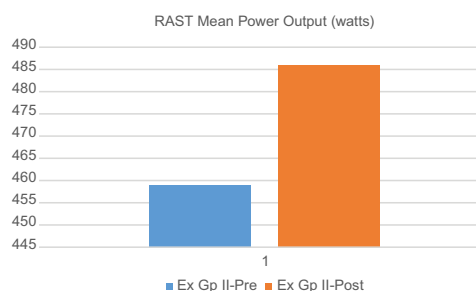
Three-minute recovery HR was measured through pulse method after 3 min of completion of the Cooper test. The results presented in Table showed a significant difference in means and SD values after 12 weeks of a training intervention in 3 min recovery HR and after 12 weeks of training that there was a significant reduction.

The 12 weeks of training proved that the calculated  $t$ -values 5.49 were higher than tabulated value 2.05, thus the training as its effects on the above-mentioned variable.

#### 5.1. Analysis of mean power output and lactate levels experimental Group II

Results						
Mean (M), standard deviation (SD), and t-scores of pre-test and post-test						
Variable	Pre-test		Post-test		t (89)	Tabulated value
	Mean	SD	Mean	SD		
Mean power output (watts)	459	7	486	11	5.39*	2.05
Lactate (mmol/dl)	14.3	0.96	11.8	0.83	4.32*	2.05

##### 5.2. Results on mean power output (watts)



Bar diagram of means of mean power output (watts).

#### 6. DISCUSSION ON THE FINDINGS OF MEAN POWER OUTPUT

Mean power output was measured through a RAST test. The results were presented in Table. A significant difference was observed after 12 weeks of training.

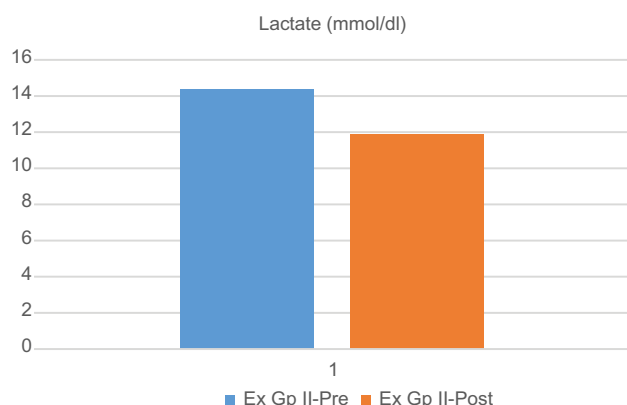
The 12 weeks of training proved that calculated  $t$ -values were higher than tabulated value thus the training as its effects on the above-mentioned variable.

##### 6.1. Results on Lactate Levels (mmol/dl)

Bar diagram of mean lactate levels (mmol/dl).

#### 7. DISCUSSION ON THE FINDINGS OF LACTATE LEVELS

Lactate levels were measured after 3–5 min of RAST test through a lactate meter test. The results presented in Table showed a significant difference in means and SD values after 12 weeks of the training program.



As the calculated  $t$ -value was higher than the tabulated value, the training had its effects on the above-mentioned variable.

## 8. DISCUSSION ON HYPOTHESES

1. There will be significant changes in Cooper 12 min running distance and 3 min recovery heart rate followed by 12 weeks of submaximal heart rate exercises for experimental Group I.

The results presented proved that experimental Group I showed significant changes after 12 weeks of submaximal heart rate-based training on Cooper 12 min running distance and 3 min recovery heart rate.

2. Mean power output and lactate level will change significantly in maximal heart rate-based exercises Group II after following 12 weeks of training. The results presented proved that experimental Group II showed significant changes after 12 weeks of maximal heart rate-based exercises on mean power output and lactate levels.

## 9. CONCLUSIONS

Within the limitations and delimitations of this study, the following conclusions were arrived:

1. It was concluded that submaximal exercises significantly altered dependent variables after 12 weeks of training in experimental Group I.
2. It was concluded that maximal exercises significantly altered dependent variables after 12 weeks of training in experimental Group II.

# Effect of Circuit Training, Coordinative Abilities Training, Specific Skills Training, and Combined Training on Selected Coordinative Abilities and Skill Performance Variables among Intercollegiate Male Basketball Players

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## ABSTRACT

The purpose of this study was to analyze the effect of circuit training, coordinative abilities training, specific skills training, and combined training on selected coordinative abilities and skill performance variables among intercollegiate male basketball players. Subjects for the present study include 60 intercollegiate male basketball players, aged between 18 and 25 years from Sri Ramakrishna Mission Vidyalaya Polytechnic College, Sri Ramakrishna College of Arts and Science, Sri Ramakrishna Mission Vidyalaya Agricultural Education and Research, and Sri Ramakrishna Mission Vidyalaya Maruthi College of Physical Education, Perianaickenpalayam, Coimbatore, Tamil Nadu. The subjects were randomized into four equal groups ( $n = 15$ ), i.e., circuit training and coordinative abilities training group, specific skills training group, combined training group, and control group. The selected coordinative abilities and skill performance variables were delimited to differentiation ability of upper limbs and shooting. Experimental groups were engaged in training for 16 weeks and control group was not engaged in any specific training program. The data were collected before, middle, and after tests experimental interference. The statistical analysis was performed using one-way repeated measures (analysis of variance [ANOVA]) test followed by Newman-Keuls *post hoc* test. Followed the analysis of covariance with Scheffe's *post hoc* test, the level of confidence was fixed at 0.05. The results of the study show that there is a significant improvement on the selected coordinative abilities and skill performance variables that were delimited to differentiation ability of upper limbs and shooting among circuit training and coordinative abilities training group, specific skills training group, and combined training group on intercollegiate male basketball players. It was concluded that the effect of control group had no significant improvement in selected coordinative abilities and skill performance variables that were delimited to differentiation ability of upper limbs and shooting among intercollegiate male basketball players.

**Keywords:** Circuit training, Coordinative abilities training, Differentiation ability of upper limbs, Shooting, Specific skills training.

## 1. INTRODUCTION

Basketball, which originated from America, has been most popular in that country has now become a game of international repute. It is played throughout the world. It can be played by players of low means using rickety blackboards attached to outdoor garages. Any playground in the neighborhood can be easily utilized to play basketball. It is also played in big arenas

costing huge amounts, being watched by thousands of spectators. Children also take more interest in the game that they play in schools from the elementary stage and go on with the game throughout their college education; women also do not lag behind. The proficient players get scholarships. They are encouraged by their schools and universities and are suitably encouraged and rewarded and it is also played coeducational. Many clubs, leagues, and centers have been set up, where people of

both gender and different age groups take an active part. Y.M.C.A and Y.W.C.A have played a prominent part in the advancement of the game. The game is played both for recreational and competitive purposes. It helps in the promotion of health, body control, alertness, coordination, and team spirit. The game is played both by amateurs and professionals (Sharma, 1999).

## 2. METHODOLOGY

The purpose of this study was to analyze the effect of circuit training, coordinative abilities training, specific skills training, and combined training on selected coordinative abilities and skill performance variables among intercollegiate male basketball players. Subjects for the present study include 60 intercollegiate male basketball players, aged between 18 and 25 years from Sri Ramakrishna Mission Vidyalaya Polytechnic College, Sri Ramakrishna College of Arts and Science, Sri Ramakrishna Mission Vidyalaya Agricultural Education and Research, and Sri Ramakrishna Mission Vidyalaya Maruthi College of Physical Education, Perianaickenpalayam, Coimbatore, Tamil Nadu. The subjects were randomized into four equal groups ( $n = 15$ ), i.e., circuit training and coordinative abilities training group, specific skills training group, Combined training group, and control group. The selected coordinative abilities and skill performance variables were delimited to differentiation ability of upper limbs and shooting. Experimental groups were engaged

in training for 16 weeks and control group was not engaged in any specific training program. The data were collected before, middle, and after tests experimental interference. The statistical analysis was performed using one-way repeated measures ANOVA test followed by Newman–Keuls *post hoc* test. Followed the analysis of covariance with Scheffe's *post hoc* test, the level of confidence was fixed at 0.05.

Table 1 shows that the obtained “F”-ratio values of circuit training and coordinative abilities training group on the selected coordinative abilities and skill performance variables that were delimited to differentiation ability of upper limbs and shooting (203.50 and 158.99) are found to be higher than the table value 2.76 with degree of freedom (df) 2, 28 at 0.05 level of confidence.

The results of the study indicate that there is a significant difference among the means of three tests of circuit training group and coordinative abilities training group on selected coordinative abilities and skill performance variables that were delimited to differentiation ability of upper limbs and shooting. The significant among means was observed through Newman–Keuls *post hoc* test is applied and the results are shown in Tables 2 and 3.

Table 4 shows that the obtained “F”-ratio values of specific skills training group on the selected coordinative abilities and skill performance variables that were delimited to differentiation ability of upper limbs and shooting (133.06 and 157.82) are higher than the table

**Table 1:** One-way repeated measure ANOVA on selected variables of before middle and after test of circuit training and coordinative abilities training group

Variables	Sources of variance	Sum of squares	df	Mean squares	Obtained “F”-ratio
Differentiation ability of upper limbs	Between	198.98	2	99.49	203.50*
	Error	13.69	28	0.49	
Shooting	Between	131.73	2	65.87	158.99*
	Error	11.60	28	0.41	

\*Significant at 0.05 level

**Table 2:** Newman–Keuls test for the differences between treatment means of differentiation ability of upper limbs of circuit training and coordinative abilities training group

Means	Ordered means			Range (r)	Critical value
	Before test	Middle test	After test		
	9.47	11.67	14.60		
Before test	9.47	-	2.2*	3	0.68
Middle test	11.67	-	2.93*	2	0.61
After test	14.60	-	-	-	-

\*Significant

value 2.76 with degree of freedom (df) 2, 28 at 0.05 level of confidence.

The results of the study indicate that there is a significant difference among the means of three tests of specific skills training group on the selected coordinative abilities and skill performance variables that were

delimited to differentiation ability of upper limbs and shooting. The significant among means was observed, through Newman–Keuls *post hoc* test is applied and the results are shown in Tables 5 and 6.

Table 7 shows that the obtained “F”-ratio values of combined training groups on the selected coordinative

**Table 3:** Newman–Keuls test for the differences between treatment means of shooting of circuit training and coordinative abilities training group

Means	Ordered means			Range (r)	Critical value
	Before test	Middle test	After test		
	9.47	10.93	13.60		
Before test	9.47	-	1.46*	3	0.62
Middle test	10.93	-	2.67*	2	0.56
After test	13.60	-	-	-	-

\*Significant

**Table 4:** One-way repeated measure ANOVA on selected variables of before middle and after test of specific skills training group

Variables	Sources of variance	Sum of squares	df	Mean squares	Obtained “F”-ratio
Differentiation ability of upper limbs	Between	297.38	2	148.69	133.06*
	Error	31.29	28	1.12	
Shooting	Between	214.93	2	107.47	157.82*
	Error	19.07	28	0.68	

\*Significant at 0.05 level

**Table 5:** Newman–Keuls test for the differences between treatment means of differentiation ability of upper limbs of the specific skills training group

Means	Ordered means			Range (r)	Critical value
	Before test	Middle test	After test		
	9.87	12.47	16.13		
Before test	9.87	-	2.6*	3	1.02
Middle test	12.47	-	3.66*	2	0.93
After test	16.13	-	-	-	-

\*Significant

**Table 6:** Newman–Keuls test for the differences between treatment means of the shooting of specific skills training group

Means	Ordered means			Range (r)	Critical value
	Before test	Middle test	After test		
	9.13	11.40	14.47		
Before test	9.13	-	2.27*	3	0.80
Middle test	11.40	-	3.07*	2	0.72
After test	14.47	-	-	-	-

\*Significant



abilities and skill performance variables that were delimited to differentiation ability of upper limbs and shooting (484.68 and 131.73) are higher than the table value 2.76 with degree of freedom (df) 2, 28 at 0.05 level of confidence.

The results of the study indicate that there is a significant difference among the means of three tests of combined training groups on the selected coordinative abilities and skill performance variables that were delimited to differentiation ability of upper limbs and shooting. To find out which of the paired means had a significant

difference, the Newman–Keuls *post hoc* test is applied and the results are shown in Tables 8 and 9.

Table 10 shows that the obtained “F”-ratio values of control group on the selected coordinative abilities and skill performance variables that were delimited to differentiation ability of upper limbs and shooting (1.56 and 1.49) are lesser than the table value 2.76 with degree of freedom (df) 2, 28 at 0.05 level of confidence.

Therefore, we accept the null hypotheses and conclude that the treatment means of these variables do not differ

**Table 7: One-way repeated measure ANOVA on selected variables of before middle and after test of combined training groups**

Variables	Sources of variance	Sum of squares	df	Mean squares	Obtained “F”-ratio
Differentiation ability of upper limbs	Between	570.84	2	285.42	484.68*
	Error	16.49	28	0.59	
Shooting	Between	255.51	2	127.76	131.73*
	Error	27.16	28	0.97	

\*Significant at 0.05 level

**Table 8: Newman–Keuls test for the differences between treatment means of differentiation ability of upper limbs of combined training group**

Means		Ordered means			Range (r)	Critical value
		Before test	Middle test	After test		
		9.93	13.40	18.60		
Before test	9.93	-	3.47*	8.67*	3	0.74
Middle test	13.40	-	-	5.2*	2	0.68
After test	18.60	-	-	-	-	-

\*Significant

**Table 9: Newman–Keuls test for the differences between treatment means of shooting of combined training group**

Means		Ordered means			Range (r)	Critical value
		Before test	Middle test	After test		
		9.73	12.07	15.53		
Before test	9.73	-	2.34*	5.8*	3	0.95
Middle test	12.07	-	-	3.46*	2	0.86
After test	15.53	-	-	-	-	-

\*Significant

**Table 10: One-way repeated measure ANOVA on selected variables of before middle and after test of control group**

Variables	Sources of variance	Sum of squares	df	Mean squares	Obtained “F”-ratio
Differentiation ability of upper limbs	Between	0.13	2	0.07	1.56
	Error	1.20	28	0.04	
Shooting	Between	0.58	2	0.29	1.49
	Error	5.42	28	0.19	

\*Significant at 0.05 level

significantly. It reveals that the mean gains of all the selected variables among the before, middle, and after test were no significant.

Table 11 reveals the computation of “F”-ratio on before test, after test, and adjusted after test means of differentiation ability of upper limbs in circuit training and coordinative abilities training group, specific skills training group, combined training group, and control group.

The obtained “F”-ratio for the before test means of differentiation ability of upper limbs of circuit training and coordinative abilities training group, specific skills training group, combined training group, and control group is found to be 0.33. Since the “F” value is lesser than the required table value of 2.76 for the degrees of freedom 3 and 56, it is found to be not significant at 0.05 level of confidence.

Further, the after test “F”-ratio 81.12 is greater than the required table value of 2.76 for the degrees of freedom 3 and 56, it is found to be significant at 0.05 level of confidence.

The obtained “F”-ratio for the adjusted after-test means of differentiation ability of upper limbs of circuit training and coordinative abilities training group, specific skills training group, combined training group, and control group is 154.80. Since the “F” value is greater than the required table value of 2.76 for the degrees of freedom 3 and 55, it is found to be significant at 0.05 level of confidence.

Since the obtained “F”-ratio is found to be significant, Scheffe’s *post hoc* test is applied to find out which of the paired adjusted after test means differ significantly. The results of Scheffe’s *post hoc* test are shown in Table 12.

The results of the study also show that there is a significant difference between circuit training and

coordinative abilities training group and specific skills training groups; circuit training and coordinative abilities training group and combined training groups; circuit training and coordinative abilities training group and control groups; specific skills training group and combined training groups; specific skills training group and control groups; and combined training group and control groups in differentiation ability of upper limbs of intercollegiate male basketball players.

The before test, after test, and adjusted after test means values of circuit training and coordinative abilities training group, specific skills training group, combined training group, and control group on differentiation ability of upper limbs are graphically shown in Figure 1.

Table 13 reveals the computation of “F”-ratio on before test, after test, and adjusted after test means of shooting in circuit training and coordinative abilities training group, specific skills training group, combined training group, and control group.

The obtained “F”-ratio for the before test means of shooting of circuit training and coordinative abilities training group, specific skills training group, combined training group, and control group is found to be 0.83. Since the “F” value is lesser than the required table value of 2.76 for the degrees of freedom 3 and 56, it is found to be not significant at 0.05 level of confidence.

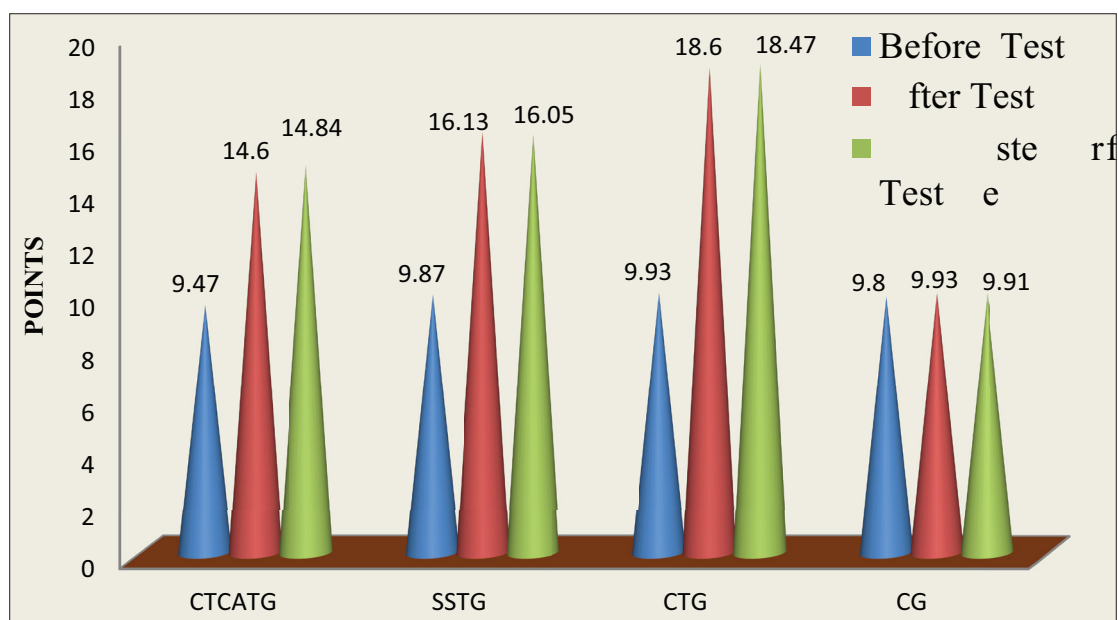
Further, the after test “F”-ratio 77.64 is greater than required table value of 2.76 for the degrees of freedom 3 and 56, it is found to be significant at 0.05 level of confidence.

The obtained “F”-ratio for the adjusted after test means of shooting of circuit training and coordinative abilities training group, specific skills training group, combined training group, and control group is 91.37. Since the “F” value is greater than the required table value of 2.76

**Table 11: Analysis of covariance for circuit training and coordinative abilities training group, specific skills training group, combined training group, and control group on differentiation ability of upper limbs**

Tests	CTCAT group	SST group	CT group	C Group	Sources of variance	Sum of square	DF	Mean square	“F”-ratio
Before test	9.47	9.87	9.93	9.80	Between	1.93	3	0.64	0.33
					Within	108.80	56	1.94	
After test	14.60	16.13	18.60	9.93	Between	599.12	3	199.71	81.12*
					Within	137.87	56	2.46	
Adjusted after test mean	14.84	16.05	18.47	9.91	Between	583.85	3	194.62	154.8*
					Within	69.15	55	1.26	

\*Significant at 0.05 level



**Figure 1:** Adjusted after test mean values of circuit training and coordinative abilities training group, specific skills training group, combined training group, and control group on differentiation ability of upper limbs

**Table 12:** Scheffe's test for the difference between paired means on differentiation ability of upper limbs

CTCAT group	SST group	CT group	C group	Mean difference	CI value
-	-	18.47	9.91	8.56*	1.21
-	16.05	-	9.91	6.14*	
-	16.05	18.47	-	2.42*	
14.84	-	-	9.91	4.93*	
14.84	-	18.47	-	3.63*	
14.84	16.05	-	-	1.21*	

\*Significant at 0.05 level. CI: Confidence interval

for the degrees of freedom 3 and 55, it is found to be significant at 0.05 level of confidence.

Since the obtained "F"-ratio is found to be significant, Scheffe's *post hoc* test is applied to find out which of the paired adjusted after test means differ significantly. The results of the Scheffe's *post hoc* test are shown in Table 14.

The results of the study also show that there is a significant difference between circuit training and coordinative abilities training group and combined training groups; circuit training and coordinative abilities training group and control groups; specific skills training group and control groups; and combined training group and control groups in the shooting of intercollegiate male basketball players. However, there is no significant difference between circuit training and

coordinative abilities training group and specific skills training groups and specific skills training group and combined training groups in shooting of intercollegiate male basketball players.

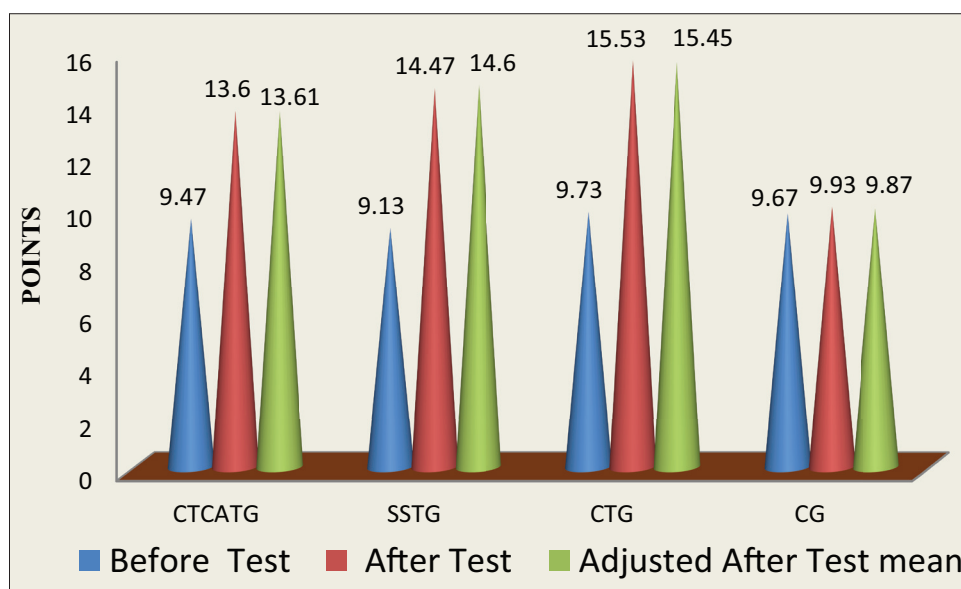
The before test, after test, and adjusted after test means values of circuit training and coordinative abilities training group, specific skills training group, combined training group, and control group on shooting are graphically shown in Figure 2.

### 3. DISCUSSION ON FINDINGS

The results of one-way repeated measures analysis of variance indicate that there is a significant improvement in differentiation ability of upper limbs and shooting due to the effect of circuit training, coordinative abilities training, specific skills training, and combined training group.

However, the results of the Newman-Keuls indicate that there is a significant difference between before, middle, and after tests in circuit and coordinative abilities training on group, specific skills training group, and combined training group and also it indicates that there is a no significant difference between before, middle, and after tests in control group.

Basketball players must process the differentiation ability of upper limbs to improve their hands eye coordination. The systematic and scientific creation of



**Figure 2:** Adjusted after test mean values of circuit training and coordinative abilities training group specific skills training group combined training group and control group on shooting

**Table 13:** Analysis of covariance for circuit training and coordinative abilities training group, specific skills training group, combined training group, and control group on shooting

Tests	CTCAT group	SST group	CT group	C group	Sources of variance	Sum of square	DF	Mean square	F- ratio
Before test	9.47	9.13	9.73	9.67	Between	3.27	3	1.09	0.83
					Within	73.73	56	1.32	
After test	13.60	14.47	15.53	9.93	Between	266.18	3	88.73	77.64*
					Within	64.00	56	1.14	
Adjusted after test mean	13.61	14.60	15.45	9.87	Between	270.89	3	90.30	91.37*
					Within	54.36	55	0.99	

\*Significant at 0.05 level

**Table 14:** Scheffe's test for the difference between paired means of shooting

CTCAT group	SST group	CT group	C group	Mean difference	CI value
-	-	15.45	9.87	5.58*	1.07
-	14.60	-	9.87	4.73*	
-	14.60	15.45	-	0.85	
13.61	-	-	9.87	3.74*	
13.61	-	15.45	-	1.84*	
13.61	14.60	-	-	0.99	

\*Significant at 0.05 level. CI: Confidence interval

the specific preparatory training is advantageous for improving the agility.

Bhowmik (2016) proved that there is an improvement in the differentiation ability of upper limbs.

Basketball players must process the shooting accuracy to improve their scoring ability. The systematic and scientific creation of the specific preparatory training is advantageous for improving the leg explosive power.

Mashuri (2017) proved that there is an improvement in shooting.

## 4. CONCLUSIONS

It was concluded that the effect of circuit training, coordinative abilities training, specific skills training, and combined training significant improvement in selected coordinative abilities and skill performance variables was delimited to differentiation ability of upper limbs and shooting among intercollegiate male basketball players. It was concluded that the effect of control group had that no significant improvement in

selected coordinative abilities and skill performance variables was delimited to differentiation ability of upper limbs and shooting among intercollegiate male basketball players.

## REFERENCES

- Aneja, O.P. *How to Play Badminton*. New Delhi: Perna Prakashan; 2012. p. 110085.
- Sebastian, A. *Analysis of Coordinative Abilities Among School Sports Persons of Different Age Groups and Disciplines*. Karaikudi, India: Unpublished Doctoral Thesis, Alagappa University; 2001.
- Sebastian, P.J. *Relationship of the Coordinative Abilities with Different Sports and Levels of Performance*. Proceeding of the National Physical Education Conference; 1997.
- Bhowmik, K. Effect of strength training on selected coordinative abilities. *Int J Adapt Phys Educ Yoga*, 2016, 1(1), 26-30.
- Panwar, A. Coordinative abilities of Inter-collegiate and inter-university level girl basketball players-a comparative study. *Int J Phys Educ Sports Sci*, 2013, 2(1), 1-9.
- Canlı, U. Effects of an eight weeks neuromuscular training on motoric and selected basketball skills in pre-pubescent male basketball participants. *Univ J Educ Res*, 2019, 7(1), 16-23.
- Lopes, M.C., Albuquerque, M.R., and Raab, M. Effect of explicit and implicit learning in children, as well as a sequential application of learning modes, in the acquisition of the basketball shooting skill in an ecological setting. *J Phys Educ*, 2018, 29, 1-11.
- Mashuri, H. The effectiveness of basketball shooting training model on improving shooting capabilities of basketball players in Pasuruan regency. *JIPES J Indonesian Phys Educ Sport*, 2017, 3(1), 71-78.
- Savas, S., Yüksel, M.F., and Uzun, A. The effects of shooting exercises and explosive strength which were applied for 8 weeks before the season in basketball sport branch, on shot percentage basketball players. *Univ J Educ Res*, 2018, 6(7), 1569-1574.



# A Study on Physical Fitness among Basketball Players and Handball Players of KGBV, Karimnagar District

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## 1. INTRODUCTION

Physical fitness is a multifaceted continuum extending from birth to death, affected by physical activity. It ranges from optimal activities in all aspects of life through high and low levels of different physical fitness to serve disease and dysfunction. The ability to function efficiently and effectively is to enjoy leisure, to be healthy, to resist disease, and to cope with emergency situations. Health-related components of physical fitness include body composition, cardiovascular fitness, flexibility, muscular endurance, and strength. Skill-related components include agility, balance, coordination, power, reaction time, and speed.

The relative importance of each of the components varies for each sport. Physical fitness is not only sport-specific that it may also be position-specific, combined good health and physical development. The object of any program of physical fitness is to maximize an individual's health, strength, endurance, and skill relative to age, sex, body build, and physiology. These ends can only be realized through conscientious regulation of exercise, rest, diet, and periodic medical examinations. Exercise should be regular and vigorous, but begun slowly and only gradually increased in strenuousness. Popular exercise methods include jogging, cycling, and the use of bodybuilding machines. It is more important periods of sleep to be regular and restful than that they extend any fixed number of hours.

### 1.1. Significance of the Study

The study is to determine the physical fitness among the basketball players and handball players of Kasturba Gandhi Balika Vidyalaya (KGBV), Karimnagar District.

### 1.2. Hypotheses

1. There may not be any significant difference between basketball players and handball players

of KGBV, Karimnagar District in relation to their speed (50 m run).

2. There may not be any significant difference between basketball players and handball players of KGBV, Karimnagar District in relation to their endurance (Cooper Test – 12 min run/walk).

## 2. SAMPLE OF THE STUDY

The study was formulated based on the simple random sampling. The samples were collected from the 50 girls basketball players and 50 girls handball players in the age group of 14–16 years from KGBV, Karimnagar District.

Sample of the study		
S. No.	Category of the subjects	Number of subjects
1.	Basketball players	50
2.	Handball players	50

## 3. TOOLS USED

The present study under investigation selected the following physical fitness test performed is as follows:

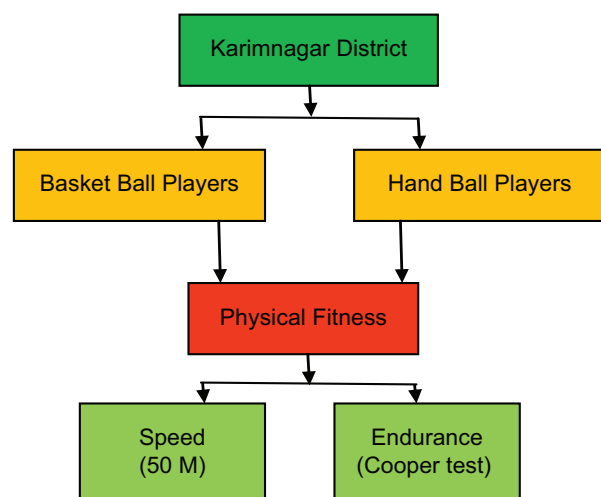
- Physical fitness  
Speed (50 m run) and endurance (Cooper test – 12 min run/walk).

## 4. DATA COLLECTION PROCEDURE

The study under report focuses on physical fitness, the basis of team game players, which is the order of the day in the everlasting sports scenario. The study was formulated based on simple random sampling. The samples were collected from the girls' 50 basketball players and girls 50 handball players at KGBV in Karimnagar District in the age group of 14–16 years, which were considered. The physical fitness test was administered, i.e., the speed (50 m run) and endurance (Cooper test – 12 min run/walk).

## 5. DESIGN OF THE STUDY

The study has focused on the following experimental design.

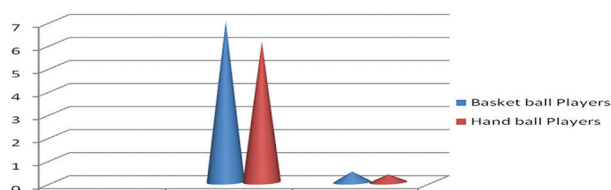


## 6. RESULTS AND DISCUSSION

The results pertaining to the study are present in the following.

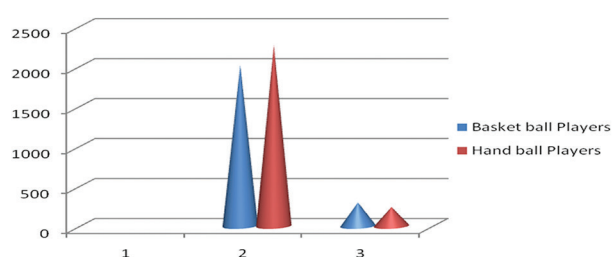
**Table 1:** The mean values, SD, df, *t*-value, and *P*-value between basketball players and handball players of KGBV, Karimnagar District in relation to their speed (50 m run)

S. No.	Subjects	<i>n</i>	Mean	SD	<i>t</i> -ratio	<i>P</i> value
1.	Basketball players	50	7.00	0.46	2.601	0.01
2.	Handball players	50	6.11	0.34		



**Table 2:** The mean values, SD, df, *t*-value, and *P*-value between basketball players and handball players of KGBV, Karimnagar District in relation to their endurance (Cooper test – 12 min run/walk)

S. No.	Subjects	<i>n</i>	Mean	SD	<i>t</i> -ratio	<i>P</i> value
1.	Basketball players	50	2016	296.76	4.01	0.01
2.	Handball players	50	2264	238.62		



## 7. CONCLUSION

The study under report has scientifically examined the various factors which influence the power game, especially the women physical fitness variables pertinent to speed and endurance. A trained individual is in a better state of physical fitness than the person who follows a sedentary and inactive life. When two persons, one trained and one untrained or approximately the same build are performing the same amount of moderate muscular work evidence indicates that the trained individual has a lower oxygen consumption, lower pulse rate, larger stroke volume poor heartbeat, less in blood pressure, greater red and white blood cell counts, slower rate of breathing, lower rate of lactic acid formation, and a faster return to normal of blood pressure and heart rate.

The heart becomes more efficient and is able to circulate more blood while bearing less frequently. Furthermore, in work of a strenuous nature that cannot be performed for any great period, the trained individuals have greater endurance, a capacity for higher oxygen consumption, and a faster return to normal heart rate and blood pressure. Training results in a more efficient organism. Since a greater efficiency of heart action enables a larger

flow of blood to reach the muscles and thus ensure an increased supply of fuel and oxygen, more work is performed at less cost; improvements in strength, power, neuromuscular coordination, and endurance occur, coordination and timing of movements as better, and an improved state of physical fitness results. Physical fitness is a multifaceted continuum extending from birth to death, affected by physical activity. It ranges from optimal activities in all aspects of life through high and low levels of different physical fitness to serve disease and dysfunction.

Hence, it is concluded that physical fitness plays a key role in the performance of the players. Physical activity can act as an antidote to some kinds of fatigue; youngsters will be harmed through sustained exercise – if they are fit, their physical endurance is great, and the exercise will be conducive to good health.

## REFERENCES

- Duncan, M.J., Woodfield, L., and al-Nakeeb, Y. Anthropometric and physiological characteristics of junior elite volleyball players. *Br J Sports Med*, 2006, 40(7), 649-651.
- Bruke, E.J. Validity of related laboratory field test of physical working capacity. *Res Q*, 1976, 47(1), 95-104.
- Dintiman, G.B. Effects of various training programme on running speed. *Res Q*, 1964, 35, 456.
- Keen, E.N., and Sloan, A.W. A modified Harvard step test for women. *J Appl Physical*, 1989, 14(85), 986.
- Matsudo VK, Rivet RE, Pereira MH. (1987), "Standard score assessment on physique and performance of Brazilian athletes in a six tiered competitive sports model", *J Sports Sci.*, vol.5(1), pp.49-53.
- Sheppard JM, Gabbett TJ, Stanganelli LC. (2009), "An analysis of playing positions in elite men's volleyball: considerations for competition demands and physiologic characteristics", *J Strength Cond Res.*, vol. 23(6), pp.1858-66.
- Shivarama Krishna (1991), "Sports Achievement Motivation, Self-Concept and Anxiety Differential among Indian Men and Women Basketball and Volleyball, Teams prior to SAG Games". *Journal of Physical Education and Sports Science*, Vol.4, p.1.
- Wittberg, Richard A.; Northrup, Karen L.; Cottrel, Lesley (2009), "Children's Physical Fitness and Academic Performance", *American Journal of Health Education*, vol.40(1), pp.30-36.

# Effect of Plyometric Training on the Development of Physical Fitness among University Athletes in Mahatma Gandhi University, Nalgonda

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## 1. INTRODUCTION

“Physical activity is probably the most enjoyable and yet most inexpensive form of preventive medicine.” A sport is an important ingredient of physical education and is a worldwide phenomenon today. The unprecedented popularity and better organization of sports activities and competitions would have been impossible without the recognition of the importance of sports for modern civilization. The value of exercise programs is becoming evident as more and more people are participating in such programs, and scientific evidence shows that their benefits are accumulated. Recent medical experiments have indicated that a higher level of strenuous activity must be performed over a relatively long excessive period for the prevention of heart diseases. The benefit of a more strenuous exercise program includes the development of mental discipline and the building of self-confidence in addition to physical benefits.

“Fitness is the ability of an individual to live a full and balanced life. It involves physical, mental, emotional, social, and spiritual factors and capacity for their wholesome expression.” Participation in daily physical activities results in the proper growth and maintenance of good health. Running, jumping, throwing, climbing, and hanging from the basic pattern of motor movements throughout the life of human beings. Physical activities promote muscular strength, endurance, agility, speed, and coordination of muscular strength, which are the basis for all physical work of the human body. One of the greatest pleasures in sports is exposure to performance at its highest level. There is something almost artistic about an athletic that is well beyond the normal and demonstrates exceptional grace speed and control while performing a skill. Getting to the highest level requires skill attainment, mental toughness, years of purposeful practice, and dedication (Cho 1990).

### 1.1. Objective of the Study

The purpose of the study was to find out the effect of plyometric training on whether or not any significant difference found between pre-test and post-test of selected physical fitness variables on athletes of men and their performance.

### 1.2. Significance of the Study

The study investigates the existing difference between pre-test and post-test in relation to their effect of plyometric training on selected physical fitness variables among men athletes and their performance. The finding of the study may provide guidance to the physical education teachers and coaches to prepare training programs on the basis of the study. It may further help researchers who are interested in sports and games. The findings of the study may add to the quantum of knowledge in the area of sports and physical education.

### 1.3. Hypothesis

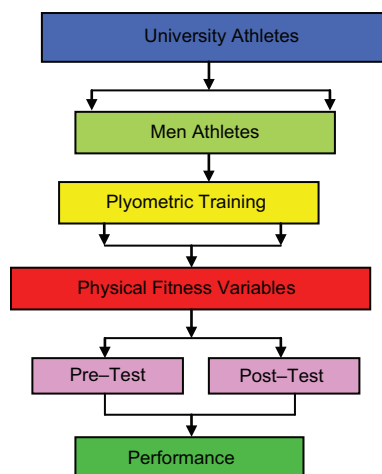
There may not be any significant difference between pre-test and post-test on the effect of plyometric training program among men athletes in Mahatma Gandhi University, Nalgonda in relation to physical fitness variable.

**Table 1:** The significance between pre-test and post-test on the effect of plyometric training program on the development of university men athletes in relation to physical fitness, i.e., speed

S. No.	Subjects	n	Mean	SD	df.	't'-value	Sig. (two-tailed)
1.	Pre-test	50	9.94	0.818	98	16.187	0.000
2.	Post-test	50	7.98	0.553			

## 1.4. Design of the Study

The diagrammatic presentation was presented hereunder.



## 2. MATERIALS AND METHODS

The university athletes consisting of 50 athletes from Mahatma Gandhi University, Nalgonda district, Telangana State. The pre-test was conducted and the post-test was administrated after the experimental treatment of the plyometric training on university athletes for 12 weeks. The researcher has collected the data separately from the experimental group and control group for pre-test and post-test of 50 university athletes of men athletes from Mahatma Gandhi University, Nalgonda district, Telangana State. The subjects were measured with physical fitness variables, i.e., speed, agility, endurance, and explosive strength, which were administrated on university athletes after systematic training of plyometric training.

### 2.1. Tools Used

The following selected physical fitness variables, i.e., speed, agility, endurance, and explosive strength, were administrated on university athletes after systematic training of plyometric training. The subjects of the study were in the age group between 18 and 22 years from two groups, i.e., experimental group and control group.

## 3. RESULTS AND DISCUSSION

The mean value of pre-test of university men athletes is 9.94, SD value is 0.818, and for post-test of university men athletes, the value is 7.98 and SD value is 0.553. It is very clear a significant difference was found

**Table 2:** The significance between pre-test and post-test on the effect of plyometric training program on the development of university men athletes in relation to physical fitness, i.e., agility

S. No.	Subjects	n	Mean	SD	df.	't'-value	Sig. (two-tailed)
1.	Pre-test	50	14.22	0.932	98	29.770	0.000
2.	Post-test	50	9.70	0.580			

**Table 3:** The significance between pre-test and post-test on the effect of plyometric training program on the development of university men athletes in relation to physical fitness, i.e., endurance

S. No.	Subjects	n	Mean	SD	df.	't'-value	Sig. (two-tailed)
1.	Pre-test	50	4852.44	326.798	98	13.130	0.000
2.	Post-test	50	5952.16	529.358			

**Table 4:** The significance between pre-test and post-test on the effect of plyometric training program on the development of university men athletes in relation to physical fitness, i.e., standing broad jump

S. No.	Subjects	n	Mean	SD	df.	't'-value	Sig. (two-tailed)
1.	Pre-test	50	1.86	0.351	98	4.149	0.000
2.	Post-test	50	2.12	0.328			

between pre-test and post-test of university men athletes at Mahatma Gandhi University, Nalgonda district of Telangana state with regard to the physical fitness, i.e., speed.

The mean value of pre-test of university men athletes is 14.22, SD value is 0.932, and for post-test of university men athletes, the value is 9.70 and SD value is 0.580. It is very clear a significant difference that exists between pre-test and post-test of university men athletes at Mahatma Gandhi University, Nalgonda district of Telangana state with regard to the physical fitness, i.e., agility.

The mean value of pre-test of university men athletes is 4852.44, SD value is 326.798, and for post-test of university men athletes, the value is 5952.16 and SD value is 529.358. It is very clear that a significant difference was found between pre-test and post-test of university men athletes at Mahatma Gandhi University, Nalgonda district of Telangana state with respect to the physical fitness, i.e., endurance.



The mean value of pre-test of university men athletes is 1.86, SD value is 0.351, and for post-test of university men athletes, the value is 2.12 and SD value is 0.328. It is very clear a significant difference was found between pre-test and post-test of university men athletes at Mahatma Gandhi University, Nalgonda district of Telangana state with regard to the physical fitness, i.e., standing broad jump.

#### 4. CONCLUSIONS

Hence, it is concluded that the pre-test and post-test of physical fitness variables, i.e., speed, agility, endurance, and explosive strength on the effect of plyometric training on the development of physical fitness among university athletes in Mahatma Gandhi University, Nalgonda district of Telangana state in their related physical fitness. The science of sports training is recent to the field of sports science. The sports science discipline has improved at a very fast pace in the past few decades. The knowledge gained by these disciplines has to be understood by the coaches and trainers to apply it correctly to the training process. Sports training aims to improving the performance of sportspersons, weight training, and plyometric training are very popular nowadays and effective training methods to promote higher performance in sprinting and jumping events. Plyometric training exercises are included depth jumping, hopping, and bounding drills. Legs plyometric and medicine ball exercise are arm plyometric exercises; these exercises are used to improve speed, explosive strength, and other motor ability components. Weight training is on activities of high intensity, short duration, and opposite side low intensity and high volume or build muscle, strength and endurance.

The major role of recent modernization, commercialization, and increased work schedule of an athlete's lifestyle has prompted the need for higher physical fitness levels. A key component of physical fitness in an athlete is to maintain high agility levels. Several studies have shown the programs of PT to

increase physical ability, and such training leads to an increase of muscle power and boosts explosive needs in the bodies. The factors such as power and acceleration have the range of motion exercises that are useful for many sports movement. According to the previous studies, this method in PT can be currently the most useful training to increase the explosive power in athletes, which is the requirement for athletes to achieve high levels of performance. Plyometric training is a training strategy designed to improve performance by incorporating the basic needs of agility and power, allows the muscle to reach an exponential increase in the maximum strength and speed of movement.

#### REFERENCES

- Amigo, N., Cadefau, J.A., Ferrer, I., Tarados, N., and Cusso, R. Effect of summer intermission on skeletal muscle of adolescent soccer players. *J Sports Med Phys Fit*, 1998, 38(4), 298-304.
- Baechle, T.R., and Earle, R.W. *NSCA Essentials of Strength Training and Conditioning*. 2<sup>nd</sup> ed. Leeds, UK: Human Kinetics; 2000.
- Balabinis, C.P., Psarakis, C.H., Moukas, M., Vassiliou, M.P., and Behrakis, P.K. Early phase changes by concurrent endurance and strength training. *J Strength Cond Res*, 2003, 17(2), 393-401.
- Bonaduce, D., Petretta, M., Cavallaro, V., Apicella, C., Ianniciello, A., Romano, M., Breglio, R., and Marciano, F. Intensive training and cardiac autonomic control in high level athletes. *Med Sci Sports Exerc*, 1998, 30, 691-696.
- Chamari, K., Hachana, Y., Kaouech, F., Jeddi, R., Moussa-Chamari, I., and Wisloff, U. Endurance training and testing with the ball in young elite soccer players. *Br J Sports Med*, 2005, 39(1), 24-28.
- Gillam, G. Physiological basis of basketball bioenergetics. *NSCA J*, 1985, 6, 44-71.
- Helgerud, J., Engen, L.C., Wisloff, U., Hoff, J. Aerobic endurance training improves soccer performance. *Med Sci Sports Exerc*, 2001, 33(11), 1925-1931.
- Lawson, E. Incorporating sports-specific drills into conditioning. In: Foran, B., (ed). *High Performance Sports Conditioning*. Champaign, IL: Human Kinetics; 2001, pp. 215-266.

# Role of Mental Training with “Imagery and Neurolinguistic Programming” to Get the Peak Performance in Players

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## ABSTRACT

It is always a challenging situation for a sportsperson to face national and international competitions. It is because the result in the field is unpredictable. It is common not to be successful, irrespective of practice sessions, having great coaches' supervision, successful player suggestions, and having great belief in self to perform well. In addition to training the body, sportsperson needs mental training to perform well in the field. The brain the top portion of the body where training is deposited, energies are channelized should be trained to excel along with the body it is housed. Slowly the coaches, players started realizing the role of counseling for players in enhancing the performance not only after the injury to recover but also in regular sports performances. Without giving the psychological training to be tough, mental picture of the best performance to happen in the competition and taking the challenge in the competitions, one cannot say the training of an athlete or a player is finished. Apart from the training on skill, technique, and physical fitness, the mental toughness and visualization of the best version of a player is a must to the players. It is proved by many a times by international athletes, many times Olympic medalist Michel Phelps, tennis player Roger Federer, Tiger Woods, etc., practicing visualization is the key in their success. This paper deals with one of the most effective methods, i.e., imagery and neurolinguistic programming visualization, how they help the players to give the peak performance in the competitions.

**Keywords:** Imagery, Performance, Visualization.

## 1. INTRODUCTION

Among sports performers and coaches, imagery is a popular and well-accepted strategy for enhancing various aspects of performance. The importance of this strategy is reflected in anecdotal reports of successful athletes.

Descriptive research also suggests that imagery is frequently used by the best athletes. In their study of the elements of success, Orlick and Partington (1988) found that 99% of Canadian Olympic athletes surveyed reported using imagery as a preparation strategy. Furthermore, higher level athletes or those with more experience typically report greater use of the strategy than their lower level or less experienced counterparts (e.g., Barr and Hall, 1992; Cumming and Hall, 2002a, 2002b; Hall *et al.*, 1998; Salmon *et al.*, 1994).

Not surprisingly, imagery has become a widely researched topic within the field of sports psychology as evidenced by numerous published studies, in sports psychology books, the chapters in (e.g., Callow and Hardy, 2005; Moran, 2004; Murphy *et al.*, 2008) an entire book (Morris *et al.*, 2005), and the introduction of a journal devoted to publishing imagery research in the physical domain (Journal of Imagery Research in Sport and Physical Activity.)

Since many years that all the successful people talk about visualization as being a key to their success. But if it works so well why are not more people experiencing personal success? There are a few reasons:

- Consistency – No matter what training a person is involved in consistency is the key
- Specifics – I can tell you to visualize your personal goals, but without knowing the quality of that image,

i.e., size, shape, color, focus, sounds, feelings, etc., I cannot help you fine-tune it so that it is real

- Association – When we visualize a memory of something that actually happened, there is a different “quality” to it, then visualizing a future event.

Since the beginning of time, man has been intrigued by his ability to see, with his eyes closed, the same detailed images that reflect the reality he sees with his eyes open. Man has been mystified by the power the mental image possesses to affect the body, mind, and matter in the outside world. For thousands of years, man has intuitively known that whatever he can vividly create in his mind will, like magic, manifest itself into a concrete reality.

Until recently, man has not had the knowledge to logically and scientifically explain the power of this phenomenon. Without such knowledge, this power has been ascribed to superstition, the occult, and coincidence.

Visual images and sensory impressions generated by the brain are holographic in nature. Every image and impression is composed of electromagnetic energy that consists of matter. Vividness and sensory detail increase the energy and power of the visualized image. In essence, what one visualizes is real. The body and mind interpret visual images and sensory impressions as reality and react to them accordingly.

Another most important tool available for the sports fraternity to improve the performance is neurolinguistic programming (NLP) method helps to influence the human mind in such a way that it starts to manage the internal states of the mind. The state of mind of the individual is an essential factor in bringing out his or her best performance. A lot of sports performers spend a lot of their time focusing on improving their fitness and technical ability and often the mental element is neglected, even at world-class level.

Invoking of states in the mind can help bring out the best in a player. Coaches generally know their players very well and therefore have an idea about what is the best thing to bring out the peak performance in a player. The use of NLP has had a significant impact in the area of sports performance.

People such as Michael Jordan, Tiger Woods, Andre Agassi, Greg Norman, Jimmy White, and Michael Vaughan are among many highly successful sports

performers who use NLP techniques consistently to achieve excellent results.

Michael Phelps is already the most decorated Olympian of all time with 22 medals to his name including 18 gold medals. He is using the power of guided imagery to prepare for success.

### 1.1. Peak Performance

1. Performing from one's highest intention: It is the ability to align one's attention to one's intention, to do what one believes in and values; it gives meaning to the reason why a person does sport
2. Working hard: Hard work gives the confidence and mental edge. Mind and body connection gets by hard work
3. Setting goals: Setting goals based on process goals, working to get outcome goals, a goal is something that a sportsperson wants. In other words, there is a distance between “what is” and “what can be.” There is a present state and a desired state. To maintain overall direction, every goal should contribute to a higher level goal
4. Trusting and inner knowing: Believing the techniques practicing and challenging the limitations inside of the brain. The belief a person has about himself plays a major role in how he will perform. A person with natural talent, physical fitness, and competent skills will not necessarily perform to his potential if he has a limited belief of his capability. Talent plays a role but it is not enough. According to Cohen and Breen (2007), it is not superior talent that separates champions from contenders but superior “nerve.” Trusting and inner knowing are embedded in a person's beliefs
5. Distinguishing between self-confidence and self-esteem: What we do (doing), worth is given to him at birth (human beingness). Person can be evaluated and criticized for his doing
6. Dealing with setbacks: Dealing with setbacks (resilience) is seen as bouncing back from injury, disappointment, or defeat. This links up with inner knowing and trusting and the distinction between self-confidence and self-esteem. A player, who can deal with setbacks effectively, will realize that “failure” is not about him as a person (being) but him as a player (doing)
7. Managing anxiety and confidence: The ability to control the anxiety and use it to their advantage distinguishes the elite athlete from the ordinary. Being relaxed during the performance is a

characteristic of peak performance. The relaxed sportsman trusts himself in every situation

8. Using language effectively in self-talk and communication: Self-talk may be defined as the internal dialogue that a person has with himself. The frequency of self-talk develops a mindset within which the athlete performs (Bunker *et al.*, 1993). Self-talk in sports affects behavior and should be rational and positive. When self-talk is used to restructure cognitions and to alter irrational thoughts, it can be referred to as positive self-talk. Irrational thoughts can lead to catastrophic ideas
9. Preparing mentally: As aspects of mental preparation, concentration and imagery will be described. Concentration is the ability to focus the mind on one source of information, often to the exclusion of others. Nideffer (1993) refers to concentration as that which one attends to. A person concentrates all the time unless he is asleep. Concentration involves three dimensions (Winter, 1992): Direction: On what is the person concentrating? Intensity: Is the person concentrating fully? And duration: How long is the concentration span?
10. Managing flow state: The flow state is an optimal state of intrinsic motivation where the person is fully immersed in what he is doing. This is a feeling everyone has at times, characterized by a feeling of great freedom, enjoyment, fulfillment, and skill. When a person is in flow state, temporal concerns are typically ignored. The idea of flow is identical to the feeling of being in the zone (Csikszentmihalyi, 1990). To achieve flow state, a balance must be found between the challenge of the task and the skill of the performer. If the task is too easy or too difficult, flow cannot occur.

## 2. METHODS TO EMPOWER THE PLAYERS TO PERFORM BETTER IN THE COMPETITIONS

1. Mental imagery: Imagery is a mental practice that has been widely used for the acquisition of sporting skills
2. NLP visualization: NLP: NLP is an approach for changing thoughts, feelings, and behavior.

### 2.1. Mental Imagery

Imagery is described as an experience that mimics real experience and involves using a combination of different sensory modalities in the absence of actual perception. White and Hardy explained that “we can

be aware of ‘seeing’ an image, feeling movements as an image, or experiencing an image of smell, taste, or sounds without experiencing the real thing” (1998: 389), another commonality among definitions is the notion that individuals are self-aware and conscious during the imagery experience (Richardson, 1969). For example, White and Hardy distinguished imagery from dreaming because the individual is awake and conscious when imaging.

Recent studies in neuroscience have shown that when we imagine ourselves doing a particular habit it activates many of the same regions in our brain as when we are physically doing that same habit. Moreover, one recent study found that when experienced pianists practice playing a new song in their heads, it improves their performance and accuracy.

In this way, visualizing in our mind’s eye can be an effective way to prepare ourselves for a situation before it plays out in the real world.

When athletes imagine themselves performing a certain way, they are mentally preparing themselves to act that same way once they step onto the field. For example, a golfer or basketball player will often visualize their shot before actually attempting it.

When using mental imagery, many sports psychologists recommend the following advice:

- (a) First-person perspective – Try to imagine how you want to act (and what you want to happen) from a first-person perspective. Experience the situation from your own eyes as if it is happening right now
- (b) Make it realistic – Try to imagine the situation as it would happen in the real world. For example, picture yourself wearing your own jersey and playing at your own home field. The closer your imagery is to the real situation, the better your mind will be prepared
- (c) Focus on process, not just results – Try to imagine the whole process from beginning to end. Do not just skip to the soccer ball going into the goal, see everything: You running down the field → teammate passing it to you → you moving past a player → you seeing an open spot in the goal → you kicking the ball. Preparing yourself to act the right way and make the right decisions is key
- (d) Evoke multiple senses – Try to imagine the experience from multiple senses. What you would see, hear, feel, taste, smell, etc.? The more senses



you can evoke, the more clearer the experience will be in your mind, and the more of an imprint it will make on your brain

All successful athletes make use of mental imagery in one form or another. They are masters at seeing their success in their mind before they make it into a reality.

Mental imagery can be especially effective for injured players who are not capable of physical practice but still want to keep their instincts sharp. Another way a lot of athletes mentally prepare themselves these days is by watching lots of video footage of themselves, especially comparing their good performances versus bad performances. Video footage can be a great aid to create effective mental imagery.

## 2.2. NLP

Stands for NLP Neuro refers to your neurology; linguistically refers to language; programming refers to how that neural language functions. In other words, learning NLP is like learning the language of your own mind!

Visualization is much more than a random daydream or just “seeing” yourself succeed. It is an extremely focused intention for improving personal performance. Let’s make this simpler with an example.

Have you ever tried to communicate with someone who did not speak your language, and they could not understand you? The classic example of this is when someone goes out to a restaurant in a foreign country and they think that they ordered chicken, when the food shows up, it turns out they actually asked for a duck.

This is the kind of relationship that most of us have with our own unconscious mind. We might think we are “ordering up” more money, a happy, healthy relationship, peace with our family members, and being able to stick to a healthy diet...but unless that’s what shows up, then something is probably getting lost in translation.

In NLP, we have a saying: the *conscious mind is the goal setter* and the *unconscious mind is the goal-getter*. Your unconscious mind is not out to get you—rather, it is out TO GET FOR YOU whatever you want in life. However, if you do not know how to communicate what you want properly, it will keep bringing something you never wanted out of the kitchen.

NLP is like a user’s manual for the brain, and taking an NLP training is like learning how to become fluent in the language of your mind so that the ever-so-helpful “server” that is your unconscious will finally understand what you actually want out of life.

### 2.2.1. Why we need NLP for the sportsperson when they have trained on skill and fitness

- There are many factors that influence sporting abilities; genetic inheritance, fitness levels, technical skills, and our mental abilities. All sports performers will give a lot of their time on their fitness and game skills, the education on the psychological side of the game is often neglected even at a world-class or Olympic level of performance
- Most sportspeople have experienced times when they are “in the zone,” where they are performing at their high-pressure situation, they give best in what some describe as a state of “flow.” If you ask someone – how they achieve flow many will say things like “I don’t know it JUST happens.” What this means is that it is an unconscious process and it is beyond of their normal conscious awareness
- In modern sports, the ability to access these flow states and optimize mental skills can mean the difference between winning and just competing!
- In sports, there are many ways that NLP can be used to optimize genetic, fitness, and technical abilities. NLP is often the difference that makes the difference
- NLP allows people to learn and adopt the strategies, techniques, and physiology used by our sporting role models to achieve excellence often in a fraction of a second
- Using NLP techniques in sports, we literally teach people to be able to go into “flow states” to consciously enter states of peak sports performance as and when needed. You can use NLP to maintain the motivation to train so as to take your skill sets to the next level, you can learn to “get over” mistakes and to learn from errors rather than dwell upon them, and you can learn to have the confidence to compete to the best of your ability
- Whether you are an aspiring Sachin, Sania Mirza, Tiger Woods, Paula Radcliffe, Lewis Hamilton, David Beckham, or someone who play sports simply for fun NLP is used by people even if they do it consciously or unconsciously
- It will either be used against you or you can learn to use it for you and when you learn to use NLP with the purpose you can really begin to play your sports at a new level.



### 2.2.2. How this NLP works

NLP is often proposed as a study of the way in which human beings structure their perceptions, it creates a framework that can be used to analyze the study, reprogram, and program a person's behavior, lifestyle, and attitude. Body posture, breathing, gestures toward the eyes, ears, body, eye movements, and language patterns are all elements that are used to trigger the unconscious mind in NLP.

High achievers and peak performers think, act, and feel differently from average people. They have superior mental strategies in place that helps them learn faster and better and perform to their potential more often (Veerender, icsm 2018). NLP was created by Richard Bandler and John Grinder in the 1970s.

Here's what you can learn from NLP:

- Change negative thinking to positive
- Stop self-limiting thinking patterns
- Increase energy
- Remove mental blocks
- Powerful visualization techniques
- Drop unwanted habits
- Create instant rapport
- Improve communication
- Remove unwanted, negative emotions
- Create smart learning and retention strategies.

NLP sports psychology (Veerender, 2018, lap lambert publishing) is based on the concept of bringing out the peak performance in an individual by improving their coordination and mental concentration. NLP for sports (Veerender, 2017, 2018) utilizes the five senses which are auditory, visual, kinesthetic, gustatory, and olfactory senses. By utilizing these five senses to influence the mind, this can help to enhance the performance of the individual. NLP for sports provides a method where a person can perceive the world around them in a certain way and with the use of sensory-based language, it is the best way to influence the human mind. When it comes to teamwork and coordination in sports, use of certain words that represent a sensation can give sportspeople that extra edge is required to win.

## 3. THE OLYMPIAN EXPERIENCES OF VISUALIZATION

As Olympic athletes gear up for 2106 Rio Olympic Games, many athletes are following the successful blueprints laid out by their 2014 Winter Olympic counterparts who competed successfully in Sochi.

Canadian bobsledder Lyndon Rush credited imagery with helping him keep his head in the game throughout the long, arduous four years of training between the 2010 and 2014 Olympic Games.

Rush: *"I've tried to keep the track in my mind throughout the year. I'll be in the shower or brushing my teeth. It just takes a minute, so I do the whole thing or sometimes just the corners that are more technical. You try to keep it fresh in your head, so when you do get there, you are not just starting at square one. It's amazing how much you can do in your mind."*

Emily cook, veteran American freestyle skier and 3-time Olympian, described how her specific imagery scripts and mental rehearsal involving all the senses have helped her maintain longevity in her sport. She says *"Visualization, for me, doesn't take in all the senses. You have to smell it. You have to hear it. You have to feel it, everything."*

Nicole Detling, a sports psychologist with the United States Olympic team, explains the importance of having a multisensory approach when visualizing. *"The more an athlete can image the entire package, the better it's going to be."*

Michael Phelps is already the most decorated Olympian of all time with 22 medals to his name including 18 gold medals. The 2016 Rio Olympics will be Phelps' fifth Olympic Games and, once again, he is using the power of guided imagery to prepare for success.

Bob Bowman has been Phelps' coach since he was a teenager and has included mental imagery or visualization as a part of Phelps' mental training.

## REFERENCES

- Abma, C.L., Fry, M.D., Li, Y., and Relyea, G. Differences in imagery content and imagery ability between high and low confident track and field athletes. *J Appl Sport Psychol*, 2002, 14, 67-75.
- Barr, K., and Hall, C. The use of imagery by rowers. *Int J Sport Psychol*, 1992, 23, 243-261.
- Bunker, L., Williams, J.M., and Zissner, N. Cognitive techniques for improving performance and self-confidence. In: Williams, J.M., (ed). *Applied Sport Psychology: Personal Growth to Peak Performance*. Mountain View, C.A: Mayfield; 1993. p. 225-242.
- Callow, N., and Hardy, L. A critical analysis of applied imagery research. In: Hackfort, D., Duda, J.L., and Lidor, R. (eds). *Handbook of Research in Applied Sport and Exercise Psychology: International Perspectives*.

- Morgantown, WV: Fitness Information Technology; 2005. p. 21-42.
- Callow, N., Roberts, R., and Fawkes, J.Z. Effects of dynamic and static imagery on vividness of imagery, skiing performance, and confidence. *J Imag Res Sport Phys Act*, 2006, 1, 1-13. Available from: <http://www.bepress.com/jirspa/voll/iss1/art2>. Retrieved on 12-4-2007.
- Cohen, P., and Breen, M. Positive Health. Self-belief in Sport Using NLP; 2007. Available from: <http://www.positivehealth.com/permit/ArticlesNLP/cohen39.html>. Retrieved on 10-5-2007.
- Cumming, J., and Hall, C. Athletes' use of imagery in the off-season. *Sport Psychol*, 2002a, 16, 160-172.
- Cumming, J., and Hall, C. Deliberate imagery practice: The development of imagery skills in competitive athletes. *J Sports Sci*, 2002b, 20, 137-145.
- Cumming, J., Olphin, T., and Law, M. Physiological and self-reported responses to different motivational general imagery scripts. *J Sport Exerc Psychol*, 2007, 29, 629-644.
- Csikszentmihalyi, M. *Flow: The Psychology of Optimal Experience*. New York: Harper and Row; 1990.
- Driskell, J.E., Copper, C., and Moran, A. Does mental practice enhance performance? *J Appl Psychol*, 1994, 79, 481-491.
- Feltz, D., and Landers, D.M. The effects of mental practice on motor skill learning and performance: A meta-analysis. *J Sport Psychol*, 1983, 5, 25-57.
- Hall, C. Imagery in sport and exercise. In: Singer, R.N., Hausenblas, H., and Janelle, C.M., (eds). *Handbook of Sport Psychology*. 2<sup>nd</sup> ed. New York: John Wiley & Sons; 2001. p. 529-549.
- Hall, C., Mack, D., Paivio, A., and Hausenblas, H. Imagery use by athletes: Development of the sport imagery questionnaire. *Int J Sport Psychol*, 1998, 29, 73-89.
- Hinshaw, K.E. The effects of mental practice on motor skill performance: Critical evaluation and meta-analysis. *Imagin Cogn Pers*, 1991, 11, 3-35.
- Jones, L., and Stuth, G. The uses of mental imagery in athletics: An overview. *Appl Prev Psychol*, 1997, 6, 101-115.
- Martin, K.A., and Hall, C. Using mental imagery to enhance intrinsic motivation. *J Sport Exerc Psychol*, 1995, 17, 54-69.
- Mills, K.D., Munroe, K., and Hall, C. The relationship between imagery and self-efficacy in competitive athletes. *Imagin Cogn Pers*, 2000, 20, 33-39.
- Moran, A.P. *Sport and Exercise Psychology: A Critical Introduction*. London: Routledge; 2004.
- Morris, T., Spittle, M., and Watt, A.P. *Imagery in Sport*. Champaign, IL: Human Kinetics; 2005.
- Murphy, S.M. Nordin, S.M., and Cumming, J. Imagery in sport, exercise and dance. In: Horn, T.S., (ed). *Advances in Sport Psychology*. 3<sup>rd</sup> ed. Champaign, IL: Human Kinetics; 2008. p. 297-324.
- Nideffer, R.M. *The Attentional and Interpersonal Style Inventory (TAIS), Theory and Application*. New Berlin, WC: ASI Publications; 1993.
- Orlick, T., and Partington, J. Mental links to excellence. *Sport Psychol*, 1988, 2, 105-130.
- Richardson, A. *Mental Imagery*. New York: Springer; 1969.
- Salmon, J., Hall, C., and Haslam, I.R. The use of imagery by soccer players. *J Appl Sport Psychol*, 1994, 6, 116-133.
- Veereder, C. Self empowering strategies in low self esteem players by using NLP and "Self Talk" techniques to win the game. *Int J Health Phys Educ Comput Sci Sports*, 2017, 13, 17.
- Veerender, C. *Effect of "NLP Visualization" and Alternate Empowering Suggestions in Counseling to Enhance the Performance of Low Self Esteem Players*. Vietnam: Proceedings of CSM; 2017.
- Veerender, C. *Effective Counseling Methods to Overcome the Psychological Factor of a Sports person*. The 2<sup>nd</sup> Yogyakarta International Seminar on Health, Physical Education, and Sports Sciences, IYISH Press; 2018.
- Veerender, C. *Role of CBT&NLP Support in Enhancing the Performance of Sports People*. LAP LAMBERT Academic Publishing; 2018. p. 35-40.
- Winter, G. *The Psychology of Cricket. How to Play the Inner Game of Cricket*. Melbourne, Australia: Sun; 1992.

# Effectiveness of Physical Conditioning in Altering the Physiological Functions of Untrained Men

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## ABSTRACT

The purpose of the study was to assess the effects of physical conditioning on physiological functions untrained men. To achieve the purpose of this study, the investigator selected 30 untrained men as participants in the age group of 40–45 years. They were divided into three groups of ten subjects each. Group-I underwent aerobic training, Group-II underwent anaerobic training, and Group-III acted as a control. The selected physiological functions such as resting heart rate, systolic, and diastolic blood pressure were assessed using a digital blood pressure monitor. During the training period, the experimental groups underwent their respective training 6 days/week for 12 weeks. The data collected from the three groups before and post experimentation on selected dependent variables were statistically analyzed by applying analysis of covariance. Due to the effect of both aerobic and anaerobic training, the resting pulse rate, systolic, and diastolic blood pressure of the untrained men subjects were significantly decreased. The result of the study also indicates that aerobic training was significantly better than anaerobic training in altering the resting pulse rate, systolic, and diastolic blood pressure of the untrained men.

**Keywords:** Physical conditioning physiological functions, Untrained women.

## 1. INTRODUCTION

In this competitive world, many people find it hard to dedicate time for physical activities like exercises, although one of their first priorities is to stay in perfect shape. Most of them told about the importance of physical activity in our daily lives. Research consistently shows that regular physical activity, combined with healthy eating habits, is the most efficient and healthful way to control weight. Whether an individual is trying to lose weight or maintain it, they should understand the important role of physical activity and include it in their lifestyle. Physical activity helps to control weight using excess calories that otherwise would be stored as fat. The number of calories we eat and use each day regulates our body weight. Everything one eats contains calories, and everything one does use calories, including sleeping, breathing, and digesting food. Any physical activity in addition to what one normally does will use extra calories.

Exercise aims at building up stamina. Exercise is also a type of physical activity, but there are the intent

and purpose of improving certain aspects of health. Exercise is planned physical activity that leads to visible improvement in health and general well-being. Physical exercises are repetitive movements. Physical exercises lay emphasis on strong movements of muscles. Science has established the fact that efficient functioning of the body improves when it is used and regresses when it is not used. This means that all normal organs of the body perform more effectively and efficiently when they are regularly exercised. Many research studies on various training on different variables such as physical, physiological, biochemical, psychological, and so on have shown evidence of improvement.

Aerobic training has numerous health and fitness benefits. Aerobic training increases our ability to supply oxygen to the muscles and tissues. With the improved heart function, resting and exercise heart rate are lowered. This results in using oxygen and energy more efficiently during exercise. The focus of aerobic training is to progressively overload the cardiorespiratory system and not the musculoskeletal system. Anaerobic exercise is used to build power and muscle mass. Anaerobic

conditions lead to greater performance in short duration high-intensity activities. It involves exercise that is intense enough to trigger anaerobic metabolism. It increases the functional capacity for the improvement of fitness and energy systems. The applicability of this method of training to improve the physiological function is not yet completely known. Consequently, the aim of the present study is to compare the various physical conditioning for differences in their effectiveness on selected physiological functions of untrained men.

## 2. METHODOLOGY

### 2.1. Subjects and Variables

To achieve the purpose of the study, the investigator selected 30 untrained men as subject in the age group of 40–45 years. They were divided into three equal groups of ten each ( $n=10$ ) at random. Group-I performed aerobic training, Group-II performed anaerobic training, and Group-III acted as a control. All the subjects selected for the experimental treatment were subjected to medical evaluation and certification from a doctor, ensuring their health capacities to undergo the training. The selected physiological functions such as resting heart rate, systolic, and diastolic blood pressure were assessed using digital blood pressure monitor.

### 2.2. Training Protocol

The training program was scheduled for one session a day for both aerobic and anaerobic training groups. Each session lasted 60 min approximately, including warming up and warming down. During the training period, the experimental groups underwent their respective training 6 days/week for 12 weeks. The experimental Group-I performed aerobic running and experimental Group-II performed anaerobic training. The subjects of aerobic and anaerobic training groups performed proposed repetitions and sets, alternating with active recovery between repetition and complete rest between sets based on work-rest ratio. The subject's training zone was computed using Karvonen formula and it was fixed at 60% HR<sub>max</sub> to 75% HR<sub>max</sub> for aerobic training group and 70% HR<sub>max</sub> to 95% HR<sub>max</sub> for the anaerobic training group. The training intensity was progressively increased once in 2 weeks.

### 2.3. Statistical Procedure

The data collected from the three groups before and post experimentation on selected dependent variables were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance

(ANCOVA). Since three groups are involved, whenever the obtained "F" ratio value was found to be significant for adjusted post-test means, the Scheffe's test was applied as *post hoc* test to determine the paired mean differences, if any. In all the cases, the level of confidence was fixed at 0.05 for significance.

## 3. RESULTS

The data collected from the experimental and control groups on resting heart rate, systolic, and diastolic blood pressure were statistically analyzed by ANCOVA and the results are presented in Table 1.

Table 1 shows that the adjusted post-test means on resting heart rate of aerobic, anaerobic, and control groups are 72.01, 73.68, and 75.60, respectively. The obtained "F" ratio value of 18.66 on resting heart rate is greater than the required table value of 3.22 for the degrees of freedom 2 and 26 at 0.05 level of confidence. It was observed from this finding that significant differences existed among the adjusted post-test means of experimental and control groups on resting heart rate.

The adjusted post-test means on systolic blood pressure of aerobic, anaerobic, and control groups are 125.71, 129.06, and 136.14, respectively. The obtained "F" ratio value of 37.63 on systolic blood pressure is greater than the required table value of 3.22 for the degrees of freedom 2 and 26 at 0.05 level of confidence. It was observed from this finding that significant differences existed among the adjusted post-test means of experimental and control groups on systolic blood pressure.

Table 1 also shows that the adjusted post-test means on diastolic blood pressure of aerobic, anaerobic, and control groups are 83.23, 85.93, and 88.09, respectively. The obtained "F" ratio value of 25.11 on diastolic blood pressure is greater than the required table value of 3.22 for the degrees of freedom 2 and 26 at 0.05 level of confidence. It was observed from this finding that significant differences existed among the adjusted post-test means of experimental and control groups on diastolic blood pressure.

Since the adjusted post-test "F" ratio was found to be significant, the Scheffe's *post hoc* test was applied to determine the paired mean differences, and it is presented in Table 2.

Table 2 shows that there was a significant difference existed between aerobic and anaerobic training groups,



**Table 1:** Analysis of covariance on resting heart rate, systolic, and diastolic blood pressure of experimental and control groups

Variables	Aerobic training group	Anaerobic training group	Control group	SoV	Sum of squares	Df	Mean squares	"F" ratio
Resting heart rate	72.01	73.68	75.60	B	63.76	2	31.88	18.66*
				W	44.41	26	1.70	
Systolic blood pressure	125.71	128.86	132.14	B	530.59	2	265.30	37.63*
				W	183.38	26	7.05	
Diastolic blood pressure	83.23	85.93	88.09	B	169.76	2	84.88	25.11*
				W	87.90	26	3.38	

(The required table value for significance with degrees of freedom 2 and 26 is 3.22) \*Significant at 0.05 level of confidence

**Table 2:** Scheffe's test for the difference between the adjusted post-test paired means of resting heart rate, systolic, and diastolic blood pressure

Variables	Adjusted post-test means			Difference between means	Confidence interval
	Aerobic training group	Anaerobic training group	Control group		
Resting heart rate	72.01	73.68		1.67*	1.48
	72.01		75.60	3.59*	1.48
		73.68	75.60	1.92*	1.48
Systolic blood pressure	125.71	128.86		3.15*	3.07
	125.71		132.14	6.43*	3.07
		128.86	132.14	3.28*	3.07
Diastolic blood pressure	83.23	85.93		2.70*	2.13
	83.23		88.09	4.86*	2.13
		85.93	88.09	2.16*	2.13

\*Significant

aerobic training and control groups, and anaerobic training and control groups on resting heart rate. Since the mean differences 1.67, 3.59, and 1.92 are higher than the confidence interval value of 1.48. It reveals that both experimental groups had significantly decreased the resting heart rate. However, aerobic training was significantly better than anaerobic training in altering the resting heart rate.

Table 2 shows that there was a significant difference existed between aerobic and anaerobic training groups, aerobic training and control groups, and anaerobic training and control groups on systolic blood pressure. Since the mean differences 3.15, 6.43, and 3.28 are higher than the confidence interval value of 3.07. It reveals that both experimental groups had significantly decreased systolic blood pressure. However, aerobic training was significantly better than anaerobic training in altering the systolic blood pressure.

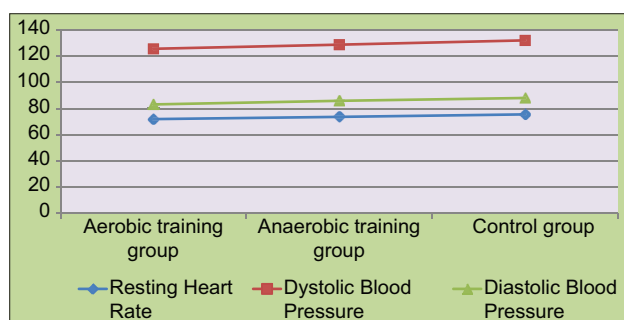
Table 2 also shows that there was a significant difference existed between aerobic and anaerobic training groups, aerobic training and control groups, and anaerobic training and control groups on diastolic blood pressure. Since the mean differences 2.70, 4.86, and 2.16 are higher than the confidence interval value of 2.13. It reveals that both experimental groups had significantly decreased systolic blood pressure. However, aerobic training was significantly better than anaerobic training in altering the diastolic blood pressure.

The adjusted post-test mean values on resting heart rate, systolic, and diastolic blood pressure of the experimental and control groups are graphically represented in Figure 1 for better understanding.

## 4. DISCUSSION

Coaches have been looking into how to get enough oxygen for performance. The methods used include





**Figure 1:** Adjusted post-test mean scores of experimental and control groups on resting heart rate, systolic, and diastolic blood pressure

improving the breathing mechanism, improving the working efficiency of the muscle, and training the body to be able to work anaerobically (Fox, 1979; Karpovcch and Sinning, 1979). Since there is a limit to how much oxygen the respiratory system can get, and as researchers are almost getting close to this limit, it is, therefore, necessary to begin to look into how to get the body to operate with little or no oxygen.

These results are also in conformity with the following findings. Balci *et al.* (2010) inferred that resting heart rate was significantly reduced in both the walk-to-run transition speeds groups. Stone *et al.* (1991) observed a reduction in pulse rate from training, which is considered beneficial. Miller *et al.* (1971) stated that repeated and continuous physical exercises may produce an extensive change in the respiratory system and the amount of vital capacity increased after a period of training. These reviews consider the effect of endurance training on the key parameters of aerobic (endurance) fitness and attempt to relate these changes to the adaptations seen in the body's physiological systems with training. The importance of improvements in the aerobic fitness parameters to the enhancement of endurance performance is highlighted, as are the training methods that may be considered optimal for facilitating such improvements (Jones and Carter, 2000).

Aerobic exercise training produces a significant reduction of systolic and diastolic blood pressure and also a significant decrease in the heart rate was registered after the 6-week follow-up cardiovascular rehabilitation, while heart rate was significantly lower in this group compared to group with sedentary lifestyle

(Ilic *et al.*, 2007). Honka *et al.* (2011) recommended that regular aerobic exercise is a treatment for elevated blood pressure. Balducci *et al.* (2010) assessed the efficacy of an intensive exercise intervention strategy and found exercise produced significant improvements in blood pressure.

## 5. CONCLUSIONS

Due to the effect of both aerobic and anaerobic training, the resting pulse rate, systolic, and diastolic blood pressure of the untrained men subjects were significantly decreased. The result of the study also indicates that aerobic training was significantly better than anaerobic training in altering the resting pulse rate, systolic, and diastolic blood pressure of the untrained men.

## REFERENCES

- Balci, S.S., Okudan, N., Pepe, H., Gokbel, H., Revan, S., Kurtoglu, F., and Akkus, H. Changes in lipid peroxidation and antioxidant capacity during walking and running of the same and different intensities. *J Strength Cond Res*, 2010, 24(9), 2545-2550.
- Balducci, S., Zanuso, S., Nicolucci, A., De Feo, P., Cavallo, S., Cardelli, P., Fallucca, S., Alessi, E., Fallucca, F., and Pugliese, G. Effect of an intensive exercise intervention strategy on modifiable cardiovascular risk factors in subjects with Type 2 diabetes mellitus: A randomized controlled trial: The Italian Diabetes and Exercise Study (IDES). *Arch Intern Med*, 2010, 170(20), 1794-1803.
- Fox, E.C. *Sports Physiology*. Philadelphia, PA: Saunders College P; 1979.
- Jones, A.M., and Carter, H.C. The effects of endurance training on parameters of aerobic fitness. *Sports Med*, 2000, 29, 373-386.
- Honka, A.M., Van Gils M.J., and Parkka, J. A personalized approach for predicting the effect of aerobic exercise on blood pressure using a fuzzy inference system. *Conf Proc IEEE Eng Med Biol Soc*, 2011, 2011, 8299-302.
- Karpovcch, V., and Sinning, W. *Physiology of Muscular Activity*. Philadelphia, PA: WB Saunders Publishers; 1979.
- Miller, M., Lurance, E., and Austin, T. *Physiology of Exercise*. 6<sup>th</sup> ed. St. Louis: The CV Mosby Company; 1971, pp. 106-119.
- Stone, M.H., Fleck, S.J., Triplett, N.T., and Kramer, W.J. Health and performance-related potential of resistance training. *Sports Med*, 1991, 11, 210-231.

# Mental Health of Students Participating in Sports, National Cadet Corps, and National Service Scheme of University of Mumbai, India

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## ABSTRACT

Nowadays, mental health tests have become quite commonplace as people want to discover more about themselves. By taking these tests, people can find out some important facets of their mental health. The present study was carried out with the purpose to find out the comprehensive status of mental health of students participating in National Cadet Corps (NCC) and National Service Scheme (NSS) of University of Mumbai. This was a comparative study under the descriptive research. The study was planned to conduct survey research on mental health of students participating in NCC and NSS of University of Mumbai. For collecting the data, one thousand five hundred ( $n = 1500$ ) students participating in sports ( $n = 500$ ), NCC ( $n = 500$ ), and NSS ( $n = 500$ ) of University of Mumbai were pulled as a sample. For selecting the sample, stratified random sampling was being used. To assess the mental health of selected samples, Inventory (Mental Health Inventory), as developed by Agase and Helode (1988), was used for assessing positive mental health of the sample of this investigation. Data were analyzed by applying one-way analysis of variance. The findings of the study were in case of mental health, students participating in sports are significantly differs than NCC and NSS group but in case of NCC and NSS, both were do not significantly differs to each other. Within the limitations, the results of the present study helped to warrant the following conclusions the mental health of the students participating in sports are significantly differs than NCC and NSS group, but in the case of NCC and NSS, both are do not significantly differs to each other.

## 1. INTRODUCTION

Mental health refers to a broad array of activities directly or indirectly related to the mental well-being component included in the World Health Organization's definition of health: "A state of complete physical, mental, and social well-being, and not merely the absence of disease." According to Menninger "mental health" is defined as "an adjustment of human beings to the world and to each other with a maximum of effectiveness and happiness". According to Poursoltani (2003), mental health comprises self-confidence and respecting self and others; identification of one's own capabilities and shortcomings and others' knowing that human beings' behaviors are resulted from some factors dependent on their existence integrity; and identification of needs, inspections, and motives that cause the individual's special behavior.

### 1.1. Objective of the Study

The objective of the study was to compare the mean scores of mental health of students participating in sports, National Cadet Corps (NCC), and National Service Scheme (NSS) of University of Mumbai.

### 1.2. Hypothesis of the Study

$H_1$ : There is no significant difference between the mean scores of mental health of students participating in Sports, NCC, and NSS of University of Mumbai.

## 2. METHODOLOGY

### 2.1. Design of Study

The present study was carried out with the purpose to find out the comprehensive status of personality trait

and mental health of students participating in Sports, NCC, and NSS of University of Mumbai. The procedure followed to conduct this comparative study under descriptive research is as under.

## 2.2. Design of the Study

This was a comparative study under the descriptive research. The study was planned to conduct a survey research on the mental health of students participating in Sports, NCC, and NSS of University of Mumbai.

## 2.3. Selection of Sample

Students participating in Sports, NCC, and NSS and studying in the degree colleges of University of Mumbai are represent the population. For collecting the data, one thousand and five hundred ( $n = 1500$ ) students participating in sports ( $n = 500$ ), NCC ( $n = 500$ ), and NSS ( $n = 500$ ) of University of Mumbai were pulled as a sample. For selecting the sample, the stratified random sampling has been used.

## 2.4. Selection Variables

Mental Health Inventory (MHI) by Agase and Helode (1988) was used for sample of this investigation. Sample was taken from different colleges which are affiliated to University of Mumbai.

## 2.5. Procedure of the Study

For collection of data, The MHI by Agase and Helode (1988) was used for the sample of this investigation. The sample was taken from different NCC units, NSS units, and colleges which are affiliated to University of Mumbai.

## 2.6. Analysis of Data

The data of all the variables were processed for descriptive statistics. Comparison of the mental health of students participating in Sports, NCC, and NSS of University of Mumbai. Data were analyzed by applying one-way analysis of variance (ANOVA).

# 3. RESULTS ON MENTAL HEALTH

## 3.1. Discipline-wise Comparison of Mean Scores of Mental Health of Students of University of Mumbai

The objective was to compare mean scores of mental health of students belonging to Sports, NCC, and NSS

of University of Mumbai. There were three disciplines, namely, Sports, NCC, and NSS of University of Mumbai. The data were analyzed with the help of one-way ANOVA and results are given in Table 1.

From Table 1, it evident that the F-value for discipline is 3.72 which is significant at 0.05 level with  $df = 2/1497$ . It reflects that the mean scores of mental health of students participated in Sports, NCC, and NSS of University of Mumbai differ significantly. Thus, the null hypothesis that there is no significant difference in mean scores of mental health of students belonging to Sports, NCC, and NSS of University of Mumbai is rejected. To know which groups of discipline were found to be more differs, the data were further analyzed using least square difference and the results are given in Table 2.

From Table 2, it can be seen that there is a significance difference in mental health between sports and NCC at 0.01, where NCC is having higher mental health in compare to sports. In the case of Sports and NSS, there is a significant difference at 0.05 level where NSS is having higher mental health in compare to sports. In the case of NCC and NSS, there is no significant difference in mental health between NCC and NSS. It may, therefore, be said that the NCC found to be a significantly higher level of mental health in compare to sports. To know the trend between Sports, NCC,

**Table 1:** Summary of one-way ANOVA of mental health of students participated in Sports, NCC, and NSS of University of Mumbai

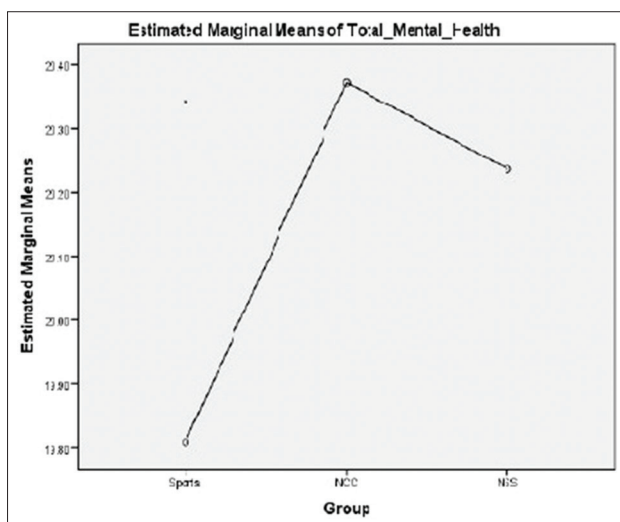
Source of variance	df	SSy.x	MSSy.x	Fy.x	Remark
Discipline		86.63	43.315	3.72	$P < 0.05$
Error	1497	1740.53	11.628		
Total	1499				

ANOVA: Analysis of variance, NCC: National Cadet Corps, NSS: National Service Scheme

**Table 2:** Discipline-wise mean, SE, and difference between mean scores of mental health of students participated in Sports, NCC, and NSS of University of Mumbai

Students	Mean	SE	NCC	NSS
Sports	19.81	0.15	$P < 0.01$	$P < 0.05$
NCC	20.37	0.15	----	np
NSS	20.24	0.15		

NCC: National Cadet Corps, NSS: National Service Scheme, SE: Standard error



**Figure 1:** Trend between students participated in Sports, National Cadet Corps, and National Service Scheme of University of Mumbai on the mental health

and NSS students belonging to University of Mumbai, Figure 1 has been plotted.

From Figure 1, it can be seen that as the discipline changes from Sports to NCC, there is a sharp inclination in mental health but when it further changes to NSS slight decrease in the total mental health of students belonging University of Mumbai. It may, therefore, be said that in case of mental health of the NCC was found

the highest level in students belonging to University of Mumbai.

#### 4. CONCLUSIONS

In the case of total mental health, students participating in sports are significantly differs than NCC and NSS group, but in the case of NCC and NSS, both are do not significantly differs to each other.

#### REFERENCES

- Allport, G.W., Odbert, H.S. Trait Names: A psycholexical Study. *Psychol Monogr*, 1936, 47(1), 211.
- Bal, B.S., Singh, S., and Singh, N. Analysis of the personality Traits of medalist and non medalist athletes. *Shield Res J Phys Educ Sports Sci*, 2008, 3, 439-442.
- Bhardwaj, V. *Comparative Study of Personlity Trits and Self Concept with Respect to Nature and Degree of Disabilities*. Gwalior, MP: Deemed University; 2010.
- Carnivez, G.L., and Allen, T.J. *Convergent and Factorial Validity of the 16PF and the NEO-PI-R*. Washington, DC: Paper Presented at the Annual Convention of the American Psychological Association; 2005.
- Cattell, H.E. The original big five: A historical perspective. *Eur Rev Appl Psychol*, 1996, 46, 5-14.
- Cattell, H.E.P., and Mead, A.D. In: Boyle, G.J., (eds). *The Sixteen Personality Factor Questionnaire (16PF)*. Thousand Oaks: Sage Publishing; 2007.

# Effect of Varied Packages of Training, Namely, Circuit Training, Interval Training, and Staircase Training on Speed among the Adikavi Nannaya University Athletes in Andhra Pradesh

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## 1. INTERDICTION

Sport plays a very prominent role in modern society. It is important to individuals, a group, a nation, and indeed the world. Throughout the world, the sport has a popular appeal among people of all ages and both sexes. Much of the attraction of sport comes from the wide variety of experiences and feeling that result from participation such as success, failure, exhaustion pain, relief, and feeling of belonging. Sport can bring money, glory, status, and goodwill. However, sport can also bring tragedy, grief, and even death (Coakley, 1998).

### 1.1. Purpose of the Study

The purpose of the study was to find out the effects of varied packages of training, namely, circuit training, interval training, and staircase training on speed among Adikavi Nannaya University, level men athletes.

### 1.2. Collection of Data

To achieve the purpose of this study, 60 university level men athletes from different colleges in Andhra Pradesh were selected. The selected subjects' age group was ranging from 19 to 24 years. The subjects were randomly divided into four groups and each group consists of 15 subjects. Group I acted as experimental Group I, Group II acted as experimental Group II, Group III acted as experimental Group III, and Group IV as control group. Group IV underwent routine activities, and care was taken that they should not involve in special exercise programs.

## 2. METHODOLOGY

Experimental Group I underwent circuit training, experimental Group II underwent interval training, and

experimental Group III underwent staircase training for 12 weeks. The requirements of the experimental procedures, testing, as well as exercise schedules were explained to them so as to avoid any ambiguity of the effort required on their part and before the administration of the study, the investigator got the individual consent from each subject.

### 2.1. Statistical Technique

Analysis of variance (ANOVA) and analysis of covariance (ANCOVA) analyzed the data obtained. The ANOVA will be used to assess the significance of the difference between the pre-test and post-test, for each of the variables due to varied packages of training, namely, circuit training, interval training, and staircase training groups separately.

Table 1.1 shows that the pre-test mean on speed of circuit training group was 7.22 with standard deviation +0.33 pre-test mean of an interval training group that was 7.26 with standard deviation +0.31. The pre-test mean of staircase training group was 7.34 with a standard deviation +0.43; the pre-test mean of control group was 7.32 with a standard deviation +0.33. The descriptive statistics on post-test mean on the speed of circuit training group were 7.03 with standard deviation +0.18 post-test mean of interval training group that was 7.10 with standard deviation +0.27. The post-test mean of staircase training group was 7.17 with a standard deviation +0.27; the post-test mean of control group was 7.35 with a standard deviation +0.31. The adjusted mean on speed on circuit training group was 7.08, interval training group was 7.11, staircase training group was 7.13, and control group was 7.32, as shown in Table 1.1.

As shown in Table 1.2, the obtained F-ratio of 0.47 on pre-test means of the groups was not significant at 0.05 level as the obtained F-value was less than the required



**Table 1.1:** Descriptive statistics on varied packages of training, namely, circuit training, interval training, and staircase training and control groups on speed

Groups	Test	Mean	Standard E deviation	Rang	
				Min.	Max.
Circuit training	Initial	7.22	0.33	6.80	7.70
	Final	7.03	0.18	6.70	7.30
	Adjusted mean	7.08			
Interval training	Initial	7.26	0.31	6.80	7.90
	Final	7.10	0.27	6.70	7.70
	Adjusted mean	7.11			
Staircase training	Initial	7.34	0.43	6.70	8.10
	Final	7.17	0.37	6.70	7.90
	Adjusted mean	7.13			
Control group	Initial	7.32	0.33	6.70	7.70
	Final	7.35	0.31	6.70	7.80
	Adjusted mean	7.32			

**Table 1.2:** Computation of analysis of covariance due to circuit training, interval training, and staircase training and control group on speed

Source of variance	Sum of squares	df	Mean squares	Obtained F
Pre-test mean				
Between	0.17	3	0.06	0.47
Within	9.30	76	0.12	
Post-test mean				
Between	1.16	3	0.39	4.55*
Within	6.44	76	0.08	
Adjusted post-test mean				
Between	0.71	3	0.24	22.76
Within	0.71	75	0.01	

Required F (0.05), (df = 3.75) = 2.77. \*Significant at 0.05 level of confidence

table F-value of 2.77 to be significant at 0.05 level. This shows that there was no significant difference in means of the groups at the initial stage. The results presented in Table 1.2, the obtained F-ratio of 4.55 on post-test means of the groups was significant at 0.05 level as the obtained F-value was greater than the required table F-value of 2.77 to be significant at 0.05 level. This shows that there was a significant difference in means of the groups at the initial stage. Taking into consideration of the pre-test means and post-test means, adjusted post-test means were determined and ANCOVA was done. The obtained F-value on adjusted means was 22.76. The obtained F-value was greater than the required value of 2.77 and, hence, it was accepted that there were significant differences among the adjusted means on the speed of the subjects.

## 2.2. Findings

This research found that varied packages of training significantly contributed to the development of physical fitness variables speed.

## 3. CONCLUSIONS

It was concluded that varied packages of training, namely, circuit training, interval training, and staircase training, significantly improved physical fitness variables, such as speed among university athletes compared to the control group. It was also found that there was no significant difference among treatment groups in altering speed.

## 4. RECOMMENDATIONS

In view of the findings of this study, coaches, physical educationists, and fitness trainers may add these training packages in their training schedule to improve.

## REFERENCES

1. Singh, A. *Essential of Physical Education*. New Delhi: Kalyani Publication; 2005, p. 66.
2. Alderman, R.B. *Psychological Behaviour in Sports*. Philadelphia, PA: WB Sounder Co.; 1974, p. 32.
3. Arlott, J. *Oxford Companion to Sports and Games*. London: Oxford University Press; 1975.
4. Tancred, B. *Health Related Fitness*. London: Holder and Stoughton; 1987. p. 66.
5. Bompa, T. *Periodization Training for Sports*. Champaign, Illinois: Human Kinetics; 1999.

# A Study on Obesity on International and Aided Schoolchildren Kalaburagi City

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## 1. INTRODUCTION

Being overweight or obese is having more body fat than is ideally present. Being overweight is particularly normal where food supplies are ample, and ways of life are inactive. How much a man is overweight, which is by and large depicted by the body mass index (BMI). Overweight is characterized as a BMI of at least 23; in this way, it incorporates pre-stoutness characterized as a BMI in the vicinity of 23 and 30 and obesity as characterized by a BMI of at least 30.

Weight and overweight are characterized as a state of interpret or anomalous fat collection in fat tissue, to the degree that well-being might be hindered. Overweight is regularly characterized as “A state of irregular or abundance of body fat ratio (triglycerides), which is related to various scatters of perilous or crippling issue or infections.” The arrangement of overweight and overweight depends on BMI, which is the proportion of the weight in kg<sup>2</sup> of the height communicated in square meters (m<sub>2</sub>) (Seidell *et al.*, 1997). However, BMI is a rough estimation that does not generally express the level of overweight.

## 2. METHODOLOGY

### 2.1. Selection of Subjects

To achieve the purpose of the study, the investigator selected 1500 school going girls out of which 750 from international school students and 750 from private aided schools who are studying in VIII, IX, and X standard and their age ranges from 13 to 15 for the year 2019–2020. They were requested by the researcher to cooperate and to participate with utmost sincerity. Every aspect regarding the tests was made clear and finally requested to participate wholeheartedly in the present study, and also prior permission was taken from their parents to conduct the tests.

### 2.2. Selection of Variables

The researcher reviewed number of books, journals, research articles, and coaching manuals and found many factors affecting overweight and obesity. Based on these observations, the investigator selected the following variables for this study.

I	Dependent variable	Body fat percentage (prevalence of obesity)
II	Independent variable	A. Physical growth
		1. Standing height
		2. Body weight
		3. Body mass index (BMI)
		4. Basel metabolic rate (BMR)

BMR: Basel metabolic rate, BMI: Body mass index

### 2.3. Statement of the Problems

The purpose of the study was to find out the obesity between international and private aided schoolchildren in Kalaburagi City.

### 2.4. Objectives of the Study

The objectives of this study were as follows:

- To find out the prevalence of obesity in school going children of Kalaburagi city
- To compare the obesity level between international and private aided schoolchildren
- To find out the factors contributing to prevalence obesity.

### 2.5. Significance of the Study

- The study identifies the percentage of obesity among schoolchildren
- The results of this study would add to the existing literature on obesity and physical activity of international and private aided schoolchildren in Kalaburagi city.

**Table 1:** Descriptive data on body fat percentage  
(*n*=1500)

Statistics	Body fat percentage
Mean	23.422
Standard error mean	0.128
Median	24.563
Mode	27
Standard deviation	4.964
Variance	24.642
Skewness	-0.750
Standard error skewness	0.063
Kurtosis	0.460
Standard error kurtosis	0.126
Range	31.8
Minimum	4
Maximum	35.8
Sum	35133.39

**Table 2:** Descriptive data on physical growth  
variable (*n*=1500)

Descriptive statistics	Standing height	Body weight	BMI	BMR
Mean	153.301	44.987	17.993	1242.681
Standard error mean	0.148	0.151	0.069	4.483
Median	153.056	44.887	17.808	1235.296
Mode	150	45	14.5	1125
Standard deviation	5.716	5.853	2.663	173.641
Variance	32.677	34.259	7.090	30150.919
Skewness	-0.051	-0.046	0.322	0.600
Standard error skewness	0.063	0.063	0.063	0.063
Kurtosis	-0.278	0.831	-0.385	0.735
Standard error kurtosis	0.126	0.126	0.126	0.126
Range	33	43	15	1277
Minimum	136	22	12.3	623
Maximum	169	65	27.3	1900
Sum	229951	67480	26989.4	1864021

BMR: Basal metabolic rate, BMI: Body mass index

## 2.6. Hypothesis

- It was hypothesized that there would not be any significant difference in the prevalence of

obesity between international and private aided schoolchildren

- It was hypothesized that there would not be any significant difference in the selected physical growth and body fat percentage variables of international and private aided schoolchildren.

## 3. RESULTS

Table 1 shows descriptive data on body fat percentage. The descriptive data such as mean scores of body fat percentage are 23.422, median is 24.563, standard deviation is 4.964, variance is 24.642, skewness is -0.750, kurtosis is 0.460, range is 31.8, minimum is 4, maximum is 35.8, and sum of scores is 35133.39 on the body fat percentage scores.

Table 2 shows descriptive data on standing height. The descriptive data such as mean scores of standing height are 153.301, median is 153.056, standard deviation is 5.716, variance is 32.677, skewness is -0.051, kurtosis is -0.278, range is 33, minimum is 136, maximum is 169, and sum of scores is 229951 on standing height scores.

## CONCLUSIONS

- There exists a significant difference in the body fat percentage of among international and private aided schoolchildren
- There exist significant differences in the standing height, body weight of international, and private aided schoolchildren
- There exist no significant differences in the BMI and basal metabolism rate of international and private aided schoolchildren.

## REFERENCES

- Agarwal, J.C. *Educational Research*. New Delhi: Agra Book Depot; 1975, p. 109.
- Harold, M.B., and Rosemary, M.G. *A Practical Approach of Measurement to Physical Education*. 3<sup>rd</sup> ed. Philadelphia, PA: Lea and Fabiger; 1979.
- Pollock, M.L., Willmore, J.H., and Fox, S.M. *Health and Fitness through Physical Activity*. New York: Wiley; 1978, p. 68.

# Importance of Psychology on Sports Performance

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## 1. INTRODUCTION

Sports psychology is a science, in which the principles of psychology are applied in sports setting to enhance performance. While sport psychology cannot replace physical and technical training or increase an athlete physical potential, it can improve the ability to remain in control under pressure, increase consistency, and help athletes to perform at their highest ability level.

Sports are recreation as well as competition and are considered to be part of one's life. In fact, sports, in the wider perspective, mean pleasure, as well as competition in sports. Competition has become very intense and all individuals and nation are striving very hard to gain supremacy over others.

This is the reason why the psychological aspects of sports or sports psychology have become such a challenging and interesting field of study and research. Sports psychology effectively uses ritualistic behavior to improve athletic performance at both the amateur and elite levels.

### 1.1. Locus of Control

Locus of control is another psychological variable influencing sports performance. Locus of related to the measurement the extent to which an individual is submotivated, directed, or controlled and the extent to which the environment influence his behavior.

### 1.2. Aggression in Sports

Aggression in sports can be caused by a number of factors. The most identifiable reason is the rules of the game, frustration, instinct, presence, arousal, environmental cause, self-control, and also the behavior of those around.

### 1.3. Self-concept

Self-concept is the most influencing factor in individual behavior. It has a relationship with personal aspects of

individuals, which determine the academic, sports, and other spheres of the individuals. A sportsman with a higher self-concept may display prominent increments in his performance. Similarly, an athlete with an internal locus of control may achieve greater success in his performance.

## 2. METHODOLOGY

### 2.1. Statement of the Problem

To study the importance of psychology on sports performance.

### 2.2. Objectives

The objective of this study was as follows:

- To study the impact of aggression on sports performance of person
- To study the impact of self-concept on sports performance of person
- To study the impact of locus of control on sports performance of person
- To examine the sex difference in sports performance
- To study the variation of psychological factors on two age group and their impact on sports performance.

### 2.3. The Setting

- Keeping major objectives of the study in view, an appropriate design is adopted. The study was conducted on 1000 sportspersons selected from the various college of Kalaburagi
- The criterion of selection was participation in sports at least at intercollegiate level. Thus, the sample selected was categorized equally on variables such as age and sex.

## 3. RESULTS

Table 2 shows the r-values between independent variables and dependent variables. It can be observed

**Table 1: Distribution of sample**

Age	Men	Women	Total
Group – I 15–20 years	250	250	500
Group – II 20 and above	250	250	500
Total	500	500	1000

**Table 2: Relationship between independent psychological factors and dependent variable**

Variable	r-value
Aggression	
Performance in 100 m	0.25**
Performance in 200 m	0.486***
Performance in 400 m	0.480**
Locus of control	
Performance in 100 m	0.195*
Performance in 200 m	0.3718****
Performance in 400 m	0.230**
Self-concept	
Performance in 100 m	0.23**
Performance in 200 m	0.14*
Performance in 400 m	0.29***

that the r-value between aggression and performance in 100, 200 and 400 meters is significant at 0.01 level.

This clearly reveals that aggression is a strong correlate of sports performance of athletes. The high aggressive respondents have significantly revealed sports skills in all three events.

Therefore, the aggression that creates reactionary attitudes necessary for excellence is found to be strongly correlated with the performance.

The r-values between locus of control and all the three events of athletes are significant at 0.01 level to indicate a strong relationship between independent and dependent variables.

Thus, the locus of control that instills mastery over the situation appears to be a strong correlate of the performance of the players. It is the internal locus of control that generates more confidence among the players. Thus, it can be said that locus of control is highly correlated with performance.

The correlation between self-concept and sports performance is definitely high the r-value for all the three events significant 0.01 level.

Hence, the results categorically pronounce the fact that the psychological factors such as aggression, locus of control, and self-concept are the strong correlates of the sports performance of players in all the three athletic events of 100, 200 and 400 meters events. The earlier studies have also noted similar findings.

## CONCLUSION

There is a significant difference between two subgroups of locus of control, aggression, and self-concept in sports performance have performed significantly higher on all three motor tests of 100, 200 and 400 meters than those of low self-concept.

## REFERENCES

- Bandura, A. *Aggression: A Social Learning Analysis*. Eagle Wood Cliffs, New Jersey: Prentice Hall; 1973.
- Bandura, A. Psychological mechanisms of aggression. In: Green, R.G., and Donnerstein, E.I., (eds). *Aggression: Theoretical and Empirical Reviews*. Vol. 1. New York: Academic Press; 1983.
- Kleiber, D.A., and Hemmer, J.D. Sex differences in the relationship of locus of control and recreational sports participations. *Sex Roles*, 1981, 7, 801-804.
- Bruce, H. Locus of Control and Participation in Intercollegiate Athletics. In: Finn, A.J., Strub, F.W., (eds). *Doctoral Dissertation*. New England: Springfield College; 1972. p. 56-60.



# Role of Nutrition among Sportspersons

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## 1. INTRODUCTION

Nutrition plays an important role in sport performance in young athletes, in addition to optimal growth and development. Macronutrients, micronutrients, and fluids in the proper amounts are very much essential to provide the required energy for growth, activity, and performance. It, therefore, becomes important for young athletes to learn what, when and how to eat and drink before, replenish during, and after activity for optimum performance.

Sports or games are something every child loves, and hence, there is no shortage of athletes in any field of sports. Every child should be encouraged to choose the game of their choice and to be in the school team. Children desire to represent their house teams in intramurals and represent their school teams should be encouraged. This would eventually contribute to the emergence of sport's person and contribute to a healthy world.

### 1.1. Objectives

The objectives of the study were as follows:

- To study the factors influencing sports performance
- To determine the baseline nutrition knowledge of sportspersons
- To create awareness of the role of sports nutrition, sports practice, and attitude on sports performance.

### 1.2. Hypothesis

- There would be a significant improvement in nutritional knowledge among adolescent athletes
- There would be a positive influence on sports nutrition knowledge on sports performance.

### 1.3. Significance of the Study

Maintaining a strong and healthy athletic performance is more than just a matter of training, practice, and keeping in shape. The body needs support in the form of proper

nutrition, hydration, and rest to optimize an athlete's performance. Nutrition is an important component of any physical fitness program. Knowledge of nutrition among adolescents in schools has to be given due importance to reach their peak performance. This not only helps athletes to maintain fitness but also helps them to strive harder for better performance in sports.

There is a strong need to have sports nutrition programs which impart knowledge on nutrition in relation to sports to adolescent athletes which would contribute to maintain higher fitness levels and enhance their sports performance.

### 1.4. The Sample

The present study was conducted on 200 football and basketball male players aged between 13 and 16 years from an urban school in Kalaburagi.

During the pre-test and post-test, physical fitness assessment will be done.

- Physical fitness—speed, agility, flexibility, endurance, power, and performance through various tests
- Nutritional status assessment.

## 2. RESULTS

Table 1 shows the perception of athletes on nutritional practices. It is very important for adolescent sportspersons to have proper nutritional practice as inadequate nutritional intake can impair the work capacity and sports performance. Adolescent being a significant period for physical growth, it is important for athletes to have good nutrition practices.

Table 2 shows the perception of athletes on nutrition and performance. During pre-test, through athletes have good perception; they feel that having less food helps them to be fitter. When an athlete participates in physical activity, he burns calories which are accumulated by food intake. Eating less food will reduce the calories present in the body and physical

**Table 1: Nutrition practices**

Nutrition practice	Game		Total (n=200)	P-value
	Basketball (n=100)	Football (n=100)		
Regular consume breakfast consumption	76	81	157	0.389
Breakfast at home	78	82	160	0.480
Preference for home food	100	99	199	1.000
Snack consumption between meals	92	86	178	0.175
Milk consumption	90	89	179	0.818

**Table 2: Perception of nutrition and performance**

Nutrition practice	Game		Total	P-value
	Basketball	Football		
Eating habits play an important role in sports performance				
Pre	4.46	4.09	4.28	0.008**
Post	4.88	4.81	4.85	0.173
P-value	<0.001**	<0.001	<0.001**	
The quality of diet affects on the performance of athletes				
Pre	4.17	3.87	4.02	0.068
Post	4.66	4.75	4.71	0.339
P-value	<0.001**	<0.001	<0.001**	

activity when gone beyond available calories will lead to fatigue.

### 3. CONCLUSIONS

- Nutrition knowledge has an impact on the performance of the sportsperson
- There is a significant improvement in the physical fitness test from pre-test to post-test
- Athletes with higher physical fitness levels will have higher performance
- Planning a nutrition program in collaboration with a registered dietician will give good results
- Health nutrition practices help athletes improve on their performance level
- Having the right attitude toward eating will help athletes develop positive eating habits
- Having a positive frame of mind toward sports will help athletes work toward optimal sports performance.

### REFERENCES

- Ahluwalia, N. Intervention strategies for improving iron status of young children and adolescents in India. *Nutr Rev*, 2002, 60(5 Pt 2), S115-17.
- Alam, N., Roy, S.K., and Ahmed, A.M. Nutritional status, dietary intake, and relevant knowledge of adolescent girls in rural Bangladesh. *J Health Popul Nutr*, 2010, 28(1), 86-94.
- Aragon, A.A., and Schoenfeld, B.J. Nutrient timing revisited: Is there a post-exercise anabolic window? *J Int Soc Sports Nutr*, 2013, 10(1), 5.

# Effect of Plyometric Training and Interval Training on Selected Physical Parameters among College Handball Players

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## ABSTRACT

The purpose of the study was to find out the effects of plyometric training and interval training on selected physical parameters among college handball players. To achieve this, the purpose of this study was to find out the effect of plyometric training and interval training on selected physical parameters among college handball players. To achieve the purpose of the study, 45 handball players from Annamalai University, Chidambaram. The subject was randomly selected as subjects, and their age was 18–22 years. They were assigned into three groups, namely, experimental Group I, experimental Group II, and control group. Experimental Group I was experimented plyometric training treatment that was given, experimental Group II was experimented interval training. Experimental III was that the control group was not given any training. The parameters selected for the study were physical parameters speed and leg explosive power, the study was formulated as a truly random group design consisting of a pre-test and post-test. The subjects ( $n = 45$ ) were randomly assigned into three equal groups of 15 subjects in each group. The groups were assigned as experimental Group I (plyometric training group), experimental Group II (interval training group), and control group, respectively. Pre-tests were conducted for all the 45 subjects on selected physical parameters. After the experimental period of 6 weeks, post-test conducted and the scores were recorded. The normality of the data was found through mean, standard deviation, and “F”-ratio, and the data collected were found to be normal. The differences between the initial and final scores in selected parameters were subjected to statistical treatment using analysis of covariance to find out whether the mean differences were significant on physical parameters.

**Keywords:** Speed and leg explosive power.

## 1. INTRODUCTION

A sport is an organized, competitive, entertaining, and skillful physical activity requiring commitment, strategy, and fair play, in which a winner can be defined by objective means. It is governed by a set of rules or customs. In sports, the key factors are the physical capabilities and skills of the competitor when determining the outcome (winning or losing). The physical activity involves the movement of people, animals, and a variety of objects such as balls and machines or equipment. In contrast, games such as card games and board games, though these could be called mind sports and some are recognized as Olympic sports, require primarily mental skills, and only mental and

physical involvement. Sports are most often played just for fun or for the simple fact that people need exercise to stay in good physical condition. However, professional sport is a major source of entertainment.

### 1.1. Statement of the Problem

The purpose of this study is to find out the effect of plyometric training and interval training on selected physical parameters among college handball players.

## 2. METHODOLOGY

The purpose of this study was to find out the effect of plyometric training and interval training on selected

physical parameters among college handball players. To achieve the purpose of the study, 45 handball players from Annamalai University, Chidambaram. The subject was randomly selected as subjects, and their age was 18–22 years. They were assigned into three groups, namely, experimental Group I, experimental Group II, and control group. Experimental Group I was experimented plyometric training treatment that was given; experimental Group II was experimented interval training. Experimental III was that the control group was not given any training. The parameters selected for the study were physical parameters speed and leg explosive power. The study was formulated as a truly random group design consisting of a pre-test and post-test. The subjects ( $n = 45$ ) were randomly assigned to three equal groups of 15 subjects in each group. The groups were assigned as experimental Group I (plyometric training group), experimental Group II (interval training group), and control group, respectively. Pre-tests were conducted for all the 45 subjects on selected physical parameters. After the experimental period of 6 weeks, post-test conducted and the scores were recorded. The normality of the data was found through mean, standard deviation, and “F”-ratio, and the data collected were found to be normal. The differences between the initial and final scores in selected parameters were subjected to statistical treatment using analysis of covariance to

find out whether the mean differences were significant in physical parameters.

## 2.1. Analysis of Data

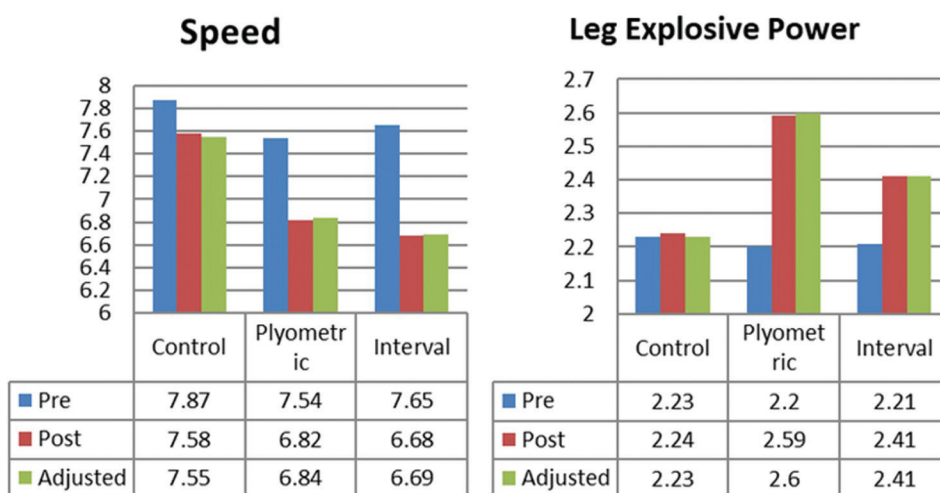
The effect of plyometric training and interval training on selected physical parameters was analyzed and presented below.

This table shows that the adjusted post-test means of plyometric training group, interval training group, and control group is 6.84, 6.69, and 7.55, respectively. The obtained “F”-ratio 17.82 for adjusted post-test means was greater than the table value 3.22 for df 2 and 41 required for significance at 0.05 level of confidence in speed. The adjusted post-test mean of the plyometric training group, interval training group, and control group is 2.60, 2.41, and 7.55, respectively. The obtained “F”-ratio 29.25 for adjusted post-test means was greater than the table value 3.22 for df 2 and 41 required for significance at 0.05 level of confidence in leg explosive power.

Bar diagram showing the pre, post, and adjusted post-test mean values of the plyometric training group, interval training group, and control group on speed and leg explosive power.

Test	Ptg	Itg	Cg	S O V	Sum of squares	Df	Mean squares	F ratio
Adjusted post-test Means of speed (scores in s)	6.84	6.69	7.55	B	6.03	2	3.01	17.82*
				W	6.93	41	0.16	
Adjusted post-test Means of leg – explosive power (Scores in m)	2.60	2.41	2.23	B	1.02	2	0.51	29.25*
				W	0.71	41	0.01	

\*Significant at 0.05 level of confidence



### 3. DISCUSSION ON FINDINGS

The result of the study showed that there was a significant difference that exists between plyometric training, interval training, and control group on speed and leg explosive power.

The result of the study showed that in plyometric training, the speed physical parameters have been improved than the interval training.

The result of the study showed that in interval training, the leg explosive power physical parameters have been improved than the plyometric training.

### 4. CONCLUSIONS

From the analysis of the data, the following conclusions were drawn:

- The plyometric training group and interval training group have achieved significant positive

improvement in physical parameters among college men handball players.

### REFERENCES

- Asaithambi, K., Venkatesan, G., and George, A. Influence of resistance training and plyometric training on explosive power among university students. *Int J Phys Educ Sports Yogic Sci*, 2012, 1(4), 49-51.
- Gokulakrishnan, D., and Pushparajan, A. Effect of plyometric training programme and plyometric training parallel with closed kinetic chain resistance training programme on the development of selected physiological variables of adolescent student. *Int J Phys Educ Sports Manage Yogic Sci*, 2014, 4(1), 46-50.
- Arazi, H., Asadi, A., Rahimzadeh, M., and Moradkhani, A.H. Post-plyometric exercise hypotension and heart rate in normotensive individuals: Influence of exercise intensity. *Asian J Sports Med*, 2013, 4(4), 235-240.
- Bavli, O. Comparison the effect of water plyometrics and land plyometricson body mass index and biometrical variables of adolescent basketball players. *Int J Sports Exerc Sci*, 2012, 4(1), 11-14.



# A Study on Psychological Traits of Krishna District and Guntur District Kabaddi Players

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## ABSTRACT

Psychology of sports means applying and psychological theories and concepts to aspects of the sport such as coaching and teaching. The sport psychology users psychological assessment techniques and intervention strategies in an effort to help individuals to achieve their optimal performance while sport psychology is concerned with analyzing human behavior is concerned with analyzing human behavior in various types of sport settling that it focuses on the mental aspects of performance the subject were tested two categories of psychological traits, i.e., motivation and anxiety. However, the psychological variables such as motivation and anxiety were recorded better results for Krishna district kabaddi players. This study will certainly contribute to the promotion and betterment of the kabaddi game.

**Keywords:** Anxiety, Competition, Kabaddi, Motivation, Psychology, Self-confident.

## 1. INTRODUCTION

Sports psychology is a specialization within the brain psychology and kinesiology that seek to understand psychological and mental factors that affect performance in sports. Physical activity and exercise apply these to enhance individual and team performance. It deals with increasing performance by managing emotions and minimizing the psychological effects of injury and poor performance. Some of the most important skills taught are goal setting, relaxation, visualization, self-talk, awareness and control, concentration, using rituals, attributions training, and periodization. Sports psychology is the specific study of people and their behaviors in sports. The main job of a sport psychologist is to recognize how participation in sport exercise and physical activity enhances and person development.

The coach should give equal attention to both, i.e., physically and mentally, that is the ideal approach. It is the job of a coach to develop it and watch it flourish by combining physical and mental training with a great work ethic. The player and his team should be prepared mentally and physically to the best of their ability. It is important to talk about peak performance because this is what athletes are trying to achieve and what experts in the field of sports psychology are trying to achieve

and what experts in the field of sports psychology are trying to help athletes and terms obtain. Imperative to examine some of the universal characteristics of that best performance. This way, it will have more control and awareness of peak performances, and they will not seem as mysterious as they once might have.

### 1.1. Significance of the Study

The study investigates the existing difference between the Krishna district and Guntur district kabaddi players in relation to their psychological traits.

### 1.2. Objectives of the Study

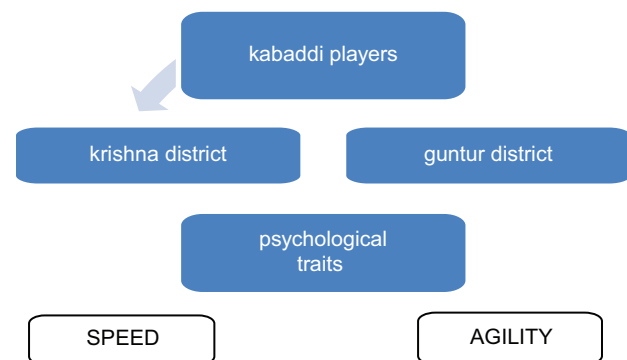
The present study finds out the existing difference between the psychological traits of Krishna district and Guntur district kabaddi players. To find out the existing difference between Krishna and Guntur district kabaddi players in relation to their motivation. To find out the existing difference between Krishna and Guntur district kabaddi players in relation to their anxiety.

### 1.3. Hypothesis

There may not be any significant difference between Krishna district and Guntur district kabaddi players in

relation to their psychological traits, i.e., motivation and anxiety.

#### 1.4. Design of the Study



Sample of the study

Category of the sub	No of sub
Krishna district kabaddi players	50
Guntur district kabaddi players	50

#### 1.5. Data Collection

The subjects of the study were in the age group between 18 and 25 years 50 Krishna district kabaddi players and 50 Guntur district kabaddi players, which were considered. The researcher has collected the data separately for Krishna district players and Guntur district players. The subjects were tested two categories of psychological traits, i.e., motivation and anxiety. Sinha scale was adopted for the opinionnaire used to measure motivation. Sport competition anxiety test was developed by martens, vealey, and burton in 1990.

## 2. RESULTS AND DISCUSSION

The results pertaining to the study were present in the following:

The table showing significant differences between Krishna district and Guntur district kabaddi players in relation to their motivation.

n	Subject	Mean	SD	T ration	P-value
50	Krishna district	29.82	7.97	3.97	0.01
50	Guntur district	26.04	9.13		

The table showing significant differences between Krishna and Guntur district kabaddi players in relation to their anxiety.

Subject	n	Mean	SD	T ratio	P-value
Krishna district	50	15.00	6.98	2.28	0.05
Guntur district	50	16.80	7.95		

## 3. CONCLUSION

The study under report has scientifically examined the various factors which influence the power game. The psychological variables, such as anxiety and motivation, are playing a significant role in the present game. The advanced game techniques have greatly influenced the psychological variables of the present game. The advanced game techniques have greatly influenced the psychological variables of the standard players. The results of the study will certainly contribute to the promotion and betterment of the kabaddi game not only in AP but also in India as well. However, the psychological variables such as motivation and anxiety were recorded better results for Krishna district kabaddi players.

In the present scenario, the academic standards in the kabaddi game have been playing a significant role in the creeping performance of the game. The fluctuations noticed by psychological variables will be attributed to the educational background of the kabaddi players. However, the fact here was that both players were well trained in all aspects due to their difference in exposure to various situations the results differ. By and large, the players exposed at higher levels of competition need to be fit physically, mentally, and technically so that the standards of the power game will remain at its best all the time at the international level.

## REFERENCES

- Shoefflet, E.L., and Griffith, A.U. Evaluation of a mental skills program for serving for an intercollegiate volleyball team. *Percept Mot Skills*, 2008, 107(1), 293-306.
- Gorz, M., Filippou, K., Kagiorig, I., and Zourbanos, N. The relationship between competitive state anxiety and self talk during performance in volleyball inquiries in sport and physical education. *Int J Phys Educ Sports Health*, 2007, 5, 173-178.
- Jones, J.G., and Cale, A. Precompletion temporal patterning of anxiety and self confidence in males and females. *J Sport Behav*, 1972, 40, 3.

# A Study on Sports Fitness and Injury Management

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## ABSTRACT

Exercising is good for all, but sometimes you can injure yourself when you play sports or exercise. Accidents, poor training practices, or improper gear can cause them. Some people get hurt because they are not in shape. Not warming up or stretching enough can also lead to injuries. The most common sports injuries are sprains and strains, knee injuries, swollen muscles, Achilles tendon injuries, pain along the shin bone, rotator cuff injuries, fractures, dislocations, etc. If you get hurt, stop playing. Continuing to play or exercise can cause more harm. Treatment often begins with the rest, ice, compression, and elevation method to relieve pain, reduce swelling, and speed healing. Other possible treatments include pain relievers, keeping the injured area from moving, rehabilitation, and sometimes surgery. While both injury and the recovery process can be painful physically and emotionally, the good news is, in many cases, you will be able to return to the routine you so dearly love. In a recent study published in the American Journal of Sports Medicine, researchers found that the majority of college athletes who suffer an anterior crucial ligament (ACL) injury return to play. However, as anyone who has recovered from an ACL tear or other physical activity-related injury can attest, that does not mean it is easy.

## 1. INTRODUCTION

Exercising is good for you, but sometimes you can injure yourself when you play sports or exercise. Accidents, poor training practices, or improper gear can cause them. Some people get hurt because they are not in shape. Not warming up or stretching enough can also lead to injuries. The most common sports injuries are sprains and strains, knee injuries, swollen muscles, Achilles tendon injuries, pain along the shin bone, rotator cuff injuries, fractures, and dislocations. If you get hurt, stop playing. Continuing to play or exercise can cause more harm. Treatment often begins with the rest, ice, compression, and elevation method to relieve pain, reduce swelling, and speed heating. Other possible treatments include pain relievers, keeping the injured area from moving, rehabilitation, and sometimes surgery. Whether it is an ankle sprain, an aching back, surgery, or a broken bone, chances are if you are physically active, you have also been sidelined by an injury. While both injury and the recovery process can be painful physically and emotionally, the good news is, in many cases, you will be able to return to the routine you so dearly love. In a recent study published in the American Journal of Sports Medicine, researchers found that the majority of college athletes who suffer an anterior crucial ligament (ACL) injury return to play. However, as anyone who has recovered from an ACL

tear or other physical activity-related injury can attest, that does not mean it is easy. Here are a few tips to make it as seamless a process as possible.

### 1.1. Purpose of the Study

The purpose of this study is to find out different reasons for injuries while playing any sports and find out remedial measures to minimize the pain.

## 2. METHODOLOGY

The conceptual research method is used for this research.

## 3. RESULTS

Mainly, there are six types of major injuries. They are as follows:

### 3.1. Jumper's Knee

Also known as patellar tendinitis, jumper's knee occurs when there is an injury (or inflammation) to the tissue that connects the kneecap and thigh muscles to the shin bone. Overuse or repetitive motion triggers this injury. Anyone can get jumper's knee, but as the name suggests, you are, especially at risk if your sport of choice involves a lot

of jumping, as in basketball and volleyball. You also are more likely to experience jumper's knee, the more you weigh or if you play sports on a hard surface. Symptoms include knee pain, especially just below the kneecap.

### 3.2. Little League Elbow

Often associated with overuse, little league elbow (also little leaguer's elbow) is a condition that affects the growth plate of the elbow in adolescents. It is a common injury not only for baseball pitchers but also for catchers, infielders, and outfielders. The repetitive motion of throwing puts too much stress on the elbow and leads to chronic inflammation of the growth plate.

### 3.3. Runner's Knee

Another repetitive motion injury, runner's knee, is common to runners or to anyone who does a lot of walking, biking, or general knee bending. It can also be caused by knee trauma or a hard bump to the knee. Symptoms include pain behind your kneecap, especially when you bend your knee. You also may be able to feel a grinding sensation when your knee bends. Swelling is also associated with this condition.

### 3.4. Sprains

A sprain is one of the most common sports injuries. A sprain is a stretch or tear of a ligament near a joint, such as a knee, ankle, or wrist. Sprains are most often caused by falling or by a twisting motion, they can be mild or severe, depending on whether the ligament is stretched or torn. Symptoms are pain and swelling (sometimes severe), as well as not being able to apply weight to the joint or use it without pain. Bruising is also typical.

### 3.5. Strains

You should not confuse a strain with a sprain. They are different. A strain refers to a muscular injury, while a sprain is an injury to a ligament. A strain occurs when you stretch or tear muscle tissue by overextending it. Mild strains can be caused by repetitive motion. Acute strains typically happen in a single movement. In sports, acute strains are most likely to occur when you are running, jumping, or lifting, or when you quickly change direction.

### 3.6. Tennis Elbow

Tennis elbow is a painful condition caused by overusing your elbow. Repetitive motions, such as those a tennis

player or golfer would use, are to blame. This condition is not limited to athletes, though. You can suffer from tennis elbow anytime you perform a repetitive task that engages your elbow in the same way. Instead of affecting the inside elbow (like little league elbow).

## 4. DISCUSSION

One should follow the below steps if gets injured while playing.

### 4.1. Stop If Pain Gets Worse

Even with a trainer by your side – but especially without one – you are going to have to pay a little extra attention to yourself as you get back into your routine. Take things slowly at first, “making sure that you’re not blindly doing movements without focusing on control,” says Davidson. Moreover, “if you do a movement and the pain gets worse, discontinue what you’re doing,” he says. Of course, for many athletes that it is easier said than done. “Due to the pressures of sport, some athletes may feel pushed to return before they’re ready,” says Carter.

### 4.2. Find Alternatives

Especially, if you are aiming for a specific fitness goal – running a marathon, setting a new bench press one-rep max – it can be particularly frustrating to time off from exercise and watch the progress you had made melt away. However, depending on what you are trying to maintain, there may be alternative ways to work out that do not affect your injury. Most people, says Davidson, are worried about losing cardiovascular fitness when injured, “due to the health ramifications associated with it,” but a number of low-impact forms of cardio, such as swimming, cycling, or even the elliptical might not cause pain like running.

### 4.3. Learn to Love Rest

Especially, if you are aiming for a specific fitness goal – running a marathon, setting a new bench press one-rep max – it can be particularly frustrating to time off from exercise and watch the progress you had made melt away. However, depending on what you are trying to maintain, there may be alternative ways to work out that do not affect your injury. Most people, says Davidson, are worried about losing cardiovascular fitness when injured, “due to the health ramifications associated with it,” but a number of low-impact forms of

cardio, such as swimming, cycling, or even the elliptical might not cause pain like running.

#### **4.4. Acknowledge Your Emotions**

In a handful of athletes, the emotional turmoil of being sidelined by an injury may be even worse than the physical pain. “Athletes typically feel shock, denial, fear, anger, sadness, and/or isolation,” says Carter. “Some athletes feel such a sense of loss that it’s like they are grieving. About 20–30% of athletes sustaining severe injuries develop symptoms of clinical depression. Individuals vulnerable to eating disorders might develop destructive food habits after an injury,” she says.

#### **4.5. Set Small Goals**

Even those of us who feel the most eager to get back into the swing of things might be simultaneously nervous to do so. “It’s common to fear reinjury,” says Carter, “and to experience a dip in confidence on return.” She suggests focusing on the fact that injuries are sometimes unavoidable in physical “activity, but it is unlikely something will happen again right away. In the meantime, take things slowly, setting small, and attainable goals so you can still feel like you are accomplishing something without getting too intense right out of the gate. “Focus on yourself and avoid comparisons to others,” she says.

### **5. CONCLUSION**

#### **5.1. Treatment Plan for Sports Injuries**

Minor sports injuries can be managed at home and should get better in a few days. The best home care is to use the RICE treatment plan: Rest, ice, compression, and elevation.

#### **5.2. Rest**

Immediately stop using the injured area. Sometimes 24–48 h of rest will make a big difference in overall recovery. It could be that the area you injured will need to rest for a longer period. For injuries affecting legs, knees, or ankles, this means using crutches so that you are not putting weight on the injured body part.

#### **5.3. Ice**

Putting ice on your injury will help with pain and swelling. You should apply ice to the affected area for 15–20 min every four hours. Crushed ice is best for ice packs because you can manipulate it easier to cover the injury.

#### **5.4. Compression**

Keeping pressure on the injury will also help with swelling and will provide additional support. An elastic medical grade bandage works best. Wrap the bandage tight, but not so tight that it cuts off circulation to the area.

#### **5.5. Elevation**

Propping up the affected area offers a few benefits. First, it will ensure you are resting your injury properly. Second, it will help reduce swelling. The correct way to elevate is to make sure that the injured area is propped up higher than your heart.

### **REFERENCES**

- Available from: <https://www.mediclineplus.gov/sportsinjuries.html>.
- Available from: [http://www.huffingtonpost.in/entry/return-to-fitness-after-injury-tips\\_n\\_5961374](http://www.huffingtonpost.in/entry/return-to-fitness-after-injury-tips_n_5961374) <https://familydoctor.org/condition/sports-injuries/?adfree=true>.



# The Role of Anthropometrics in Kabaddi Player's Selection

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## ABSTRACT

Anthropometry refers to the measurement of the human individual. It is the science of obtaining systematic measurements of the human body. It is a well-known fact that children are to be given specific training starting from the age of 8 years with the aim of excellence in a particular game or sport. The decision of which game to be opted is not just the choice of the parent or interest of the child. It has a lot of scientific inputs to be given while taking the decision. One of the leading scientific criteria for player selection and game selection is anthropometry. Anthropometric measurements are a series of quantitative measurements of the muscle, bone, and adipose tissue used to assess the composition of the body. In earlier times, it was only the basic physical components such as height and weight and the traditional AAHPER test which was used to identify the talent of players and during selections. During the past 2 centuries, a lot of research has gone into sports and physical education. It has developed a wider scope to various branches related to sports and sportsmen for research. In the game of kabaddi, the important fitness variables which result in performance are muscular strength, flexibility, vital capacity, agility, and endurance and the major physical variables involved are height, weight, upper leg length, calf girth, hip circumference, lower leg length, thigh circumference, hand length, chest circumference, etc. This paper is a review article in which the role of anthropometrics in selecting a kabaddi player at the very initial stage on starting professional and specific training. We will be discussing how anthropometry helps in selecting better players to achieve the best results during competitions.

## 1. DEFINITION OF ANTHROPOMETRICS

Anthropometry refers to the measurement of the human individual. Anthropometry involves the systematic measurement of the physical properties of the human body, primarily dimensional descriptors of body size and shape. Hence, the scientific study of the measurements and proportions of the human body is called anthropometry.

Anthropometric measurements are a series of quantitative measurements of the muscle, bone, and adipose tissue used to assess the composition of the body. The core elements of anthropometry are height, weight, body mass index, body circumferences (waist, hip, and limbs), and skinfold thickness.

Today, anthropometry plays an important role in industrial design, clothing design, ergonomics, and

architecture, where statistical data about the distribution of body dimensions in the population are used to optimize products.

## 2. SCIENCE OF ANTHROPOMETRICS

Anthropometry is the science of obtaining systematic measurements of the human body. Anthropometry first developed in the 19<sup>th</sup> century as a method employed by physical anthropologists for the study of human variation and evolution in both living and extinct populations.

Anthropometrics are the comparative study of the measurements and capabilities of the human body. There are two basic areas of anthropometry: Static anthropometry is the measurement of body sizes at rest and when using devices such as chairs, tables, beds, mobility devices, and so on. Anthropometrics are used to help scientists and anthropologists understand physical variations among humans. Anthropometrics

are useful for a wide array of applications, providing a kind of baseline for human measurement.

### 3. ANTHROPOMETRICS AND BIOMECHANICS

Biomechanics and anthropometry play important roles in the design of VDT workstations. They are intertwined with other ergonomic aspects of the workplace and have implications for both postural and visual task requirements. Human factor problems can be analyzed in a systems context.

### 4. IMPORTANCE OF ANTHROPOMETRY IN SPORTS

Anthropometry is the science of measuring the size and proportions of the human body. In all the games, height, weight, and other anthropometric variables play a key role in the player's performance. The physical structure, especially the height and arm length, has a definite and decisive advantage in many games.

Anthropometric tests: Tests of anthropometry include measurements of body size, structure, and composition. The body composition, such as the amount of body fat and muscle mass, can also significantly affect sporting performance. We also have many discussions over anthropometric measurements and tests for a range of sports.

### 5. PHYSICAL FITNESS COMPONENTS OF KABADDI PLAYERS

Strength plays an important component in this game. Specific fitness is achieved when a player acquires the required motor ability at a higher level for a particular sport. In kabaddi, specific fitness consists of strength, speed, and coordination. Independent variables such as endurance, hip, and trunk flexibility, agility, speed, and explosive strength are key dependent variables in kabaddi performance.

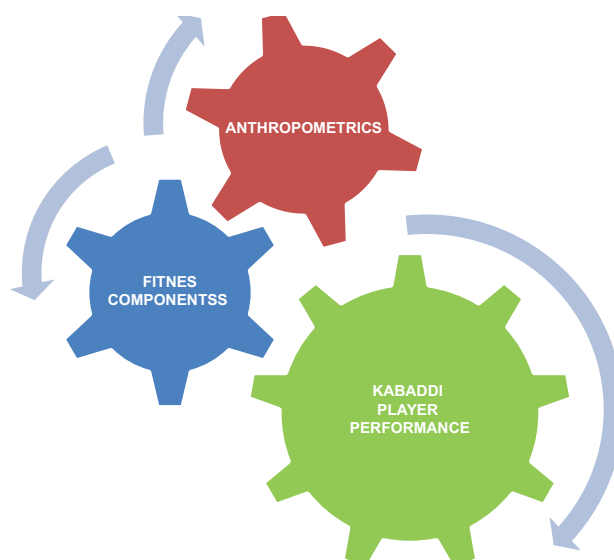
### 6. RAIDING AND DEFENDING SKILLS IN KABADDI

When a raider from the opposition team is raiding are said to be defenders. Some players have the unique skills to be defenders as they can pin down the raider according to their specific positions on the mat. There are broadly two categories of skills that a kabaddi player needs to learn offensive skills and defensive skills.

Foot touch, toe touch, thrust, squat, hand touch, kick, dubki, bonus, ankle hold, thigh hold, back/waist hold, block, and chain tackle are some of the prominent and essential skills of kabaddi players.

### 7. ANTHROPOMETRICS OF KABADDI PLAYERS

Endurance, hip and trunk flexibility, agility, speed, and explosive strength are the major determining components of a kabaddi player's performance. Among these components, hip and trunk flexibility, agility, speed, and explosive strength are largely dependent on the muscle size, leg length, thigh and calf circumference, player height, and hip circumference, which are the anthropometric measurements.



## “Yoga in Modern Education System”

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### ABSTRACT

The theoretical paper emphasizes the role of yoga in the modern education system to control over stresses and tension, promotion of positive health, increasing human skill, improves the quality of life, etc., which is attracting people from all sections of the society. Human being is made up of three components body, mind, and soul corresponding which are need health, knowledge, and inner peace. Health is physical needs; knowledge is our psychological need; and inner peace is a spiritual need. When all three are present, then there is harmony. If we peep into the benefits of yoga, they are numerous. It improves physical fitness, stress, control general well-being, mental clarity, and greater self-understanding. The asana enhances muscle strength, coordination, and flexibility and can help to keep our body fit. Yoga provides training of mind and body to bring emotional balance. The aim of all education undoubtedly is the attainment of human excellence and perfection not just in any field of knowledge or activity but also life in totality.

**Keywords:** Harmony, Modern Education, Yoga.

### 1. INTRODUCTION

We are living in the 21<sup>st</sup> century, in which the technology storm destroys human moral value. We are surrounded by a number of gadgets, on which we waste our precious time in doing nothing at all. To overcome from this situation, the only way is the value-based education which has been wish for most of the nation because, without it, our present generation is just a branch of poor graduates and rich criminals. After seeing this critical situation, we are worried about the present generation because their moral value is been destroyed by westernization due to which the bases of life come in darkness.

### 2. VALUE-BASED EDUCATION IN YOGA

Yoga, the ancient science of India, is a conscious process for gaining mastery over the mind. Yoga harmonizes our growth and regulates balance, which helps in total

development. Yoga is a science of holistic living and is synonymous with basic or real education. Hence, yoga is being introduced in the educational system. Education is not the mere acquisition of knowledge but is a process to manifest the perfection already in man. It should help a growing child to blossom into a fine flower. In Patanjali yoga sutra, the yoga is defined as “Yogash Chitta Vritti Nirodha” or, in simple words, yoga is the resistance to stop Chitta from forming various forms (vrittis). In the Ashtanga yoga of Patanjali, it has been told that yoga has the capability to enhance every aspect of human life. To build, a truly great character is the most glorious of human achievements. Such a man-making education, in which India has all the technical know-how, handed down from time immemorial, should form the basis of our national efforts in the field. In most exquisite words have our ancient masters sung the glory of such a true education: Asato ma sadgamaya, tamaso maa jyotir gamaya, and mrityor maa amrutam gamaya lead me from the unreal to the real lead me from darkness to light.

### 3. LEAD ME FROM DEATH TO IMMORTALITY

Swami Vivekananda was very clear in portraying this concept of education of our ancient seers-“Education is the manifestation of perfection already in man.” It is not mere cramming of information neither is it a mere sharpening of the intellect. It is a process of transforming a man to man, a process by which man raises himself for from his sleeping animal level to instincts, to a normal level and then becomes a great man, superman, and divine man ultimately reaches divinity itself. Hence, education and yoga are almost synonyms. The role of yoga education in modern education is very significant; it is a universal truth that every country needs healthy citizens. This aim can be achieved through the study of yoga education. The main aim of yoga education to develop physical, mental, social, spiritual, and emotional factors for this region yoga in education is becoming mandatory. The systematic introduction of yoga technique, the right way, can certainly go a long way in reconstructing the lost value system in our country, which has been the prime cause for our decadence. This needs a systematic development of techniques, their scientific assessment to establish their usefulness to students at different levels.

Yoga with its usefulness to modern man to relieve his stresses and tension to the patients in prevention, treatment, rehabilitation, and promotion of positive health to the professionals in increasing their skill, improves the quality of life, etc. Research shows that the most stressed-out generation is a current young adult. It is common knowledge that stress can have serious health consequences. If unaddressed consistently, a high stress level could become a chronic condition, which could result in arrange of health problems, including anxiety, insomnia, muscle pain, high blood pressure, and weakened immune system. Research indicated that stress can even contribute to the development of major illnesses such as heart disease, depression, and

obesity. Many yogic researches proved that yoga plays an important role in the overall development of human personality; the role of yoga education in modern education is very significant. It is a universal truth that every country needs healthy citizen. Yoga in education the power to heal everything, then why do not, we link it with value-based education.

### 4. CONCLUSION

If we connect yoga with the modern education system, then our ancient tradition will be remained alive, and it will definitely bring the life of our youth on track. Whichever path or profession, the youth may adopt if they carry yoga with themselves, it will not only help in tackling the problem but will also eliminate stress, strain, and lead them to create a society which will result into the progress of our nation.

### REFERENCES

1. Satyananda, S.S. *Dynamics of Yoga*. Munger, Bihar, India: Yoga Publication Trust; 2002.
2. Nagendra, H.R., and Mohan, T. *Yoga in Education*. Bangalore: Swami Vivekananda Yoga Prakshana; 2003.
3. Franais, X.G. *Yoga for Health and Personality*. New Delhi: Pustak Mahal; 2004.
4. Girish, P. *Positive Health*. New Delhi: Prajapita Brahma Kumari; 1986.
5. Swami, S. *Concentration and Meditation*. 10<sup>th</sup> ed. Rishikesh: The Divine Life Society; 1997. Bharat, T. *Yoga for Weight Loss*. New Delhi: Publishing Wisdom Tree; 2005.
6. Sumukhi, F. *Yoga Hand Book*. Wednesbury, England: S Webb and Son; 2003.
7. Rangan, R., Nagendra, H., and Bhat, G.R. Effect of Yogic education system and modern education system on memory. *Int J Yoga*, 2009, 2, 55-61.
8. Telles, S. Practicing yoga postures possibly increases relaxation and reduces anxiety. *Med Sci Monit*, 2009, 15(12), LE9.

# A Comparative Analysis of Selected Physical and Psychological Characteristics of Men Soccer Players of Different Positions

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## 1. INTRODUCTION

Think big and aim high for sure win.

Let your ambition surface. Be true to your own self. Your aspiration may see mere daydreams and wild castles in the air at the start. Never mind and never fear, what appears impossible today will become a reality tomorrow with your determination, dedication, and application-Surendra Kumar Sachdeva.

By nature, human beings are competitive and ambitious for the excellence in all athletic performance. Not only everyman but also every nation wants to show their supremacy by challenging the other nations. Thus, this challenge stimulates, inspires, and motivates all the nations to sweat and strive to run faster, jump higher, throw farther, and exhibit greater strength, endurance, and skills. This can only be possible through scientific, systematic and planned sports training as well as channelizing them into appropriate games and sports by finding out their potentialities.

## 2. FITNESS, PHYSICAL, AND PSYCHOLOGICAL FACTORS IN GENERAL

“The body is the temple of the soul and to reach harmony of body, mind, and spirit; the body must be physically fit.”

In today's world's physical education, sports play an important role in the development of physical, mental, intellectual, and social aspect of like. The aim of physical education is effective citizenship and social efficiency. The object of physical education is to help us in the production and maintenance of health, body, and mind. A harmoniously developed, well-coordinated body is an asset to the individual and the nation. A fit nation is an asset and a weak nation is a liability.

A sound and fit body are a pre-requisite for a top-level performance in any of the games and sports. It is considered a matter of common sense that even when all the contributing factors are controlled, an improvement in the level of physical fitness shall definitely lead to the improvement in the performance level of the sportsman participation in any activity.

The important components of physical fitness are speed, strength, power, agility, flexibility, and endurance coupled with mental alertness.

“A fit man is one who is well adapted to his environment” whose mind and body are in harmony and who can meet the normal demands both mentally and physically without undue fatigue.

It has been fully recognized by all experts and sports scientists that performance in soccer team game does not directly depend on the mastery over skills, but also on the optimum development of physical and psychological factors. Sports training are the medium to achieve the optimum and highest levels of performance by combining the various aspects. The players aspiring for high level of achievements and record-breaking standards are not only highly skilled but also mentally well balanced to cooperate with various kinds of disturbed emotional set up during competition.

Scientific evidence obtained from different investigations has revealed that apart from somatic and psychological variables, techniques, and tactics, higher level of performance of a sportsman is dependent on his psychological makeup. Different psychic abilities play a decisive role in achieving top-level performance, winning international sports competitions generally depend on psychological abilities. Therefore, superb psychological fitness and training of the individual are the factors, which help us achieving outstanding performance.



### 3. FIELD POSITIONS IN SOCCER

Field positions in any game are related to the structure and mode of the game. The rules and regulations, which govern the game, also influence the field positions. Field positions are very rigid in certain games, but this may change according to the system of play adopted by a particular team.

According to the system of soccer play, a total of 11 players of the team are given different tests, some individually and others collectively. In soccer games, the following 11 positions are there. They are goalkeeper, right fullback, left fullback, left stopper back, right stopper back, right half, left half, right out forward, right in forward, left out forward, and left in forward.

The way in which one lose marker is frequently dictated by the pattern of play adopted by teams and it is very important for a goal scorer to know how to work in various formations. 4-4-2, 4-3-3, and 4-2-4 require different strategies from the goal scorer and it is vital that one create understanding with forward partner of partners. During the late sixties and early seventies, the Brazilian team exhibited the 4-2-4 system in which four fullbacks, two halfbacks, and four forwards are played along with the goalkeeper. Goalkeeper is not included in the numbering of players. All require different objectives, methods, and positioning, whose positions are inevitable by law. Gradually many teams converged to defensive type and offensive area. However, the systems of play are changing day by day and the field positions also.

For the purpose of this study, only four positions were taken for the analysis, namely, goalkeepers, fullbacks, halfbacks, and forwards.

### 4. PSYCHOLOGICAL FACTORS SELECTED FOR THE STUDY

Many psychological factors have direct relation with soccer competitions whether the game is success or failure. Modern man lives in a mental world in which the important skills and success based on his psychological makeup. Various factors have been isolated, which are responsible for the excellence in sports. Apart from better training, good equipments, proper atmosphere, and some other factors that play an important role at the time of competition at any level in all sports are psychological factors such as anxiety, self-confidence, cohesiveness, aggression, and cooperation.

### 5. STATEMENT OF THE PROBLEM

The study was intended to compare the physical characteristics (speed, power, and endurance) and psychological characteristics (such as anxiety, self-confidence, aggression, cohesiveness, and cooperation) of men soccer of players, playing at different field positions, namely, goalkeeping, fullbacks, halfbacks, and forwards.

### 6. HYPOTHESIS

To aid the findings of this study, the following hypothesis was formulated.

1. It was hypothesized that forwards may have better speed than goalkeepers, fullbacks, and halfbacks in the game of soccer.
2. It was further hypothesized that fullbacks may have better power than goalkeepers, halfbacks, and forwards.
3. It was also hypothesized that halfbacks may have better endurance than goalkeepers fullbacks, and forwards.
4. It was further more hypothesized that goalkeepers may have less anxiety than fullbacks, halfbacks, and forwards.
5. Further, it was hypothesized that halfbacks may have better self-confidence than goalkeepers, fullbacks, and forwards.
6. Further, more it was hypothesized that fullbacks may be more aggressive than goalkeepers, halfbacks, and forwards.
7. Again it was hypothesized that forwards may have more cohesiveness than goalkeepers, fullbacks, and halfbacks.
8. Once again, it was hypothesized that halfbacks may have more cooperation than goalkeepers, fullbacks, and forwards.

### 7. SIGNIFICANCE OF THE STUDY

Modern competitive sports of today demand more emphasis on the training of physical and psychological aspects of sports. The high level of performances seen in competitive sports is nothing but perfect optimum harmonious development of one's physical, psychological preparedness, and technical preparation.

It is believed that superior athletes' performance has benefited from knowledge about the physiology and biomechanics of human activity. However, many

coaches and psychologists throughout the world believe that future records will be broken primarily due to increased attention to the physical and psychological parameters of human personality. Understanding of the physical and psychological aspects of athletes will provide useful information and guidelines, which may be helpful to coaches and athletes. Therefore, the present study may provide some significant contribution in the following aspects.

1. The study may help to explore the levels speed, power, endurance, anxiety, self-confidence, aggression, cohesiveness, and cooperation among soccer players, playing at different field positions.
2. The results of the study may be helpful to compare the physical and psychological variables such as speed, power, endurance, anxiety, self-confidence, aggression, cohesiveness, and cooperation among soccer players playing at different field positions.
3. The results of the study may add to the quantum of knowledge in the area of soccer.
4. The study may be helpful to the future research scholars to select new problems relating to this study.
5. The findings of the study may provide useful information and guidelines to physical education administrators, teachers, coaches, and players for better physical and psychological performance in sports activities and to enhance the total personality.
6. The study may provide some useful information, which may help to trace some aspects of the physical and psychological profiles of interuniversity soccer players.
7. Based on the results of the study, training program may be scheduled to develop speed, power, endurance, anxiety, self-confidence, aggression, cohesiveness, and cooperation for various team games.
8. The study may be helpful to the soccer players to know the physical and psychology of each position physical and psychological characters.
9. The study may be helpful to know which of the physical and psychological factors are dominant in each field position.
10. Based on the results of this study, the physical education program may be planned to develop the needed variable for each position.

## 8. DELIMITATIONS

1. The study was restricted to three physical variables, namely, speed, power, and endurance and five psychological variables, namely, anxiety,

self-confidence, aggression, cohesiveness, and cooperation only.

2. The study was delimited to 120 male intercollegiate soccer players who participated in intercollegiate tournament at Mahatma Gandhi University, Nalgonda, in the year 2009–2010.
3. The study was conducted for the soccer players, playing in four field positions such as goalkeeping, fullbacks, halfbacks, and forwards only.
4. The age of intercollegiate participating players was restricted below 25 years.

## 9. LIMITATIONS

1. Certain factors such as personal habits, lifestyle, daily routine, diet, and climatic conditions, which might have an effect on the result of this study, could not be taken into consideration and they were considered as limitation.
2. Intercollegiate soccer players were tested at different centers and there might be slight variation due to the environmental condition and judgments. This might be considered as a limitation.
3. No special motivation technique was used during testing. Hence, the differences that might have occurred in performance due to the motivation were recognized as a limitation for the study.
4. Subjects response to the statements in the questionnaire would depend on various factors such as understanding of the statements, seriousness, and sincerity of the subject.
5. The accuracy and reliability of the subjects' response to the questionnaire could not, therefore, be assessed and this was considered as a limitation.

## REFERENCES

- Mohan, G.M. *A Comparative Study of Selected Physical Fitness Components of Football Players*. Gwalior, MP: Master Thesis Lakshmibai National College for Physical Education; 1991.
- Cratty, B.J. *Psychology and Physical Activity*. New Jersey: Engle Wood Cliffs Prentice Hall Inc.; 1991.
- Paritosh, V.P. *Determination of Order of Required Motor Fitness Component on the Basis of Skill Performance for the Football, Basketball Games*. Amaravathi, MS, India: Masters Dissertation Amravati University; 1987.
- Verma, J.P. *Statistical Methods for Sports and Physical Education*. New Delhi: Tata McGraw-Hill Education Private Ltd.; 2011.

# Locus of Control and Competitive Anxiety as Correlates of Mental Toughness among Combat Sportspersons

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## ABSTRACT

Since mental health is as important as physical health precisely for sportspersons and athletes, a study was conducted to measure the level of locus of control and competitive anxiety as correlates of mental toughness among combat sportspersons. The scales used were Rotter's locus of control scale to determine the internal and external locus of control, and competitive state anxiety inventory-2 that it measures somatic anxiety, cognitive anxiety, and self-confidence, Alan Heary's mental toughness test which determines – control under pressure, motivation/commitment, concentration, and concentration. The sample consisted of national and state athletes, comprising 30 individuals from each of four different combat categories, i.e., (1) muaythai, (2) mixed martial arts (MMA), (3) kickboxing, and (4) karate from different clubs, respectively, within age group ranging from 15 years to 30 years. Each participating individual had a minimum experience of 2 years and a maximum of 8 years of experience. The consent from both the participants and their respective institutions were taken following which the scales were administered with appropriate instructions in a noise free and comfortable environment for which the results are observed. The individuals from karate had the highest level of mental toughness, followed by kickboxing, muaythai, and MMA. The discipline of MMA had the highest internal locus, followed equally by karate and kickboxing, and lastly muaythai, while highest external locus was found in the discipline of karate followed by kickboxing, muaythai, and MMA. Cognitive anxiety was found to be highest in karate, followed by kickboxing, and equally in muaythai and MMA, while somatic anxiety was found to be highest in kickboxing followed by muaythai, MMA, and karate. The self-confidence was highest in MMA followed by muaythai and was equal in karate and kickboxing. The other factors and conditions that influenced or distracted the individuals while taking the test were their experience in the field, the mastery of skills, mood, and also hunger.

## 1. INTRODUCTION

A combat sport, or fighting sport, is a competitive contact sport that involves one-to-one combat. The engagement is typically with the aim of simulating parts of real hand-to-hand combat through kata and self-defense training. Boxing, kickboxing, amateur wrestling, judo, mixed martial arts (MMA), muaythai, and swordsmanship are examples of combat sports. All of these require both mental and physical strengths. In the present study, the researcher selected four categories of combat sports:

### 1.1. Muaythai

The arts of eight limbs, it is a striking style combat sport that uses kicks, punches, elbow strikes, knee strikes, and locking strategies.

### 1.2. MMA

Involves both ground and striking style combat. As the name speaks for itself, this style involves techniques from all disciplines of martial arts, namely, locks, throws, chokes, kicks, and punches.

### 1.3. Kick Boxing

A modified boxing style that involves both punches and kicks is unique in its own way. It is widely used in teaching basic self-defense techniques apart from competing in the ring.

### 1.4. Karate

The most commonly known martial art has its own different styles of combating, for example, the katas and the Kumite style.

These categories were selected to study the effect of locus of control and competitive anxiety on mental toughness. The three scales used for administering the tests are as follows: The mental toughness scale by Alan Heary, the competitive state anxiety inventory-2 (CSAI-2), and Rotter's locus of control scale.

### 1.5. Purpose of the Study

The purpose of this study was to explore whether the locus of control and competitive anxiety is related to mental toughness.

### 1.6. Objectives

The objectives of this study were to find whether there is a difference in levels of competitive anxiety, locus of control, and mental toughness of different combat sports persons.

## 2. METHODOLOGY

### 2.1. Hypotheses

- (H<sub>1</sub>): Competitive anxiety and external locus of control will be negatively correlated to mental toughness of combat sports persons
- (H<sub>2</sub>): Athletes from MMA will have higher mental toughness, internal locus of control, and lower level of competitive anxiety than other combat sports persons (Muaythai, karate, and kickboxing).

## 3. OPERATIONAL DEFINITIONS

Locus of control determines whether our attributions to the outcomes are internal or external. Competitive anxiety comprises of three dimensions – cognitive anxiety, somatic anxiety, and self-confidence. The mental toughness scale by Alan Heary measures confidence, concentration, motivation, control under pressure, etc.

## 4. DESCRIPTION OF THE TOOLS

Three scales/inventories have respectively been used, namely, (1) Rotter's locus of control scale, (2) CSAI-2, and (3) mental toughness scale by Alan Heary.

### 4.1. Rotter's Locus of Control Scale

Those with an internal locus of control believe that their own behavior determines events in their lives, while

those with an external locus of control believe that life events are generally outside of their control. These scales have 29 (six filler items) items. The response options are A or B, where one represents an internal locus of control and the matching statement, an external locus of control.

### 4.2. CSAI-2

It comprises 27 items which test three factors: Cognitive anxiety state, somatic anxiety state, and self-confidence. Athletes answer each item as defined by the general statement: "Before competition." Answers are chosen from an option of four offered on a Likert type scale of four categories, one meaning "nothing" to four meaning "a lot."

### 4.3. Mental Toughness Scale

Formed by Alan Heary, there are four main components of mental toughness: Commitment/motivation, concentration/focus, and control under pressure. With six statements under each category.

## 5. SAMPLE

The sample includes sportpersons from four different categories of combat sports – muaythai, karate, and kickboxing. Thirty participants from each category with age ranging from 15 to 30 years are included in the sample. The criteria used to select the sample include a minimum experience of 6 months and participation in competitions at least at a district level championship.

**Table 1:** Correlation among locus of control, competitive anxiety, and mental toughness among combat sportspersons

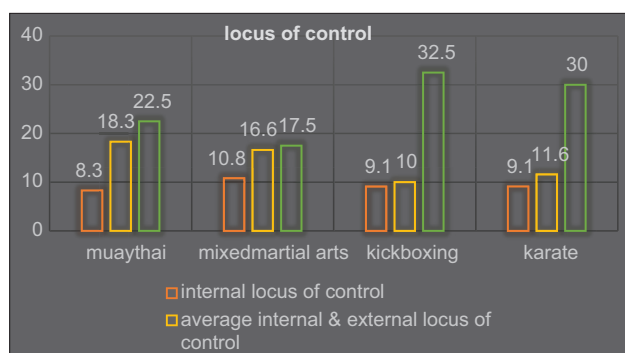
	Cognitive anxiety	Somatic anxiety	Self-confidence	Mental toughness
Internal locus of control	0.1	-0.2	0	0
Moderate locus of control	-0.1	0	0	0.2
External locus of control	0	-0.1	-0.1	0.1
Mental toughness	0	-0.1	0	-

## 6. PROCEDURE

Multiple private and state training clubs and institutions were officially approached and explained the purpose of the study. After seeking permission, consent of the participants is taken to participate in the study. Then, tests of locus of control, competitive anxiety, and mental toughness were administered. The responses were scored and subjected to statistical analysis.

**Table 2: Locus of control among combat sportspersons**

Type of combat sports	Internal locus of control	Average internal and external locus of control	External locus of control
Muaythai	8.3	18.3	22.5
Mixed martial arts	10.8	16.6	17.5
Kickboxing	9.1	10	32.5
Karate	9.1	11.6	30



## 7. RESULTS

Table 1 shows that the internal locus of control has a low but positive correlation with cognitive anxiety but low and negative correlation with somatic anxiety. However, no correlation is found between internal locus of control and self-confidence and mental toughness.

Results also indicated that a moderate locus of control has a low and negative correlation with cognitive anxiety and low and positive correlation with mental toughness. However, no correlation is found between external locus of control and somatic anxiety and self-confidence.

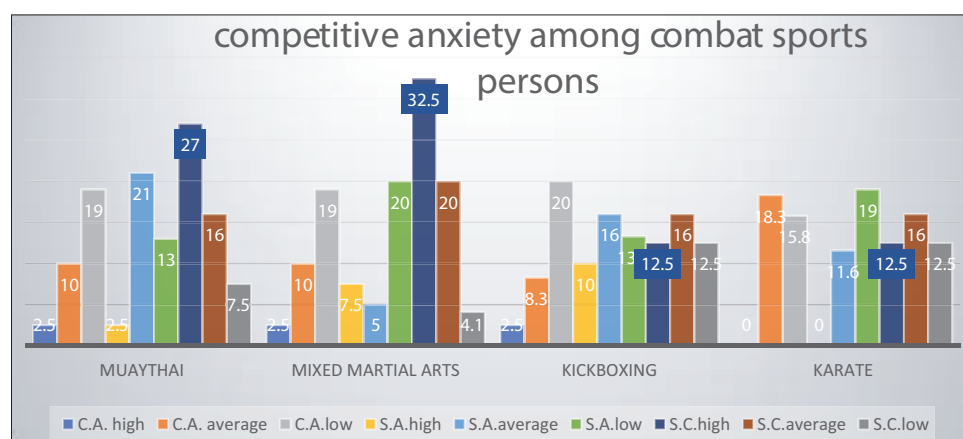
It can be inferred from the results that the external locus of control has no relation with cognitive anxiety but low and negative correlation with somatic anxiety and self-confidence and low and positive correlation with mental toughness.

It is also found that mental toughness has no correlation with cognitive anxiety and self-confidence but low and negative relation with somatic anxiety.

From Table 2, it can be inferred that irrespective of the type of combat sport, all are on a higher external locus of control. It can also be observed that kickboxing has the highest external locus of control, followed by karate, muaythai, and MMA.

**Table 3: Competitive anxiety among combat sportspersons**

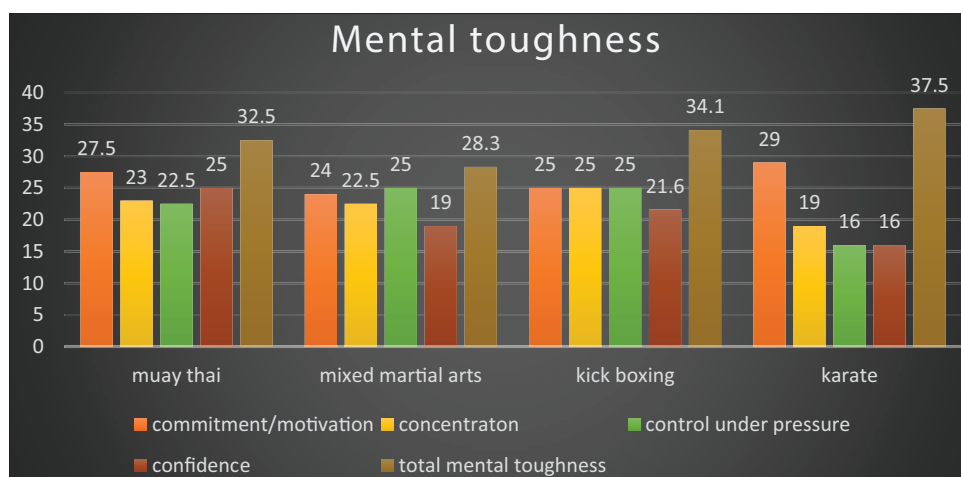
Type of combat sport	Cognitive anxiety (%)			Somatic anxiety (%)			Self-confidence (%)		
	High	Average	Low	High	Average	Low	High	Average	Low
Muaythai	2.5	10	19	2.5	21	13	27	16	7.5
Mixed martial arts	2.5	10	19	7.5	5	20	32.5	20	4.1
Kickboxing	2.5	8.3	20	10	16	13.3	12.5	16	12.5
Karate	0	18.3	15.8	0	11.6	19	12.5	16	12.5





**Table 4: Mental toughness among combat sportspersons**

Type of combat sport	Commitment/motivation (%)	Concentration (%)	Control under pressure (%)	Confidence (%)	Total mental toughness (%)
Muaythai	27.5	23	22.5	25	32.5
Mixed martial arts	24	22.5	25	19	28.3
Kickboxing	25	25	25	21.6	34.1
Karate	29	19	16	16	37.5



From Table 3, it can be inferred that irrespective of the type of combat sport, all are high on self-confidence. It can also be observed that MMA has the highest level of self-confidence followed by muaythai, and equally in kickboxing and karate.

From Table 4, it can be inferred that karate has the highest level of mental toughness, followed by kickboxing, muaythai, and MMA.

## 8. FINDINGS

The discipline of karate had the highest level of mental toughness, followed by kickboxing, muaythai, and MMA. The discipline of MMA had the highest internal locus, followed equally by karate, kickboxing, and lastly muaythai, while highest external locus was found in the discipline of karate, followed by kickboxing, muaythai, and MMA. Cognitive anxiety was found to be highest in karate, followed by kickboxing, and equally in

muaythai and MMA, while somatic anxiety was found to be highest in kickboxing, followed by muaythai, MMA, and karate. The self-confidence was highest in MMA followed by muaythai and was equal in karate and kickboxing.

## 9. CONCLUSION

The hypothesis that external locus of control and competitive anxiety is negatively correlated to mental toughness was rejected since there was no correlation between locus of control and mental toughness.

The hypothesis that states – athletes from MMA will have higher mental toughness, internal locus of control and lower level of competitive anxiety than other combat sportspersons (Muaythai, karate, and kickboxing) was also rejected as karate has highest level of mental toughness, followed by kickboxing, muaythai, and MMA.

# An Impact of Different Modes of Interval Training on Resting Pulse Rate in Different Position among College Men Players

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## ABSTRACT

The purpose of the study was to investigate the effect of extensive and intensive interval training on resting pulse rate in different position among college men players. To achieve the purpose of the study, the researcher randomly selected 30 college men players; those ages ranged from 18–22 years from Anna University BIT Campus, Tiruchirappalli. The subjects were divided into two groups randomly, Group-I extensive interval training group and the other Group-II is intensive interval training group. Both groups were treated with their respective treatments for 5 days in a week for 8 weeks. Initial test was conducted on resting pulse rate. After the completion of the initial tests, the subject was underwent their respective training program. After the completion of the treatment period, all the subjects were tested on criterion measures using means and methods used during the initial test. The result shows that there was a slight increase in resting pulse rate in intensive interval training rather than in extensive interval training which denoted that the aerobic type of training reduced the pulse rate more than the anaerobic type of training.

**Keywords:** Extensive interval, Intensive interval, Resting pulse rate.

## 1. INTRODUCTION

Exercise, in general, is one of the best preventive actions to fight illness and maintain health. There is increasing evidence of cardiovascular problems in the present era, due to which the importance of exercise for the development of fitness is on rise. There is a slow decline in cardiovascular function with advancing age that is significantly accentuated by a sedentary lifestyle. ACSM has released a physical activity guideline to improve physical fitness (Hagberg *et al.*, 1980).

The interval method is based on the interval principle activity done with pauses of complete recovery. The activity is to be done for prescribed time, after which there should be recovery pause which may be sufficient for complete recovery. The prime principle of the interval method is that the heart rate should go up to 180 beats/min during the workout. The next repetition may be started after the rate comes down to 120–130 beats/min. The methods based on the interval principle

are classified into either duration or the intensity of the activity (Whyte *et al.*, 2010).

Interval training consists of periods of high-intensity exercise alternated by periods of relative rest that makes it possible for patients to complete short work periods at higher intensities. Aerobic interval training is one of the most common training methods to improve athletes' endurance and training performance (Burgomaster *et al.*, 2008).

## 2. METHODOLOGY

The purpose of the study was to investigate the effect of extensive and intensive interval training on resting pulse rate. To achieve the purpose of the study, the researcher randomly selected 30 college women subjects; those ages ranged from 18–22 years from Anna University BIT Campus, Tiruchirappalli. The subjects were divided into two groups randomly, Group-I extensive interval training group and the other Group-II is intensive

interval training group. Both groups were treated with their respective treatments for 5 days in a week for 6 weeks. Initial test was conducted on resting pulse rate in varied positions.

After the completion of the initial tests, the subject was underwent their respective training program. After the completion of the treatment period, all the subjects were tested on criterion measures using means and methods used during the initial test.

### 2.1. Treatment of Procedure

The purpose of the study was to investigate the effect of extensive and intensive training on resting pulse rate. Further, it was decided to find out the remarkable or significant changes due to training in varied positions such as standing, sitting, and lying on resting pulse rate. For the above purposes, the scholar adopted the following procedures. The subjects for the study were selected on random sampling method. Their initial resting pulse rate in varied positions was recorded by conducting Harvard step test in different days. They were divided into two groups, each consisting of 15 subjects and the experimental treatments were assigned.

Group A: Extensive interval training group

Group B: Intensive interval training group

Separate interval training schedule was prepared by the investigator and the training schedule was carried out by the subjects under the supervision of the research scholar. The two training groups were well acquainted with their allotted techniques and involved in the training schedule for a period of 6 weeks. When the stipulated period was over, the final readings were recorded.

## 3. RESULTS AND DISCUSSION

Table 1 shows the means of three positions. The means of extensive interval training 72.77 are less than the means of intensive interval training 73.20. The extensive type of training is having the reduction of resting pulse rate than the intensive type of training resting pulse rate.

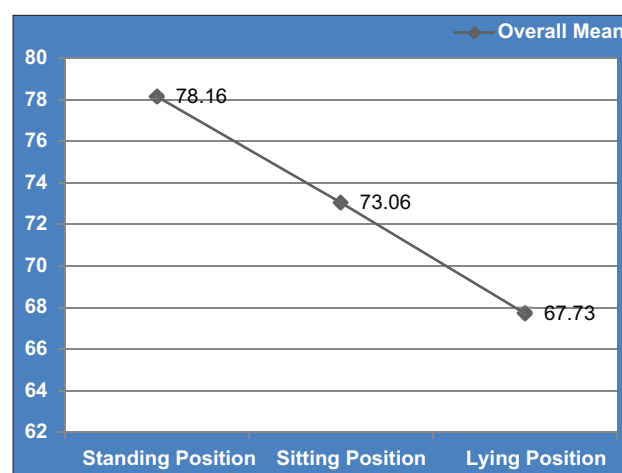
It is also clear that the standing position resting pulse rate mean 78.16 is higher than the sitting position means 73.06 and lying position means of 67.73 of resting pulse rate. The resting pulse rate is lower in lying position, higher in sitting position, and still higher in standing position. Apart from that, the extensive interval training group has less pulse than the intensive training group.

The overall mean values on the resting pulse rate of scores on standing, sitting, and lying positions are graphically represent in Figure 1.

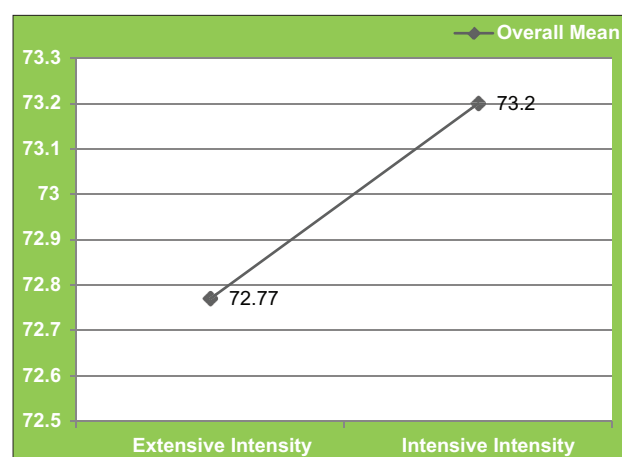
The overall mean values on resting pulse rate of scores on extensive intensity and intensive intensity were graphically represent in Figure 2.

**Table 1:** Mean resting pulse rate of scores on standing, sitting, and lying positions

Intensity	Standing	Sitting	Lying	Overall means
Extensive 60%	78.13	72.8	67.4	72.77
Intensive 75%	78.2	73.33	68.06	73.20
Overall means	78.16	73.06	67.73	



**Figure 1:** Overall mean values on the resting pulse rate of scores on standing, sitting, and lying positions



**Figure 2:** Overall mean values on resting pulse rate of scores on extensive intensity and intensive intensity

#### 4. SUMMARY

When the means of different positions were compared with one another, it was clear that the means of the standing position resting pulse rate were higher than other two positions resting pulse rate. The study also proved that the resting pulse rate was the lowest in lying position, higher in sitting position, and still higher in standing position.

There was also slight increase in resting pulse rate in intensive interval training rather than in extensive interval training which denoted that the aerobic type of training reduced the pulse rate more than the anaerobic type of training.

#### 5. CONCLUSION

1. The resting pulse rate in lying position was lesser than the resting pulse rate in sitting and standing

position. However, it was higher in sitting and standing and yet higher in standing position.

2. There was a slight effect on resting pulse rate.

#### REFERENCES

- Burgomaster, K.A., Howarth, K.R., Phillips, S.M., Rakobowchuk, M., Macdonald, M.J., McGee, S.L., and Gibala, M.J. Similar metabolic adaptations during exercise after low volume sprint interval and traditional endurance training in humans. *J Physiol*, 2008, 586(1), 151-160.
- Hagberg, J.M., Hickson, R.C., Ehsani, A.A., and Holloszy, J.O. Faster adjustment to and recovery from submaximal exercise in the trained state. *J Appl Physiol*, 1980, 48, 218-224.
- Whyte, L.J., Gill, J.M., and Cathcart, A.J. Effect of 2 weeks of sprint interval training on health-related outcomes in sedentary overweight/obese men. *Metabolism*, 2010, 59(10), 1421-1428.

# A Comparative Study of Endurance Between Kabaddi and Kho-Kho Games Players

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## ABSTRACT

The present study has been designed to investigate the endurance of kabaddi and kho-kho players. To accomplish the study, a total of 50 players (25 kabaddi and 25 kho-kho) were randomly selected as sample. All samples were selected from the Rohtak district. The age of the subjects was ranged from 16–19 years. To measure the endurance, we used the 12 min run and walk test in the study. The data were analyzed by applying the “*t*”-test to determine the difference of endurance between kabaddi and kho-kho players. The level of significance was set at 0.05. A significant difference was observed between kabaddi and kho-kho players in their endurance. We find out that kabaddi players having more endurance in comparison to kho-kho players.

**Keywords:** Endurance, Kabaddi, Kho-Kho.

## 1. INTRODUCTION

Endurance fitness is the capacity to manage the important movement level for a particular aggressive game. It incorporates both cardiovascular and strong perseverance required for the game. Occasions or games more than 2–3 min change from brisk vitality (muscle glycogen) sources to an oxygen-based (high-impact) vitality source. A tolerably high to high  $\text{VO}_2$  max is a basic part of achievement in high-impact occasions, and also neighborhood solid continuance. Marathon running requests an abnormal state of consistent, supported movement, as opposed to weight lifting. Most games utilize a blend of both oxygen consuming and anaerobic vitality frameworks, and quality speed perseverance. Mentors must think about vitality necessities, muscle gatherings, congruity, and force of action, and also aptitude prerequisites when planning preparing programs for their games.

### 1.1. Objectives of the Study

The objectives of this study were to compare the endurance between kabaddi and kho-kho players.

### 1.2. Hypothesis of the Study

There would be no significant difference in the endurance of kabaddi and kho-kho players.

### 1.3. Research Process and Methodology

The sample for the present study was 25–25 male players of kabaddi and kho-kho which were randomly selected as a sample from Rohtak district. The age of the samples was ranged 16–19 years.

### 1.4. Test Administration

This study was 12 min run/walk test.

**Purpose:** The purpose of this study was to assess endurance.

**Objective:** The objective of this study was to run/walk as fast as possible for 12 min.

### 1.5. Equipment

Four hundred m/200 m athletics track stopwatch, track is used or another suitable running area measured so that exact distances are indicated. Distance covered in 12-min is then compared to the score.

## 2. INSTRUCTIONS

This is a timed run to measure the heart and vascular system's capability to transport oxygen. It is an important area for performing police tasks involving stamina and



**Table 1: Mean difference between kabaddi and kho-kho players in their endurance ( $n$ =total numbers of students)**

S. No.	Variables	Group	N	Mean Score	SD	MD	DF	t-value
1.	Kabaddi	MALE	25	1722.80	411.88	406.80	48	3.92*
2.	Kho-kho	MALE	25	2129.60	314.61	406.80	48	3.92*

Table value at 0.05 level 2.00 with df 48 \*Significant at 0.05 level

endurance and to minimize the risk of cardiovascular problems. The score is in minutes and seconds.

### 2.1. Procedure

It is aerobic power test; the term “aerobics” was adopted from the term “aerobic,” which refers to the type of metabolism utilizing oxygen in the production of energy for the body. The 12-min run/walk test is used to determine the efficiency of the cardiorespiratory system.

### 2.2. Scoring

The total time taken for 12 min run/walk test was recorded as the final score.

### 2.3. Tool and Techniques

To measure the endurance, we used the 12 min run and walk test in the study.

### 2.4. Statistical Method

The obtained data were analyzed by applying a t-test to determine the endurance between kabaddi and kho-kho players. The level of significance was set at 0.05. For obtaining the reliable results, special statistics software (SPSS) was used.

Table 1 shows “ $t$ ” value (3.92). The mean score of endurance between kabaddi and kho-kho players is higher than the table value 0.05. The mean score of kabaddi players (1722.80) is lower than the kho-kho players (2129.60), which show a significant difference. It means that the endurance of kabaddi players is higher than the kho-kho players.

## 3. RESULTS

A significant difference was observed between kabaddi and kho-kho players in their endurance, that is, why hypothesis-1. “There would be no significant difference in the endurance of kabaddi and kho-kho players,” which was formulated earlier that was rejected, we observed that kabaddi players have more endurance in comparison of kho-kho players.

## REFERENCES

1. Mathews, D.K. Measurement in physical education. In: *Cardiovascular Test*. Philadelphia, PA: W.B. Saunders Company; 1978. p. 278.
2. Sangwan, S. *Effect of Selected Asana on Endurance of Kabaddi Players*. National Seminar Presentation, DGHE; 2017.
3. Retrieved from: <https://www.brianmac.co.uk/idealw.htm>.
4. Retrieved from: <https://www.sports-trainingadviser.com/endurancefitness.html>.

# A Study on Attitude of School Students Toward Cleanliness with Regards to Swachh Bharat Abhiyan

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## ABSTRACT

Honorable Prime Minister Shri Narendra Modi has launched the Swachh Bharat Abhiyan (SBA) on October 2, 2014, aiming to keep the country clean and open defecation free (ODF). To gather the information on attitude and awareness toward cleanliness with regards to SBA, a cross-sectional survey was being conducted on school students (10–16 years of age) of Ujjain region to determine the impact of the SBA on students those are already under the basic learning stage of their life. A semi-structured questionnaire was designed for the data collection; the data further analyzed in LibreOffice Calc and evaluated using percentage and Chi-square test. The findings revealed 93.97% students are aware of SBA; still, after the Abhiyan 53.98% students witnessed fecal matter in the environment. The significant difference was found among the availability and throwing waste material in dry and wet bin ( $\chi^2 = 160.88$ ) and then to municipality garbage vehicle ( $\chi^2 = 164.63$ ). The significant difference was observed for using paper/cloth carry bags ( $\chi^2 = 82.78$ ) instead of plastic carry bags ( $\chi^2 = 84.78$ ). The significant difference was observed in terms of cleaning the surrounding area of house ( $\chi^2 = 38.46$ ), but there was no significant difference found regarding house cleaning ( $\chi^2 = 8.97$ ). It can be concluded from the study that there is a definite change in behavior of the students, but still, some of them need to understand the value of keeping the environment clean and to throw the garbage in particular bin allotted for the purpose, the change in attitude is surely one of the reasons in decreasing communicable diseases caused due to dirty surroundings. The findings revealed that 99.5% of the sample population are using toilet for early morning defecation; thus, it can be fairly concluded that the region is said to be ODF.

**Keywords:** Attitude, Awareness, Cleanliness, Open Defecation Free, School Students, Swachh Bharat Abhiyan.

## 1. INTRODUCTION

India is transforming toward cleanliness. In the vast field of physical education, sociology is one of the part to understand and to gain knowledge about the society and environment, as per the need of era, especially in India where several diseases are spreading due to unhealthy environment and poor socioeconomical background which affect the health and fitness of the citizens. Thus, keeping all the aspects in mind Swachh Bharat Abhiyan (SBA) was announced by honorable P.M. Narendra Modi, the main aim is to build the toilets in each and every home around India which in other terms also stated as open defecation free (ODF) India, and other is to keep our environment clean. The mission of dedicating a Swachh Bharat to Mahatma Gandhi on his 150<sup>th</sup> birth anniversary has a great impact in many aspects, as per the report of UNICEF in 2017 with lives

and time Indian families in ODF villages save 50,000 Rs./year on account of medical cost by avoiding several medication, according to the report of the WHO in 2018 over 3 lakh lives saved by avoiding diarrheal deaths, again the results of UNICEF report in 2019 showed that there were 7.55 million full-time equivalent jobs created between October 2014 and February 2019. All of these impacts are the result of the innovative idea and it is execution from the Ministry of Drinking Water and Sanitation in collaboration with Ministry of Urban Development.

With the help of this study attitude of school students would be revealed against the cleanliness which may further helpful to find out the effect on their health and fitness by comparing the data from the hospital entries of patients for related diseases such as diarrhea and typhoid. Attitude according to the dictionary defines as

“a feeling, emotion, or mental state with regard to a fact or state.” For the study, “attitude” stands for the feelings of said students for cleanliness and the cleanliness campaign called SBA.

### 1.1. Purpose of the Study

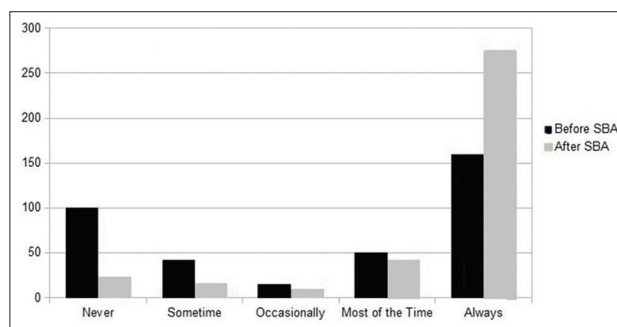
The prime purpose of this study was to investigate the attitude and awareness toward cleanliness with regards to SBA of school students of Ujjain region and to determine the impact of the SBA on those students who are already under the basic learning stage of their life.

## 2. METHODOLOGY

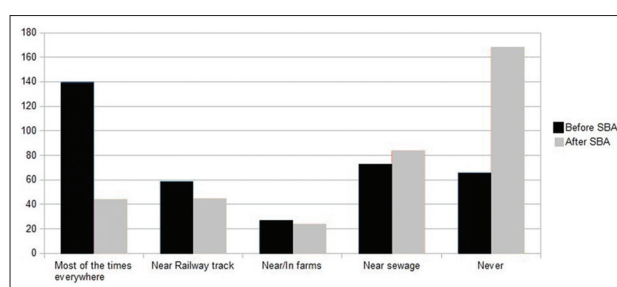
For this study, of 365 subjects the majority of students were from four school, i.e., Oxford Junior College, Nalanda Academy, Kalidas Montessori Senior Secondary School, and Ujjain Public School and the rest minority were from other school and private coaching classes from the area which somehow did not allow to conduct the survey in their school; all the students were within the age group of 10–16 years. Selection was done by employing multi-stage cluster sampling method. The scholar personally visited and approached several schools and coaching classes, the data pertaining to this study were collected from the students by administering the questionnaire, before distributing the questionnaire purpose of the study and procedure for filling up the questionnaire was clearly explained to the subjects in details so as to enable the respondent to give correct and reliable information. The responses given by the respondents against the options given in the questionnaire were arranged in a table for further calculation to test the hypothesis, the total number of responses was calculated on the percentage basis and to find out the significance of difference Chi-square statistical technique was employed for each question. Observation of cleanliness on streets and societies also done through photography and videography.

## 3. RESULTS

The findings from the analysis show that 343 students (93.97%) of 365 are aware of SBA; still, after the Abhiyan 53.98%, students witnessed visible feces which is comparatively less than feces visibility before SBA (i.e., 81.92%) in the environment. The significant difference was found among the availability and throwing waste material in dry and wet bin ( $\chi^2=160.88$ ), and even if no one will come to collect the garbage,



**Figure 1:** Responses of having separate dustbin for wet and dry wastage at home



**Figure 2:** Responses of observation of any visible feces in the environment/any public or open area

86.84% of the selected sample will dump the garbage in the waste container provided by municipality for the area. The significant difference is observed for using paper/cloth carry bags ( $\chi^2=82.78$ ) instead of plastic carry bags ( $\chi^2=84.78$ ). The significant difference is observed for washing hands before and after meals ( $\chi^2=20.66$ ) and after defecation ( $\chi^2=16.33$ ). The significant difference is observed in terms of cleaning the surrounding area of house ( $\chi^2=38.46$ ), but no significant difference is found regarding house cleaning ( $\chi^2=8.97$ ).

## 4. DISCUSSION

As a result showed the positive attitude of the greater percentage of the students toward SBA, it may be attributed due to the fact that in this Abhiyan media and celebrities played an important role in the promotion as well as to spread awareness all around the country. Several steps and disciplined routine were announced for offices, hospitals, schools, organizations, and municipalities. To keep the surroundings neat and clean and the appreciation was given for the deserving ones by the government and PM Modi himself through social media. The future depends on the youth and this study focuses on the school students who will decide the fate of the country. Cleanliness should be the attitude of the school students to build up a healthy and hygienic

environment so as to minimize the health hazards and diseases in society. Some questionnaire came with suggestions about the food left after the meal was not thrown in the dustbin rather give it to street animals. About street animals and especially pet roaming around with their owners spread feces anywhere which also causes unhygienic environment and chaos. Another is the status of public toilets which are still not up to the mark; citizens have to understand their responsibility to keep it clean at least by flush after using it.

## 5. CONCLUSION

It can be concluded that the attitude of students toward cleaning is positive which is a very good sign of emerging youth toward cleanliness; but still, there are some students who are not completely aware of the Abhiyan such as where to throw the garbage, segregation of waste in separate dry and wet bins. About using paper/cloth carry bags and avoiding plastic carry bags during shopping and for another purpose. Recognizing

the delimitations of the study on the basis of statistical findings, it may be fairly concluded that to make the environment clean, hygienic, and healthy still further steps to be taken up for educating the remaining citizens.

## REFERENCES

- Patric, A.S. The performance of rural and urban areas in the Swachh Survekshan survey: An analysis. *Int J Res Anal Rev*, 2019, 6(1), 290-292.
- Verma, L., and Vanshika. Assessment of impact of Swachh Bharat Abhiyan on managers: A cross-sectional study. *Int J Home Sci*, 2018, 4(3), 198-201.
- Kumar, N. A study of the awareness and attitude regarding the Swachh Bharat Abhiyan in class 9 of St. Francis D'assisi high school, Mumbai. *English Marathi Q*, 2017, 6(3), 27-36.
- Suthar, P., Joshi, N.K., and Joshi, V. Study on the perception of Swachh Bharat Abhiyan and Attitude towards cleanliness among the residents of urban Jodhpur. *J Family Med Prim Care*, 2019, 8(10), 3136-3139.
- Available from: <http://www.sbm.gov.in>.

# Effect of Interval Training on Selected Physical Fitness Variables among Intercollegiate Women Athletes, Visakhapatnam at Andhra Pradesh

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## ABSTRACT

The purpose of the study was to find out the effect of interval training on selected physical fitness variables among intercollegiate women athletes. A pretest-posttest randomized group design was used for this study. The randomly selected 40 intercollegiate women athletes were divided into two groups randomly consisting of 20 women athletes in each group. Before the training, pre-test was taken for all the groups on selected physical fitness variables. The control group did not undergo any type of training. The experimental group was provided with interval training for 12 weeks. At the end of 12 weeks interval, training post-test was conducted on selected variables. The differences between the initial and final scores were considered as the effect of interval training among women athletes. To statistically significant, the obtained data were subjected to statistical treatment using ANCOVA. In all cases, 0.05 was fixed to test the hypothesis of this study.

**Keywords:** Interval training, Physical fitness variables intercollegiate athletes.

## 1. INTRODUCTION

The ancient philosopher Aristotle of Greece proclaimed the quality of people, quoted by Bucher as follows: "The body is the temple of the soul and to reach harmony of body, mind, and spirit, the body must be physically fit." The efficiency of the human body depends on many factors. With the enhanced status of sports in society, the provision of sports training has become very important although the need for competent training has long been recognized.

### 1.1. Training

In general usage, the term "training" is used to denote different things. In the broad sense, training today is used to mean any organized instruction whose aim is to increase man's physical psychological, intellectual, or mechanical performance rapidly. In the field of sports, we speak of training, in the sense of preparing sportsman for the highest levels of performance. The training is a process of preparing an individual for any event or

an activity or job. Training for competitive sports is particularly effective way of developing the personality.

### 1.2. Sports Training

Sports training is a program of exercise designed to improve the skills and to increase the energy capacity of an athlete for a particular event, therefore, training is essential for the development of physical fitness components (William and Sperry, 1976). Sports training is the process of sports protection based on scientific and pedagogical principles for higher performance (Singh, 1991).

### 1.3. Interval Training

In 1956 Olympic Games at Melbourne, four athletes created a new Olympic record in 800 m and nine athletes in 1500 m race. This record-breaking effort in middle distance and many other events has been the recent trend in Olympics and World championships is the scientific training method which was then and is



now being adopted as “interval training” specific to each sport/event. In interval training, the aims of athlete are to run a particular distance, 5, 10, or 15 times at the same speed and time. The interval in between each run should also be almost the same and the athlete must learn to judge the speed of run.

#### **1.4. Athletes**

Athletics is one of the most popular sports around the world. The events are the oldest form of organized sports and are associated with the simplest physical activities running, throwing a stone, and surmounting an obstacle. These activities gradually evolved into sports events such as running, jumping, and throwing events. Athletics is one of the purest of all sports, relying solely on the strength of the human body rather than technological implements to improve performances. Athletics is divided into two main categories; events that take place inside the stadium and events that take place outside the stadium such as Marathon and road walk ([www.athens2004.com](http://www.athens2004.com)).

#### **1.5. Physical Fitness**

Fitness is a term, which is often used as synonyms to health in a limited manner. Fitness denotes different facts of health. The term fitness is the capacity of the individual to live and function effectively, purposefully, here, and now to meet confidently the problems and crises which are among his expectations. Fitness is a state which characterizes the degree to which a person is able to function. Ability to function depends on the physical, mental, emotional, social, and spiritual components as fitness, all of which are related to each other and are mentally independent. This may be referred to as total fitness (Uppal, 2004). The physical fitness plays a key role in the performance. An individual physical fitness and performances depend in the coordinative functions of the various factors such as physical, physiological abilities, nutrition, technique, tactics, physique, body size, and composition. Physical fitness is the human body what fine-tuning is to an engine. It enables us to perform up to our potential. Fitness can be described as a condition that helps us for better look, pleasant feel, and do our best. More specifically, it is “the ability to perform daily tasks vigorously and alertly, with energy left over for enjoying leisure-time activities and meeting emergency demands. It is the ability to endure, to bear up, to withstand stress, to carry on in circumstances where an unfit person could not continue, and is a major basis for good health and well-being.” Physical fitness

involves the performance of the heart and lungs and the muscles of the body. And since what we do with our bodies also affects what we can do with our minds, fitness influences to some degree qualities such as mental alertness and emotional stability.

As any one undertakes his fitness program, it is important to remember that fitness is an individual quality that differs from person to person. It is influenced by age, sex, heredity, personal habits, exercise and eating habits, diet, attitude toward life, anxiety, tension and stress, values of physical fitness, institutional curricular, and states policy/legislation. One cannot do anything about the first three factors, however, it is within his power to change and improve the others were needed (Uppal, 2004).

To find out the effect of interval training among intercollegiate women athlete’s, flexibility was selected for this study as physical fitness variables.

#### **1.6. Training**

Training has been explained as a program of exercise designed to improve the skills and increase the capacities as resting heart rate.

#### **1.7. Interval Training**

Fox and Mathews (1974) defined interval training as a system of conditioning or training consisting of a series of repeated bouts of exercise alternated with periods of relief, light or mild exercise usually constitutes the relief period.

#### **1.8. Flexibility**

Flexibility is defined as the ability of an individual to move the body and its parts through as wide range of motion as possible without undue strain to the articulations and muscles attachments (Singh, 1991).

#### **1.9. Need of the Study**

The training process acts as a means of improvement of sports performance. To ensure fast development of sports performance in every individual, the physical education teacher, the coaches, and the instructors must possess a thorough knowledge of the improvement aspects of sports training. Training demands correct understanding and realization of the sportsman’s strength, capacity, and weakness, so planned and formulated that the strong points are further encouraged and developed and his weakness is discriminated and eliminated.

Interval training improves the functions of the circulatory, the respiratory, and the muscle system while practice is largely aimed at improving the control of muscle activity by the nervous system. In this research, the investigator was interested to find out the effect of interval training on selected physical and physiological variables among intercollegiate women athletes.

### 1.10. Objectives of the Study

The study aimed at finding out the physical fitness levels of flexibility capacity of intercollegiate level women athletes Andhra University, Visakhapatnam at Andhra Pradesh. The study further aimed at formulating suitable interval training for the benefit of women athletes and to find out the effect of the same on selected physical variables of intercollegiate level women athletes.

### 1.11. Statement of the Problem

The purpose of the study was to find out the effect of interval training on selected physical variables among intercollegiate women athletes Andhra University, Visakhapatnam at Andhra Pradesh.

### 1.12. Hypothesis

It was hypothesized that:

1. There would be no significant differences due to interval training on physical fitness variables such as flexibility among intercollegiate women athletes.

### 1.13. Significance of the Study

The following are the significance of the study:

1. This study may provide suitable interval training programs to help women athletes to improve fitness and thereby the performance in competition
2. This study will help to find out that interval training programs are essential to develop athletes' physical fitness levels
3. The study is significant in suggesting interval training that would help in maintaining and improving body weight and shape
4. This study will provide additional knowledge to the research scholars on interval training and its effect on physical variables of women athletes.

### 1.14. Limitations

This study was limited in the following respects.

1. The study was conducted on intercollegiate level women athletes only

2. The diet, atmosphere, and temperature were not taken into consideration
3. The performance and skills of the subjects and their background experience in the field of sports and games were not taken into consideration
4. The psychological and nutritional status of the subjects were not measured in the study, and
5. The subjects were allowed to do their routine work of the college throughout the experiment period.

### 1.15. Delimitations

This study was delimited in the following respects.

1. This study was conducted on 40 intercollegiate women athletes from different colleges in Visakhapatnam, Andhra Pradesh
2. The selected interval training exercises were applied to the subjects in this study
3. The experiment was conducted for a period of 12 weeks
4. This study was conducted on the physical variables flexibility.

## 2. METHODOLOGY

This paper describes the methodology and procedure adopted. This includes the selection of subjects, selection of variables, research design, procedure for administering the test items, selection of test items, collection of data, and statistical technique employed for analyzing the data.

The purpose of the study was to find out the effect of interval training on selected physical variables among intercollegiate women athletes, Andhra University, Visakhapatnam at Andhra Pradesh.

### 2.1. Selection of Subjects

The subjects taken for the present study were 40 intercollegiate level women athletes from different colleges in Andhra University, Visakhapatnam at Andhra Pradesh, who represented their colleges in intercollegiate level athletic meets. The subjects were selected on a random basis and were allotted to two groups (control and experimental groups) by random assignment. The age of the subjects ranged from 19 to 24 years with the mean age of 20.5 years.

### 2.2. Selection of Variables

The investigator reviewed books, journals, and research articles on the effect of interval training on selected

physical and physiological variables and selected the following variables for the purpose of this research.

- Dependent variables: Physical fitness variables
  1. Flexibility
- Independent variable: Twelve weeks interval training.

### 2.3. Experimental Design

The primary responsibility of the investigator is to adopt the appropriate experimental methodology before proceeding with data collection (Clarke and Clarke, 1984).

A pretest-posttest randomized group design was used for this study. The randomly selected 40 intercollegiate women athletes were divided into two groups randomly consisting of 20 women athletes in each group. Before the training, pre-test was taken for all the groups on selected physical fitness variables. The control group did not undergo any type of training. The experimental group was provided with interval training for 12 weeks. At the end of 12 weeks interval, training post-test was conducted on selected variables. The differences between the initial and final scores were considered as the effect of interval training among women athletes. To statistically significant, the obtained data were subjected to statistical treatment using ANCOVA. In all cases, 0.05 was fixed to test the hypothesis of this study.

### 2.4. Test Administration and Collection of Data

The investigator explained the objectives of the test to the subject before the test.

#### 2.4.1. Flexibility (*sit and reach*)

- Purpose: To estimate the trunk flexibility
- Equipment: Yardstick and measuring steel tape
- Procedure: Place the yardstick on the floor and put an 18 inch piece of tape across the 15 inch mark on the yardstick. The tape should secure the yardstick to the floor. The subject sits with the O end of the yardstick between the legs. The subject heel should almost touch the tape at the 15 inch mark and be about 12 inch apart with the legs held straight. The subject bends forward slowly and reaches with parallel hand as far as possible and touches the yardstick. The subject should hold this reach long enough for the distance to be recorded
- Scoring: The best score recorded out of the three trials was the score in flexibility.

### 2.5. Training Schedule of Interval Training: Warming Up Segment

The subjects before the training sessions performed a 10 min warming up session consisting of 200 m jogging balanced combination of static stretches as smoothly controlled rhythmic calisthenics and limbering exercises.

After the warm-up, interval training was given for 20 min. The following exercises were designed to be executed as interval training group. It was based on progressive loading. The subject was asked to ran;

1. 60 m within 8 s for 10 repetitions and with 10 s recovery for each repetition
2. 100 m within 14 s for 8 repetitions and with 8 s recovery
3. 140 m within 20 s for 6 repetitions and with 6 s recovery
4. 180 m within 30 s for 4 repetitions with 4 s recovery.

Both the training sessions took approximately 30 min each.

#### 2.5.1. Cooldown segment

The interval training sessions concluded with continued light aerobic activities such as walking, standing leg kicks, and static stretches to prevent pooling of blood in the lower extremities immediately after the endurance phase and lower the heart rate gradually toward normal to promote faster removal of metabolic waste products from the muscles. Caution was taken to avoid bent-over stretches for long periods to avoid dizziness.

## 3. RESULTS AND DISCUSSION

### 3.1. Computation of Analysis of Covariance (ANCOVA)

#### 3.1.1. Results on flexibility

The initial and final means on the interval training group and control group on flexibility through ANCOVA are presented in Table 1.

The pre-test mean on the experimental group was 14.30 and the control group was 15.10 and the obtained  $F=1.93$  was less than the required  $F=4.10$  to be significant. Hence, it was not significant and the groups were equal at initial stage.

The comparison of post-test mean, the experimental group 18.45 and the control group 16.10 proved to be

**Table 1: Analysis of covariance results on physical fitness variable flexibility due to interval training**

	Experimental group	Control	Source of variance	Sum of squares	Df	Mean squares	Obtained F
Pre-test mean	14.30	15.10	Between	6.40	1	6.40	1.93
			Within	126.00	38	3.32	
Post-test mean	18.45	16.10	Between	55.23	1	55.23	14.30*
			Within	146.75	38	3.86	
Adjusted post-test mean	18.62	15.93	Between	69.37	1	69.37	20.93*
			Within	122.65	37	3.31	
Mean diff.	4.15	1.00					

Table F-ratio at 0.05 level of confidence for 1 and 38 (df)=4.10, 1 and 37(df)=4.11. \*Significant at 0.05 level

significant at 0.05 level as the obtained  $F=14.30$  was greater than the required table  $F=4.10$  to be significant at 0.05 level.

Taking into consideration, the initial and final mean values adjusted post-test means were calculated and the obtained  $F=20.93$  was greater than the required  $F$ -value to be significant 4.11, and hence, there was significant difference.

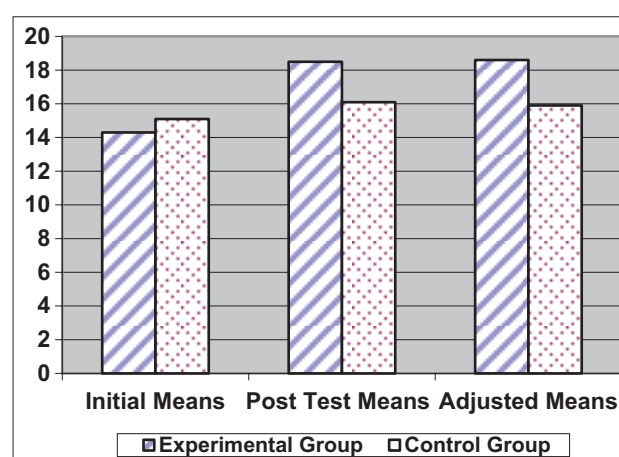
Thus, it was proved that the interval training group gained mean difference of 4.15 which was due to interval training given to intercollegiate women athletes, and the difference was found to be significant at 0.05 level.

The initial, post, and adjusted means values of the experimental and control groups on flexibility are presented in Figure 1 for better understanding of the results of this study.

### 3.2. Discussion on Flexibility

The results presented in Table 1 proved that the flexibility has not been significantly improved among the control group, as they did not undergo interval training experimental treatment. However, the 12 weeks interval training given to the experimental group significantly improved variable flexibility among intercollegiate women athletes. The statistical mean difference between the initial test and final test of the experimental group stood at 18.62 and the control group stood at 15.93. Moreover, the differences were found to be significant at 0.05 level as the obtained  $F=20.93$  was greater than the required table  $F=4.11$  to be significant at 0.05 level.

Thus, it was proved that interval training was significantly better than the control group in improving flexibility of the intercollegiate women athletes.



**Figure 1:** Bar diagram showing initial, final, and adjusted means on flexibility of the experimental and control groups

## 4. DISCUSSION ON HYPOTHESIS

For the purpose of the study, it was hypothesized that:

There would be significant differences due to interval training on physical fitness variables such as flexibility among intercollegiate women athletes.

The results presented in Table 1 on the effects of interval training on physical fitness variables, flexibility proved that the obtained  $F=20.93$  was greater than the required  $F=4.11$  to be significant at 0.05 level. This proved those selected physical fitness variables, flexibility was significantly improved due to interval training among intercollegiate women athletes. The formulated hypothesis No. 1 that there would be significant differences due to interval training on physical fitness variables such as flexibility among intercollegiate women athletes was accepted at 0.05 level.

## 5. FINDINGS

The results proved that selected physical fitness variables, flexibility was significantly beneficially altered due to 12 weeks interval training among intercollegiate women athletes.

## 6. CONCLUSIONS

Within the limitations and delimitations of the study, the following conclusions were drawn:

It was concluded that the 12 weeks interval training significantly improved physical fitness variable, flexibility among intercollegiate women athletes.

## REFERENCES

1. Anthony, A.A. *Development Condition for Physical Education and Athletes*. St. Louis: The C.V. Mosby Company; 1992. p. 33.
2. Willgoose, C.E. *Evaluation in Health Education and Physical Education*. New York: McGraw-Hill Book Co.; 1961. p. 16.
3. Clarke, D.H., and Clarke, H.H. *Research Process in Physical Education, Recreation and Health*. Englewood Cliffs, N.J: Prentice Hall, Inc.; 1970. p. 39.
4. Clarke, D.H., and Clarke, H.H. *Research Processes in Physical Education*. 2<sup>nd</sup> ed. Englewood Cliffs, N.J: Prentice Hall Inc.; 1984. p. 246.
5. Harre, D. *Principles of Sports Training*. Berlin: Sportverlag; 1982.
6. Fox, E.L., and Mathews, D.K. *Interval Training*. London: W.B. Saunders Company; 1974. p. 36.
7. Fox, E.L. *Sports Psychology*. Philadelphia, PA: Saunders College Publishers; 1984. p. 401.
8. Hooks, G. *Application of Weight Training to Athletes*. Englewood Cliffs, N.J: Prentice Hall Inc.; 1962. p. 1.
9. Bresnahan, G.T., and Tottle, W.W. *Track and Field Athletics*. 3<sup>rd</sup> ed. St. Louis: The C.V. Mosby Company; 1950.
10. Green, S., and Dowson, B. *Measurement of Aerobic Capacity in Humans*. Australia: University of Western Australia; 1999.



# Effect of Yogic Exercises on Breath-holding Capacity of Undergraduate Male Students

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## ABSTRACT

This study was designed to find out the effect of selected yogic exercises on breath-holding capacity of undergraduate male students. To achieve this purpose, a total of sixty ( $n = 60$ ) undergraduate male students were selected. All subjects were healthy having no physical ailment and their age ranged from 18 to 22 years. The selected subjects were randomly divided into two equal groups. Group I served as the experimental group (EG) ( $n = 30$ ) and Group II was treated a control group (CG) ( $n = 30$ ). The dependent variables selected for this study positive breath-holding time and negative breath-holding time (NBHT) were measured at baseline and after 6 weeks of training protocol. Random group pre-test and post-test design was used as an experimental design. The collected data were statistically analyzed using Student's  $t$ -test. The result showed a significant ( $P < 0.01$ ) improvement in both positive and NBHT of the EG and there was no significant change which was recorded in the CG on positive and NBHT. It concludes that even 6-week yogic exercises are effective enough to enhance breath-holding capacity of undergraduate male subjects.

**Keywords:** Breath-holding capacity, Negative breath-holding time, Positive breath-holding time, Yogic exercises.

## 1. INTRODUCTION

Yoga is a psychosomatic spiritual discipline for achieving union and harmony between our mind, body, and soul and the ultimate union of our individual consciousness with the Universal consciousness (Madanmohan *et al.*, 2008). From ancient times, people are doing yoga without knowing its significance in health. In the modern era, due to the poor lifestyle and the environmental pollution, the respiratory health status of the people has been decreased. Especially in case of students there are so many health issues are reported, cardiorespiratory disorders are one of the major health issues among them (Singh and Galay, 2020). The air we breathe is our passport to life. We can live a few days without water, several days without food, but the moment oxygen is taken away from us, our physical bodies immediately begin to pass away. It, therefore, stands to reason that not only is breathing the most essential element of life but also that breathing correctly will enhance the overall quality of your life (Shaw, 2004). The act of controlling one's breath for the purpose of restoring or enhancing one's health has been practiced for thousands of years among Eastern cultures. For example, yogic breathing (pranayama) is a well-known ancient practice of controlled breathing, often performed in conjunction

with meditation or yoga, for its spiritual and perceived health-enhancing effects (Brown and Gerbarg, 2005). The beneficial effects of different yogic exercises are well-reported and have a sound scientific basis (Lakhera *et al.*, 1984; Joshi and Gokhale, 1992). Many studies show that yoga benefits many aspects of respiratory health. In the present scenario, Yoga has become both physical activity and spiritual practice. Yogic practice is a key to good health (Gopal *et al.*, 1973; Gupta and Sawane, 2012); hence, yogic exercises are important for improving the physical and physiological health of everyone (Udupa *et al.*, 1975). Yoga is a mind-body activity that involves moving through a series of body poses and breathing exercises that can improve strength, flexibility, balance, and lung functioning. Therefore, this study is designed to scrutinize the effect of yogic exercises on positive breath-holding time (PBHT) and negative breath-holding time (NBHT) of undergraduate male students.

## 2. METHODOLOGY

To achieve this purpose, a total of sixty ( $n = 60$ ) undergraduate male students were purposively selected as subjects. All subjects were fit and healthy; their age

ranged from 18 to 22 years. The selected subjects were randomly assigned into two groups: Experimental group (EG) and control group (CG). Subjects of the EG ( $n = 30$ ) practiced yogic exercises for 6 weeks and subjects of CG ( $n = 30$ ) were not allowed to participate in any special yogic exercises except their routine. The dependent variable selected for this study, breath-holding capacity, was recorded through PBHT and NBHT with the help of nostril clip method. All the subjects were tested at baseline (pre-test) and after 6 weeks of yogic exercises. Random group pre-test and post-test design was used as an experimental design. Both groups were recorded for PBHT and NBHT at baseline and after the 6 weeks of the training period.

### 2.1. Training Protocol

The subjects in the EG participated in the yogic exercise training program for 6 days in a week except Sunday for 6 weeks. The yogic exercises period was approximately 50 min, including warming up and cool down exercises. The package of exercises such as Surya Namaskar, asanas (trikonasana, sarvangasana, ustrasana, setubandha, janusirsasana, padottanasana, paschimottanasana, viparitarakani, and savasana), pranayama (anulom vilom, nadi shodhana, ujjayi, agnisara, sheetali, sheetkari, bhasrika, kapalbhati, and bhramari pranayama), meditation, and mantra chanting were given in the morning session between 6:30 am and 7:30 am. More emphasis of the yogic session was given on the pranayama.

### 2.2. Statistical Analysis

Statistical analyses were performed using the statistical package for the social sciences 23.0 version. Data are expressed as the mean and standard deviation (SD). A dependent  $t$ -test was utilized to compare the means of the pre- and post-test. The level of significance was set at 0.01 level of significance.

## 3. RESULTS

The analysis of the dependent  $t$ -test on the data obtained from the experimental and CG for PBHT and NBHT is analyzed and presented in Tables 1 and 2, respectively.

Table 1 shows the result of the comparison of PBHT among experimental and CG undergraduate male students. The mean of 30 pre- and post-test of EG undergraduate male students is 52.9 and 65.03 with SD of 14.19 and 14.57, respectively. Further,  $t$ -value is 3.27, mean and SD of PBHT on the other sample, i.e., 30 pre- and post-test of the CG undergraduate male students are 41.48, 42.89, 7.51, and 8.0, respectively. Further,  $t$ -value of CG is 0.7.

$P$ -value of both groups reveals that there is a significant difference between the pre- and post-test mean scores of EG on PBHT as the obtained  $P = 0.000$  is  $<0.01$ . Whereas in the case of CG the obtained  $P = 0.242$  is  $>0.01$  level. Thus, it is concluded that due to the effect of 6 weeks of yogic exercises, the PBHT of EG increased

**Table 1:** Comparison of positive breath-holding time among experimental and control group undergraduate male students

Group	$n$	Test	Mean	Standard deviation	Standard error of the mean	$t$ -value	$P$ -value
Experimental group	30	Pre-test	52.9	14.19	2.59	3.27	0.000*
		Post-test	65.03	14.57	2.66		
Control group	30	Pre-test	41.48	7.51	1.37	0.7	0.242
		Post-test	42.89	8.0	1.46		

\*Significant at 0.01 level ( $P < 0.01$ )

**Table 2:** Comparison of negative breath-holding time among experimental and control group undergraduate male students

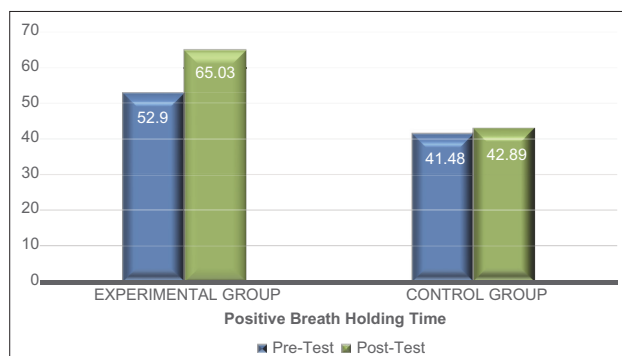
Group	$n$	Test	Mean	Standard deviation	Standard error of the mean	$t$ -value	$P$ -value
Experimental group	30	Pre-test	41.37	10.56	1.93	4.6	0.000*
		Post-test	53.89	10.51	1.92		
Control group	30	Pre-test	43.89	9.74	1.78	0.97	0.168
		Post-test	46.51	11.18	2.04		

\*Significant at 0.01 level ( $P < 0.01$ )

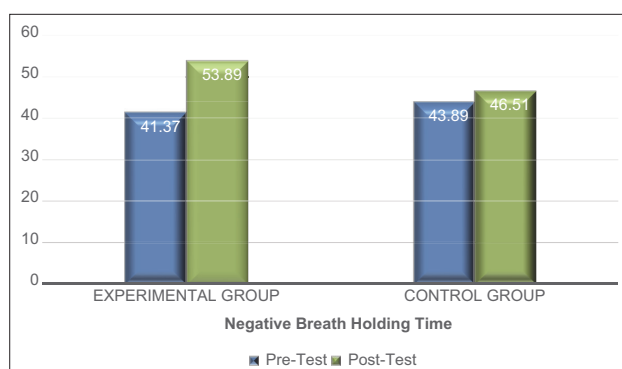
significantly. The pre-test and post-test mean scores of the EG and CG for PBHT are graphically presented in Figure 1.

Table 2 shows the result of the comparison of NBHT among experimental and CG undergraduate male students. The mean of 30 pre- and post-test of EG undergraduate male students is 41.37 and 53.89 with SD of 10.56 and 10.51, respectively. Further,  $t$ -value is 4.6, mean and SD of NBHT on the other sample, i.e., 30 pre- and post-test of the CG undergraduate male students are 43.89, 46.51, 9.74, and 11.18, respectively. Further,  $t$ -value of CG is 0.97.

$P$ -value of both groups reveals that there is a significant difference between the pre- and post-test mean scores of experimental and CG on NBHT as the obtained  $P$ -value of EG 0.000 is  $<0.01$  level. Whereas in the case of CG,  $P = 0.168$  is  $>0.01$  level. Thus, it is concluded that there is a significant effect of 6 weeks yogic exercises on NBHT. The pre-test and post-test mean scores of the EG and CG for NBHT are graphically presented in Figure 2.



**Figure 1:** Mean values of pre-test and post-test on the positive breath-holding time



**Figure 2:** Mean values of pre-test and post-test on the negative breath-holding time

## 4. CONCLUSIONS

In summary, the present work manifests an overriding endeavor to explore the effects of yogic exercises on breath-holding capacity of undergraduate male students. The result showed a significant ( $P < 0.01$ ) improvement in positive and NBHT of the EG, whereas there was no significant change which was recorded in the CG on positive and NBHT. It concludes that even 6-week yogic exercises are effective enough to enhance the breath-holding capacity of undergraduate male students. The daily practice of yogic exercises may help to improve respiratory health; thus, yogic exercises should be a part of the lifestyle of the undergraduate male students.

## REFERENCES

- Brown, R.P., and Gerbarg, P.L. Sudarshan Kriya yogic breathing in the treatment of stress, anxiety, and depression: Part I-neurophysiologic model. *J Altern Complement Med*, 2005, 11(1), 189-201.
- Gopal, K.S., Bhatnagar, O.P., Subramanian, N., and Nishith, S.D. Effect of yogasanas and pranayamas on blood pressure, pulse rate and respiratory functions. *Indian J Physiol Pharmacol*, 1973, 17(3), 273-276.
- Gupta, S.S., and Sawane, M.V. A comparative study of the effects of yoga and swimming on pulmonary functions in sedentary subjects. *Int J Yoga*, 2012, 5(2), 128-133.
- Joshi, L.N., and Gokhale, L.V. Effect of short term pranayama practice on breathing rate and ventilator functions of lung. *Indian J Physiol Pharmacol*, 1992, 36(2), 105-108.
- Lakhera, S.C., Mathew, L., Rastogi, S.K., and Sen-Gupta, J. Pulmonary function of Indian athletes and sportsmen: Comparison with American athletes. *Indian J Physiol Pharmacol*, 1984, 28(3), 187-194.
- Madanmohan, Mahadevan, S.K., Balakrishnan, S., Gopalakrishnan, M., and Prakash, E.S. Effect of 6 weeks yoga training on weight loss following step test, respiratory pressures, handgrip strength and handgrip endurance in young healthy subjects. *Indian J Physiol Pharmacol*, 2008, 52(2), 164-170.
- Shaw, S. *The Little Book of Yoga Breathing: Pranayama Made Easy*. Boston, MA: Weiser Books; 2004.
- Singh, J., and Galay, V.P. Effect of yogic exercises on hemoglobin of male soccer players. In: Poonia, R., (ed). *Physical Education and Sports Science*. New Delhi, India: Khel Sahitya Kendra; 2020. p. 34-37.
- Udupa, K.N., Singh, R.H., and Settiwar, R.M. Physiological and biochemical studies on the effect of yogic and certain other exercises. *Indian J Med Res*, 1975, 63(4), 620-624.

# Effect of Swiss Ball Training on Selected Motor Variables among Junior Boys

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## ABSTRACT

The purpose of the study was to determine the effect of Swiss ball training on selected motor variables on junior boys. The subjects were 40 boys' students of the Crescent English Medium School, Kannur. The age of the subjects was ranged from 13 to 14 years. The selected students were further divided at random into two groups, namely, Swiss ball training and control groups. The sample was considered as the true representative of the population. The number of each group was ten. To accomplish the purpose of this study, the experimental design, the subjects, the criterion variables, and test of measuring them and their variables and methods of applying them have been systematically presented. Experimental groups were given 12 weeks Swiss ball training and the control groups were not allowed to participate in any of the training programs. The training program was given 3 days a week for 45 min. The experimental group was tested before and after the training on motor variables such as flexibility and core strength. The data were computed statistically using the dependent "*t*"-test.

**Keywords:** Motor variables, Swiss ball.

## 1. INTRODUCTION

Swiss ball is also known as an exercise ball. It is most often used in physical therapy, athletic training, and exercise. It can also be used for weight training. A primary benefit of exercising with Swiss ball as opposed to exercising directly on a hard flat surface is that the body responds to the instability of the ball to remain balanced, engaging many more muscles. The best equipment for improving core stability is the stability ball, also called the exercise ball, balance ball, or Swiss ball. The biggest benefit to training using ball exercises is that they are very effective at targeting core muscles, those muscles that are essential for stability and good posture but are often overlooked when exercising with fixed position equipment.

We know that for important in any games or sport, its techniques should be first mastered. For improving the techniques to work on it, it is very important to analyze it know the motor fitness variables of the technique which must be given due attention to improving that particular technique. The physical fitness is an entire human organism ability to function efficiently and effectively. It is made up of components which contribute to total quality of life. Physical fitness is associated with a

personal ability to work efficiently and enjoy leisure time to be healthy; the optimal physical fitness is not possible without regular exercise. The physical fitness is the sum of five motor abilities, namely, flexibility, speed, endurance, strength, and coordinative abilities and their complex from such as strength endurance, maximum strength, explosive strength, maximum strength, and agility which are the basic prerequisites of human motor action.

## 2. METHODOLOGY

The study was designed to find out the effect of Swiss ball training on selected motor variables among junior boys. Forty boys' students of the Crescent English Medium School, Kannur, and their age ranged from 13 to 14 years. The subjects were equally divided into two groups, namely, control and experimental groups with 20 subjects in each group. The control group did not undergo any training program rather than their daily routine work. The experimental group was treated with Swiss ball training. The training was given for 12 weeks. The results of pre-test and post-test were compared using the dependent "*t*"-test. The subjects living condition and lifestyle were not taken into consideration for this study.

**Table 1: *t*-ratio of the experimental and control group on flexibility**

Groups	Pre-test			Post-test			sDM	Obtained “ <i>t</i> ” value	Tabulated “ <i>t</i> ” value
	N	Mean	SD	N	Mean	SD			
Experimental	20	3.15	1.52	20	4.84	1.40	1.7	0.12	7.59*
Control	20	1	3.08	20	.95	2.74	0.05	0.34	0.37

\*“*t*” value required for significant (0.05 level of confidence) is 2.101

**Table 2: *t*-ratio of the experimental and control group on core strength**

Groups	Pre-test			Post-test			DM	sDM	Obtained “ <i>t</i> ” value	Tabulated “ <i>t</i> ” value
	N	Mean	SD	N	Mean	SD				
Experimental	20	30.50	7.13	20	35.70	7.66	5.20	0.53	7.01	2.101
Control	20	22.15	6.63	20	21.05	6.52	1.1	.11	1.68	

\*“*t*” value required for significant (0.05 level of confidence) is 2.101

#### Independent variables

1.	Experimental Group – I	Yogasana training
2.	Control Group	No training

#### Dependent variables

Physical motor variables		Test
1.	Flexibility	Sit and reach test
2.	Core strength	Sit-ups test

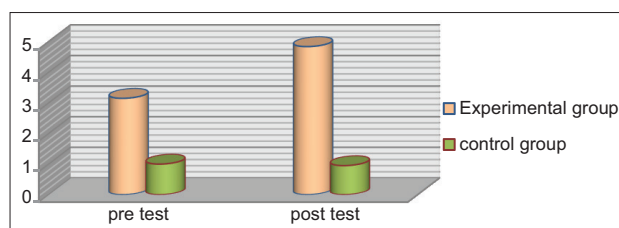
### 3. RESULTS

Table 1 indicates that there was a significant difference between the pre- and post-test performance on flexibility since the calculated “*t*” value of 7.59 is higher than tabulated “*t*” value of 2.101 at 0.05 level of significance with 19 degrees of freedom. In the case of the control group, there was no difference in flexibility.

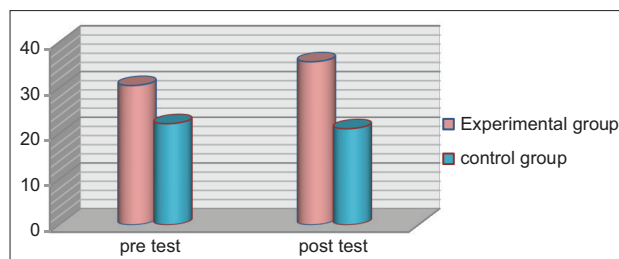
Table 2 indicates that there was a significant difference between the pre and post-test performance on sit-up since the calculated “*t*” value of 7.01 is higher than tabulated “*t*” value of 2.101 at 0.05 level of significance with 19 degrees of freedom. In the case of the control group, there was no difference between the pre- and post-test performance on sit-up.

### 4. DISCUSSION

All the subjects of the experimental groups had undergone 6 weeks of Swiss ball training for 1 h 3 days/week. From the statistical analysis, it is evident that in the case of selected general motor variables, namely, flexibility and core strength have significant changes



**Figure 1: Pre and post mean score of flexibility**



**Figure 2: Pre and post mean score of core strength**

that were noticed after 6 weeks of Swiss ball training. No change was seen in none of the variables in the case of the control group.

### 5. REFERENCES

- Faiz, P.A.A., and Gnanachellam, C.J. Effect of swiss ball training on cardiovascular endurance and abdominal strength of physical education students. *Int J Physiol Nutr Phys Educ*, 2017, 3(1), 1378-1381.
- Palraj, A. Effect of swiss ball training on selected motor fitness variables among kabaddi players. *Int J Recent Res Appl Stud*, 2014, 2(11), 40-42.
- Faigenbaum, A.D., McFarland, J.E., Keiper, F.B., Tevlin, W., Ratamess, N.A., Kang, J., and Hoffman, J.R. Effects of a short-term plyometric and resistance training program on fitness performance in boys age 12 to 15 years. *J Sports Sci Med*, 2007, 6(4), 519-525.



Nagla, E. Effect of swiss ball exercises on some physical and physiological variables and their relationship with kata performance level. *J Phys Educ Sport*, 2011, 11, 56-64.

Stanton, R., Reaburn, P.R., and Humphries, B. The effect of short-term swiss ball training on core stability and running economy. *J Strength Cond Res*, 2004, 18(3), 522-528.

# Effect of Resistance Training Combined with Low-Intensity Vascular Occlusion Training on Leg Muscle Strength and Power in Young Adult Men Soccer Players

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## ABSTRACT

**Background:** Resistance training with vascular occlusion training has been used to enhance muscular fitness. This study aims to find out the effect of resistance training combined with low-intensity vascular occlusion training on leg muscle strength and leg muscle power among young adult men soccer players. **Materials and Methods:** Data were analyzed from 45 young adult men soccer players, which were recruited from the University of Madras affiliated colleges, Chennai, Tamil Nadu. They were stratified into a low-intensity vascular occlusion with resistance training (LI-VORT,  $n = 15$ ;  $20.73 \pm 2.15$  years), low-intensity resistance training without vascular occlusion (LI-RT,  $n = 15$ ;  $21.73 \pm 2.05$  years), and a control group (CON,  $n = 15$ ;  $20.53 \pm 1.84$  years). The LI-VORT and LI-RT received periodized LI-VORT and low-intensity resistance training without vascular occlusion training for 12 weeks. The leg muscle strength and leg muscle explosive power of all the groups were evaluated before and after the training, and the variables were measured by the Leg dynamometer test and vertical jump test. Analysis of covariance (ANCOVA) and Scheffe's *post hoc* analysis were performed to find out the significant mean differences. In all the cases, the level of significance was set at  $P < 0.05$ . **Results:** Following the 12 weeks of structured LI-VORT for LI-VORT and LI-RT without vascular occlusion training for LI-RT groups', the difference was found significantly, whereas no significant difference was found in the CON. **Conclusion:** Conferring to the obtained results, it could conclude that LI-VORT and low-intensity resistance training without vascular occlusion training lead to a significant change in the leg muscle strength and leg muscle explosive power in young adult men soccer players. Although, LI-VORT has relatively more effective in the improvement of leg muscle strength and leg muscle explosive power in young adult men soccer players as compared to low-intensity resistance training without vascular occlusion training and experimental and control (CON) group.

**Keywords:** Leg muscle explosive power, Leg muscle strength, Low-intensity vascular occlusion, Resistance training.

## 1. INTRODUCTION

Soccer is the most favorite and crowd-pleasing sport in the world. More or less 200 million players of all ages and gender, both on amateur and professional levels, play soccer in clubs across the globe (Longo *et al.*, 2012). An exceptional level of soccer performance needs the successful skillfulness in abilities such as the repeated explosive burst, strength, power, kicking, tackling, and their derivatives such as jumping, turning, sprinting, and changing direction speed (Ramirez *et al.*, 2015). To become a successful soccer player, he needs an infinite level

of athleticism. Therefore, resistance training is the backbone of professional athletes and teams these days. Furthermore, researchers are discovering the countless ways that resistance training can be used to improve athletic performance.

### 1.1. Resistance Training

Resistance training is a kind of preparation for the improvement of strength and size of skeletal muscles. It is conditioning that involves the progressive use of a wide range of resistive loads and a variety of training modalities. Resistance training enhances the ability

of the body to perform at a very high force or power outputs for a concise period (Tang *et al.*, 2008).

## 1.2. Vascular Occlusion Training

Occlusion Training is an innovative training approach, whereby resistance exercise or aerobic exercise is performed while a tourniquet is employed to the proximal aspect of the muscle (Scott *et al.*, 2015).

## 2. OBJECTIVES

This study was intended for the following objectives:

- To examine the effect of experimental treatment on leg muscle strength in young adult men soccer players.
- To examine the effect of experimental treatment on leg muscle explosive power in young adult men soccer players.

## 3. MATERIALS AND METHODS

### 3.1. Participants

Forty-five young adult men soccer players, aged 18–25 years of mean age: (LI-VORT,  $n = 15$ ;  $20.73 \pm 2.15$  years), (LI-RT,  $n = 15$ ;  $21.73 \pm 2.05$  years), and (CON,  $n = 15$ ;  $20.53 \pm 1.84$  years), were recruited from the University of Madras affiliated colleges through the verbal message and flyers to participating in the study during the year 2019. All study participants were familiar with the basics of resistance training. Moreover, the participants have completed the Physical Activity Readiness Questionnaire (PAR-Q) to determine each participant's safety or potential risk associated with exercising.

#### 3.1.1. Inclusion and exclusion criteria

Inclusion criteria were college students and soccer players with the capacity to do resistance training and low-intensity vascular occlusion training. Exclusion criteria were excluded hesitation, reluctance, or denial to do resistance training and low-intensity vascular occlusion training.

### 3.2. Experimental Groups, Variables, and Tests

**Table 1: Training groups**

Group	Name
Group I: Experimental	Low-intensity vascular occlusion with resistance training (LI-VORT) ( $n = 15$ ; $20.73 \pm 2.15$ years)
Group II: Experimental	Low-intensity resistance training without vascular occlusion (LI-RT) ( $n = 15$ ; $21.73 \pm 2.05$ years)
Group III: Control	Controlled (no training) (CON) ( $n = 15$ ; $20.53 \pm 1.84$ years)

**Table 2: Selection of tests**

Variables	Test	Measurement
Leg muscle strength	Leg dynamometer test	Kilograms
Leg muscle explosive power	Vertical jump test	Centimeters

### 3.3. Experimental Design

The experimental treatment low-intensity vascular occlusion with resistance training (LI-VORT) and low-intensity resistance training (LI-RT) without vascular occlusion were designated to the experimental groups. The pre-test and post-test random group designs were used in the present study. The participants were randomly assigned with the help of an online program (<https://www.bestrandoms.com>) to the trial (LI-VORT and LI-RT) and control (CON) groups consisting of 15 participants each. Group – I employed into the LI-VORT, Group – II employed into LI-RT without vascular occlusion, and Group – III controlled CON, which had not received any specific exercise or training apart from the regular activities.

### 3.4. Training Program

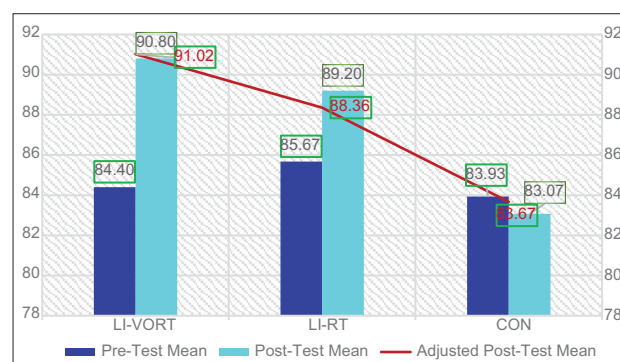
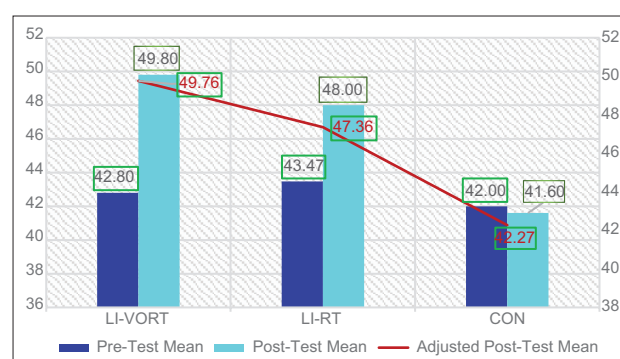
Throughout the training period, the LI-VORT and LI-RT groups underwent LI-VORT and LI-RT without vascular occlusion for 3 days (Monday, Wednesday, and Friday, 48 h rest) per week for 12 weeks. The workout lasted to 75 min/session including dynamic warming up (jogging, banded walk, and elliptical training), lower body foam rolling (quadriceps, hamstring, it band, adductor, gluteus, peroneal, gastrocnemius, TFL, and hips), deadlift (0–3 weeks – 20 kg, 4–6 weeks – 24 kg, 7–9 weeks – 28 kg, and 10–12 weeks – 30 kg), and warming down periods. Participants completed three training sessions per week over 12 weeks (36 sessions). The control (CON) group was instructed not to participate in any strenuous physical exercise and specialized training throughout the training program apart from regular soccer training. The training program was conducted with the help of certified fitness and medical professional during the study.

#### 3.4.1. Vascular occlusion pressure and cuff

A vascular Doppler (vascular Doppler BT-200V) was employed over the tibial artery to analyze the blood pressure (mmHg) of vascular occlusion. A standard elastic blood flow restriction cuff (10 cm) was utilized for the experimental treatment. The level of compression was set at an optimal training level scale of 6–8/10 (10: Complete occlusion). The cuff pressure level kept for lower extremity was 150–250/mmHg.

**Table 3: Training schedule**

	Intensity	Sets	Reps	Rest (S)	Cuff Pressure
Exercise (0–3 weeks)					
Squat	(25 % of 1-RM)	4	30/15/15/15	30	160 (mm/Hg)
Leg extensions	(25 % of 1-RM)	4	30/15/15/15	30	160 (mm/Hg)
Leg curl	(25 % of 1-RM)	4	30/15/15/15	30	160 (mm/Hg)
Leg press	(25 % of 1-RM)	4	30/15/15/15	30	160 (mm/Hg)
Lunges (kettlebell)	(25 % of 1-RM)	4	30/15/15/15	30	160 (mm/Hg)
Calf raise (weighted)	(25 % of 1-RM)	4	30/15/15/15	30	160 (mm/Hg)
Exercise (4–6 weeks)					
Squat	(30 % of 1-RM)	4	30/15/15/15	30	190 (mm/Hg)
Leg extensions	(30 % of 1-RM)	4	30/15/15/15	30	190 (mm/Hg)
Leg curl	(30 % of 1-RM)	4	30/15/15/15	30	190 (mm/Hg)
Leg press	(30 % of 1-RM)	4	30/15/15/15	30	190 (mm/Hg)
Lunges (kettlebell)	(30 % of 1-RM)	4	30/15/15/15	30	190 (mm/Hg)
Calf raise (weighted)	(30 % of 1-RM)	4	30/15/15/15	30	190 (mm/Hg)
Exercise (7–9 weeks)					
Squat	(35 % of 1-RM)	4	30/15/15/15	35	210 (mm/Hg)
Leg extensions	(35 % of 1-RM)	4	30/15/15/15	35	210 (mm/Hg)
Leg curl	(35 % of 1-RM)	4	30/15/15/15	35	210 (mm/Hg)
Leg press	(35 % of 1-RM)	4	30/15/15/15	35	210 (mm/Hg)
Lunges (kettlebell)	(35 % of 1-RM)	4	30/15/15/15	35	210 (mm/Hg)
Calf raise (weighted)	(35 % of 1-RM)	4	30/15/15/15	35	210 (mm/Hg)
Exercise (10–12 weeks)					
Squat	(40 % of 1-RM)	4	30/15/15/15	40	240 (mm/Hg)
Leg extensions	(40 % of 1-RM)	4	30/15/15/15	40	240 (mm/Hg)
Leg curl	(40 % of 1-RM)	4	30/15/15/15	40	240 (mm/Hg)
Leg press	(40 % of 1-RM)	4	30/15/15/15	40	240 (mm/Hg)
Lunges (kettlebell)	(40 % of 1-RM)	4	30/15/15/15	40	240 (mm/Hg)
Calf raise (weighted)	(40 % of 1-RM)	4	30/15/15/15	40	240 (mm/Hg)

**Figure 1:** Bar diagram showing the mean values of low-intensity vascular occlusion with resistance training, low-intensity resistance training, and control on leg muscle strength**Figure 2:** Bar diagram showing the mean values of low-intensity vascular occlusion with resistance training, low-intensity resistance training, and control on leg muscle explosive power

### 3.5. Statistical Analysis

The pre-test and post-test random group designs were employed in the present study. The data collected from groups before and after completion of the training period on selected criterion variables. The data were examined using the Statistical Package of the Social Sciences (SPSS, IBM, v25). The selected variables were statistically examined for significant differences, if any, by applying the analysis of covariance (ANCOVA). Moreover, Scheffe's *post hoc* analysis was performed to find out the significant mean differences. In all the cases, the level of significance was set at  $P < 0.05$ .

## 4. RESULTS

The difference between the mean scores of leg muscle strength and leg muscle explosive power before and after the 36 sessions of LI-VORT and low-intensity resistance training without vascular occlusion training

**Table 4:** Analysis of covariance on leg muscle strength and leg muscle power of LI-VORT, LI-RT, and CON

	LI-VORT	LI-RT	CON	Source of variance	Sum of square	df	Mean square	'F' ratio
Leg muscle strength								
Pre-test mean	84.40	85.67	83.93	Between	24.133	2	12.067	0.92
S.D.	3.22	3.35	4.18	within	547.86	42	13.044	
Post-test mean	90.80	89.20	83.07	Between	499.91	2	249.95	18.55*
S.D.	2.85	3.82	4.20	within	565.73	42	13.470	
Adjusted post-test mean	91.02	88.36	83.67	Between	412.14	2	206.07	45.08*
				within	187.41	41	4.571	
Leg muscle explosive power								
Pre-test mean	42.80	43.47	42.00	Between	16.178	2	8.089	0.57
S.D.	3.98	2.69	4.37	within	592.13	42	14.098	
Post-test mean	49.80	48.00	41.60	Between	557.20	2	278.60	17.46*
S.D.	4.28	3.02	4.51	within	670.00	42	15.952	
Adjusted post-test mean	49.76	47.36	42.27	Between	432.70	2	216.35	44.69*
				within	198.47	41	4.841	

\*Significant 0.05 level of significance. Table values required for significance at 0.05 level with df 2 and 42, 2 and 41 were 3.22 and 3.23, respectively

**Table 5:** Scheffe's *post hoc* analysis for the differences between the adjusted post paired mean on leg muscle strength and leg muscle power

Means values			Mean difference	C.I
LI-VORT	LI-RT	CON		
Leg muscle strength				
91.02	88.36	-	2.66*	1.98
91.02	-	83.67	7.35*	
-	88.36	83.67	4.69*	
Leg muscle explosive power				
49.76	47.36	-	2.40*	2.04
49.76	-	42.27	7.49*	
-	47.36	42.27	5.09*	

\*Significant at 0.05 level of significance. The Scheffe's *post hoc* analysis revealed that there is a significant difference between the paired mean of the three groups (LI-VORT, LI-RT, and CON) as the obtained value is higher than the required table value

was statistically significant. The analysis of variance on leg muscle strength and leg muscle explosive power of LI-VORT, LI-RT, and CON was analyzed and presented in given below table, respectively.

The analysis showed that the pre-test mean values of leg muscle strength for LI-VORT, LI-RT, and CON were  $84.40 \pm 3.22$ ,  $85.67 \pm 3.35$ , and  $83.93 \pm 4.18$ , respectively. The obtained 'F' ratio value of 0.92 for pre-test scores of LI-VORT, LI-RT, and CON on leg muscle strength was less than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of significance. The post-test mean values for leg muscle strength for LI-VORT, LI-RT, and CON were  $90.80 \pm 2.85$ ,  $89.20 \pm 3.82$ , and

$83.07 \pm 4.20$ , respectively. The obtained 'F' ratio value of 18.55 for post-test scores of LI-VORT, LI-RT, and CON was higher than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level significance. The adjusted post-test mean values of leg muscle strength for LI-VORT, LI-RT, and CON were 91.02, 88.36, and 83.67, and respectively. The obtained 'F' ratio value of 45.08 for adjusted post-test scores of LI-VORT, LI-RT, and CON was more significant than the required table value of 3.23 for significance with df 2 and 41 at 0.05 level of significance. Based on the pre, post, and adjusted post data, it is found that there is a significant difference that exists among the three groups on leg muscle strength. Based on the results of this study have shown that there was a significant difference between LI-VORT, LI-RT, and CON on leg muscle strength. Although, LI-VORT has relatively more effective in the improvement of leg muscle strength among men soccer players as compared to LI-RT and CON.

The analysis showed that the pre-test mean values of leg muscle explosive power for LI-VORT, LI-RT, and CON were  $42.80 \pm 3.98$ ,  $43.47 \pm 2.69$ , and  $42.00 \pm 4.37$ , respectively. The obtained 'F' ratio value of 0.57 for pre-test scores of LI-VORT, LI-RT, and CON on leg muscle strength was less than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of significance. The post-test mean values for leg muscle explosive power for LI-VORT, LI-RT, and CON were  $49.80 \pm 4.28$ ,  $48.00 \pm 3.02$ , and  $41.60 \pm 4.51$ , respectively. The obtained 'F' ratio value of 17.46 for post-test scores of LI-VORT, LI-RT, and CON was higher than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level significance.



The adjusted post-test mean values of leg muscle explosive power for LI-VORT, LI-RT, and CON were 49.76, 47.36, and 42.27, respectively. The obtained 'F' ratio value of 44.69 for adjusted post-test scores of LI-VORT, LI-RT, and CON was more significant than the required table value of 3.23 for significance with df 2 and 41 at 0.05 level of significance. Based on the pre, post, and adjusted post data, it is found that there is a significant difference that exists among the three groups on leg muscle explosive power. Based on the results of this study have shown that there was a significant difference between LI-VORT, LI-RT, and CON on leg muscle explosive power. Although, LI-VORT has relatively more effective in the improvement of leg muscle explosive power among men soccer players as compared to LI-RT and CON.

## 5. DISCUSSION

The present study examined the effect of LI-VORT and LI-RT without vascular occlusion training on leg muscle strength and leg muscle explosive power among young adult men soccer players. The results showed a statistically significant increase ( $P < 0.05$ ) in the mean values of the leg muscle strength and leg muscle explosive power in the LI-VORT and LI-RT as compared to the CON.

Several research studies have illustrated the benefits of young adults using vascular occlusion with resistance training to manage leg muscle strength and power. Moreover, the results of this study incorporate with other research studies results flawlessly.[1] Amani *et al.* (2019) discovered an enhanced leg strength due to 10 training sessions of blood flow restriction training among futsal players.[2] Amani *et al.* (2019) revealed an improved leg strength due to 12 weeks of different combinations of blood flow restriction training with changed exercise intensity among physically active college women. Vechin *et al.* (2015) unveiled that 12-week low-intensity resistance training with vascular occlusion increases muscle strength in older adults. Cook *et al.* (2014) observed more significant improvements in leg power in trained athletes because of 3-week occlusion training. Yasuda *et al.* (2011) also identified similar results in 6 weeks of resistance training with vascular occlusion on muscular fitness outcomes in young adults. Karabulut *et al.* (2010) determined that low-load vascular restriction training improves leg muscle strength in middle-aged male participants. Laurentino *et al.* (2008) find an enhanced lower body muscular strength due to 8 weeks of vascular occlusion training. Teramoto and

Golding (2006) examined that low-intensity exercise combined with vascular occlusion training improved leg muscle strength among male college students. Takarada *et al.* (2002) also observed that resistance training with vascular occlusion increases muscle size, strength, and endurance among athletes. The results of this study encored with the above said study findings and suggest that LI-VORT and LI-RT over 12 weeks were able to promote improvements in leg muscle strength and leg muscle explosive power in young adult soccer players.

## 6. CONCLUSION

The results of the study emphasized that 12 weeks of LI-VORT and LI-RT without vascular occlusion training led to significant improvements in leg muscle strength and leg muscle explosive power among soccer players. LI-VORT evidenced more effective in leg muscle strength and leg muscle explosive power when compared to LI-RT and CON. Based on the results of the study, the investigator recommends that LI-VORT can be followed to enhance the leg muscle strength and leg muscle explosive power among the athletes and players.

## REFERENCES

- Sadegh, A., Farid, F., Hamid, R., Ali, A., Ali, S., Carl, P., Mahdi, B., Daniel, B., Thomas, R., Theodoros, N.P., and Beat, K. Blood flow restriction during futsal training increases muscle activation and strength. *Front Physiol*, 2019, 10, 614.
- Sadegh, A., Saeedeh, R., Hamid, R., Daniel, E.G., Carl, P., Mahdi, B., Thomas, R., Theodoros, N.P., and Beat, K. Effects of blood flow restriction and exercise intensity on aerobic, anaerobic, and muscle strength adaptations in physically active collegiate women. *Front Physiol*, 2019, 10, 810.
- Cook, C.J., Kilduff, L.P., and Beaven, C.M. Improving strength and power in trained athletes with 3 weeks of occlusion training. *Int J Sports Physiol Perform*, 2014, 9(1), 166-172.
- Karabulut, M., Abe, T., Sato, Y., and Bembem, M.G. The effects of low-intensity resistance training with vascular restriction on leg muscle strength in older men. *Eur J Appl Physiol*, 2010, 108(1), 147-155.
- Laurentino, G., Ugrinowitsch, C., Aihara, A.Y., Fernandes, A.R., Parcell, A.C., Ricard, M., and Tricoli, V. Effects of strength training and vascular occlusion. *Int J Sports Med*, 2008, 29(8), 664-667.
- Longo, U.G., Loppini, M., Cavagnino, R., Maffulli, N., and Denaro, V. Musculoskeletal problems in soccer players: Current concepts. *Clin Cases Miner Bone Metab*,

- 2012, 9, 107-111.
- Ramirez-Campillo, R., Burgos, C.H., Henriquez-Olguin, C., Andrade, D.C., Martinez, C., Álvarez, C., Castro-Sepulveda, M., Marques, M.C., and Izquierdo, M. Effect of unilateral, bilateral, and combined plyometric training on explosive and endurance performance of young soccer players. *J Strength Cond Res*, 2015, 29, 1317-1328.
  - Scott, B.R., Loenneke, J.P., Slattery, K.M., and Dascombe, B.J. Exercise with blood flow restriction: an updated evidence-based approach for enhanced muscular development. *Sports Med*, 2015, 45(3), 313-325.
  - Takarada, Y., Sato, Y., and Ishii, N. Effects of resistance exercise combined with vascular occlusion on muscle function in athletes. *Eur J Appl Physiol*, 2002, 86(4), 308-314.
  - Tang, J.E., Perco, J.G., and Moore, D.R. Resistance training alters the response of fed-state mixed muscle protein synthesis in young men. *Am J Physiol Regul Integr Comp Physiol*, 2008, 294, 172-178.
  - Teramoto, M., and Golding, L.A. Low-intensity exercise, vascular occlusion, and muscular adaptations. *Res Sports Med*, 2006, 14(4), 259-271.
  - Vechin, F.C., Libardi, C.A., Conceição, M.S., Damas, F.R., Lixandão, M.E., Berton, R.P.B., and Ugrinowitsch, C. Comparisons between low-intensity resistance training with blood flow restriction and high-intensity resistance training on quadriceps muscle mass and strength in elderly. *J Strength Cond Res*, 2015, 29(4), 1071-1076.
  - Yasuda, T., Ogasawara, R., Sakamaki, M., Ozaki, H., Sato, Y., and Abe, T. Combined effects of low-intensity blood flow restriction training and high-intensity resistance training on muscle strength and size. *Eur J Appl Physiol*, 2011, 111(10), 2525-2533.
  - Wilson, J. Your Complete Guide to Blood Flow Restriction Training! 2019. Available from: <https://www.bodybuilding.com/content/your-complete-guide-to-blood-flow-restriction-training.html>.
  - Mackenzie, B. Sargent Jump Test; 2007. Available from: <https://www.brianmac.co.uk/sgtjump.html>.
  - Robert Wood. Isometric Leg Strength Test; 2008. Available from: <https://www.topendsports.com/testing/tests/isometric-strength.html>.

# Building Psychological Resilience among Athletes with Injury

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**Keywords:** Crises, Injury, Recovery, Resilience, Risk.

Resilience is a positive psychological characteristic that reflects an individual's capacity to better perceive, deal with, and overcome adversity; psychological resilience exists in people who develop psychological and behavioral capabilities that allow them to remain calm during crises/chaos and to move on from the incident without long-term negative consequences. Psychological resilience is important in sport because athletes must utilize and optimize a range of mental qualities to withstand the pressures that they experience. Most athletes will encounter one or more major setbacks or adversities during their sporting careers. An elite athlete may experience a career-threatening injury, garner demotion from a top-tier team due to poor performance, or need to relocate to another club/place to continue competing in their sport. It is generally understood that participation in any professional sport carries an elevated risk of injury (De Lira *et al.*, 2017 and Junge, 2009). There are numerous factors which contribute to injury (Andersen and Williams, 1988) such as age, inactivity, history of injuries (Benza, *et al.*, 2010), and fatigue (Clansey *et al.*, 2012). As injuries are part of athletes' lives, sometimes, facing an injury exercises a direct effect on how to overcome it. From this perspective, resilience is an element that may play an essential role in dealing with injuries more optimistically. It promotes well-being or protects them against the overwhelming influence of risk factors (Zautra *et al.*, 2010).

Parents and sports practitioners can help the athletes through building resilience to reduce their injury risk and facilitate recovery by paying attention to social and emotional elements.

"Resilient person understands that they are the architect of their own joy and their own destiny."

In the world of sports, everyone loves a good comeback story. Most athletes will encounter one or more major

setbacks or adversities during their sporting careers. Injuries are part of athletes' lives. Sometimes, facing an injury exercises a direct effect on how to overcome it. Whether it is a recreational participant or a high-performance athlete, fear of getting injured is inevitable as they negotiate the trials in daily life. Beyond the physical effects, getting injured can impact mental health in a big way, whether it is an athlete, a casual jogger, or just an active person. Many athletes, after an injury feel sad, were frustrated, depressed, anxious, nervous, and fearful. It can often be a grief process, even if it is temporary, there is still loss involved, with a feeling that things have gone out of control and it could be tough to cope with the adversities. However, there is no injury-prone personality type. However, there is a strong relationship between psychological factors and injuries as they may contribute to the risk of athletic injuries above and beyond physical and environmental factors. Personality factors (e.g., introversion/extroversion, self-esteem, and perfectionism) and other psychological factors (e.g., a less supportive social network, low personal coping skills, and high achievement motivation) may be at an even greater risk of sustaining an athletic injury.

Top-level sport is characterized by the ability of athletes to utilize and optimize a range of psychological qualities to withstand the pressures that they experience (Fletcher and Sarkar, 2012 and Gould *et al.*, 2002). Over the past few decades, researchers have identified numerous stressors that sport performers encounter (e.g., McKay *et al.*, 2008 and Scanlan *et al.*, 1991) and explored the role of psychological characteristics in helping elite performers adapt to setbacks and transitions encountered along the pathway to excellence (MacNamara *et al.*, 2010a and 2010b). Resilience is a concept which has shown increasing importance in recent years within the scope of sports (Fletcher *et al.* 2012). It is observed that; given situations in which athletes endure adverse situations (injury), resilience can provide: optimism, support, humor, and other means of viewing risks and adversities.

The influence of psychological factors within the context of the stress process is typically conceptualized as psychological resilience (cf. Fletcher and Sarkar, 2013). Psychological resilience seeks to understand why some individuals are able to withstand – or even thrive on the pressure; they experience in their lives. It is important to develop resilience in athletes because they are exposed to a wide variety of stressors, such as injury, performance decrements, controllable and uncontrollable variables, or even being dropped from a team or sponsor. Stressors can also come from fans, family, opponents, competitions, family members, teammates, coaches, and trainers. When it comes to sports injuries, we are most likely to focus on the pain and how it affects our physical health. However, injuries can also have a profound impact on our emotional well-being. By building resilience among the athletes with injury, they would be able to develop positive personality, healthy social network, and effective coping resources, which would limit the potentially detrimental effects that stressors can have on performance. Parents and sports practitioners working with a different sport should consider looking into their athletes' resilience levels, identifying those with higher vulnerability, to reduce their injury risk, and to facilitate recovery by paying attention to social and emotional elements and applying proper psychological interventions to strengthen resilience levels among the athletes.

## REFERENCES

- Fletcher, D., and Sarkar, M. A grounded theory of psychological resilience in Olympic champions. *Psychol Sport Exerc*, 2012, 13, 669-678.
- Sarkar, M., and Fletcher, D. Psychological resilience in sport performers: A review of stressors and protective factors. *J Sports Sci*, 2014, 32(15), 1419-1434.
- Fletcher, D., and Sarkar, M. Psychological resilience: A review and critique of definitions, concepts and theory. *Eur Psychol*, 2013, 18(1), 12-23.
- Hosseini, S.A., and Besharat, M.A. Relation of resilience with sport achievement and mental health in a sample of athletes. *Procedia Soc Behav Sci*, 2010, 5, 633-638.
- MacNamara, A., Button, A., and Collins, D. The role of psychological characteristics in facilitating the pathway to elite performance. Part 2: Examining environmental and stage related differences in skills and behaviors. *Sport Psychol*, 2010a;2010b, 24, 74-96.
- McKay, J., Niven, A., Lavalley, D., and White, A. Sources of strain among UK elite 6 athletes. *Sport Psychol*, 2008, 22, 143-163.
- Morgan, P., Fletcher, D., and Sarkar, M. Understanding team resilience in the world's best athletes: A case study of a rugby union World Cup winning team. *Psychol Sport Exerc*, 2015, 16, 91-100.
- Scanlan, T.K., Stein, G.L., and Ravizza, K. An in-depth study of former elite figure 8 skaters: III. Sources of stress. *J Sport Exerc Psychol*, 1991, 1, 102-120.

# An Investigation of Pre-Competitive Anxiety Female Hockey Players of Hyderabad District and Ranga Reddy District

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## 1. INTRODUCTION

Competitive sport can make even the world's most successful player feel nervous. There are many factors such as expectations, perfectionism, fear of failure, and lack of confidence that can induce feelings of anxiety in players. In sport psychology, anxiety means an unpleasant emotion that can be identify by vague but persistent feelings of apprehension and dread. Anxiety plays an important role and can either increase or decrease the performance of any player. Moreover, pre-competitive anxiety is a state of arousal that is uncomfortable or negative and occurs during the 24 h span before the competition. For many years, it has been recognized that psychological factors, particularly anxiety, play an important role in the competition. Pre-competitive anxiety is the mental component that recognized by negative expectations about success or self-evaluation, negative self-talk, tense about the performance, fear of failure, inability to concentrate, and disrupted attention.

**Table 1:** Comparison of pre-competitive anxiety between Hyderabad District and Ranga Reddy District female's hockey players

Group	Number of players	Mean	Variance	df	't'-value
Hyd. hockey players	25	20.633	6.597	48	0.213*
RR district hockey player	25	23.617	9.537		

\*Significant at 0.05 level

## 1.1. Objective of the Study

The purpose of the present study was to investigate the pre-competitive state anxiety between Hyderabad District and Ranga Reddy District female's hockey players before the competition and to evaluate any possible differences of the players.

## 2. MATERIALS AND METHODS

The sample of the study consisted of 50 hockey players (25 Hyderabad District and 25 Ranga Reddy) that were participated in the state-level hockey tournaments. The sample age ranges were between 18 and 24 years. For the data collection, the Sports Competition Anxiety Test (SCAT) model developed by Martens *et al.* was used. The test consists of 15 items which include five spurious items, eight positive items, and two negative items to be answered by making a mark of "X." The players made a cross mark (X) on any one of the responses that fitted according to them. Every statement consisted of three responses, i.e., hardly ever, sometimes, and often.

## 3. RESULTS AND DISCUSSION

Pre-competitive anxiety plays a key role in sports. It is a challenge for a sportsperson to handles anxiety. In this study, the data analysis revealed that the mean scores of Hyderabad District hockey players and Ranga Reddy District hockey players were 20.633 and 23.617. The results show that there is a significant difference



between the performance of Hyderabad District hockey players and Ranga Reddy District hockey players.

#### 4. CONCLUSIONS

Sometimes, it may be positive or can interfere with successful performance in sports events. Besides this, the extent of precompetitive anxiety also varies in different conditions. Thus, it can be supposed that players are having the same level of anxiety utilized by both psychological and physiological measures while they go to play in any game event. Psychological training must be included by coaches in coaching.

#### REFERENCES

- Moran, A.P. *Sport and Exercise Psychology: A Critical Introduction*. Vol. 73. USA: Routledge; 2004, p. 65.
- Cashmore, E. *Sport Psychology*. London, UK: Routledge; 2002.
- Martens, R., Vealey, R.S., and Burton, D. *Competitive Anxiety in Sport*. Champaign, IL: Human Kinetics; 1990, p. 117-173.
- Lizuka, P. Anxiety and performance in young table tennis players. *Sports Sci Res*, 2005, 26(3), 73-75.
- Martens, R., Burton, D., Vealey, R.S., Bump, L.A., and Smith, D.E. Development and validation of the competitive state anxiety inventory-2 (CSAI-2). In: Martens, R., Vealey, R.S., Burton, D. (eds). *Competitive Anxiety in Sport*. Champaign, IL: Human Kinetics; 1990, p. 117-173.
- Jarvis, M. *Sport Psychology*. New York, USA: Routledge; 2002.
- Scanlan, T.K., and Passer, M.W. Sources of competitive stress in young female athletes. *J Sport Psychol*, 1979, 1, 248-250.
- Wark, K.A., and Witting, A.F. Sex role and sport competition anxiety. *J Sport Psychol*, 1979, 1, 248-250.
- Krane, V., and Williams, J.M. Cognitive anxiety, somatic anxiety and confidence in track and field athletes: The impact of gender, competitive level and characteristics. *Int J Sport Psychol*, 1994, 25, 203-217.

# A Study on Selected Physical Fitness Variables among Kabaddi and Kho-Kho Players of Osmania University

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## 1. INTRODUCTION

Sports is all forms of usually competitive physical activity which, through casual or organized participation, aim to use, maintain, or improve physical ability and skills while providing entertainment to participants, and in some cases, spectators. Hundreds of sports exist, from those requiring only two participants, through to those with hundreds of simultaneous participants, either in teams or competing as individuals. Physical fitness is not an end in itself but it is a means to an end. It provides us with a basis for optimal physiological health and capacity to enjoy a full life. As we regularly need food, rest and sleep so do we need daily exercise for the maintenance of our physical capabilities. Physical fitness is a pre-requisite not only for excellence in competitive sport but is also closely related to defense and economic potential of a nation and for the quality of individual and social life. Physical fitness is a general concept defined in many ways by differing scientists. Here two major categories are considered: General fitness (a state of health and well-being) and specific fitness (a task-oriented definition based on the ability to perform specific aspects of sports or occupations).

Physical fitness is generally achieved through correct nutrition, exercise, hygiene, and rest. Physical fitness used in two close meaning: General fitness (a state of health and well-being) and specific fitness (a task-oriented definition based on the ability to perform specific aspects of sports or occupation). Physical fitness is the capacity of the heart, blood vessels, lungs, and muscles to function at optimum efficient. IN previous years, fitness was destined as the capacity to carry out

the day activities without undue fatigue. Automation, increased leisure time, and changes in lifestyle following the industrial revolution meant this criterion will be no longer sufficient. Optimum efficiency is the key. Physical fitness is now defined as the body's ability to function efficiently and effectively in work and leisure activities to be healthy, to resist hypokinetic diseases, and to meet emergency situations.

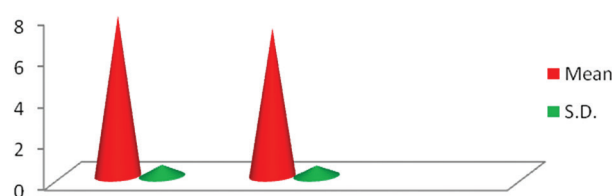
### 1.1. Objectives of the Study

The proposed objectives of the present study were as follows.

- To measure the present level of Speed between Kabaddi and Kho-Kho players of Osmania University.
- To measure the present level of explosive strength between Kabaddi and Kho-Kho Players of Osmania University.

### 1.2. Hypothesis of the Study

- There may not be any significant difference between Kabaddi and Kho-Kho Players of Osmania University in relation to speed.
- There may not be any significant difference between Kabaddi and Kho-Kho players of Osmania University in relation to explosive strength.

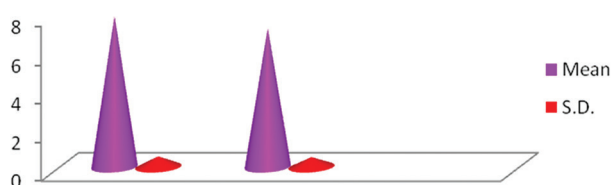


**Table 1:** Comparison of explosive strength component of Kabaddi and Kho-Kho players of Osmania University in standing broad jump

Variable	Pre-test		Post-test		SEd.	t-ratio	Level of significant
	Mean	SD	Mean	SD			
Strength (standing broad jump)	2.38	0.23	2.31	0.1	0.05	1.4	Significant

**Table 2:** Comparison of speed component of Kabaddi and Kho-Kho players of Osmania University in speed

Variable	Pre-test		Post-test		SEd.	t-ratio	Level of significant
	Mean	SD	Mean	SD			
Speed	7.79	0.55	7.17	0.51	0.16	3.88	Significant



## 2. MATERIALS AND METHODS

The present study was delimited on the following aspects such as only 30 Kabaddi players and 30 Kho-Kho players of Osmania University were considered. The age of the subjects was ranged from 18 to 22 years. The physical fitness components, i.e., explosive strength and speed considered for the present study. The criterion measures were used to collect the data in a deal and systematic way to record in a correct unit and style for each test item. Explosive leg strength was measured by standing broad jump test and scores were recorded in centimeters. Speed was measured by 50 yards dash and time was recorded to the nearest 1/100 of a second with the help of a digital stopwatch. Statistical techniques used for the present study, the mean value, standard deviation, *t*-test were applied to analyze the data.

## 3. RESULTS AND DISCUSSION

Table 1 shows the comparison of explosive strength component of Kabaddi and Kho-Kho players of Osmania University in standing broad jump.

Table 2 showing the comparison of speed component of Kabaddi and Kho-Kho players of Osmania University in speed.

## 4. FINDING AND DISCUSSION

The mean score (2.38) of the explosive strength of physical fitness in Kabaddi players is high than the mean

score (2.31) of Kho-Kho players of Osmania University. However, the *t*-ratio is 1.4 which is significant at 0.05 level. High score better speed. It means that Kabaddi players of have better Explosive strength of physical fitness than the Kho-Kho players of Osmania University. The mean score (7.79) of the speed component of physical fitness of Kabaddi players is high than the mean score (7.17) of Kho-Kho players of Osmania University. However, the *t*-ratio is 3.88, which is significant at 0.05 level. High score better speed. It means that Kabaddi players have a better speed of physical fitness than the Kho-Kho players of Osmania University.

## 5. CONCLUSION

On the basis of the analysis of data, the Kabaddi players were having better mean values among speed and explosive strength than Kho-Kho players of Osmania University.

## REFERENCES

- Bouchard, C., and Shepherd, R.J. Physical activity, fitness and health: The model and Key concepts In: Bouchard, C., Sheppard, R.J., Stephens, T., (eds). *Physical Activity Fitness and Health: International Proceeding and Consensus Statement*. Vol. 3. USA: Human Kinetics; 1994, p. 77-88.
- Dhayanithi, R., and Kumar, P.R. Continuous and alternate pace endurance methods and their effects on training and determining on selected physical and determining on selected physical and psychology variables among boys. *Research bi-annual for movement* 2002, 19(1), 16.
- Hartman, E., Visscher, C., and Houwen, S. The effect of age on physical fitness of deaf elementary school children. *Pediatr Exerc Sci*, 2007, 19, 267-278.
- Gaurav, V., Singh, A., and Singh, S. A study of physical fitness variables among baseball players at different level of achievement scientific. *J sports Exerc*, 2011, 7(2), 34-38.
- Gentova, L. Energy and macronutrient requirements for

physical fitness in exercising subjects. *J Clin Nutr*, 2010, 29(4), 413-423.

- Gupta, A., Sandhu, J.S., and Koley, S. Study on the physical fitness, spinal mobility and flexibility in football. *Indian Sport Stud*, 2002, 6(1), 1-5.
- Habbinen, A. Association of physical fitness with health related quality of life in finish young men. *J Health Qual Life Outcomes*, 2010, 10, 1477-7525.
- Haga, M. Physical fitness in children with high

competence is different from that in children with low motor competence. *J Phys Ther*, 2009, 89(10), 1089-1097.

- Iahinone, M., Mito, R., and Satio, K. Physical activity fitness and health: Obesity and lifestyle in mamaica. *Int Collab Community Health*, 2004, 1267, 39-50.
- Koutedakis, Y., and Bouziotas, C. National physical education curriculum motor and cardiovascular health related fitness in Greek adolescents. *Br J Sports Med*, 2003, 37, 311-314.

# Analytical Study on Physical Fitness among Junior National Kabaddi Players and Kho-Kho Players

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## 1. INTRODUCTION

Physical fitness test total fitness can be defined by how well the body performs in each one of the components of the physical fitness test as a whole. Some components of physical fitness test are often used in our school systems, health clubs, and fitness centers to gauge how good a shape; we are truly in physical fitness test throughout the 20<sup>th</sup> century, scientific evidence emerged demonstrating the usefulness of strength training, and aerobic exercise in maintaining overall health, and more agencies began to incorporate standardized physical fitness test. They are commonly employed in educational institutions as part of the physical education curriculum in medicine as part of diagnostic testing and as eligibility requirements in fields that focus on physical ability such as military or police. A physical fitness test is a test designed to measure physical strength, agility, and endurance.

### 1.1. Significance of the Study

The study will throw some light on the different physical fitness tests of kabaddi and kho-kho players. The results further help coaches, physical directors, and teaching faculty in the assessment of the player's ability to take part in different activities. At last, this provides the physical education teachers. Physical directors and coaches for the purpose of guidance and counseling the individuals and classifying them and placing them in different sports also suggest constructive steps.

### 1.2. Hypotheses

1. It is hypothesized that there might be a significant difference between kabaddi players and kho-kho players with regard to speed.
2. It is hypothesized that there might be a significant difference between kabaddi players and kho-kho players with regard to endurance.
3. It is hypothesized that there might be a significant difference between kabaddi players and kho-kho players with regard to agility.

## 2. MATERIALS AND METHODS

The subjects of the study were in the age group between 18 and 20 years, 50 kabaddi players and kho-kho players of Hyderabad district were considered. The study is delimited for the Hyderabad district. The researcher has collected the data separately for kabaddi and kho-kho players. The subjects were tested in three categories of physical fitness, i.e. speed (50-yard dash), endurance (Cooper test 12 min run/walk), and agility (4 × 10 m shuttle run).

## 3. RESULTS AND DISCUSSION

Table 1 shows that a significant difference between kabaddi players and kho-kho players in relation to their speed is presented.

Table 2 shows that a significant difference between kabaddi players and kho-kho players in relation to their agility is presented.

**Table 1**

Subjects	n	Mean	SD	df	t-value	P-value
Kabaddi players	50	9.01	0.989	98	3.053	1.658
Kho-kho players	50	11.66	1.276			

**Table 2**

Subjects	n	Mean	SD	df	t-value	P-value
Kabaddi players	50	9.36	1.212	98	4.23	1.563
Kho-kho players	50	10.26	1.865			



**Table 3**

Subjects	n	Mean	SD	df	t-value	P-value
Kabaddi players	50	2016	296.76	98	4.01	0.01
Kho-kho players	50	2264	238.62			

Table 3 shows that a significant difference between kabaddi players and kho-kho players in relation to their endurance is presented.

#### 4. CONCLUSION

Physical fitness is the ability to perform vigorous physical activity. It is not measured in terms of achieving specific motor skills, but rather, it is assessed in terms of muscle strength, endurance, and flexibility. The circulatory and respiratory systems are also involved

due to their role in supplying muscles with blood and oxygen.

#### REFERENCES

- Bruke, E.J. Validity of related laboratory field test of physical working capacity. *Res Q*, 1976, 47(1), 95-104.
- Dintiman, G.B. Effects of various training programme on running speed. *Res Q*, 1964, 35, 456.
- Matsudo, V.K., Rivet, R.E., and Pereira, M.H. Standard score assessment on physique and performance of Brazilian athletes in a six tiered competitive sports model. *J Sports Sci*, 1987, 5(1), 49-53.
- Krishna, S. Sports achievement motivation, self-concept and anxiety differential among Indian men and women Kabaddi and Volleyball, teams prior to SAG games. *J Phys Educ Sports Sci*, 1991, 4, 1.
- Wittberg, R.A., Northrup, K.L., and Cottrel, L. Children's physical fitness and academic performance. *Am J Health Educ*, 2009, 40(1), 30-36.

# Recreational Sports Activity, Psychosocial Functioning, and Emotional Wellness among the Multinational Corporate Employees

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## ABSTRACT

The present research makes an attempt to find out the role of recreational sports activity on the psychosocial functioning, and emotional wellness among the multinational corporate employees.” Three hundred samples in the age group of 25–45 years were selected on the basis of a random sampling technique. An interview schedule was used to collect information about their sports activities, Positive and Negative Affect Schedule was used to measure the emotional wellness, and Medical Outcomes Study 36-item Short Form Health Survey was used to measure the multiple dimensions of psychosocial functioning which includes the physical functioning, role limitation due to physical health, emotional problems, energy/fatigue, emotional well-being, social functioning, pain, and general health among the MNC employees. Mean value, t-ratio was used to find the significant difference among different age groups. The results showed that the involvement in the recreational sports activity resulted in better emotional wellness among the MNC employees. The ratio of involvement in recreational sports activities by males was more than the females, although the influence on their psychosocial functioning and emotional wellness in females is better than the males. Furthermore, the employees between the age range 25 and 35 years who were having better psychosocial functioning and emotional wellness were involved in recreational sports activities. The study concludes that the involvement in recreational sports activities leads to better psychosocial functioning and emotional wellness and recommends recreational sports activities to promote the social, physical, and mental health of the individual.

**Keywords:** Emotional wellness, Psychosocial functioning, Recreational sports.

## 1. INTRODUCTION

Over the recent years, such as creativity, culture and art, and leisure, recreational sports have also become very important in our society. Due to the highly demanding and pressurizing work environment, improving the health and mental wellness, empowering the individual holistically have been the concern recently in several multinational corporate companies, for which they have been emphasizing in recreational sports as a path for stress management and work–life balance. For achieving it, several ways such as by providing infrastructure and motivation for their associates to participate were attempted. The developments of infrastructure within multinational corporates are huge in the past decade. Recreational sports activities include competitive

physical games such as basketball, football, baseball, and tennis which are played for fun with other fellow mates. As a result, several organizations have witnessed an increase in the work performance and improved emotional stability among their employees, especially in the corporate sectors. The present study has made an attempt to understand such areas such as psychosocial functioning, including physical functioning, role limitation due to physical health, emotional problems, social functioning, and the emotional well-being of the individual working in a corporate set up.

### 1.1. Purpose of the Study

The purpose of this study was to study recreational sports activities and its impact on psychosocial

functioning and emotional wellness among corporate employees.

## 1.2. Objectives of the Study Include

- To find out the relationship between psychosocial functioning and recreational sports activities among corporate employees.
- To find out the relationship between emotional wellness and recreational sports activities among corporate employees.
- To find out gender differences in the involvement of recreational sports activity.

## 2. METHODOLOGY

The aim of the study is to find out the level of psychosocial functioning and emotional wellness among the corporate employees who are involved in the recreational sports activity regularly. To achieve the purpose of the study, 300 corporate employees at Chennai in the age range of 25–45 years were selected based on random sampling as subjects for this study. Further, the subjects were divided into two groups based on the data collected on their involvement in recreational sports activities through an interview schedule which was the independent variable. Standardized tools such as Positive and Negative Affect Schedule and Medical Outcomes Study 36-item Short Form Health Survey were used to measure the emotional wellness and the multiple dimensions of psychosocial functioning, respectively, which were dependent variables.

Table 1 shows the distribution of individuals involved in a recreational sports activity on the basis of gender.

## 3. ANALYSIS AND INTERPRETATION

### 3.1. Statistical Analysis

As a quantitative study, data from the survey instrument was analyzed using the statistical software SPSS version 20. The following statistical techniques were used to analyze the data.

- t*-test: The *t*-test is considered as an appropriate test for judging the significance of sample mean. “*t*”-value was computed to find a significant difference between the mean at two groups like gender.
- Correlation analysis: Pearson product-moment correlation was done to find out the relationships

between the variables such as psychosocial functioning, emotional wellness, and recreational sports activity.

The scores of each respondent are obtained after a detailed interview. The collected data were subjected to statistical analysis. The mean, standard deviation, and correlation were computed. The significance of scores were analyzed using *t*-value and Pearson’s correlation. The results obtained are tabulated, as shown below.

## 4. RESULTS AND DISCUSSION

Table 2 shows the correlation for psychosocial functioning and involvement in the recreational sports activity.

There is a significant positive relationship between psychosocial functioning and recreational sports activity among multinational corporate employees. The correlation is 0.861, which is found to be positively correlating and significant at the 0.01 level. Therefore, the formulated hypothesis is accepted. The result reveals that when the individual is involved in recreational sports activity, the level of psychosocial functioning is high, and when the individual is not involved in recreational sports activity, the level of psychosocial

**Table 1**

Variable	Level	Gender	Number of respondents	Percentage
Recreational sports activity	Involved	Male	81	27
		Female	72	24
		Total	153	51
	Not involved	Male	69	23
		Female	78	26
		Total	147	49

**Table 2**

	Psychosocial functioning	Recreational sports activity
Psychosocial functioning		
Pearson correlation	1	0.861**
Sig. (two-tailed)		0.000
<i>n</i>	300	300
Recreational sports activity		
Pearson correlation	0.861**	1
Sig. (two-tailed)	0.00	
<i>n</i>	300	300

\*\*Correlation is significant at the 0.01 level (2 tailed)

**Table 3**

	Emotional wellness	Recreational sports activity
Emotional wellness		
Pearson correlation	1	-0.264**
Sig. (two-tailed)		0.008
<i>n</i>	300	300
Recreational sports activity		
Pearson correlation	-0.264**	1
Sig. (two-tailed)	0.008	
<i>n</i>	300	300

\*\*Correlation is significant at the 0.01 level (two-tailed)

**Table 4**

Gender	<i>n</i>	Mean	SD	<i>t</i> -value	Level of significance
Male	150	112.56	51.075		
Female	150	108.68	62.305	0.341	NS

NS: Not significant

functioning is comparatively low. This could be because the recreational sports activities enhance social behavior and personality of an individual.

Table 3 shows the correlation for emotional wellness and involvement in recreational sports activity.

There is a significant positive relationship between emotional wellness and recreational sports activity among multinational corporate employees. The correlation is -0.264, which is found to be negatively correlating and significant at the 0.01 level. Therefore, the formulated hypothesis is accepted. The results reveal that when the individual is involved in recreational sports activity then the level of emotional wellness is high and when the individual is not involved in recreational sports activity, the level of emotional wellness is comparatively low. This could be because the recreational sports activities help the individual to have work-life balance and reduce work stress to encourage calmness and emotional stability in the individual.

Table 4 shows the mean, SD, *t*-value, and the level of significance in the involvement of recreational sports activity among multinational corporate employees on the basis of gender.

The mean value of males is 112.56 and the mean value of females is 108.68. Although the mean value of males and females is different, they are not significant. The results reveal that there is no significant difference in the level of involvement in the recreational sports activity among the multinational corporate employees on the basis of gender. As the samples were from the corporate system, which were the sports infrastructure that is highly facilitated and equally encouraged for all the individuals, the participation of employees, both male and female were equal, and there is no much significant difference observed in their participation on the basis of gender among the samples.

## 5. CONCLUSION

The study concludes that the involvement in recreational sports activity influences the psychosocial functioning and emotional wellness of the individual and also the recreational sports can be considered as an intervention to improve physical, social, and mental health.

## REFERENCES

- Abraham, R. Emotional intelligence in organization: A conceptualization. *Genet Soc Gen Psychol Monogr*, 1999, 125, 209-224.
- Cohen, S., and Hoberman, H.M. A global measure of perceived stress. *J Health Soc Behav*, 1983, 24, 385-396.
- Mayer, J.D., Salovey, P., and Caruso, D.R. Emotional intelligence: Theory, findings, and implications. *Psychol Inq*, 2004, 15, 197-215.
- Reay, J.L., Hamilton, C., Kennedy, D.O., and Scholey, A.B. MDMA polydrug users show process-specific central executive impairments coupled with impaired social and emotional judgement processes. *J Psychopharmacol*, 2006, 20(3), 385-388.

# Talent Identification in Youth Players of Manipur

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## ABSTRACT

The purpose of the study was carried out using the experimental approach to talent identification in youth players of Manipur. In this study, the subjects for data collection were drawn from the Th. Birachandra Singh Football Academy (TBSFA), Toubungkhok, Langjing Achouba, Manipur, and Sports Authority of India (SAI), Khuman Lampak, Manipur. A simple random sampling technique was used to select the subjects. The age of the subjects ranged between 12 and 18 years old. The sample consisted of 30 male players who have been regularly practices under the Th. Birachandra Singh Football Academy (TBSFA), Toubungkhok, Langjing Achouba, Manipur, and SAI, Khuman Lampak, Manipur. Fifteen male youth players from football and 15 male youth players from hockey. To find out the talent identification among youth football players and youth hockey players, selected motor abilities were used for the purpose of the study. To find out the talent identification of youth players of Manipur, the independent *t*-test statistical technique was employed. The level of significance was set at 0.05 level. According to the research findings, there is a significant difference found between the youth football players and youth hockey players on selected motor abilities in this study.

**Keywords:** Football, Hockey, Motor abilities, Talent identification.

## 1. INTRODUCTION

Talent identification is the prediction of future performance based on an evaluation/screening of current physical, technical, tactical, and psychological qualities. It also takes a long-term approach to player selection and development and focuses on training large numbers of players instead of cutting all but the elite ones. It recognizes that many factors affect whether a kid will make it or not, but rarely are childhood results the main factors. Talent identification has become an important area of research in sports. In performance sports, due to rapidly increasing participation and performance density, only persons have talent stand a chance of winning a medal in an international competition. Sports talent is the sum total of prerequisites (and possibilities of their development) possessed by a person which will enable him to achieve high performance in a sport in the future. Sports talent is a product of heredity and environment. However, a person must be endowed with a basic minimum of biological potential only; then, it can be developed through training and other environment factors to a level needed in performance

sports. According to Astrand and Rodahl (1986), “genetic factors probably play a major role in a person’s performance capacity,” at least for those persons aspiring to the levels required for the attainment of Olympic medals. The individual’s response to training is also associated with an endowed genotype. According to them, about 70% of an individual’s maximal force, power, or capacity are a matter of genetical factors. Talent identification is now generally believed that by 13–14 years of age sports talent can be judged fairly accurately. The process of talent identification must begin in early childhood and it should be spread over a number of years.

### 1.1. Purpose of the Study

The purpose of the study was to find out the talent identification in selected motor abilities of the Th. Birachandra Singh Football Academy (TBSFA), Toubungkhok, Langjing Achouba, Manipur, and Sports Authority of India (SAI), Khuman Lampak, Manipur. Researcher has stated the problem as “Talent Identification in Youth Players of Manipur.”



## 2. METHODOLOGY

### 2.1. Selection of Subject

For the present study, total of 30 male players, 15 football players, and 15 hockey players were selected as a subject from Manipur state who regularly practices in the Th. Birachandra Singh Football Academy (TBSFA), Toubungkhok, Langjing Achouba, Manipur, and SAI, Khuman Lampak, Manipur. The ages of the subjects were ranged from 12 to 18 years and all the subjects were physically fit.

### 2.2. Selection of Test Items

The following selected motor abilities were selected in relation with the talent identification in youth players of Manipur who are regularly practices in the Th. Birachandra Singh Football Academy (TBSFA), Toubungkhok, Langjing Achouba, Manipur, and SAI, Khuman Lampak, Manipur.

### 2.3. Criterion Measures

To measure the talent identification on football and hockey, selected motors abilities were used to find out the talent of the youth players of Manipur.

### 2.4. Statistical Test

To analyze the data on the talent identification between youth football players and youth hockey players of Manipur, independent “t”-test was employed. The level of significance was set at 0.05.

## 3. RESULTS

To know, the significant mean difference in the performance of the shuttle run between youth football players and youth hockey players is presented in Table 1.

From the finding of Table 1, the mean value of youth football players is 10.8 and the mean value of youth hockey players is 9.18. After the analysis the data, the “t”-ratio is 4.144 at 0.05 level of significance. Hence, there is a significant difference found between the youth football players and youth hockey players of Manipur.

The significant mean difference in the performance of standing broad jump between youth football players and youth hockey players is presented in Table 2.

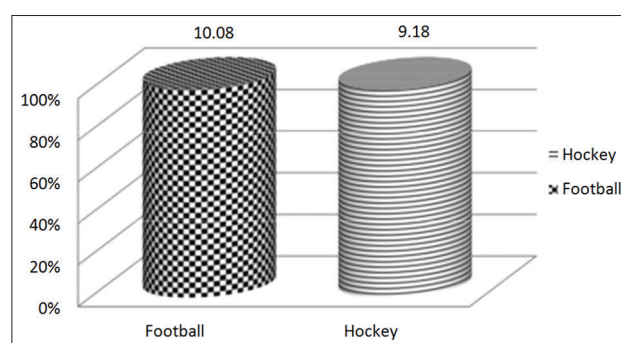
From the finding of Table 2, the mean value of youth football players is 6.51 and the mean value of youth

Table 1						
Group	n	Mean	Σ	SEM	df	t-value
Football	15	10.08	0.723	0.186	28	4.144
Hockey	15	9.18	0.432	0.111		

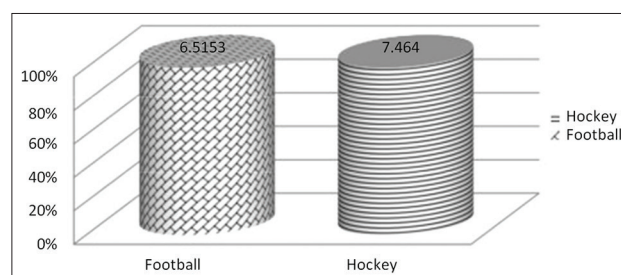
\*Significant at 0.05 level  $t = 0.05 (28) = 2.048$

Table 2						
Group	n	Mean	Σ	SEM	df	t-value
Football	15	6.51	0.949	0.245	28	3.394
Hockey	15	7.46	0.520	0.134		

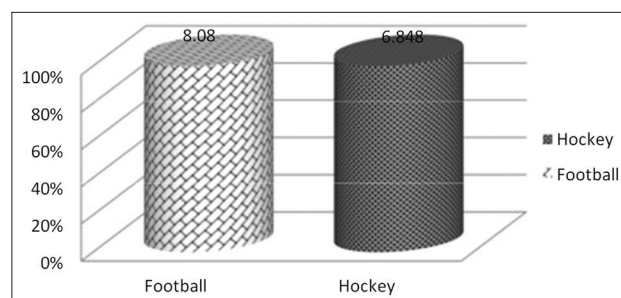
\*Significant at 0.05 level  $t_{0.05} (28) = 2.048$



**Figure 1:** Graphical representation of mean difference in the performance of shuttle run between youth football players and youth hockey players.



**Figure 2:** Graphical representation of mean difference in the performance of standing broad jump between youth football players and youth hockey players



**Figure 3:** Graphical representation of mean difference in the performance of 50 m dash between youth football players and youth hockey players

**Table 3**

Group	n	Mean	$\Sigma$	SEM	df	t-value
Football	15	8.08	0.6165	0.1591	28	7.308
Hockey	15	6.84	0.2148	0.0554		

\*Significant at 0.05 level  $t_{0.05}(28) = 2.048$

hockey players is 7.46. After analysis the data, the “t”-ratio is 3.394 at 0.05 level of significance. Hence, there is a significant difference found between the youth football players and youth hockey players of Manipur.

The significant mean difference in the performance of 50 m dash between and youth football players and youth hockey players is presented in Table 3.

From the finding of Table 3, the mean value of youth football players is 8.08 and the mean value of youth hockey players is 6.84. After analysis the data, the “t”-ratio is 7.308 at 0.05 level of significance. Hence, there is a significant difference found between the youth football players and youth hockey players of Manipur.

#### 4. DISCUSSION AND FINDINGS

It is evident from table that significant differences were noticed with regard to talent identification among the youth players of Manipur.

The significant results are due to all the selected youth players of football and hockey have been staying at different places, having different types of food intake, having different training schedule, and having different lifestyle of the players.

Thus, on the basis of findings, it was found that the male youth football players were significantly better than the male youth hockey players.

#### 5. CONCLUSION

The results of the study showed that there was a significant difference among youth football players and youth hockey players on selected motor abilities.

#### REFERENCES

1. Kansal, D.K. *A Practical Approach to Test, Measurement and Evaluation*. New Delhi: SSS Publication; 2012, p. 200-238.
2. Kevin, T., Ben, L.J., Stephen, C., David, M., O'Hara, J., Chris, C., Carlton, C., and Clive, B.B. Identifying talent in youth sport: A novel methodology using higher-dimensional analysis. 2016, *PLoS One*, 11(5), e0155047.
3. Singh, H. *Science of Sports Training*. New Delhi: DVS Publication; 1995, p. 317-318.

# Assessment of VO<sub>2</sub> Max and Forced Vital Capacity of the Engineering College Women Students

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## ABSTRACT

The combination of aerobic and anaerobic activities in different games will affect the cardiorespiratory system. The study was to analyze the VO<sub>2</sub> max and forced vital capacity (FVC) of the players and non-players. For this study, 180 women students were taken six groups, each with sixty students from volleyball, basketball, badminton, table tennis, throwball, and nonplaying group. Computerized PFT kit was used to measure the VO<sub>2</sub> max and FVC of the students. Analysis of variance was applied for the six groups to understand whether there was any significant difference. Scheffe's *post hoc* comparison test was used to find out the source of significant difference among the groups. 0.05 level of significance was used to test the statistical derivatives. From the result, it was concluded that VO<sub>2</sub> max of all the five study sports groups is significantly higher when compared to the nonplayer and FVC of all the five sports groups are significantly higher when compared to the nonplayer group.

**Keywords:** Aerobic, Anaerobic and cardiorespiratory, Forced Vital Capacity, VO<sub>2</sub> max.

## 1. INTRODUCTION

Physical inactivity which would cause for a decrease in cytokine movements in the tissue cytoplasm environment induces a state of lacunae which causes for the inappropriate or insufficient cross-talk between the organs or systems of the body. This cross-talk is done by various chemical substances that are produced in the tissues and are transferred to the required sites of the body to function as determined. This cross-talk is the hallmark of the perfect maintenance of biochemical environment of the body. For the excellent and even for optimal movement of these cytokines which are responsible for initiation of several biochemical reactions, physical activity is highly essential. Regular physical exercise is very credible way of intervention for the prevention of diseases such as hypertension, diabetes, atherosclerosis, arthritis, and certain cancers. Therefore, the combination of aerobic and anaerobic activities in different games will affect the cardiorespiratory system (Narazaki *et al.*, 2009).

### 1.1. Statement

The study was to conduct the comparative analysis of VO<sub>2</sub> max and forced vital capacity (FVC) between

the selected sports activities participating students and nonparticipating students of engineering college.

### 1.2. Hypothesis

There is a significant difference between the participants and nonparticipants with respect to VO<sub>2</sub> max. There is a significant difference between the participants and nonparticipants in FVC.

## 2. METHODS

A total of 180 women students belonging to Chaitanya Bharathi Institute of Technology, Sridevi College of Engineering, and G. Narayanamma Institute of Technology and Science of Hyderabad city volunteered for this study. The sports activities included are basketball, volleyball, badminton, throwball, and table tennis, which are more intensively involved by the technology college women students of Hyderabad. All the students were in the age range of 18–22 years and the inclusion criterion was college-level participants for players. Computerized PFT kit was used to measure the VO<sub>2</sub> max and FVC of the students. Analysis of variance (ANOVA) was applied for the six groups to understand

**Table 1: Analysis of variance**

Source of variation	SS	df	MS	F	P-value	F crit.
Between groups	295.8531	5	59.17062	13.06419	8.42E-11	2.266062
Within groups	788.0847	174	4.529222			
Total	1083.938	179				

**Table 2: Summary table**

Groups	n	Sum	Average	Variance
VB	30	1103.4	36.78	3.544414
BB	30	1143.1	38.103	4.535506
BAD	30	1122.4	37.413	5.221885
TT	30	1097.3	36.576	4.28323
TB	30	1086	36.2	4.162759
NP	30	1019.8	33.993	5.42754

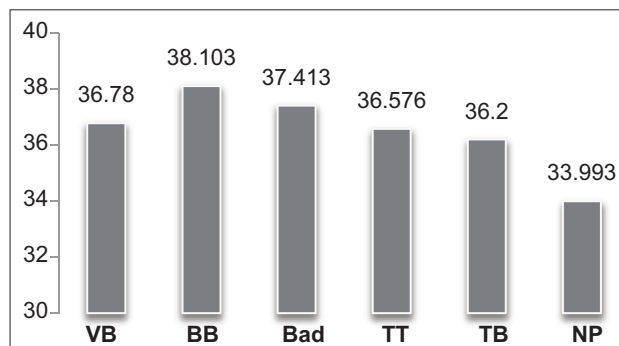
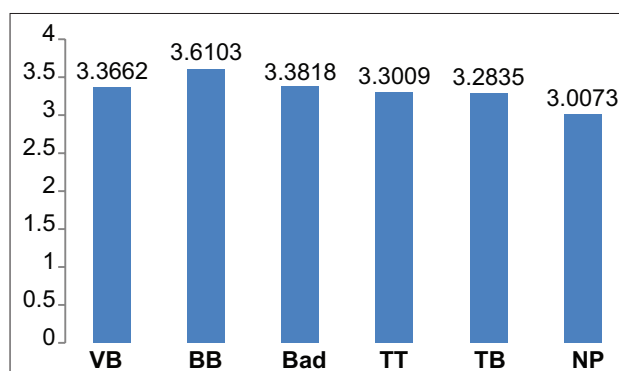
whether there was any significant difference for the  $VO_2$  max and FVC. Scheffe's *post hoc* comparison test was used to find out the source of significant difference among the groups. 0.05 level of significance was used to test the statistical derivatives.

### 3. RESULTS

ANOVA as depicted in Table 1 indicates that the different sports groups of the study differ significantly with respect to their  $VO_2$  max values as the derived F value, i.e., 13.064 is higher than the F critical value, i.e., 2.26 at the significant  $P = 0.00000842$ . Since this will not illustrate each group status with respect to the different other groups of the study, further analysis was conducted.

Descriptive analysis as conducted in Table 2 indicates that basketball activity group showed higher  $VO_2$  max value with 38.1, followed by badminton activity group (37.41), volleyball activity group (36.78), table tennis activity group (36.576), throwball group (36.2), and nonplayer group (33.99). The same is also clearly depicted in Figure 1.

Comparing with the obtained CD value of 1.85, the Scheffe's individual comparison indicated that all the sports activity groups of the study showed significantly higher  $VO_2$  max value when compared to the nonplayer group. Among the combinations of the sports activity groups of the study, the basketball activity group showed significantly higher  $VO_2$  max value when compared to the throwball activity group alone (1.9, higher when compared to the CD of 1.85) and no other group

**Figure 1: Mean values for  $VO_2$  max****Figure 2: Mean values for forced vital capacity**

comparison show any significant difference in *post hoc* test.

ANOVA as depicted in Table 4 indicates that the different sports groups of the study differ significantly with respect to their FVC values as the derived F value, i.e., 14.104 is higher than the F critical value, i.e., 2.26 at the significant  $P = 0.00014$ . Since this will not illustrate each group status with respect to the different other groups of the study, further analysis was conducted.

Descriptive analysis as conducted in Table 4 indicates that basketball activity group showed higher FVC value with 3.61 followed by badminton group with 3.38, volleyball activity group with 3.36, table tennis activity group with 3.30, throwball group with 3.28, and nonplayer group with 3.007. The same is clearly depicted in Figure 2.

**Table 3: Scheffe's *post hoc* test**(CD= $\sqrt{(a-1)F/2(MS\ error)/n}=1.85$ )

Group/Value	Bad 37.413	VB 36.78	TT 36.57	TB 36.2	NON 33.99
BB 38.103	0.69 n. sig.	1.32 n. sig.	1.53 n. sig.	1.9 sig.	4.12 sig.
Bad 37.413		0.63 n. sig.	0.84 n. sig.	1.21 n. sig.	3.42 sig.
VB 36.78			0.21 n. sig.	0.58 n. sig.	2.79 sig.
TT 36.57				0.37 n. sig.	2.58 sig.
TB 36.2					2.21 sig.

**Table 4: Analysis of variance**

Source of variation	SS	Df	MS	F	P value	F crit.
Between groups	5.686797	5	1.137359	14.10439	1.4E-11	2.266062
Within groups	14.03113	174	0.080639			
Total	19.71793	179				

**Table 5: Summary table**

Groups	n	Sum	Average	Variance
VB	30	100.986	3.3662	0.07547
BB	30	108.309	3.6103	0.108148
BAD	30	101.455	3.3818	0.086589
TT	30	99.027	3.3009	0.084118
TB	30	98.505	3.2835	0.096238
NP	30	90.219	3.0073	0.033269

Comparing with the obtained CD value of 0.24, the Scheffe's individual comparison indicated that all the sports activity groups of the study showed significantly higher FVC value when compared to the nonplayer group. Among the sports activity groups, both basketball and badminton groups did not differ significantly (0.23), indicating both groups' FVC values are similar though there was a slight difference in terms of absolute mean values.

However, the Scheffe's *post hoc* comparison table indicates clearly that the basketball group showed significantly higher FVC value when compared to the volleyball group (0.25), table tennis group (0.31) and throwball group (0.33), and all these three groups did not differ significantly in their FVC values indicating that these three activity group's FVC values are similar, though slight variation appears in terms of absolute mean values.

#### 4. DISCUSSION

VO<sub>2</sub> max value is considered as one of the highly used variable for cardiorespiratory endurance capacity of

individuals. Higher intensity aerobic activities are more favored for enhancements in VO<sub>2</sub> max capacity and this is one reason why the basketball sports activity group of the study had a highly significant VO<sub>2</sub> max value followed by badminton sports activity group of the study.

Results indicate that the general lung capacity and lung health of all the five sports groups of the study are significantly better than the nonplaying group of the study. Furthermore, the basketball group of the study is better when compared to the volleyball, table tennis, and throwball groups of the study in the general lung health and lung capacity. Regular basketball activity had caused for the better FVC values, though badminton participation also had caused for some considerable improvement in the FVC values as both the groups of the women students have considerably higher FVC values when compared to the other sports activity groups of the study.

#### 5. CONCLUSIONS

The following conclusions were derived from the analysis of the results of the study.

1. VO<sub>2</sub> max of all the five study sports groups is significantly higher when compared to the nonplayer women group of the women engineering colleges of the study and VO<sub>2</sub> max of basketball group of the study was significantly higher when compared to throwball group of the study but not with the table tennis, volleyball, and badminton groups of the study.
2. FVC of all the five sports groups is significantly higher when compared to the nonplayer women



**Table 6: Scheffe's *post hoc* test**(CD= $\sqrt{(a-1)F\sqrt{2(MS\ error)/n}}$ =0.24)

Group/Value	Bad 3.38	VB 3.36	TT 3.30	TB 3.28	NON 3.007
BB 3.61	0.23 n. sig.	0.25 sig.	0.31 sig.	0.33 sig.	0.6 sig.
Bad 3.38		0.02 n. sig.	0.08 n. sig.	0.1 n. sig.	0.373 sig.
VB 3.36			0.06 n. sig.	0.08 n. sig.	0.353 sig.
TT 3.30				0.02 n. sig.	0.293 sig.
TB 3.28					0.273 sig.

group of the women engineering colleges of the study. Furthermore, the basketball and badminton women group of the study is significantly higher when compared to volleyball group, table tennis group, and throwball group of the study in FVC.

## 6. RECOMMENDATIONS

The following recommendations are made, keeping in view of the results obtained from the present study.

1. Even the college level participation in basketball, badminton, volleyball, table tennis, and volleyball sports activities can cause for better lung health of the individuals by causing enhanced FVC and hence college level involvement in such sports events by adolescent and young students especially women students should be encouraged for better lung health.
2. The women students of the colleges be encouraged by incorporating compulsory credits and making sports activities as one of the compulsory curricular aspects of the regular study.

## REFERENCES

1. Richard, P., Anne, H., Philippe, M., David, L., Laurence, P., Ronan, G., Brice, L., and Jean-Dominique, D. Evolution of the ventilator function of professional divers over 10 years. *Undersea Hyperb Med*, 2013, 40(4), 339-343.
2. Fariaa, A.G., Ribeiro, M.A., Marson, F.A., Schivinski, C.I., Severino, S.D., Ribeiro, J.D., and Filho, A.A. Effect of exercise test on pulmonary function of obese adolescents. *J Pediatr*, 2013, 90, 242-249.
3. Grisbrook, T.L., Wallman, K.E., Elliott, C.M., Wood, F.M., Edgar, D.W., and Reid, S.L. The effect of exercise training on pulmonary function and aerobic capacity in adults with burn. *Burns*, 2012, 38(4), 607-613.
4. D'Aquino, L.C., Rodriques, S.C., Barros, J.A., Rubin A.S., Filho, N.A., and Pereira, C.A. Predicting reduced TLC in patients with low FVC and a normal or elevated FEV1/FVC ratio. *J Bras Pneumol*, 2010, 36(4), 460-467.
5. Pelkonen, M., Notkola, I.L., Lakka, T., Tukiainen, H.O., Kivinen, P., and Nissinen, A. Delaying decline in pulmonary function with physical activity a 25-year follow-up. *Am J Respir Clin Care Med*, 2003, 168(4), 494-499.

# A Comparative Study of Sports Motivation among Male and Female Archers

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## ABSTRACT

The purpose of this study is to compare the sports motivation among male and female archers of Tamil Nadu. The sports motivation scale-28 was administered for collecting the data. A total of 60 archers ( $n = 60$ ) male ( $n_1 = 30$ ), and female ( $n_2 = 30$ ) were selected subject for my study from The Archery Association of Tamil Nadu, Chennai. The age group of the subjects is selected between 15 and 25 years, to measure sports motivation. The collected data were statistically analyzed using “*t*-test” and the level of significance was tested at 0.05. Female archers have high sports motivation as compared to male archers. This study showed that there is a significant difference between male and female archers.

## 1. INTRODUCTION

Archery is a sport demanding a range of skills from a steady hand, strong shoulders, flexible muscles, a keen eye, and a cool disposition. Archery has a number of health and fitness benefits, as well as being an enjoyable and social sport.

The sport motivation scale (SMS) consists of seven subscales that measure three types of intrinsic motivation (Intrinsic Motivation; IM to Know, IM to Accomplish Things, and IM to Experience Stimulation), three forms of regulation for extrinsic motivation (Identified, Introjected, and External), and amotivation.

Motivation is an internal energy force that determines all aspects of our behavior; it also impacts on how we think, feel, and interact with others. In sport, high motivation is widely accepted as an essential prerequisite in getting athletes to fulfill their potential. However, given its inherently abstract nature, it is a force that is often difficult to exploit fully. Some coaches, such as Portugal manager Luiz Felipe “Big Phil” Scolari, appear to have a “magic touch,” being able to get a great deal more out of a team than the sum of its individual parts; others find motivation to be an elusive concept they are forever struggling to master.

## 2. METHODOLOGY

The purpose of the study was to find out sports motivation among male and female archers. To achieve

the purpose of this study, the investigator selected 60 archers consisting of 30 male and 30 female archers. The subjects were randomly selected from the shooting range who competed in nationals. The selected subject’s age group was ranging from 15 to 25 years. Selected psychological variable was motivation through SMS-28 and subjects motivation level was assessed subjectively through how they were practicing and performing in the national and to examine the difference between male and female motivation skill using SMS.

## 3. RESULTS

**Table 1:** Descriptive statistics number of subjects, mean, standard deviation, and “*t*”-test analysis of the male and female archers

Group statistics				
Sports motivation scale 28	Gender	<i>n</i>	Mean±Std. deviation	<i>t</i>
Intrinsic motivation to know	Female	30	24.63±3.034	5.249741
	Male	30	18.90±5.155	
Intrinsic motivation to accomplish	Female	30	20.20±5.327	0.100521
	Male	30	20.07±4.941	
Intrinsic motivation to experience stimulation	Female	30	20.13±3.998	1.197941
	Male	30	18.90±3.977	
Extrinsic motivation identified	Female	30	19.03±5.933	1.239125
	Male	30	17.37±4.367	
Extrinsic motivation introjected	Female	30	14.80±3.448	-7.133662
	Male	30	20.37±2.526	

(Contd...)

**Table 1: (Continued)****Group statistics**

<b>Sports motivation scale 28</b>	<b>Gender</b>	<b>n</b>	<b>Mean±Std. deviation</b>	<b>t</b>
Extrinsic motivation external regulation	Female	30	11.57±5.507	-1.378614
	Male	30	13.60±5.911	
Amotivation	Female	30	5.27±1.388	-2.316720
	Male	30	6.10±1.398	

**4. CONCLUSION**

The results proved that, while comparing between male and female archers, it was found that female archers were found motivated than the male archers. The selected psychological variable was calculated with the help of SMS-28. The (SMS-28) female archers were

found more (or) highly motivated than the male archers in the archery association of Tamil Nadu.

**REFERENCES**

- Pelletier, L., Fortier, M., Vallerand, R.J., Briere, N.M., Tuson, K.M., and Blais, M.R. Toward a new measure of intrinsic motivation, extrinsic motivation, and amotivation in sports: The sport motivation scale (SMS). *J Sport Exerc Psychol*, 1995, 17(1), 35-53.
- Keegan, R.J., Harwood, C.G., and Spray, C. A qualitative investigation of the motivational climate in elite sport. *Psychol Sport Exercise*, 2009, 15(1), 97-107.
- Ko, Y.J., Park, H., and Claussen, C.L. *Int J Sports*, 2008. Available from: <http://www.search.ebscohost.com>.
- Backwell, L., d'Errico, F., and Wadley, L. Middle Stone age bone tools from the howiesons poort layers, Sibudu Cave, South Africa. *J Archaeol Sci*, 2008, 35, 1566-1580.

# Enhancing Golfer's Performance through Psychological Skills

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## ABSTRACT

Golf is a club and ball sport, in which the player uses different types of clubs to hit balls into a sequence of holes on a golf course in the least number of strokes possible. The modern game of golf originated in Scotland. The 18-hole round was created at the old course at St Andrews in 1764. This paper would throw light on to help athletes to improve their focus through the training and utilization of mental skills that will enhance their ability to achieve new levels of performance in golf. The physical impacts of elite sport participation have been well documented; however, there is comparatively less research on the mental health and psychological well-being of elite golfers. The intense mental and physical demands placed on them are a unique aspect of a sporting career, and these may increase their susceptibility to certain mental health problems and risk-taking behavior. Furthermore, the peak competitive years for elite golfers tend to overlap with the peak age for the risk of onset of mental challenges (Cumming and Hall, 2002; Ericsson and Tesch-Romer, 1993; and Feltz and Landers, 1983). It is most important for sport psychologists to be able to develop a richer relationship with the golfer with whom they are working. In addition, it is important for the golfer to have an interest in learning the skills and a true understanding of the time and practice that it takes to see the effects of mental skills on their performance.

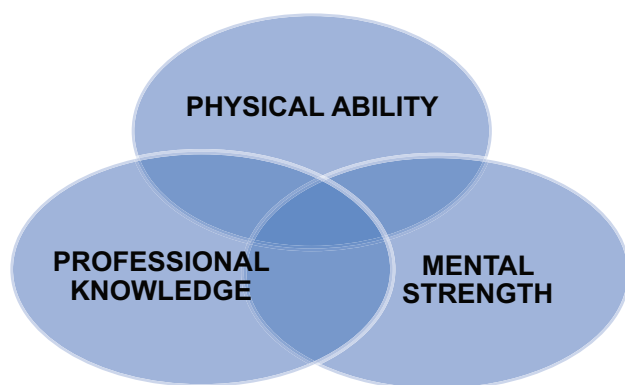
## 1. INTRODUCTION

It is very essential for every athlete to realize his/her full potential and become the best in his sport. A sports psychologist plays a very key role in enabling the athlete to succeed in the most testing and challenging situations by addressing specific problems, which keeps him away from reaching the top spot. Those seeking to improve athletic performance, therefore, need to develop the specific skills demanded in particular sports. McCaffrey and Orlick's (1989) study on excellence in golf revealed a number of psychological skills that differentiated elite performers from others. Golf is a club and ball sport, in which the player uses different types of clubs to hit balls into a sequence of holes on a golf course in the least number of strokes possible. The modern game of golf originated in Scotland. The 18-hole round was created at the old course at St Andrews in 1764. A sports psychologist would aim to decipher the extra component that sets athletes with similar physical training backgrounds and capabilities apart. Research

suggests that this extra piece is a mental component in the form of mental skills that are deliberately trained along with the physical components (Ericsson and Tesch-Romer, 1993; Krane and Williams, 2010; and Orlick and Partington, 1988).

This paper highlights the significance of the psychological skills in enhancing and achieving new levels of performance in golf.

Golf psychology is unique to every golfer. It is the combination of the fundamental mental skills of focusing, managing thoughts, and arousal, which is all effected by a golfer's attitude, personality, wellness, and experience. A golfer's psychology is the biggest determinant of his level of consistency and performance. As the game is hard, it goes with the old saying goes, "golf is 90% mental," which is true. There are three fundamental components of a golfer, namely, physical ability, mental capability, and professional knowledge. Figuratively, they can be depicted as,



Golf is a very interesting game as it challenges all the above three attributes in a golfer. For a par four hole, a golfer needs to tee off with a long-distance driver which requires physical ability to hit about 250 yards. The subsequent strokes need professional acumen to understand the distance, terrain, wind velocity, direction, hazards in between, etc. The last one needs the mental strength to retrieve the ball from sand bunkers/water hazards and putt into the hole.

“Success in golf depends less on the strength of the body and more on the strength of mind and character.” (Palmer, Arnold Daniel – professional golfer) Mental preparation and mental skills are less tangible than other aspects of the sport, such as physical fitness. It is often easy to see how physically prepared athletes, such as golfers, are in terms of their flexibility, agility, and endurance or their technique and hours; they have spent practicing on the golf course or getting swing lessons on the golf range. This being said, there are plenty of athletes with similar

physical capabilities and preparation, leading to the notion that there must be something more that sets them apart. It is this “less tangible” mental aspect that allows certain athletes to perform at high levels under pressure while others fall victim to breakdowns in concentration, judgment, or swing mechanics. Mental training is an integral part of preparing for athletic performance. It is incorporated into the practice regimens of many of the highest achieving athletes in a variety of sports (Orlick and Partington, 1988). While the highest achieving athletes certainly have remarkable physical abilities, it is clear that the mental aspect of sport must also be trained and practiced deliberately to achieve. It can also be said that the psychology of a golfer plays an equal role in his successful career as much as his physical strength and professional knowledge of the sport.

## REFERENCES

- Ericsson, K., and Tesch-Romer, C. The role of deliberate practice in the acquisition of expert performance. *Psychol Rev*, 1993, 100(3), 363-406.
- Krane, and Williams, J.M. Psychological characteristics of peak performance. In: Williams, J., (ed). *Applied Sport Psychology: Personal Growth to Peak Performance*. New York: McGraw-Hill; 2010. p. 169-188.
- McCaffrey, N., and Orlick's, T. Mental factors related to excellence among professional golfers. *Int J Sport Psychol*, 1989, 20, 256-278.
- Orlick, T., and Partington, J. Mental links to excellence. *Sport Psychol*, 1988, 2, 105-130. Retrieved from: [https://www.researchgate.net/publication/267197860\\_Mentallinks\\_toExcellence](https://www.researchgate.net/publication/267197860_Mentallinks_toExcellence).



# Impact of Junk Food on Young Football Players

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## ABSTRACT

Nutrition is an integral part of life. This could be a boon or a curse. Sport is given much importance for various reasons, but this sport rather than doing good is bringing negative effects, on analyzing, it is not the sport but the food taken to do that. Any sports require a lot of energy that is got from food, but the high calorie, convenient, and tasty food available seems to have taken the front bench; many people, especially young aspiring sports children, are falling prey to it. Study shows that the children are becoming obese, lethargic, and very aggressive. They also suffer from many ailments related to respiration gastric, psychological, and heart related too. This performance has come down considerably due to this junk food eating habit.

**Keywords:** Disease, High calorie, Junk food, Low performance.

## 1. INTRODUCTION

When someone decides on taking up a sport that influences the food choice. This sport makes an incredible demand on the body for its additional energy and full requirement. Nutrition is a fine line between balancing to train hard enough to reach those goals and avoid the risk of injury. This influences how one makes nutritional decisions. These days the food selection is often based on taste, time convenience, and availability more than the nutritional value. This has resulted in disordered eating, eating more processed food.

Foods contribute lots of calories but little nutrition, the processed foods named as junk foods. Their foods have low satiation value, so people do not tend to feel full when they eat them. These are globally available that they are more appealing and simply available. It has been observed that increased intake of junk foods leads to obesity, its related complications, heart problems, lethargy, diabetes, and also depression. According to old literature and related articles and based on athletes targeting healthy exercise and nutrition alternatives, a healthy eating index should be more than 80% are considered good. However, many studies show that this index is standing around 50–55%, which is alarming.

More than 60% of the global food market is filled with what we call junk food. What makes junk food so interesting, and the present study is trying to understand

the after effects of this junk food eating habit in children who aspire to become sportspersons. For this study, upcoming food ball players training for the same at least 20 h a week were selected, and their eating habits analyzed.

### 1.1. Why One Craves for Junk Food

What makes it so attractive, quoting exactly from the work of Witherly Steven food scientist, the following aspects are presented.

1. Orosensation  
These foods what kind of sensation does they give while eating what it smells like and how it feels in the mouth.
2. Macronutrient make up  
The junk food has a perfect combination of salt, sugar, and fat that excite the brain and gets coming back.
3. Dynamic contrast  
Combination of different sensations in the same food. Foods with an edible shell go crunch, followed by something soft, creamy, and full of taste active compounds, for example, pizza.
4. Salivary response  
The more it makes salivation, for example, chocolate.
5. Rapid food meltdown and vanishing calorie density  
Meeting in the mouth, signal to the brain that you are not eating as much as you actually are. These

foods tell that you are not full even when you are eating a lot of calories resulting in overeating.

6. Sensory specific response  
Eating the same food again and again decreases pleasure. Junk foods, however, are designed to avoid this.
7. Caloric density  
Junk food is designed to convince the brain that it is getting nutrition, not filling up.
8. Memories of past eating experiences  
This is where the psychobiology of junk food works against one. When something is eaten, the brain registers that feeling. The next time even when one reads about that food, the brain starts to trigger the memories and responses of eating it. This, in turn, cause responses such as salivation and create a mouth-watering craving.

### 1.2. Nutrient Requirement for Soccer Players

According to studies, the nutrient requirement of a soccer player is as follows:

- Carbohydrate: This is the least energy giving of the three macronutrients. We can consider this weight the amount carbs are taken will give that equivalent energy. This is the most important nutrient during intense activity involving sprints running jumping; thus, it is the only source of energy.
- Fat: A minimum requirement of fat is very important for the body. Care to be taken to see that the saturated fat should never be more than 10% of the diet.
- Protein: This is the bodybuilding food very important for muscle formation. Nearly 60 grams of protein are required per day.

### 1.3. Ideal Diet for Soccer Players

A soccer player should aim for a diet that has 60–65% carbohydrate, 20–25% fats, and 10–15% protein.

Carb	60%
Fat	25%
Protein	15%
Calcium	800–1000 Mg
Sodium	1100–3300 Mg

The goal of soccer's diet before a game is to maximum carbohydrate stores in the muscle and lives and top-up blood glucose stores.

The present study is trying to understand the effect of junk food on young football players and their football performance.

## 2. MATERIALS AND METHODS

### 2.1. Sample Selection

Fifteen aspiring sportspersons practicing soccer for at least 3 h a day under the competitive footballing, junior category all boys under the age groups of 12–17 years were studied for nearly a month, especially their practice time.

### 2.2. Method

Questionnaire and observation. Grounded theory approach, credibility checked through written information.

Anthropometric measurements assess nutritional status. Height and weight were assessed.

The weight ranged from 26 kg to 85 kg. Height ranged between 4.5 feet and 5.5 feet. The number was 15 children ranging from 12 years to 16 years. They come from different economical standards and family backgrounds.

The young football players practiced for 3 h in a day between 4 pm and 7 pm. This study was done for

**Table 1: Weight analysis**

Weight	Number <i>n</i> =15 (%)
Underweight	3 (20)
Overweight	7 (46.7)
Normal weight	5 (33.3)

**Table 2: Junk food eating habit**

Junk food eating habit	Number <i>n</i> =15 (%)
Habitual eaters	11 (73.3)
Occasional eaters	4 (26)
Does not eat junk food	0

**Table 3: Jumping performance**

Junk food	Mean±SD	" <i>t</i> "
Eating habited	106±15.2	1.3
Eaters occasional	112.6±21	5.7
Non eaters	125±18	3

SD: Standard deviation

**Table 4: Running performance**

Junk food	Mean±SD	"t"
Eating habited	13.3±2.9	2.2
Eaters occasional	15.6±1.5	5.3
Non eaters	17.9±2.0	3.1

SD: Standard deviation

10 days questionnaire that was asked related mostly to their sport and eating habits.

### 2.3. Observations

1. Football players showed interest in taking packed and processed food.
2. These foods mainly were made up of more than five ingredients, sugar, and salt.
3. Junk foods such as pizzas, burgers, pastries, cheetah, kurkure, bingo, chocolates, and soft drinks of all kinds were preferred along with any other locally made foods.

During their practice, their performance was analyzed mainly in relation to running and jumping.

Based on these inter preparations and using the following, many observations were drawn. Physical fitness tested by Cooper Motor Fitness Test (1963).

### 2.4. Statistical Analysis

Analyses using mean, standard deviation, and *t*-test.

BMI calculated to grade chronic energy deficiency CED (quoting previous work).

BMI (Quetelets index) = Body weight (kg)/Height m<sup>2</sup>.

## 3. DISCUSSION AND RESULTS

1. A 90 min game can burn as much as 1500–2000 calories and this can go up to 3500/day.
2. When the brain is stressed, it gets addictive and calls for more sugar and fats.
3. Consuming food with high G1 within an hour of exercise actually lowers the blood glucose.
4. Sipping on sugary, acidic fluid damaged the enamel. This also led to an increase in blood glucose levels leading to a drop in blood sugar.
5. It was very well observed that eating junk food reduced the ability of their muscle to turn glucose to energy. This change could lead to insulin resistance

and resulting in type-2 diabetes, poor digestion, and constipation.

This overweight can be linked up to their junk feeding habit, this increases many risks of heart, brain, etc., nutritional starvation, kidney liver and skin diseases, depression weak, lethargic, and depressed. Symptoms of diabetes blurred vision numbers of bounds (Brown 2014).

## 4. CONCLUSION

Quoting from the earlier works, diet does not turn poor players into great players but make a difference between playing and playing to your full potential.

High-protein low-carbohydrate diets are unsuitable for soccer players. Soccer players should allow the slow release of glucose into the blood so as to avoid insulin surge. The refined sugar level intake should be only 10%. The goal of nutrition in any sport is not to explode the muscle but to load it with fuel (Heather Mangieri MSRDN).

Junk foods have become popular among children due to their attractive appearance, taste, convenience, low cost, easy to consume, and availability globally. However, its ill effects are so long lasting and dangerous ruining the very existence of the individual with a vital blow to their sports career. Junk food kills the appetite, causes digestive disorders, respiratory problems greatly effects the nervous system, erosion of teeth, enamel and bones, insomnia, and depression. Increasing ability risk, heart diseases, constipation bloating. The individual feels lethargic, weak with a decline in memory and cognitive function.

The only solution to avoid many of this and enhance the sports performance is to avoid the craving for this junk food replacing with healthy substitutes.

## REFERENCES

1. Sceery, S. Nutritional impact on performance in student athletes: Reality and perception. In: *Health Science Student Book*. Pittsburgh: M. S. Health and Wellness Management; 2017.
2. Tanya, B. Soccer Nutrition-Phil Davis; 2018.
3. Hosie, R. The Times.
4. Kashyap, R., Joglekar, A., and Verma, S. Effect of junk food on physical performance of school children. *Indian J Sci Res Tech*, 2014, 2(4), 21-25.
5. MOP Vaishran College for Women. *Impact of Junk Food on Society*. Chennai: MOP Vaishran College for Women.

# Personality Traits among Elite and Sub-elite Athletes

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## ABSTRACT

The aim of the present study was to find out the personality traits among elite and sub-elite athletes. A total number of 100 athletes ( $n = 50$  elite and  $n = 50$  sub-elite) athletes were included as the sample of the study. For the present study, personality trait was measured using the big five-factor inventory by John *et al.*, 1991 and John *et al.*, 2008. The data were analyzed using SPSS software. Personality trait has five dimensions such as openness, conscientiousness, extraversion, agreeableness, and neuroticism. The study revealed that elite athletes are differing significantly from sub-elite athletes on neuroticism. However, the insignificant difference was found in openness, conscientiousness, extraversion, and agreeableness.

**Keywords:** Athletes, Elite, Personality trait, Sub-elite.

## 1. INTRODUCTION

### 1.1. Personality and Personality Traits

Personality has been defined as a unique pattern of characteristics, thoughts, feelings, and behaviors that distinguish one person from another, and that persist over time and situations, according to Phares and Chaplin. This definition emphasizes that personality is an internal process that guides behavior. Gordon Allport (1961) makes the point that personality is psychophysical, which means both physical and psychological. Recent research has shown that biological and genetic phenomena do have an impact on personality. We do not change dramatically from week to week, we can predict how our friends will behave, and we expect them to behave in a recognizably similar way from 1 day to the next. Child (1968) includes consistency (within an individual) and difference (between individuals) in his definition, and Allport (1961) refers to characteristic patterns of behavior within an individual. These are also important considerations. Hence, personality is what makes our actions, thoughts, and feelings consistent (or relatively consistent), and it is also what makes us different from one another. Sport personality is a product of biological and cultural heritage. It reveals the psychological makeup of an individual through his behavior. In fact, it is the quality of a person's total behavior. In fact, it is the quality of a person's total behavior.

### 1.2. Big Five Personality Traits

In psychology, the big five personality traits are five broad domains or dimensions of personality that are used to describe human personality. The big five factors are openness, conscientiousness, extraversion, agreeableness, and neuroticism. The big five has been preferably used since it is able to measure different traits in personality without overlapping. During studies, the big five personality traits show consistency in interviews, self-descriptions, and when observed.

### 1.3. Openness

People who like to learn new things and enjoy new experiences usually score high in openness includes traits such as being insightful and imaginative, and having a wide variety of interests.

### 1.4. Conscientiousness

People that have a high degree of conscientiousness are reliable and prompt. Traits include being organized, methodic, and thorough.

### 1.5. Extraversion

Extraverts get their energy from interacting with others, while introverts get their energy from within themselves.

Extraversion includes the traits of energetic, talkative, and assertive.

### 1.6. Agreeableness

These individuals are friendly, cooperative, and compassionate. People with low agreeableness may be more distant. Traits include being kind, affectionate, and sympathetic.

### 1.7. Neuroticism

Neuroticism is also sometimes called emotional stability. This dimension relates to one's emotional stability and degree of negative emotions. People that score high on neuroticism often experience emotional instability and negative emotions. Traits include being moody and tense.

Stoyanova *et al.* 2016 (A) found that the athlete's age and period of sport experience were related that seemed natural as more practice was achieved with advance in age. Connections between personality attributes suggest that the more successful athletes, elite athletes could be differentiated from the sub-elite athletes by some personality features. The chosen personality characteristics included some perceptual cognitive peculiarities such as concentration that is important for every executed task, especially in sport. In sport, attention should be mainly goal driven not so much stimuli driven; selective, focused on a specific aspect, rather than divided – distributed in several simultaneous tasks with external broadband focus, i.e. spread broader region (Afonso *et al.*, 2012).

The relationship between personality and sport has been studied since the early 60s and 70s when this area grew significantly and became one of the most explored fields in sport psychology (Vealey, 2002). More recently, the work of Allen *et al.* (2013), Rhodes and Pfaeffli (2012), Rhodes and Smith (2006), and Hoyd *et al.* (2009) concludes that sport practice is positively associated with features of responsibilities (e.g., tendency to order, self-discipline, and achievement orientation) and extroversion (e.g., sociability, activity, pursuits of stimulation, and positive affection) and negatively associated with neuroticism features (e.g., emotional instability, anxiety, and vulnerability to depression).

### 1.8. Objectives of the Study

The objectives of the study are state as follows:

- To compare the mean scores of openness of elite and sub-elite athletes

- To compare the mean scores of conscientiousness of elite and sub-elite athletes
- To compare the mean scores of extraversion of elite and sub-elite athletes
- To compare the mean scores of agreeableness of elite and sub-elite athletes
- To compare the mean scores of neuroticism of elite and sub-elite athletes.

### 1.9. Hypothesis

- There is no significant difference between the mean scores of openness of elite and sub-elite athletes
- There is no significant difference between the mean scores of conscientiousness of elite and sub-elite athletes
- There is no significant difference between the mean scores of extraversion of students of elite and sub-elite athletes
- There is no significant difference between the mean scores of agreeableness of elite and sub-elite athletes
- There is no significant difference between the mean scores of neuroticism of elite and sub-elite athletes.

## 2. METHODOLOGY

The sample of the present study comprised 50 elite (male = 25 and female = 25) and 50 sub-elite (male = 25 and female = 25) athletes of Odisha, who have participated at various international level, national level, university level, and state level competitions. Athletes were classified as elite and sub-elite athletes based on their level of participation. Elite athletes have participated in the international level competitions and have won medals in various international level competitions. On the other hand, sub-elite athletes have participated in various national level competitions and have won medals in various national level and state level competitions. The data were collected from the sample from the discipline of athletics.

## 3. TOOLS USED

### 3.1. Personality Traits

The big five personality traits are the best accepted and most commonly used scientific measure of personality and have been extensively researched. There are many different versions of the big five personality test; this one uses the public domain scale from the international personality item pool. The big



five inventory (John *et al.*, 1991 and John *et al.*, 2008) is a 44-item inventory that was developed to assess the big five personality domains of extraversion, agreeableness, conscientiousness, neuroticism, and openness. Of 44 items, 8 items (1, 6R, 11, 16, 21R, 26, 31R, and 36) are measuring extraversion, 9 items are measuring agreeableness (2R, 7, 12R, 17, 22, 27R, 32, 37R, and 42), 9 items (3, 8R, 13, 18R, 23R, 28, 33, 38, and 43R) are measuring conscientiousness, 8 items (4, 9R, 14, 19, 24R, 29, 34R, and 39) are measuring neuroticism, and 10 items (5, 10, 15, 20, 25, 30, 35R, 40, 41R, and 44) are measuring openness.

### 3.2. Procedure

Data were collected through the administration of big five-factor inventory for obtaining the scores of personality in five dimensions among elite and sub-elite athletes. The data were collected from the sample during their off practice hours. The data were analyzed using SPSS software.

## 4. RESULTS AND DISCUSSION

Table 1 shows the significance of the mean difference between elite and sub-elite athletes on openness. The mean score of elite athletes on openness is found to be (29.82) and the mean score of sub-elite athletes is found to be (29.18). The result was found to be not significant. It means that elite athletes are not differing from sub-elite athletes in openness.

Table 2 shows the significance of the mean difference between elite and sub-elite athletes on conscientiousness. The mean score of elite athletes on conscientiousness is found to be (29.28) and the mean score of sub-elite athletes is found to be (28.90). The result was found to be not significant. It means that elite athletes are not differing from sub-elite athletes in conscientiousness.

Table 3 shows the significance of the mean difference between elite and sub-elite athletes on extraversion. The mean score of elite athletes on extraversion is found to be (30.90) and the mean score of sub-elite athletes is found to be (30.68). The result was found to be not significant. It means that the elite athletes are not differing from sub-elite athletes in extraversion.

Table 4 shows the significance of the mean difference between elite and sub-elite athletes on agreeableness. The mean score of elite athletes on agreeableness is found to be (31.74) and the mean score of sub-elite

athletes is found to be (31.14). The result was found to be not significant. It means that the elite athletes are not differing from sub-elite athletes in agreeableness.

Table 5 shows the significance of the mean difference between elite and sub-elite athletes on neuroticism. The mean score of elite athletes on neuroticism is found to be (25.66) and the mean score of sub-elite athletes is found to be (28.90). The result was found to significant ( $t = P < 0.01$ ). It means that the elite athletes are differing from sub-elite athletes in neuroticism.

## 5. DISCUSSION

The present study was an attempt to study the personality trait of elite and sub-elite athletes.

**Table 1: Significance of the mean difference between elite and sub-elite athletes on openness**

Group	Mean	SD	t-value
Elite	29.82	4.91	0.42
Sub-elite	29.18	5.66	

**Table 2: Significance of the mean difference between elite and sub-elite athletes on conscientiousness**

Group	Mean	SD	t-value
Elite	29.28	5.03	0.31
Sub-elite	28.90	3.69	

**Table 3: Significance of the mean difference between elite and sub-elite athletes on extraversion**

Group	Mean	SD	t-value
Elite	30.90	2.36	0.27
Sub-elite	30.68	5.31	

**Table 4: Significance of the mean difference between elite and sub-elite athletes on agreeableness**

Group	Mean	SD	t-value
Elite	31.74	3.82	0.47
Sub-elite	31.14	5.28	

**Table 5: Significance of the mean difference between elite and sub-elite athletes on neuroticism**

Group	Mean	SD	t-value
Elite	25.66	4.10	2.70**
Sub-elite	28.90	3.84	

From the result, it is revealed that five dimensions of personality trait elite and sub-elite athletes are significantly differing from sub-elite athletes on neuroticism. The reason could be due to the fact that the elite athlete's participation and achievement in major competitions helped them to be more emotionally stable compared to sub-elite athletes. Compared to elite athletes, sub-elite athletes were not exposed to many major competitions and have experience of less success. As a result of which elite athletes are differing from sub-elite athletes in neuroticism. While interacting with sub-elite athletes, it was revealed lack of experience, exposure, and success in sport makes them emotionally not stable.

On the other hand, in openness, agreeableness, conscientious, and extraversion dimension of personality trait, elite athletes are not differing from sub-elite athletes. The reason could be due to the fact that elite and sub-elite athletes are regularly participating in different international, national, and state level competitions. Both the groups are more or less and have experienced success in sport. As a result of which elite and sub-elite athletes are not differing from each other in extraversion, openness, agreeableness, and conscientiousness. Both the groups could able to develop more or less similar personalities except neuroticism.

## 6. CONCLUSION

Personality is the collection of characteristic thoughts, feelings, and behaviors that are associated with a person. From the present study, it is concluded that some personality qualities did not distinguish the elite and sub-elite athletes, but they are important for some successful sports performance.

## 6.1. Limitations

In the present study, athletes from individual games are included as sample. Therefore, it recommended that further studies on team game athletes be included.

## REFERENCES

- Afonso, J., Garganta, J., and Mesquita, I. Decision making in sports: The role of attention, anticipation and memory. *Braz J Kinesiology Hum Perform*, 2012, 14(5), 592-601.
- Allen, M.S., Greenlees, I., and Jones, M. Personality in sport: A comprehensive review. *Int Rev Sport Exerc Psychol*, 2013, 6(1), 184-208.
- Allport, G.W. *Pattern and Growth in Personality*. New York: Holt, Rinehart and Winston; 1961.
- Hoyd, A., Rhodes, R., Hausenblas, H.Y., and Giacobbi, P. Integrating five-factor model facet level traits with the theory of planned behaviour and exercise. *Psychol Sports Exerc*, 2009, 10, 565-572.
- John, O.P., Naumann, L.P., and Soto, C.J. Paradigm shift to the integrative big five trait taxonomy: History, measurement, and conceptual issues. In: John, O.P., Robins, R.W., and Pervin, L.A., (eds). *Handbook of Personality: Theory and Research*. New York: Guilford Press; 2008, pp. 114-158.
- John, O.P., Hampson, S.E., and Goldberg, L.R. Is there a basic level of personality description? *J Pers Soc Psychol*, 1991, 60, 348-361.
- Rhodes, R.Y., and Pfaeffli, L. Personality. In: Acevedo, E.O., (ed). *The Oxford Handbook of Exercise Psychology*. New York: Oxford University Press; 2012.
- Rhodes, R.Y., and Smith, N. Personality correlates of physical activity: A review and meta analysis. *Br J Sport Med*, 2006, 40(12), 958-965.
- Stoyanova, S., Ivantchev, N., and Petrova, K. Connectivity of athletes' personality traits and career period as their predictor. *Balt J Career Educ Manage*, 2016a, 4(1), 41-50.
- Vealey, R.S. Personality and sport behaviour. In: Horn, T.S., (ed). *Advances in Sport Psychology*. 2<sup>nd</sup> ed. Champaign, IL: Human Kinetics; 2002, pp. 43-74.

# Knowledge and Attitude of Students toward Obesity and Physical Activity

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## ABSTRACT

A descriptive study was conducted to assess knowledge and attitude regarding obesity among adolescent students of College of Horticulture, Bengaluru, a sample comprised of 100 adolescent students, were selected, convenience sampling technique was used. The tools used for data collection were structured knowledge questionnaires and attitude scale. Data analysis was done by using descriptive and inferential statistics. Findings of the study revealed that the majority of the adolescent students 56% were in the age group of 17–21 years of age and with regard to educational, 61% of the adolescent students were in senior secondary level of education. Knowledge of the adolescent students ranged between 1 and 14 and mean knowledge score of adolescent students was found to be  $5.65 \pm 2.907$ . The range of attitude scores lies between 65 and 101, the mean attitude score of adolescent students  $84.88 \pm 8.346$ . Findings further showed that the coefficient of correlation between mean knowledge score and mean attitude score of adolescent students regarding obesity (0.442) was found to be significant at 0.05 level of significance. A significant association was observed between levels of knowledge of adolescent students with regard to their age, gender, area of residence, monthly family income, heard of obesity, and type of family. A significant association was observed between attitude of adolescent students with heard about obesity.

**Keywords:** Attitude, Knowledge, Obesity, Physical activity, Students.

## 1. INTRODUCTION

Obesity is a serious health problem and its prevalence has increased dramatically over the past 20 years. Today, it is estimated that over 250 million people in low- and middle-income countries suffer from obesity, but globally more than one billion are overweight, and of these, 300 million are obese. Even in India, it is becoming a growing concern [1].

Adolescence is a period of crucial growth. During this phase, physical changes including growth, the onset of menarche for the girls, and increase in fat and muscle mass takes place. This contributes to obesity. Adolescent obesity is associated with increased morbidity and mortality in adulthood. In India, among adolescent increased consumption of more energy-dense, nutrient-poor foods with high levels of sugar and saturated fats, combined with reduced physical activity (due to increased use of automated transport,

technology in the home), and more passive. Leisure pursuits are suspected as major contributors to rising levels of obesity [2].

Obesity may be caused by number of social, cultural, behavior, physiological metabolic, and genetic factors that are beyond the person's control. Symptoms of obesity usually show up in the form of breathing trouble, excess accumulation of fat, insulin resistance increase in size or number of fat cells that rise in blood pressure, high cholesterol levels, etc. [3].

According to 1999–2000 National Health and Nutritional Examination Survey, 10% of 2–5 years old and adolescents of 16–19 years old in the US were overweight. The prevalence of overweight and obese children has risen dramatically and at alarming rates in the past few decades in developing countries. About 30% of children have been found to be affected with overweight problems [4].

A study conducted among adolescents in selected schools in the age group of 10–15 years, at Udupi district, Karnataka, revealed that the prevalence of obesity ranged from 8.0% to 10.81% with peaks at 10 years, 12.5 years, and 13 years [5].

Since 1980, the number of overweight adolescents has tripped. In 1999, 11% of the children and adolescents were found to be overweight in India. At least one in 10 urban middle-class children in India is overweight. Globally, there are 300 million adolescents who are obese. India is in the midst of a rapidly escalating epidemic of Type II diabetes and coronary heart disease (CHD). It is predicted that CHD will soon become the leading cause of death in our country [6].

Hence, the gap in knowledge is growing risks that necessitate the need to systematically investigate the knowledge of obesity among adolescent. Based on the findings, health education programmers can be conducted in different settings such as schools, colleges, and the community. This challenged the researcher to explore the importance of knowledge and attitudes of adolescent regarding obesity and to impart knowledge regarding obesity and its consequences. It is also anticipated that this study may increase awareness among adolescent regarding obesity [7].

### 1.1. Objectives of the Study

The objectives of the study were as follows:

1. To assess the knowledge of adolescents students regarding obesity.
2. To assess the attitude of adolescents students regarding obesity.
3. To determine the relationship between knowledge and attitude of adolescents students regarding obesity.

To find out the association among knowledge and attitude of adolescents students with selected demographic variables

### 1.2. Hypothesis

H<sub>1</sub>: There will be a significant positive relationship between the knowledge scores and attitude scores of adolescent students regarding obesity.

H<sub>2</sub>: There will be a significant association of levels of knowledge of adolescent students regarding obesity with selected variables.

H<sub>3</sub>: There will be a significant association of levels of attitude of adolescent students regarding obesity with selected variables.

## 2. METHODS AND INTERPRETATIONS OF DATA

A non-experimental research approach and descriptive survey design was used. A total sample of the study was 100 students. Convenience sampling technique was used to select the sample. In view of the nature of the problem and to accomplish the objectives of the study, structured questionnaire and attitude scale were prepared focusing on knowledge and attitude of adolescent students regarding obesity. Validity was ensured in consultation with guides and experts in the field of nursing and community medicine. Reliability of the structured knowledge questionnaire was tested by KR 20 ( $r = 0.71$ ) and for attitude scale was tested by Cronbach's alpha (0.77). After obtaining formal permission from the concerned authority structured questionnaire and attitude scale were used to collect the needed data. Both descriptive and inferential statistics were used to analyze the data.

The mean knowledge score of the adolescent students was between one and 14 and mean knowledge score of adolescent students was  $5.65 \pm 2.907$ , median was five, and mean percentage of knowledge score was 28.25 [Table 1].

About 93% of the adolescent students had below-average knowledge regarding obesity followed by 6% of the adolescent students had average knowledge and only 1% had had good knowledge regarding obesity [Table 2].

The range of attitude scores lies between 65 and 101, the mean attitude score of adolescent students  $84.88 \pm 8.346$ , median was 86, and mean percentage of knowledge score was 56.59 [Table 3].

The adolescent students 84% had moderately favorable attitude regarding prevention of obesity followed by 16% of adolescent students had unfavorable attitude [Table 4].

The coefficient of correlation between mean knowledge score and mean attitude score of adolescent students regarding obesity is moderately positive correlation between knowledge score and attitude score, the computed " $r$ " value between knowledge score and

**Table 1:** Range, mean, median, mean percentage, and standard deviation of knowledge scores of adolescent students regarding obesity

	Range	Mean	Median	Mean percentage	Standard deviation
Knowledge	1–14	5.65	5	28.25	2.907
Minimum score=0, Maximum score=20					

**Table 2:** Frequency and percentage distribution of knowledge scores of adolescent students regarding obesity ( $n=100$ )

Level of knowledge	Knowledge score (%)	Range of score	f (%)
Good	61–75	13–15	1
Average	50–60	11–12	6
Below average	Below 50	1–10	93
Minimum score=0, Maximum score=20			

**Table 3:** Range, mean, mean percentage, median, and standard deviation of attitude score of adolescent students regarding obesity ( $n=100$ )

	Range	Mean	Mean %	Median	Standard deviation
Attitude	65–101	84.88	56.59	86	8.346
Minimum score=30, Maximum score=150					

**Table 4:** Frequency and percentage distribution of adolescent students in terms of levels of attitude ( $n=100$ )

Level of attitude	Range of score	Frequency (%)
Moderately favorable	77–113	84
Unfavorable	30–76	16
Minimum score=30, Maximum score=150		

**Table 5:** Correlation between mean knowledge score and mean attitude score of adolescent students regarding obesity ( $n=100$ )

Area	Mean score	Standard deviation	Coefficient of correlation R
Knowledge score	5.65	2.907	
Attitude score	84.88	8.346	0.442*

\*Significant at 0.05 level of significance

attitude score obtained by adolescent students was significant at 0.05 level of significance [Table 5].

The Chi-square value of knowledge score was found to be significant at 0.05 level of significance. [Table 6]

**Table 6:** Chi-square showing association of knowledge scores of adolescent students with selected variables ( $n=100$ )

Demographic variables	Above median (%)	Below median	Chi-square value
Age (in years)			
15–16	8 (25)	24 (75)	6.962*
17–18	25 (45)	31 (55)	
19–20	8 (67)	4 (33)	
Gender			
Male	31 (51)	30 (49)	6.235*
Female	10 (26)	29 (74)	
Area of residence			
Urban	18 (44)	23 (56)	0.242*
Rural	23 (39)	36 (61)	
Monthly family income (Rs.)			
Below 5000	2 (15)	11 (85)	9.027*
5001–10,000	16 (33)	32 (67)	
10,001–15,000	19 (54)	16 (46)	
More than 15,001	4 (100)	0 (100)	
Heard of obesity			
Yes	37 (63)	22 (37)	28.288*
No	2 (18)	11 (82)	
Not sure	2 (7)	26 (93)	
Family type			
Joint	21 (32)	45 (68)	6.765*
Nuclear	20 (59)	14 (41)	

\*Significant at 0.05 level, NS: Non-significant.  $X^2(1)=3.841$ ,  $X^2(2)=5.991$ ,  $X^2(3)=7.815$

Adolescent students in the age group of 15–16 years 8 (67%) had more knowledge regarding obesity, while those who are in the age group of 20–30 years 24 (75%) had less knowledge regarding sexually transmitted infection.

Male adolescent students 31 (51%) had more knowledge regarding obesity while comparing with the female adolescent students, 29 (74%) had less knowledge regarding obesity.

Adolescent students who were residing in urban 18 (44%) had more knowledge regarding obesity while comparing with the adolescent students those who were residing in rural 36 (61%) had less knowledge regarding obesity.

Adolescent students whose family income was more than 15,001 Rs. 4 (100%) had more knowledge regarding obesity while comparing with the adolescent students whose family income was below 5000 Rs. 11 (85%) had less knowledge regarding obesity.



Adolescent students who had heard of obesity 37 (63%) had more knowledge regarding obesity while comparing with the adolescent students was not sure to be heard of obesity 26 (93%) had less knowledge regarding obesity.

Adolescent students who belong to a nuclear family 20 (59%) had more knowledge regarding obesity while comparing with the adolescent students who belong to joint family, 45 (68%) had less knowledge regarding obesity.

The Chi-square value of attitude scale was found to be significant with heard with obesity. Adolescent students who had heard of obesity 55 (93%) had a moderately favorable attitude regarding obesity while comparing with the adolescent students was not heard of obesity, 4 (31%) had unfavorable attitude regarding obesity [Table 7].

### 3. DISCUSSION

The study was conducted to assess knowledge and attitude regarding obesity among adolescent students of College of Horticulture, Bengaluru.

A descriptive study was conducted to assess the prevalence of obesity and overweight and their association with socioeconomic status (SES). A sample size of 100 college students aged between 17 and 21 years was selected. SES and lifestyle factors were determined using a pre-tested questionnaire.

The result shows that the prevalence of overweight was found to be 14.3% among boys and 9.2% among girls, whereas the prevalence of obesity was 2.9% in boys and 1.5% in girls [7].

The present study also revealed that male adolescent students 31 (51%) had more knowledge regarding obesity while comparing with the female adolescent students 29 (74%) had less knowledge regarding obesity, that's why the prevalence of obesity is more in boys.

In the present study, findings revealed that adolescent students who were residing in urban 18 (44%) had more knowledge regarding obesity while comparing with the adolescent students, those who were residing in rural 36 (61%) had less knowledge regarding obesity.

Adolescent students whose family income was more than 15,001 Rs. 4 (100%) had more knowledge regarding obesity while comparing with the adolescent students whose family income was below 5000 Rs. 11 (85%) had

**Table 7: Chi-square showing association of attitude of adolescent students with selected variables (n=100)**

Demographic variables	Moderately favorable (%)	Unfavorable (%)	Chi-square value
<b>Heard of obesity</b>			
Yes	55 (93)	4 (7)	6.655*
No	9 (69)	4 (31)	
Not sure	20 (71)	8 (29)	

less knowledge regarding obesity.

### 3.1. Recommendations

A similar study can be conducted for a larger sample covering the entire population of adolescent students of each and every universities to validate and generalize the findings.

A study can be conducted to evaluate the effectiveness of the information booklet for teachers who deal with adolescent students in schools.

A comparative study can be undertaken to assess the knowledge of adolescent students of the different states of India.

A study can be undertaken to develop and standardize the tool regarding obesity.

### REFERENCES

1. Mandowara, S.L. IAP criteria for grading the nutritional status of Indian children need modification. *Indian J Pediatr*, 1986, 53, 127-128.
2. World Health Organization. Obesity and Overweight. Geneva: World Health Organization; 2004, pp. 1-4.
3. Pollock, J. An Introduction to Obesity; 2006. Available from: <http://www.ezinearticles.com>. [Last accessed on 2009 May 03].
4. Pearson, D. Taking obesity in the community. *J Community Nurs*, 2018, 17(6), 19-22. A weighty crisis. *Health Environ*, 2005, 3(2), 1-6.
5. Prabhakaran. Watching weight. *Health Action*, 2004, 7, 31-33.
6. Bhav, S., and Bavadekar, A. IAP national task force for childhood prevention of adult diseases: Childhood obesity. *Indian Pediatr*, 2004, 41, 550-575.
7. Goyal, R.K., Shah, V.N., Saboo, B.D., Phatak, S.R., Shah, N.N., Gohel, M.C., Raval, P.B., and Patel, S.S. Prevalence of overweight and obesity in Indian adolescent school going children: Its Relationship with socioeconomic status and associated lifestyle factors. *J Assoc Physicians India*, 2010, 58, 151-158.

# Traditional Kabaddi versus Techno Kabaddi

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## ABSTRACT

Life of every man is ridden by two horses – tradition and technology. The fight in every mind, whether to follow tradition or to enjoy the user-friendliness of technology, is always evident. In the phase of life, the betterment man is mostly driven by technology. Every test on a traditional practice results in a new technology. That was the ultimate cause of western games to reach the peak in recent years. This article has discussed the traditional heritage of India's very own sport kabaddi in line with technology for the game to reach the Olympic podium. Reaching the Olympic podium is possible by winning over the popularity contest. The more the popularity, the more are the fan followers. The recent rule changes and advancement in technology have escalated kabaddi facilitating popularity. Another important avenue is that at least 50 affiliated countries should systematically play the game setting up professional associations. When all these falls in place, the Olympic podium will be at a one-step reach.

**Keywords:** Kabaddi, Olympic, Technology, Tradition.

## 1. INTRODUCTION

Oh! What a revolution. The clock has spun too fast this decade. On one-side, advancements in science and technology have made man lead a switch button age. On the other side, the same has made the man run a rat's race. To update the ongoing latest changes that too alongside the rapid growth is still a challenging task. Like now cricket being a fond street-side hobby sport, during the early 19<sup>th</sup> century, kabaddi was one such [1,2]. Even in the present era, no Pongal festival of rural Tamil Nadu is celebrated without kabaddi. Kabaddi is a test for bravery. A quest for confidence and pride. Kabaddi is still developing from the rural roots. Earlier in the south of Tamil Nadu, especially, it was a pride call for every bridegroom.

## 2. THE PAST TENSE OF KABADDI

The dehydrating temperature, layered skin tan, the bleeding toes and knees, dusty, polluted playfields, sludgy floor, and dirty jerseys were all real signs of popular kabaddi. Although being a popular game in South Asia, it has gained tremendous popularity around the world [3-6]. Kabaddi is also known as Hututu, Do-do, and Ghidugudu. It is an ancient mass-based group game, which is played in most of the tropical countries of titles. It is popularly known as Hadudu in Bangladesh, Gudu in Sri Lanka, the Chub in Indonesia, and kabaddi in India.

The game of kabaddi is one of the oldest games of Indian origin. As you know, the game has been playing for a long time (about 1000 years ago) in India. Circle kabaddi is a 4000 years old game. It was properly invented to be group attacks an individual and *vice versa*. A dramatized version of the great Indian epic Mahabharata has made an analogy of the game a tight situation faced by Abhimanyu when he was surrounded by the entire team of opponents. Buddhist literature speaks of the Gautama Buddha were also playing circle kabaddi for recreation. Further, in Mahabharata times, different kings such as Jarasandh, Bhim, Balarama, Krishna, Abhimanyu, Kansa, and Daryodhanaetcare few examples, who make the history of great battle by performing rules of the fight. The king Chandragupta, Krishnadevaraya, and Prithviraj Chauhan is further great examples for maintaining the tradition of kabaddi in the form of sport as well as battle. Hence, the origin of kabaddi poses infinite changes in the history of Indian scenario, and the popularity of this game is a rural indigenous origin draw charms and identity for a great performance about the blend of human strength, sound mind, concrete spirit, decision-making ability, and in the last human satisfaction.

## 3. KABADDI HISTORY AND THE OLYMPIC MYSTERY

The origin of the game dates back to prehistoric times, played in different forms. The modern kabaddi game

was played all over India and some parts of South Asia from 1930. The first known framework of the rules of kabaddi, as an indigenous sport of India, was prepared in Maharashtra, in 1921, for kabaddi competitions, combining the patterns of Sanjeevani and Gamini. Thereafter, a committee was constituted in 1923, which amended the rules framed in 1921. The amended rules were applied during the All India Kabaddi Tournament in 1923. The All India Kabaddi Federation was formed in 1950 to look after the promotion of the game, and the Senior National Championship started in the year 1952. The new body, Amateur Kabaddi Federation of India, came into existence from the year 1972 affiliated to the Indian Olympic Association with a view to popularize the game in India and neighboring countries of Asia. After the formation of this body, kabaddi took a new shape and national level competitions started for junior and sub-junior boys and girls. A separate competition, the Federation Cup, was introduced for men and women for the elite teams (best eight) of the country. Kabaddi was included as a regular sports discipline in the 11<sup>th</sup> Beijing Asian Games, 1990, where India won a gold medal for kabaddi – its only gold medal in Beijing. The Indian team continues to create history by winning the gold medal at each succeeding Asian Games held thereafter Hiroshima 1994, Bangkok 1998, Busan 2002, Doha 2006, Guangzhou 2010, and Incheon 2014. For the 1<sup>st</sup> time in the history of the Asian Games, a separate indoor stadium was built for kabaddi competitions and training for the 15<sup>th</sup> Asian games held in Doha (Qatar) 2006. The training/warming up courts and main field of play were equipped with a giant public screen, which displayed replays and the running score. Two Tissot plasma scoreboards, info terminals for the presentation crew, the ceremony crew, and the media were also provided. The 15<sup>th</sup> Asian games at Doha provided an excellent opportunity to showcase kabaddi to many Europeans and Australians, who were responsible for organizing the games. A large number of spectators belonging to European countries, USA, Australia, Western Asia, and the Mediterranean countries, experiencing the game for the 1<sup>st</sup> time, were very impressed with the simple rules and the thrill of the sport and desired to introduce the sport in their countries. This had given kabaddi a very good and positive exposure for its future development in the continents of Europe, the USA, Australia, and Africa. Kabaddi has been included as a major discipline in the 2<sup>nd</sup> Asian Indoor Games that were held in Macau from October 25 to November 3, 2007, and in the Asian Beach Games hosted by Indonesia in 2008, which are major landmarks in the history of the game.

## **4. THE PRESENT TENSE OF KABADDI**

It was surprising and astonishing to watch pro kabaddi in television channels. What a tremendous growth. An outdoor fest has now become an indoor feast! R&D has not left any stone unturned. Yes! It has turned stony mud courts to soft and safe mattresses. Mother India, the home of kabaddi, has extended its case, thereby preventing 90% open injuries. Time and tide wait for no one. Now, we, too, need not wait for the sun to spread its light. Midnight or scorching sun kabaddi lovers can play anytime indoors. The love for the game has multiplied. After the pro kabaddi revolution, the viewership increased to 56%, that is, 43.5 crore viewers which were the second highest in India watching matches on television.

## **5. NEW RULE CHANGES**

### **5.1. 30 Seconds**

A raid begins when a player enters the opponent's half. It lasts for 30 s within which the raider has to try and score a point – either a touchpoint or bonus point – and return back to his half. Failure to return within 30 s rules the raider as out. Each raid is restricted to 30 s (in both the halves). The clocks will be set/reset as the raider crosses the centerline or when the raid is over. The clocks will be stopped when each raid is restricted to 30 s (in both the halves). The clocks will be set/reset as the raider crosses the centerline or when the raid is over. Raider crosses center line on returning to his court raider exits the arena after being declared “OUT” or goes out of bounds and is declared out.

### **5.2. Do-or-Die Raid**

If a team has two consecutive empty raids, then its raider in the next raid has to score a point. If he does not, then he is ruled as out. Quite aptly, it is called the “do-or-die raid.” Hence, a team cannot have three empty raids in a row. A do-or-die raid, thus, often serves as a turning point in the game.

### **5.3. Super Tackle**

A super tackle is when a raider is caught by the opponent who has just three or fewer defenders left on the court. In case of a super tackle, the defending team gets an additional point apart from the point from the tackle. However, it only revives one lost member, despite the number of points earned is two. A super tackle serves

teams in a spot of bother, giving them a good chance to come back in the encounter, thus keeping the game in the balance.

#### 5.4. Weight Category

- Men: Should not be >85 kg
- Junior boys: Should not be >70 kg
- Women: Should not be >75 kg
- Junior girls: Should not be >65 kg
- Sub-junior: Should not be >65 kg (Boys and Girls).

#### 5.5. Technical Point

Awarding technical points to the opponent, but the same team shall take up the consecutive raid for late cant, double entry, and late entry.

#### 5.6. The Future Tense of Kabaddi

There has been a gradual but significant change in trends of the game over the past 50 years. What was once considered, a game of brawn is not so now. The introduction of mats, shoes, new techniques, and changes in rules has made the sport infinitely more athletic and interesting. The modern, international, competitive avatar of kabaddi have evolved into a spectacular, hugely popular sport in an ever-growing list of countries from around the globe. India's very own sport – kabaddi – has been the talk of the town. Sanjeevani, Gaminee, Amar, Punjabi, or Sadugudu are various forms of kabaddi. With all the new rule changes and technological developments, the game has gained tremendous popularity. However, one thing that kabaddi is not is an Olympic sport. For a sport to be considered to be part of the Olympics, it must be widely practiced around the world – 75 countries across four continents. Kabaddi has seen an exponential growth in popularity and this would be just a formality in the near future. Despite the popularity, there are plenty of reasons why kabaddi should be part of the biggest multi-sport event in the world. The number of countries and continents has never been in question in kabaddi, but the lack of a professional kabaddi association and league hampers the sport's chances of being part of the Olympics. Hence, if all the countries who play kabaddi invest in making it a professional sport in their country, kabaddi can put forth their name for consideration.

Kabaddi was introduced as a demonstration sport in Berlin Olympics in 1936. However, kabaddi never got recognized as an Olympic competitive sport due to

various reasons. It has been recognized as an international sport and is featured in the Asian games format. However, to become an Olympic sport, it has crossed a few more hurdles. The World Kabaddi Federation is working hard to get a game into the Olympics, but they have been told by the International Olympic Committee that their request could only be entertained if the game can be played systematically in 50 affiliated countries. To gain the Olympic berth, the sport needs to be widely adopted in many countries. Countries like Japan have started playing this sport well. We need more countries to adopt this sport for it to be included in the Olympics. Apart from all these, to make the Olympic dream come true, we should work on the vigilant and acceptable technical methods which will make this game much more reliable, entertaining, safe, and interesting.

## 6. CONCLUSION

Reaching the Olympic podium is possible by winning over the popularity contest. The more the popularity, the more are the fan followers. The recent rule changes and advancement in technology have escalated kabaddi facilitating popularity. Another important avenue is that at least 50 affiliated countries should systematically play the game setting up professional associations. When all these falls in place, the Olympic podium will be at a one-step reach.

## REFERENCES

1. Deshmukh, K.U., and Pushpalata, M. A comparative study of socioeconomic status in intercollegiate participation of kabaddi and football players. *Indian Streams Res J*, 2013, 2, 1-4.
2. Javeed, Q.S., and Dhonde, S.P. Effect of socioeconomic status and area of residence on aggression and neuroticism of national kabaddi players. *Indian Streams Res J*, 2012, 2, 1-5.
3. Rao, K.V.S., and Kishore, Y. Effect of yogic practices on cant ability among kabaddi players. *Int J Multidiscip Res Dev*, 2014, 1, 11-13.
4. Saravanan, C., Mahaboobjan, A. Impact of yogic and mallakhamb practices on selected physiological and performance variables among kabaddi players. *Paripex Indian J Res*, 2017, 6, 215-217.
5. De, A. K., Dasgupta, P. K., Panda, B. K., and Bhattacharya, A. K. Physical efficiency tests on Indian male "Kabaddi" inter-university players. *Br J Sports Med*, 1982, 16, 33-36.
6. Sidhu, H. Kabaddi, a vigorous game. *J Phys Educ Recreation Dance*, 1986, 57, 75-77.



# Magical Relationships for Inner Peace and Harmony

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## ABSTRACT

Indigenous methods of treatments are available for complex emotional problems evolved from different situations, including disturbed marital and family relationships, with blocks of unhealthy psychosomatic disorders. Yogic practices along with psychological remedies such as empathy and gratitude contemplations ease out the complexity associated with emotional wellness. This paper attempts to throw light on this subject by addressing the integrated approach to attend to these emotional issues. A combination of scientifically analyzing the problem and training the mind through yogic view of understanding to enhance the innate nature of human emotions such as empathy and gratitude helps in creating inner peace and harmony in a positive manner.

**Keywords:** Empathy, Gratitude, Harmony, Magical relationship, Mental wellness, Peace.

## 1. INTRODUCTION

“Integrated Wellness Concept” is a complex mixture and circle of surrounding factors comprising a harmonious mixture of elements such as a healthy lifestyle, positive mindset, proper food habits, conducive environment at home, and outside. Here, physical, physiological, as well as psychological dimensions play a major deciding role. Because through experimental studies of “gratitude and empathy contemplation intervention,” as research suggested that there is a physiological connection between one’s emotional and physical states and that by manipulating one’s emotional state, one can produce a physiological change, whether positive or negative.

### 1.1. Observation

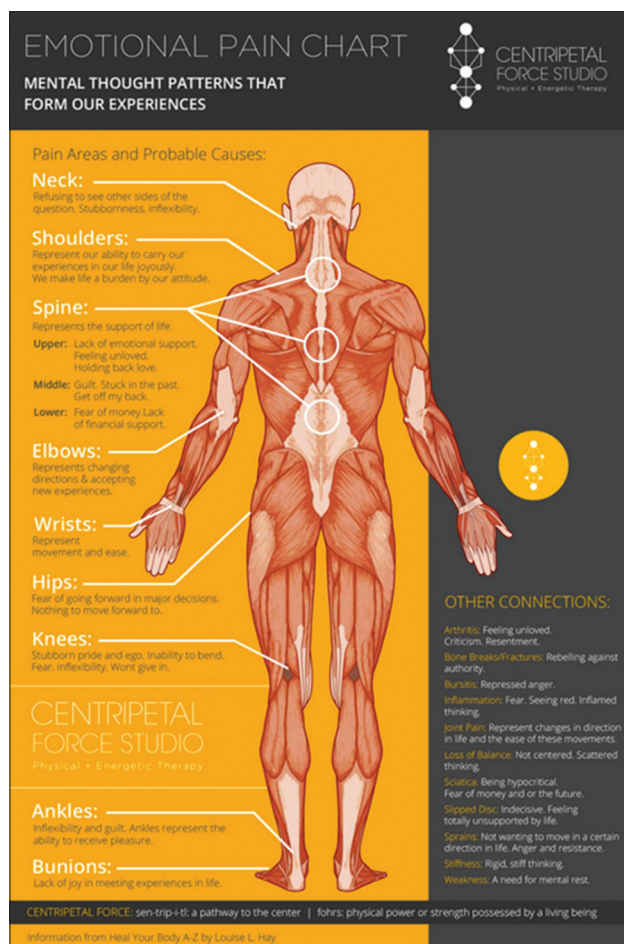
#### 1.1.1. The ill-effects of negative thoughts and emotions on the human body

Because we are human beings, we feel a range of emotions from happiness to sadness, from joy to deep depression. Each of these emotions will influence body organs and bodily functions. It is not possible to think positive when we are nervous. When we have pain in certain parts of the body like pain in the spine area, it is likely to be associated with loneliness, lack of emotional support, and an “unloved feeling.” Likewise, low back pain is associated with the weak hip for not able to bear

own body weight due to misalignment at base chakra, which is related to the spine, leg, and feet. For stubborn persons, pain in the neck is associated with their stubbornness, one-sided thinking, inflexibility, and lack of empathy. The naval region is controller for stability and rootedness, which is controlled by the adrenal gland. Again, pain in the knee is related to stubbornness and ego, inability to adapt to new situations, fear, etc. By releasing the mounted emotional “baggage,” individuals can be empowered to communicate with their own subconscious.

According to the emotional pain chart, the spine and shoulder pain indicate the inability in handling the burden of protecting the family or self. All these pains emerge from disruption of nerve energy centers, which are known as chakras, to elicit various emotions, and when they are disturbed at their main office – their ill effects would reach out as the physiological reactions with irrelevant behavioral expressions. Emotional pain management is important to be manipulated for correcting them for contented daily activities. These conditions were recorded as self-reported emotional blocks which were their experiences in the study. The expression, nowadays, popularly known as “gut feeling” is also gaining more importance. This feeling of fear is experienced at that center of nerve energy in the navel region known as “*manipura chakra*” which





is the seat for pride, covertness, lust, jealousy, anger, gluttony, envy, and hatredness. This chakra positively induces an “urge” and the “fire” to achieve something in that person, especially when manipulated properly. This energy center directly controls the adrenal glands and pancreas, control blood sugar levels, and digestive functions in the body.

### 1.1.2. Psychosomatic magical relationships

We cannot underestimate the connection between our mind, our emotional experience, and our body. It is a powerful magical relationship, which unites them, such as the mini-compact universe. We can have either an overall positive mental attitude to create a healthy lifestyle or, by dwelling in negative, create self-destructive thoughts and not deal with our internal issues of an unhealthy lifestyle. In general, it is imperative that negative thoughts and self-importance reduce empathy, as this is an emotional response expressed as a feeling of compassion toward another person, which looks quite simple to understand and practice – but it is quite challenging. The “reduced empathy” or the difficulty

to feel what others are feeling might have developed as a result of a genetic defect or physical trauma or a response to one’s environment. Research has shown that empathy can improve mental wellness, and it is possible to develop a feeling of empathy even for non-empathetic persons. According to a study by Wood *et al.* (2010), to improve overall well-being, inducing a feeling of empathy, and gratitude had brought about the changes to one’s life, instilled a sense of fulfillment, and identified benefits associated with being grateful. Like other positive emotions, gratitude is believed to reflect, motivate, and reinforce the expressions of thankfulness and sense of appreciation which can result in various prosocial behavioral forms and directed toward the larger community. There are reasons to believe that experiences of gratitude might be associated – perhaps even in a casual fashion – with happiness and well-being. Researchers, writers, and practitioners have all speculated that gratitude possesses happiness bestowing properties (Emmons and McCullough, 2003).

### 1.1.3. Magical relationship through group “therapy”

“Talking with family people eases out several problems.” Significantly, the World’s first-ever “Time to Talk Day” was observed in February 2014 to be followed every year on that day. People are encouraged to start conversations regarding mental health in a bid to end the discrimination against mental illnesses. This mission also threw light on the importance of interacting with immediate family members who can tender unconditional love and support. Besides family, the formation of “similar thinking” groups such as laughter clubs, confession sessions through empty chair therapy, and psychodrama sessions have recently started to play bigger roles in treating the bruised and affected minds. Mind cleansing therapy involving right breathing techniques and proper yogic dietary changes along with meditation that has evolved in ancient India has gained global acceptance for being the only unique and complete systematic remedy to gain emotional control.

No matter whatever our temperament is elucidating gratitude will develop more patience, understanding, compassion, and kindness while ignoring all the minor irritations and the complaints in our relationships will magically disappear, because when we are truly grateful for another person, there is nothing, we want to change about that person. We will not criticize, complain about, or blame them because we are actually grateful for the good things about them. In fact, “we can only be said to be alive in those moments when our hearts are conscious of our treasures.”

## 2. CONCLUSION

Science has, thus, affirmed the wisdom of the great Indian sages of the past, with research showing that people who have empathy and gratitude have closer relationships, are more connected to family and friends, and are perceived by other people as favorable. Gratitude makes relationships flourish, with an increase in the abundance of happiness and good things in that relationship. Gratitude not only changes relationships, but it also changes individuals' thought processes. To enjoy the positive life of our dreams, it is important to understand good relationships – the most powerful channels for empathy and gratitude, to start magically changing our life, and build inner peace and harmony. Relationships are nothing but the reflections of our own heart and feelings.

So as we think – we become. Think Positive and act Positive, as it only benefits us.

## REFERENCES

- Centripetal Force Studio. *Emotional Pain Chart Illustration*. California: Centripetal Force Studio; 2019.
- Emmons, R.A., and McCullough, M.E. Counting blessings versus burdens: An experimental investigation of gratitude and subjective well-being in daily life. *J Pers Soc Psychol*, 2003, 84, 377-389.
- Wood, A.M., Froh, J.J., and Geraghty, A.W. Gratitude and well-being: A review and theoretical integration. *Clin Psychol Rev*, 2010, 1, 1-16.
- Svatmarama, Y.S. *Hatha Yoga Pradipika*. London: The Aquarian Press; 1992, pp. 35-102.

# Effects of Altitude Training for Sports Athletes of Volleyball

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## ABSTRACT

Altitude training is to enhance training performance. The fundamental theory behind altitude training is that, by exposing an athlete to an environment that is low in oxygen (hypoxic), the body will eventually adapt and improve its efficiency (acclimatized). In volleyball, it is necessary to clarify the effect of altitude training on hematological variables, increased oxygen intake, fitness factor, molecular adaptations, and genetic adaptations to acclimatization. The main objective of altitude training and team sports is to present cutting-edge research on the basic and applied aspects of altitude training to enhance match-related performance in team sports. Exercise and training in a hypoxic environment include neuromuscular, metabolic, and cardiac vascular adaptation. Despite the limited research on the effects of altitude (or hypoxic) training interventions on team-sport performance, players from all around the world engaged in these sports are now using altitude training more than ever before. In March 2013, an altitude training and team-sports conference were held in Doha, Qatar, to establish a forum of research and practical insights into this rapidly growing field.

**Keywords:** Altitude, Assessing physical training modalities in enhancing sports performance, Elite performance, Training, Volleyball.

## 1. INTRODUCTION

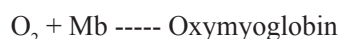
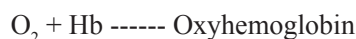
Exercise at altitude has been gaining popularity in recent decades. High-altitude exercise ranges from casual hiking to highly competitive ultra-endurance races (e.g., foot race, mountain biking, and cross-country skiing) and even includes team sports. Travel to high altitude has potential significant health consequences. Not only are altitude and environmental factors a concern for the athletes' safety, but access is often a barrier to appropriate medical care. For safety reasons, proper acclimatization is important for those traveling to high altitudes. Altitude training is also thought to be beneficial for athletic performance, though the evidence for this is not clear. The purpose of this article is to review physiologic changes at high altitude, altitude illness, and medical considerations for both recreational and competitive athletes. As skill proficiency increases, it is clear that overall technical and tactical effectiveness – rather than (competitive) physical performance *per se* – have a greater impact

on winning. Over the past two decades, however, it is indisputable that team sports have experienced a tremendous increase in the tempo of play and energy demands imposed on players during matches. In this context, coaches and their staff are continuously looking for innovative ways to improve match outcomes, and moderate altitude training (~ 2000–3000 m) too has emerged as a popular ergogenic aid. Pre-competition acclimatization while residing at altitude (e.g., training for 1–2 weeks at the competition venue elevation) versus using altitude training to improve players' "trainability" and competition performance in the days and weeks following return to sea level (e.g., 2–3 weeks of living high and training low during the preseason) is two distinct forms of altitude interventions that were debated by the expert panel. Despite altitude training being an area of interest for many sporting organizations, for example, Federation International de Football Association, symposium on playing volleyball at altitude, and the International Olympic Committee, consensus statement on thermoregulatory and altitude

challenges for all high-level athletes – research on the impact of altitude training for team sports – is still in its infancy.

### 1.1. Impact of Partial Pressure

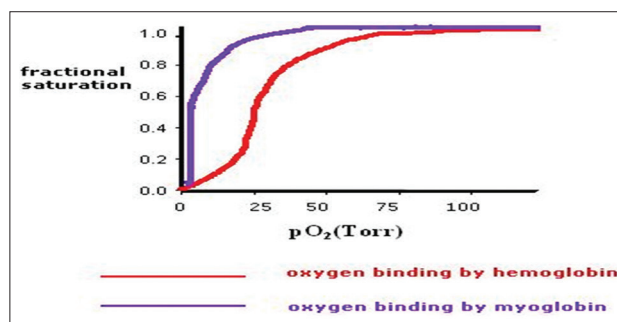
The human body is a highly aerobic organism, in which it is necessary to match oxygen supply at tissue levels to the metabolic demands. Along metazoan evolution, an exquisite control developed although oxygen is required as the final acceptor of electron respiratory chain, an excessive level could be potentially harmful. Understanding the role of the main factors affecting oxygen availability, such as the gradient of pressure of oxygen ( $PO_2$ ) during normal conditions and during hypoxia, is an important point. Several factors, such as anesthesia, hypoxia, and stress, affect the regulation of the atmospheric, alveolar, arterial, capillary, and tissue partial  $PO_2$ . Our objective is to offer to the reader a summarized and practical appraisal of the mechanisms related to the oxygen's supply within the human body, including a facilitated description of the gradient of pressure from the atmosphere to the cells. In high-altitude environments, you draw in less oxygen per breath than you would at lower altitudes. When they compete at lower altitudes, they get a natural boost to the muscles when additional oxygen is available. This blood expanding effect can enhance performance in elite athletes by 1–2%. In hemoglobin (Hb) concentration, 50% saturation is at 26.80 mm of Hg while 50% saturation has a higher affinity for oxygen than does myoglobin (Mb) occurs at 1 mm of Hg. Therefore, cooperative binding much more efficient in Hb than Mb. Mb does not show cooperative binding of  $O_2$ .



Mb has higher affinity for  $O_2$  than Hb. Although the percentage of oxygen in inspired air is constant at different altitudes, the fall in atmospheric pressure at higher altitude decreases the partial pressure of inspired oxygen and hence the driving pressure for gas exchange in the lungs. The role of Mb is to take up  $O_2$  from the blood and function as a reservoir of  $O_2$ . Instead of binding of the  $O_2$  by Mb is unaffected by the  $O_2$  pressure in the surrounding tissue. Figure 1 shows oxygen-binding curve:

## 2. PURPOSE OF STUDY

While elite team-sport players do not exhibit the specific physical/physiological capacities of elite



**Figure 1:** Oxygen-binding curve

endurance and sprint athletes, they generally possess an efficient combination of “aerobic” and “anaerobic” potential, though the relative contribution of oxidative versus glycolytic component varies widely across players and sports. Although aerobic metabolism dominates the energy delivery during most team sports, decisive actions (e.g., sprints, jumps, and tackles) are covered by means of anaerobic metabolism. As a result, the demands of team sports lend themselves toward a potential gain from adaptations to hypoxia from aerobically (maximal oxygen uptake [ $VO_2$  max], economy, and PCr resynthesis) and anaerobically (muscle buffer capacity) derived mechanisms. However, because the extent to which a player may benefit from different altitude training methods may differ according to both their general and specific training focus (more aerobic vs. anaerobic type of adaptations), no uniform recommendations can be made across all team sports. Nonetheless, it is anticipated that those activities displaying shorter exercise-to-rest ratios and/or requiring prolonged time spent at high relative exercise intensity are more likely to benefit from altitude training.

It has been acknowledged that in elite endurance as well as team-sport athletes, the effect of altitude training on red cell mass may depend on the initial Hb mass. Noteworthy, however, is the observation that meaningful increases in Hb mass also occur in highly trained endurance athletes – that is, with some of the highest reported pre-intervention Hb mass values – from different sports and after various forms of altitude training. In team sports, where a high Hb mass is not necessarily a pre-requisite in all positions, players are generally characterized by a low-to-moderate Hb mass (or  $VO_2$  max values usually ranging from 55 to 65 ml/min/kg) in comparison with endurance athletes. The rationale for attempting to increase Hb mass in team-sport players would be to increase their  $VO_2$  max and enhance blood buffer capacity and thereby decrease relative exercise intensity during games and increase tolerance for repeated-sprint exercises, respectively.



### 3. METHODOLOGY

Contemporary altitude training practices among athletes include living high and training high (LHTH), living high and training low (LHTL), as well as living low and training high (LLTH). These paradigms can be achieved with natural altitude, simulated altitude, or a combination. In a 2009 meta-analysis of sea level performance after hypoxic exposure, it was found that in elite endurance athletes, an enhancement of maximal aerobic power output was only possible with natural LHTL (4.0%; 90% confidence limits  $\pm 3.7\%$ ) and unclear with LHTH (1.6%;  $\pm 2.7\%$ ) and LLTH (0.6%;  $\pm 2.0\%$ ). While it is arguably easier to accumulate hours of hypoxia with LHTH, a recent meta-analysis concluded that Hb mass increases at approximately 1.1%/100 of altitude exposure regardless of the type of exposure (i.e., LHTH [ $>2100$  m] or LHTL [3000 m]). Alternatively, work and rest ratios could be altered during sessions also taking into account the altitude of the training venue and players' background. Exercise capacity during high-intensity intermittent exercise not only depends on the blood oxygen-carrying capacity but also on molecular adaptations in the skeletal muscle and the efficiency of the neuromuscular system. Training at sea level in enhancing peripheral adaptations (i.e., oxidative capacity, capillary density, and muscle glycolytic potential as well as increased expression of hypoxia-inducible factor 1 and downstream genes to oxygen and transport) and, thereby, high-intensity intermittent performance [3]. Likewise, resistance training combined with systemic hypoxia has been reported to further increase muscle strength.

#### 3.1. Current Trends in Altitude Training

In individual athletes, the success of altitude training requires living high enough ( $>2000$  m), for enough hours/day ( $> 14\text{--}16$  h/day), for a sufficient period of time ( $> 19\text{--}20$  days) to sustain an erythropoietin effect of hypoxia; that is, the so-called altitude dose (300–400 h). There is a widespread belief that elevation higher than 3000 m should be used with caution because of the excessive loss of training intensity and the characteristics of ball flight will change substantially due to the thinness of the air. On the one hand, the degree of hypoxia determines the magnitude of the induced physiological changes in a “dose–response” relationship, with higher altitudes triggering larger/faster increases in red cell mass. The field of altitude training represents a good example of how a better understanding of the acute/chronic effects of hypoxia, as well as the best practices

to acclimatize, can help teams to better prepare their players.

#### 3.2. The Scientific Approach of Altitude Training

Hb binds  $O_2$  molecules to its iron atoms and transports them from lungs to muscles where they are delivered to Mb molecules. These Mb store the  $O_2$  until it is required for metabolic action. Hb then uses certain amino groups to bind  $CO_2$  carry it back to the lungs. The skeletal muscle of driving mammal is particularly rich in Mb which serves as a store of  $O_2$  during drive. Although Hb is about as good as  $O_2$  binder as Mb at high  $O_2$  pressure, it is much poorer at the lower pressures prevailing in muscles, hence passes on its  $O_2$  to the Mb as required. The need for  $O_2$  will be greatest in tissues that have already consumed  $O_2$  and simultaneously have produced  $CO_2$ . The  $CO_2$  lowers the pH thus causing the Hb to release even more  $O_2$  to the Mb (Bohr effect). The  $O_2$ -binding curves for Mb and Hb. The graph showing the pH dependence for the latter (Hb), thus at low partial pressure Hb releases significant amount of  $O_2$ . In other words at the low partial pressure, the Mb is totally saturated (bound with  $O_2$ ) and binding of  $O_2$  (sigmoidal curve) indicates that partial pressure pH dependence (Bohr effect) both of are essential to the role played by Hb (i.e.,  $O_2$  transport). However, atmosphere pressure at about 13 km (8 miles) above the sea level, there is one-fifth of the  $O_2$  present to that of sea level. With every 10 m increase in altitude, there is 1 mm of Hg (pressure) decrease in  $O_2$  pressure.

#### 3.3. Biological Advantages

People living in higher altitudes (low  $O_2$  pressure) are genetically adapted to have more RBCs (with pink/red checks). To carry sufficient  $O_2$  to the tissue. There is an advantage of sportsperson living in higher altitude, we can say that they are genetically adapted (evolved) to be supplied with more Hb, thus more storage reserves of Mb. This can release more  $O_2$  during vigorous physical activity. For example, athlete gets extra energy when the rest of his competitors get exhausted. It is an example of biological evolution or genetic modification. Biological advantages: Hb carries 4  $O_2$  molecules at a time, whereas Mb carries 2  $O_2$  molecules (biological dioxygen carrier), Hb shows cooperative binding, i.e., binding of 2  $O_2$  molecules. The binding of  $O_2$  to Hb is cooperative as Hb binds successive  $O_2$ . The practice of training at an altitude is well-known among coaches and athletes, particularly elite athletes. The enhancement of performance, often at sea level, is



the main goal for athletes training at an altitude. This is also called “hypoxic” training. Altitude training is differentiated into “live high-train high” (LHTH), “live high-train low” (LHTL), “live moderate-train moderate” (LMTM), and “live low-train high” (LLTH). Cardiovascular progress is high-altitude training that improves your body’s oxygen-carrying capacity.

## 4. RESULTS

### 4.1. Cardiovascular Advantages

High-altitude training improves our body’s oxygen-carrying capacity. Under normal conditions, kidneys release a hormone called erythropoietin, which stimulates bone marrow of athlete’s to produce and release adequate amount red blood cells to transport oxygen to tissues and organs. At high altitudes, the reduced oxygen levels cause kidneys to increase erythropoietin release, resulting in more number of corpuscles, which transport more oxygen throughout the body.

### 4.2. Respiratory Improvements

High-altitude training exerts beneficial effects on respiratory system of an athlete.  $VO_2$  is a measure of how much oxygen body can use and convert to energy from food. This is done by converting nutrients from diet to a high-energy molecule called adenosine triphosphate. High-altitude training increases  $VO_2$  max, which, in turn, improves endurance and athletic performance.

### 4.3. Improves Cortisol

High-altitude training is effects on cortisol levels. Cortisol is a stress hormone, and it increases when athletes body is placed under stress. The low oxygen conditions at high altitude trigger adrenal glands to increase cortisol production. Cortisol is a catabolic hormone, its break down muscle for energy in a process called catabolism. High cortisol levels cause body to go from a muscle building state to a state of muscle breakdown.

## 5. DISCUSSION

Some individual possesses inherited beneficial enzymes, as well as specially equipped cells, that enable them to withstand the physical demands of high-altitude living.

As per Hoppeler led, a joint Swiss/Italian team took muscle tissue samples from nine Tibetans who live

approximately 2–3 miles above sea level and six of their parents who had emigrated to the lowlands of Tibet.

Late Peter Hochachka indicated that the Quechua people of the Andes also possess genetic adaptations for improved high-altitude living.

The American Association for the Advancement of Science appears to support Hoppeler’s claim that high-altitude dwellers have evolved unique physical abilities.

## 6. CONCLUSIONS

The field of altitude training represents a good example of how a better understanding of the acute/chronic effects of hypoxia, as well as the best practices to acclimatize, can help teams to better prepare their players. At present, most of our understanding, and information on altitude-training methods, have been focusing on endurance (individual) athletes. Based on this literature, there is little question as to the benefits of training at altitude for the purpose of improving performance at altitude (acclimatization). However, the benefits of using an LHTH, LHTL, and LLTH altitude training intervention or a combination of those methods to improve team-sport-related physical performance on return to sea level are not as definitive. The approach that consists of extrapolating existing data obtained with individual athletes to understand the effects of altitude training on complex team-sport performance is limited. The question of whether altitude/hypoxic training are it natural or artificial is relevant to improve team-sport performance (and its putative underlying mechanisms) has not yet been convincingly proven. Nevertheless, it is undeniable that no single recommendation is likely suitable for all players in a team, or across all team sports, requiring the development of optimized interventions at the individual player level.

## REFERENCES

- [1] Armellini, F., Zamboni, M., Robbi, R., Todesco, T., Bissoli, L., Mino, A., Angelini, G., Micciolo, R., and Bosello, O. The effects of high altitude trekking on body composition and resting metabolic rate. *Horm Metab Res*, 1997, 29, 458-461.
- [2] Aughey, R.J. Applications of GPS technologies to field sports. *Int J Sports Physiol Perform*, 2011, 6, 295-310.
- [3] Beidleman, B.A., Fulco, C.S., Staab, J.E., Andrew, S.P., and Muza, S.R. Cycling performance decrement is greater in hypobaric versus normobaric hypoxia. *Extrem Physiol Med*, 2014, 3, 8.

- [4] Bergeron, M.F., Bahr, R., Bartsch, P., Bourdon, L., Calbet, J.A., Carlsen, K.H., Castagna, O., González-Alonso, J., Lundby, C., Maughan, R.J., Millet, G., Mountjoy, M., Racinais, S., Rasmussen, P., Singh, D.G., Subudhi, A.W., Young, A.J., Soligard, T., and Engebretsen, L. International Olympic committee consensus statement on thermoregulatory and altitude challenges for high-level athletes. *Br J Sports Med*, 2012, 46, 770-779.
- [5] Campbell, A.D., McIntosh, S.E., Nyberg, A., Powell, A.P., Schoene, R.B., and Hackett, P. Risk stratification for athletes and adventurers in high-altitude environments: Recommendations for preparticipation evaluation. *Clin J Sport Med*, 2015, 25, 404-411.
- [6] Cheng, I., Kiss, A., and Lilge, L. An observational study of personal ultraviolet dosimetry and acute diffuse reflectance skin changes at extreme altitude. *Wilderness Environ Med*, 2013, 24, 390-396.
- [7] Fulco, C.S., Beidleman, B.A., and Muza, S.R. Effectiveness of preacclimatization strategies for high-altitude exposure. *Exerc Sport Sci Rev*, 2013, 41, 55-63.
- [8] Bailey, D.M., and Davies, B. Physiological implications of altitude training for endurance performance at sea level: A review. *Br J Sports Med*, 1997, 31(3), 183-190.
- [9] Julian, G.C., and Lorna, G. Moore human genetic adaptation to high altitude: Evidence from the Andes. *Genes (Basel)*, 2019, 10(2), 150.

# Effects of 4-Week Yoga Training on Muscular Strength, Muscular Endurance, Flexibility, and Agility of Female Hockey Players

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## ABSTRACT

The aim of the present study was to investigate the effect of yoga training on muscular strength, muscular endurance, flexibility, and agility of hockey players. For this purpose, a sample of 40 female hockey players of age ranging from 16 to 18 years was selected from the Hyderabad Public School, Begumpet. Further, the subjects were purposively divided into two groups. Group I designated as the experimental group ( $N_1 = 20$ ) and the Group II as the control group ( $N_2 = 20$ ). All the participants were informed about the objectives and methodology of this study and they volunteered to participate in this experimental study. The study was restricted to the variables: Muscular strength, muscular endurance, flexibility, and agility. The same was measured using flexed-arms hang test, sit-ups test, sit and reach test, and shuttle run test, respectively. Experimental group has undergone yoga for 4 weeks by following a sequence of selected yogic asanas, i.e., Parivrtta Trikonasana, Utthita Parsvakonasana, Gomukhasana, Ardha-Matsyendrasana, Paschimottanasana, Ustrasana, Dhanurasana, Chakrasana, Bhujangasana, Sarvangasana, Halasana, and Hanumanasana. The paired sample *t*-test was applied to study the effects of yoga training on hockey players. The level of significance was set at 0.05. Results revealed significant differences between the pre- and post-tests of the experimental group with respect to muscular strength ( $t=6.946^*$ ), muscular endurance ( $t=9.863^*$ ), flexibility ( $t=11.052^*$ ), and agility ( $t=14.068^*$ ). However, insignificant differences were observed between the pre- and post-test of the control group.

**Keywords:** Flexibility and agility, Hockey players, Muscular endurance, Muscular strength, Yoga.

## 1. INTRODUCTION

In the present scenario, global recognition of yoga virtually attracts the attention of intellectuals of varied fields, including sports. Worldwide, there seems to be a considerable rise in scientific research in the field of yoga. Yoga is a science as well as an art of healthy living physically, mentally, morally, and spiritually. It is not limited by race, age, sex, religion, and caste or creed and can be practiced by those who want to have a more meaningful life. Yoga is about developing harmony between mind and body. Yoga is that a “science of sciences” is too comprehensive in its nature and too profound in its scope of teachings to be fitted into the framework of any particular philosophy, religion or belief, and ancient or modern (Taimni, 2005). Yoga is a psycho-somatic-spiritual discipline for achieving union and harmony between our mind, body, and soul and the ultimate union of our individual consciousness with the universal consciousness (Mohan, 2008). Some simple yoga

postures that may be used by beginners with time improve flexibility, strength, and endurance (Sequiera, 1999). The purposes of the asanas are to condition the body, which ultimately increase strength, flexibility, and endurance. Mobility is defined as the ability to move body structures or parts of the body through the existing range of motion for a functional activity (Kisner and Colby, 2007). Improved flexibility is one of the most obvious and quickly achieved effects of regular yoga practice since this is based on gradual stretching of muscle and connective tissue around bones and joint (Woodyard, 2011), static retention of yoga poses and movements of joints throughout the entire existing range of motion (McCall, 2007). More so, these yoga postures are argued to stimulate body organs, promoting digestion, improving circulation, and nervous system functioning (Iyengar, 2005). Asanas are performed standing, sitting, reclining, or inverted and may involve forward bending, backward bending, and twisting of the trunk. It has been argued that holding these poses for a

prolonged time (about 30 s or more for each pose) is one of the most important aspects of yoga exercise. Several proposed mechanisms have been offered to explain the neuromuscular benefits of yoga. One idea is that the repetitive stretching and force resistance movements of yoga postures increase the contraction ability and size of muscles as well as range of motion of various joints. This has been supported through evidence of increased muscle size, strength, and endurance (Brochu, 2002). The present research was conducted to fetch out the effects of 4-week yoga training on muscular strength, muscular endurance, flexibility, and agility on female hockey players.

## 2. MATERIALS AND METHODS

### 2.1. Subjects

The study was conducted on a sample of 40 female hockey players of age ranging from 16 to 18 years, selected from the Hyderabad Public School, Begumpet. Further, the subjects were purposively divided into two groups. Group I designated as the experimental group ( $N_1 = 20$ ) the Group II as the control group ( $N_2 = 20$ ). All the participants were informed about the objectives and methodology of this study, and they volunteered to participate in this experimental study.

### 2.2. Methodology

The study was restricted to the variables: Muscular strength, muscular endurance, flexibility, and agility. Experimental group has undergone yoga training for 4 weeks by following a sequence of selected yogic asanas, i.e., Parivrtta Trikonasana, Utthita Parsvakonasana, Gomukhasana, Ardha-Matsyendrasana, Paschimottanasana, Ustrasana, Dhanurasana, Chakra-asana, Bhujangasana, Sarvangasana, Halasana, and Hanumanasana, as per the images given below.



*Utthita Parsvakonasana*



*Gomukhasana*



*Parivrtta Trikonasana*



*Ardhya-matsyendraana*





*Paschimottasana*



*Chakrasana*



*Ustrasana*



*Bhujangasana*



*Dhanurasana*



*Sarvangasana*



*Halasana**Hanumanasana*

The experimental group was given yoga training of 11/2 h morning sessions daily (excluding Sunday) for 4 weeks, and no such training was given to the control group. Both the groups took part in the pre-training and post-training measurements test for the study. Muscular strength was assessed with the help of flexed-arm hang test; sit-up test was used to assess the muscular endurance; and sit and reach test was employed to measure the flexibility, while a shuttle run test was administered to assess the agility.

### 2.3. Statistical Analysis

The paired samples “t”-test was employed to find out the significance of differences between the experimental and control groups. The level of significance was set at 0.05. The data relates to variables of the study were analyzed with the help of Statistical Package for the Social Science statistical software.

## 3. RESULTS

For the variables, the statistical analysis reveals significant differences between the pre-test and post-test of the experimental group regarding muscular strength,

muscular endurance, flexibility, and agility. However, insignificant differences were seen in the control group.

Table 1 exhibited the mean values ( $\pm$ SD) of pre- and post-test of 4-week yoga training of female hockey players of experimental and control groups with respect to muscular strength, muscular endurance, flexibility, and agility. The table shows that the mean of muscular strength of pre- and post-tests of the experimental group was 29.8 and 33.7, respectively, whereas the mean of muscular strength of pre- and post-tests of the control group was 27.45 and 27.95. The muscular endurance of pre- and post-tests of the experimental group was 38.8 and 42.75, respectively, whereas the mean of muscular strength of pre and post-tests of the control group was 36.35 and 36.95. The flexibility of pre- and post-tests of the experimental group was 8.85 and 10.35, respectively, whereas the mean of muscular strength of pre- and post-tests of the control group was 8.05 and 8.2. The agility of pre- and post-tests of the experimental group was 13.58 and 13.19, respectively, whereas the mean of muscular strength of pre- and post-tests of the control group was 13.75 and 13.72.

The critical value of  $t$  at 95% probability level in the experimental group is much lower (2.093) than the observed values of  $t$  with regard to muscular strength (6.946\*), muscular endurance (9.863\*), flexibility (11.052\*), and agility (14.068\*). The data does suggest that the differences between the pre- and post-tests of the experimental group with regard to muscular strength, muscular endurance, flexibility, and agility are found statistically significant. Whereas the critical value of  $t$  at 95% probability level in control group is much higher (2.093) than the observed values of  $t$  with regard to muscular strength (0.741), muscular endurance (0.89), flexibility (0.616), and agility (0.193). The data does suggest that the differences between the pre- and post-tests of the control group with regard to muscular strength, muscular endurance, flexibility, and agility are insignificant.

## 4. DISCUSSION

The present study was structured to find out the effects of 4-week yoga training on female hockey players of the experimental and control groups with regard to muscular strength, muscular endurance, flexibility, and agility. Results revealed significant differences between the pre- and post-tests of the experimental group with respect to muscular strength ( $t$ -6.946\*), muscular endurance ( $t$ -9.863\*), flexibility ( $t$ -11.052\*), and agility

**Table 1:** Mean values ( $\pm$ SD) of pre- and post-tests of 4-week yoga training of female hockey players of the experimental and control groups

Variables	Experimental group (N <sub>1</sub> =20)		“t”-ratio	Control group (N <sub>2</sub> =20)		“t”-ratio
	Pre-test mean ( $\pm$ SD)	Post-test mean ( $\pm$ SD)		Pre-test mean ( $\pm$ SD)	Post-test mean ( $\pm$ SD)	
Muscular strength	29.8 (4.12)	33.7 (4.32)	6.946*	27.45 (4.31)	27.95 (5.87)	0.741
Muscular endurance	38.8 (5.39)	42.75 (5.55)	9.863*	36.35 (2.68)	36.95 (4.87)	0.890
Flexibility	8.85 (1.81)	10.35 (1.72)	11.052*	8.05 (1.43)	8.2 (1.44)	0.616
Agility	13.58 (0.76)	13.19 (0.8)	14.068*	13.75 (0.68)	13.72 (0.95)	0.193

(\*) Significant at 0.05 levels, Tabulated  $t=2.093$

( $t=14.068^*$ ). However, in the case of the control group, insignificant differences were observed between the pre- and post-tests. The findings of the present study are in line with the study of Singh *et al.* (2011), they concluded that yoga asana training improves agility and muscular strength. The result with regard to flexibility is also in line with the result of Hovsepian *et al.* (2013) as they observed that yoga and aerobic training significantly improved flexibility; Petric *et al.* (2014) also favor this result as he found that regular practice of yoga has a significant effect on body flexibility in young healthy women. The results of the present study are partially in line with the study of Damle (2012) as she concluded that yogic exercises and breathing exercises improve flexibility, agility, strength, concentration, lung capacity, and speed. Pauline and Rintaugu (2011) also concluded that yoga training increases the strength and flexibility of females from South West London. Results are also in line with the study of Ezhilarasi and Amsanatarajan (2014) as they concluded that yogic practices group is significantly better than the control group in improving the muscular strength among college women basketball players.

## 5. CONCLUSION

It is concluded that 4 weeks of yoga training can significantly improve muscular strength, muscular endurance, flexibility, and agility among female hockey players, which ultimately enhances their level of sports performance. Nowadays, it has been observed that yoga can play a pivotal role in all spheres of life, including sports.

## 6. ACKNOWLEDGMENTS

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## REFERENCES

- [1] Brochu, M., Savage, P., Lee, M., Dee, J., Cress, M., Poehلمان, E., Tischler, M., and Ades, P. Effects of resistance training on physical function in older disabled women with coronary heart disease. *J Appl Physiol*, 2002, 92, 672-678.
- [2] Damle, S. Effect of yogic practices for development of physical fitness of college girls. *Phys Educ*, 2012, 10(12), 51-52.
- [3] Ezhilarasi, and Aramsantajan. Effects of yogic practices and aerobic exercise on muscular strength among college women basketball players. *Star Phys Educ*, 2014, 2(2), 1-5.
- [4] Iyengar, B. *Light on Life*. New York: Rodale, Inc.; 2005.
- [5] Kisner, C., Colby, L.A. *Therapeutic Exercise: Foundations and Techniques*. 5<sup>th</sup> ed. Philadelphia, PA: FA Davis Company; 2007.
- [6] Madanmohan. *Role of Yoga and Ayurveda in Cardiovascular Disease*; 2008. Available from: <http://www.fac.org.ar/qcvc/llave/c039i/madanmohan.php>. [Last accessed on 2011 Sept 11].
- [7] McCall, T. *Yoga as Medicine: The Yogic Prescription for Health and Healing*. New York: Random House, Inc.; 2007.
- [8] Pauline, M., and Rintaugu, EG. Effects of yoga training on bilateral strength and shoulder and hip range of motion. *Int J Curr Res*, 2011, 3(11), 467-470.
- [9] Petric, M., Vauhnik, R., and Jakovljevic, M. The impact of hatha yoga practice on flexibility: A pilot study. *Altern Integr Med*, 2014, 3(2), 160.
- [10] Singh, A., Singh, S., and Gaurav, V. Effects of 6-weeks yoga asanas training on agility and muscular strength in sportsmen. *Int J Educ Res Tec*, 2011, 2(2), 72-74.
- [11] Taimini, I.K. *The Science of Yoga*. Adyar Chennai: The Theosophical Publishing House; 2005.
- [12] Volga, H., Marandi, SM., Kelishadi, R., and Zahed, A. A comparison between yoga and aerobic training effects on pulmonary function tests and physical fitness parameters. *Pak J Med Sci*, 2013, 29(1), 317-320.
- [13] Woodyard, C. Exploring the therapeutic effects of yoga and its ability to increase the quality of life. *Int J Yoga*, 2011, 4(2), 49-54.
- [14] Chetana-Center for Yoga and Health Education.

# Horizons and Trends of Pedagogy on Leadership Qualities of Kabaddi Coaches among the Physical Directors in Telangana State

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## 1. INTRODUCTION

Horizons and trends of pedagogy on leadership qualities of kabaddi coach among the physical directors in Telangana state. Research topic was aimed to encourage wider interest and involvement in the game of kabaddi among physical directors in Telangana state. Kabaddi is basically an outdoor team game which requires both skill and power combines the characteristics of wrestling and rugby. School and college kabaddi physical directors aim for children to maintain their health always fit through the game. Kabaddi was included as regular sports discipline for institution games aims to develop the skills of self-defense, attack, as well as survival and take up the game at an early age. The purpose of doctoral research study was to determine the self-assessment of leadership quality of kabaddi physical directors confined NS NIS 6 weeks and teacher B. P. Ed./M. P. Ed. specialization kabaddi PE coaches, managers current state of sociological influences on kabaddi pedagogy not only toward the enhancement of training program and attain recognition as a sports education in the pre-university educational institutions. Normative values of kabaddi physical efficiency and specific skill battery test observational and survey items can affect kabaddi coaches societal and environmental influences from 1 year to the next or between interactions with different kinds of competitions. Kabaddi in B. P. Ed./M. P. Ed. course detailed knowledge of game coaching structure not significantly different in quality of curricular PE course content.

## 2. PURPOSE OF THE STUDY

The purpose of the study was to emphasize that physical directors will break down fundamentals and expert techniques on coaching speed and strength with leadership to create their vision and performance across

the school education. Different types of academic and professional qualifications of physical director sports effect of Sports Authority of India (SAI) NS NIS kabaddi 6 weeks certified coaches, B. P. Ed./M. P. Ed. professional specialization confined kabaddi coaches and managers worked at state and national competitions of school games in Telangana state. Identify and contribute to educational qualitative research participant observation of physical directors collective group case survey and correlation study. To update and to more about a topic provides field the advance knowledge competence of kabaddi managers and coaches through the school games organization of state and national competitions leadership activities award of doctor of philosophy in Kakatiya University, Warangal, Telangana state.

## 3. HYPOTHESES

Kabaddi physical directors attend NIS 6 weeks coaching certificate, SAI shows greater leadership abilities than who do not attend NIS kabaddi certificate and kabaddi academic specialization degrees in Telangana state. There may be any difference eminence coaching and development of physical directors participant an observational and attitude questionnaire test, career professional standards of state coach association confined kabaddi national institute of sports (6 weeks) coaches, PE specialization of B. P. Ed./M. P. Ed. coaches and managers in Telangana state. Is there any significant difference of leadership competencies self-assessment survey degree of agreement group-wise ground work at state and national kabaddi competitions in Telangana state. To assess physical directors leadership multi variable that enhance the magnitude of correlation between primary role model innovator and broker, internal process model coordinator and monitor, rational goal model goal setter or director and human relation

model SAI NS NIS (6 weeks) and specialization of B. P. Ed./M. P. Ed. coaches and kabaddi managers in Telangana state. There is no statistically significant difference physical directors leadership between NIS 6 weeks, physical education specialization of kabaddi game confined kabaddi coaches and kabaddi managers in Telangana state.

#### 4. METHODOLOGY AND MATERIAL – DEGREE OF AGREEMENT (LIKERT SCALE) QUESTIONNAIRE

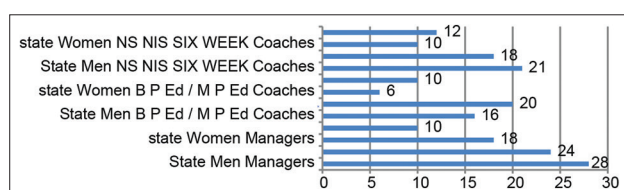
Descriptive correlation special type of research design surveys study focussed as comparative, descriptive, and group case studies (Campbell and Stanley, 1963; Crowl, 1993) physical directors men and women categorical leadership degree of responses; strongly agree – 5, agree – 4, neither agree nor disagree – 3, disagree – 2, and strongly disagree – 1.

##### 4.1. Innovator (Primary Role Model)

- Comes up with new PE kabaddi training techniques.
- Ideas and applies innovative technique in PE kabaddi coaching scheduled.
- Searches for innovation and potential improvements plans in PE kabaddi training.
- Creates new skills and strategies preparatory/competition period in kabaddi matches.

##### 4.2. Broker (Primary Role Model)

- Exerts upward influence in the organization of camp PE kabaddi administration.
- Influence people/players at managerial levels state/national PE kabaddi matches.
- Influence decisions made at state/national levels PE kabaddi training.
- Well-acquainted players of influence in build – main up PE competitions participation.



**Figure 1:** Representation of research data on different physical directors area of work kabaddi training leadership role models of men and women in state and national level kabaddi competitions in Telangana state – 2015–2020

##### 4.3. Goal Setter/Monitor (Rational Process Model)

- Defines the areas of responsibility of PE kabaddi team (give priority the records/result).
- Assigns the roles for player in session task scheduled in PE kabaddi play.
- Encourages players to achieve the goal in the level of participation of PE kabaddi matches.
- Sets clear objective for kabaddi team/group tasks in PE training/competitions.

##### 4.4. Coordinator (Internal Process Model)

- Maintained day-to-day PE kabaddi training as scheduled follows scientific methods.
- Minimizes disruptions to session/unit plans and screened in PE kabaddi training.
- Keeps continuity PE training of kabaddi play defense-offence skills/techniques/tactics.
- Overview of PE kabaddi training practice avoids disruption in owing/learning skills.

##### 4.5. Director (Internal Process Model)

- Compares records data on PE players and teams to detect discrepancies of eligibility.
- Review the PE training programs and game schedules in every type of training cycle.
- Examine the records to find weaknesses of kabaddi fundamental skill/zone positional play.
- Train players based on data obtained during practice/competition of PE kabaddi matches.

##### 4.6. Facilitator/Mentor (Human Relation Model)

- Encourages player to offer an option of kabaddi play positions (friendly environment team).
- Shows affection and concern to PE kabaddi players in coaching and training camp.
- Treats each player as an individual/group/team to play PE kabaddi matches.
- Encourages PE players to participate in decision-making during play (builds leadership).

A high correlation means that two or more variables have a strong direction of relationship with each other, while a weak strength correlation that the variables are hardly related. Table 1 shows mean, standard deviation, and *n* pairs of sample and helps in understanding the nature and future course of actions.

In statistics, Levene's test of homogeneity of variances (1960) is an inferential statistical used to assess the



**Table 1:** The kabaddi managers of physical directors self-assessment to their categorical variable training leadership abilities in state ( $n=28$ , 18) and national ( $n=24$ , 10) level kabaddi competitions for and paired sample mean, standard deviation, and  $t$ -test of men and women

LsQ	Role	Test	Mean				SD				df		t-value		P value	
			State		National		State	National		S	N	State	National	State	National	
			Pre	Post	Pre	Post		Pre	Post							
Primary model	Innovator	M	13.7	14.5	14.4	15.6	4.13	2.98	3.88	2.91	27	23	3.82	3.05	0.01	0.05
		W	11.3	13.4	10.1	12.7	2.09	2.59	2.13	2.45	17	9	4.53	4.33	0.00	0.02
	Broker	M	12.3	13.8	13.1	14.5	4.71	3.52	3.65	2.72	27	23	4.53	3.14	0.00	0.05
		W	9.6	12.1	8.5	11.2	1.72	2.04	1.96	2.39	17	9	5.50	4.67	0.00	0.01
Internal process	Director	M	14.0	15.6	13.8	15.3	4.15	3.12	3.82	2.65	27	23	4.87	3.42	0.00	0.02
		W	11.2	13.6	10.2	13.3	1.79	1.69	2.04	2.16	27	9	5.13	5.89	0.00	0.00
	Coordinator Rr.	M	13.6	15.1	13.6	15.3	4.62	3.16	3.77	2.52	17	23	1.92	3.75	0.00	0.01
		W	11.2	13.9	9.8	12.8	4.62	3.16	1.93	1.90		9	2.24	6.07	0.00	0.00
Rational	Monitor	M	13.5	15.5	13.3	15.3	4.59	3.13	3.77	2.37	27	23	5.25	4.45	0.00	0.00
		W	10.9	13.9	9.6	12.8	1.80	2.00	2.32	1.93	17	9	6.49	7.24	0.00	0.00
Human	Facilitator	M	11.6	15.3	13.8	15.7	4.13	2.98	3.86	2.57	27	23	4.93	4.44	0.00	0.00
		W	11.3	11.4	9.6	12.9	4.61	3.16	2.13	1.66	17	9	5.79	8.34	0.00	0.00

Result: Physical directors paired sample mean, standard deviation, and  $t$ -test  $P \leq 0.05$  sig.



**Table 2:** Paired sample correlation leadership abilities men and women manager

Leadership	Primary role mode				Sig.	Type of correlation
	Innovator					
Correlation	State	National		National		
Men	0.946	0.863		0.863	0.000	Excellent
Women	0.681	0.665		0.665	0.002 0.031	Negligible
Leadership	Internal process model				Perfect positive correlation	
	Director		Coordinator			
Correlation	State	National	State	National	Sig.	Type
Men	0.928	0.840	0.947	0.846	0.000	Excellent
Women	0.357	0.689	0.565	0.682	0.146 0.015	Low medium
Leadership	Rational goal model monitor or goal setter				Paired ideal correlation	
Correlation	State		National		Sig.	
Men	0.943		0.850		0.000	Excellent
Women	0.490		0.798		0.039	Low
Leadership	Human relation role model facilitator				0.4 and 0.65 critical	
Correlation	State		National		Sig.	Type
Men	0.928		0.867		0.000	Excellent
Women	0.472		0.807		0.048	Medium

Correlation (r/p): Men/women at level 0.05 significant r(28)-367, r(24)-388; r(18)-444, r(10)-576 df=N-2; r/p significance coefficient

equality of variances for B. P. Ed./M. P. Ed. specialization Group-B and NS NIS 6 weeks kabaddi coaches men and women to their categorical leadership variables self-assessment Likert responses at state and national level kabaddi competitions – 2015–2020, Table 2.

## 5. RESULTS

$F < 1$ , we straightway interpret it as non-significant resulting in the fail to rejection of the null hypothesis. It indicates that both types of coaches did not differ significantly among themselves in their degree of agreement in relation to categorical leadership role models at state and national kabaddi competitions in Telangana state.  $L > P$ ;  $t(20)$ ,  $t(28)$ ,  $t(29)$ ,  $t(28) > P$  (0.05 level of significant).

Kabaddi leadership is neither bossism nor synonymous with management. Each letter of “kabaddi leadership” can be abbreviated in the following manner:

K = Knowledge about defensive and offensive skills, A = Adequate athletic attitude and avoid a drug without a doctor, B = Book on quality of event methods and balanced diet, A = Appreciation of recreation activities and awareness of practicability, D = Discipline

of individual and social personality, D = Direction of duplicate drills and dynamic strength and done endurance, I = Interesting incubation to improve growth and behavior and intelligence.

L = Loyalty, E = Enthusiasm, endurance, engaging personality, A = Alertness, adjustment, ability to coordinate activities, D = Discipline, dependability, desire to help other, E = Energetic, earnestness.

R = Reliability, right thinking, and right judgment, S = sincerity, sympathy, self-control, sacrifice, super motor capacity, H = health, honey, humor, I = intelligent, industriousness, impartiality, interest in teaching, P = Patience, perseverance, personality, physical skill, public relations.

## 6. CONCLUSIONS

Kabaddi training and coaching are the science and *art of education*. Coaching is basically a plan or scheme to encourage kabaddi players to learn more and more formal as well as informal faced challenges and solutions practical competitions. Assess the individual, emphasize connection, stress the importance, describe the duties and be patient. Physical directors confined

kabaddi managers and coaches extramural competitions quality of leadership specialist knowledge, exhibit ground leader. He/she motivates and presents kabaddi game offensive/defensive skills, techniques, tactics, strategies, and shape the culture of presents their teams. Physical directors become highlight the practical things they would do in practice sessions contributes to the success of the team managers, coaches are several considerations assistant and serve a key role can be fun and appreciate value to the program compete at state kabaddi trainers and coaches association.

## 7. SUGGESTIONS

AKFI/SGFI physical director changes regard to the profession criticism than appreciation and universities/institutions/associations are not modified

and run half-backed professionals accepting suitable sports curriculum in T.S. in-service PE teachers precise knowledge updated as per modern times kabaddi training and competition of outstanding contribution.

## REFERENCES

- Jones, R., Morgan, K., and Harris, K. Developing coaching pedagogy: Seeking a better integration of theory and practice. *Sport Educ Soc*, 2011, 17(3), 313-329.
- Rao, E.P. *The Complete Handbook on Kabaddi*. India: Jagadamba Publications; 2002.
- Library Sources Osmania and Kakatiya University and Journals, Articles Research Publication Various Publishers in Physical Education. New Patterns According to Latest Revised Syllabus and UGC Guidelines Research Publications and Website Information.

# Comparative Study on Mobile Phone Dependency among Adolescent Athletes and Non-athletes

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## ABSTRACT

The purpose of the study is to know the effect of sport participation on mobile phone dependency by comparing the scores of adolescent athletes and non-athletes. The study also verifies if there is any significant difference exists between boys and girls in the above-said categories. The subjects of the study included 120 individuals, consisted of adolescent athletes and non-athletes. The subjects were from 13 to 19 years of age. Classification of the subjects was athletes ( $n = 60$ ) and non-athletes ( $n = 60$ ). This population includes boys ( $n = 60$ ) and girls ( $n = 60$ ). The data were collected using test of mobile phone dependence (TMD) (Chóliz, 2012) on randomly selected subjects from different schools of Kerala state. Statistical technique used to compare the means was independent “ $t$ ”-test. Within the limits and limitations of the present study, the results indicate that there is a significant difference between athletes and non-athletes in all factors of TMD, i.e., individuals with sports exposure were found to be less addictive to mobiles than those who have not received any kind of sports training. However, boys and girls showed a significant difference only in the factor lack of control and in total TMD. In these boys scored significantly higher than the girls. A well-planned sports program to strengthen these life attributes is vital for the effective functioning of an individual. Sports’ being a mean of strengthening mind are always advisable for a better quality life.

## 1. INTRODUCTION

From the past one decade, there is a vast increase in the use of mobile phones as well as problems related to its overuse and addiction. While a smartphone can be a hugely productive tool, compulsive use can interfere with work, school, and relationships. Unfortunately, cell phone addiction may become more widespread as greater numbers of children are using cell phones. Psychological needs and extraneous necessities, causing a constant attachment to one’s gadget, leading to loss of productivity and developing chronic side effects such as depression, loneliness, lack of social behavior, loss of sound sleep, and various health issues, is termed as mobile phone addiction. Smartphone addiction is considered as the inability to control the smartphone use despite negative effects on users. The use of a smartphone not only produces pleasure and reduces feelings of pain and stress but also leads to failure to control the extent of use despite significant harmful consequences in financial, physical, psychological, and social aspects of life (Shaffer, 1996; Van Deursen *et al.*, 2015; Young, 1999). Children using the cell phone displayed more behavioral problems such as nervousness, temperament, mental distraction, and indolence, and

these problems worsened if the children began using a cell phone at an early age (Divan *et al.*, 2012). A new kind of health disorder; smartphone addiction is now challenging health policy-makers globally to think on this rapidly emerging issue. Adolescents would be more at risk of smartphone addiction as compared with adults because adolescents are yet to develop self-control in smartphone use. Adolescents with working parents could be at a risk of smartphone addiction, possibly because such children could not be cared by their parents after school and they would use smartphones without any rules and guidance.

Sports participation has many advantages of psychological and physical well-being such as decreasing anxiety, depression, and stress (Hassmen *et al.*, 2000; Salmon, 2001; Scully *et al.*, 1998; Warburton *et al.*, 2006). Specifically, prior studies have shown the effect of physical exercise and sport participation on self-control.

Park *et al.*, in 2016, tried to identify the relationship among sports participation, self-control, and internet addiction among Korean adolescents and indicated a significant effect of sports participation on internet addiction mediated by self-control. The results proved

the effectiveness of sport and physical activity in internet addiction treatment programs. Billieux *et al.* (2008) tested gender differences in both teams of impulsions and problematic mobile phone use among the young. The results showed that men use their mobile phones more frequently in dangerous situations, whereas women are more dependent on them. The results on impulsions showed that men exhibit significantly higher levels of sensation seeking and lower levels of perseverance, while women reveal significantly higher levels of urgency. Females are more likely to be involved with their mobile than males are (Walsh *et al.*, 2011), due to the differences in the purpose of the use of mobile phones. A study titled “on the Gendered Nature of Mobile Phone Culture in Israel” suggested that males are more likely to use their phones for functional purposes, such as work-related use, whereas females primarily use their phones to keep in contact with valued people (Lemish and Cohen, 2005). Thus, it seems that males and females have different smartphone use patterns.

### 1.1. Purpose of the Study

The purpose of the study is to know the effect of sport participation on mobile phone dependency by comparing the scores of adolescent athletes and non-athletes. The study also verifies if there is any significant difference exists between boys and girls in the above-said categories.

## 2. METHODOLOGY

### 2.1. Sample

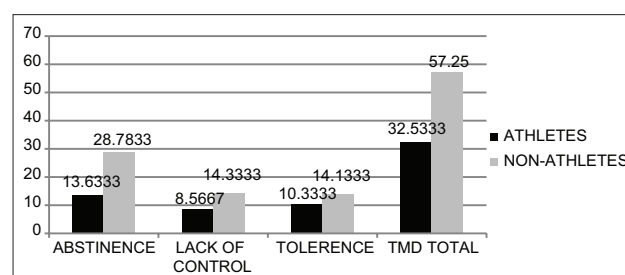
The subjects of the study included 120 adolescents, consisted of male and female athletes and non-athletes from 13 to 18 years of age. Classification of the subjects was athletes ( $n = 60$ ) and non-athletes ( $n = 60$ ).

### 2.2. Tool

The level of mobile phone addiction was assessed using the test of mobile phone dependence (TMD) by Chóliz, 2012. The questionnaire exhibits good reliability (Cronbach's  $\alpha = 0.94$ ), consists of 22 items grouped into three factors: (a) Abstinence (this factor measures the degree of discomfort produced by being deprived of mobile phones as well as the use of these phones to resolve affective problems that may or may not be related to mobile phone abuse), (b) lack of control and problems derived from use (difficulty controlling the behavior), and (c) tolerance and interference with other activities (addictions come to interfere with other activities that are incompatible with the high use because less time is available for these activities when excessive time is spent on the activity involved in the dependence). The instrument was previously validated for use in adolescents and 22 items rated on Likert-type scales. The first 10 items are answered on scales ranging from 0 (never) to 4 (frequently). The 12 remaining items use a scale ranging from 0 (completely disagree) to 4 (completely agree).

### 2.3. Statistical Analysis

This was done using the SPSS package. Mean is used as a measure of central tendency and standard deviation



**Graph 1:** Comparison of the scores of athletes and non-athletes in the dimensions of the test of mobile phone dependence

**Table 1:** Significant difference between athletes and non-athletes in the dimensions of TMD

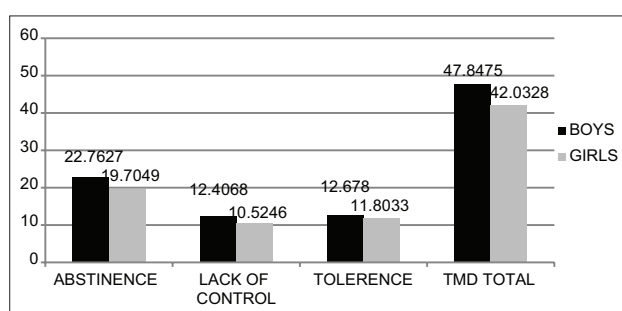
Variables	Groups	n	Mean	Std. deviation	t-value	Sig.
Abstinence	Athletes	60	13.6333	4.89194	-15.431	0.000
	Non-athletes	60	28.7833	5.82249		
Lack of control	Athletes	60	8.5667	4.41633	-7.838	0.000
	Non-athletes	60	14.3333	3.60163		
Tolerance	Athletes	60	10.3333	4.04913	-6.021	0.000
	Non-athletes	60	14.1333	2.73995		
TMD total	Athletes	60	32.5333	10.90244	-13.771	0.000
	Non-athletes	60	57.2500	8.62716		

TMD: Test of mobile phone dependence

**Table 2: Significant difference between boys and girls in the dimensions of the test of mobile phone dependence**

Variables	Gender	<i>n</i>	Mean	Std. deviation	<i>t</i> -value	Sig.
Abstinence	Boys	59	22.7627	10.12055	1.817	0.072
	Girls	61	19.7049	8.24286		
Lack of control	Boys	59	12.4068	4.61302	2.113	0.037*
	Girls	61	10.5246	5.12057		
Tolerance	Boys	59	12.6780	3.27709	1.220	0.225
	Girls	61	11.8033	4.46773		
TMD total	Boys	59	47.8475	15.38115	2.041	0.043*
	Girls	61	42.0328	15.80925		

TMD: Test of mobile phone dependence

**Graph 2:** Comparison of scores of girls and boys in the dimensions of the test of mobile phone dependence

is used as a measure of dispersion. Independent *t*-test was used to find a significance of difference between different groups in different factors of mobile phone dependence.

### 3. RESULTS AND DISCUSSION

This study investigated the distribution of the variables of mobile phone dependence in the sample studied. The study also verified if there is any significant difference between the athletes and non-athletes and between males and females. The obtained results are discussed below.

Table 1 indicates the results obtained for the sample athletes and non-athletes in all the dimensions of mobile phone dependence. It is found that in all dimensions, there is a significant difference between both athletes and non-athletes. The total mobile phone dependency score is significantly low for athletes when compared with non-athletes. This may be because children active in sports get less free time to waste on mobiles and mostly occupied with training and competitions. Furthermore, they experience gaming and socializing in ground and they do not have to depend on smartphones. Sport environment personnel and the

sport process itself modify the individual by providing challenging opportunities directly or indirectly by teaching or emphasizing certain psychological lessons and involving modeling or unintentionally creating certain psychological environments. Osman Gumusgul (2018) investigated smartphone addiction effect on physical activity, recreational sports participation, and educational success and found out that participants practicing physical and recreational sports have less smartphone addiction score which supports the present findings.

Table 2 indicates the significance of difference between male and female athletes in the variable mobile phone dependence. The results show that there is a significant difference in lack of control and total TMD. However, males showed comparatively high score on all dimensions than females. This may be because adolescent girls are under parental control much more in Indian family system, and they get less chance to own or use mobile phones than their more privileged counterparts.

### 4. CONCLUSION

The study intended to have a comparison of the mobile phone dependence and its dimensions in both male and female, athletes and non-athletes. The results showed that there is a significant difference in all dimensions of mobile phone dependency, i.e., abstinence, lack of control, and tolerance, between both athletes and non-athletes. Athletes showed significantly low score on all dimensions of TMD, which supports a positive effect of sport participation on mobile addiction. The results indicate the urgent demand for including sport and physical activity in mobile addiction treatment programs and for other addictions as well. Furthermore, sports participation has a wider variety of psychological



sociological and physical benefits unlike regular medical rehabilitation programs. Thus, sports should be used not only for mere physical development but also for correcting various psychological problems among adolescents. In verifying gender differences, women showed significantly low score in lack of control and total TMD. This result clearly implies that sports participation can definitely be chosen as both a remedial and preventive measure against mobile phone dependency not only for children but also for adults.

## REFERENCES

1. Chóliz, M. Mobile-phone addiction in adolescence: The test of mobile phone dependence (TMD). *Prog Health Sci*, 2012, 2, 33-44.
2. Chóliz, M. *Mobile Phone Addiction in Adolescence: Evaluation and Prevention of Mobile Addiction in Teenagers*. Saarbrücken: Lambert Academic Publishing; 2010. p. 65.
3. Lemish, D., and Cohen, A. On the gendered nature of mobile phone culture in Israel. *Sex Roles*, 2005, 52(7), 511-521.
4. Stewart, D; 2020. Available from: [https://www.streetdirectory.com/travel\\_guide/109138/addictions/the\\_growing\\_problem\\_of\\_cell\\_phone\\_addiction.html](https://www.streetdirectory.com/travel_guide/109138/addictions/the_growing_problem_of_cell_phone_addiction.html).
5. Billieux, J. Problematic use of the mobile phone: A literature review and a pathways model. *Curr Psychiatry Rev*, 2012, 8, 299-307.
6. Kim, S.E., Kim, J.W., and Jee, Y.S. Relationship between smartphone addiction and physical activity in Chinese international students in Korea. *J Behav Addict*, 2015, 4(3), 200-205.
7. Park, J.A., Park, M.H., Shin J.H., Li, B., Rolfe, D.T., Yoo, J.Y., and Dittmoree, S.W. Effect of sports participation on internet addiction mediated by self-control: A case of Korean adolescents. *Kasetsart J Soc Sci*, 2016, 37, 164-169.
8. Parashkouh, N.N., Mirhadian, L., EmamiSigaroudi, A., Leili, E.K., Hasandoost, F., and Rafiei, H. Internet and mobile phone addiction among high school students: A cross sectional study from Iran. *IOSR J Nurs Health Sci*, 2016, 5(3), 31-34.
9. Shaffer, H.J. Understanding the means and objects of addiction: Technology, the internet, and gambling. *J Gambl Stud*, 1996, 12, 461-469.

# Impact of Interval, Circuit, and Combined Training on Selected Skill-related Physical Fitness Variables and Performance Variables among High School Football Players

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## 1. INTRODUCTION

Soccer requires peak physical conditioning of its players to be played at the highest level. The only way to achieve this level of conditioning is training specifically for soccer and the amount of running done in a match. The benefits of this training vary from better performance on the pitch (soccer field) for longer amounts of time to a decreased chance of injury or cramping before, during and after a match. Furthermore, the better conditioned a player is, the more likely he is to perform with the same amount of skill necessary when passing, dribbling, and shooting at the end of the game as the beginning.

Interval training is a type of physical training that involves bursts of high-intensity work interspersed with periods of low-intensity work. The high-intensity periods are typically at or close to near-maximum exertion, while the recovery periods may involve either complete rest or activity of lower intensity. Interval training provides benefits to any healthy person such as improving fitness, health, speed, and stamina; it is a very demanding type of activity and certainly not one you would want to fly into without adequate preparation.

Circuit training is a form of conditioning combining resistance training and high-intensity aerobics. It is designed to be easy to follow and target strength building as well as muscular endurance. An exercise “circuit” is one completion of all prescribed exercises in the program. When one circuit is complete, one begins the first exercise again for another circuit. Circuit training is an arrangement of exercises that require the athlete to spend some time completing each exercise before moving on. It is an excellent way to improve mobility and, at the same time, build strength and stamina.

The purpose of the present study was to analyze the influence of interval, circuit, and combined training on selected skill-related physical fitness variables and performance variables among high school football players.

A well-designed and well-supervised interval, circuit, and combined training programs will be beneficial to the high school football players. The aim of the present study is to contribute to the training methods which are listed below:

- The ultimate aim of research in physical education is to help the physical education and sports professionals to train their sportspersons based on the new concepts in improving their performances
- The study would add knowledge in the area of interval, circuit, and combined training
- The results of the study may provide the standards of the football players in various selected physical fitness and performance parameters
- The conclusions of this study will pave a way to train football players with interval, circuit, and combined training
- This study might motivate other professionals and scholars to take up similar studies.

## 2. METHODOLOGY

For the present study, 60 football players studying in the High Schools of Anantapur, Kurnool, Chittoor and Kadapa Districts of Andhra Pradesh, were randomly selected as subjects during the academic year 2019–2020. The selected subjects were divided into three experimental groups and a control group with fifteen subjects ( $n = 15$ ) in each group. Experimental Group I (ITG = 15) underwent interval training, Group II (CTG = 15) underwent circuit training, Group III (COMG = 15) underwent combined training, and Group IV served as the control group (CG = 15). All subjects were informed about the nature of the study and their consent was obtained to cooperate until the end of the experiment and testing period. Pilot study groups and experimental groups (namely, ITG, CTG, and COMG) were trained-up in which three modes of training were given independently with separate subjects in each group. The subjects were free to withdraw their consent in case they felt any discomfort during the period of their

participation, but there were no dropouts. A qualified physician examined the subjects medically and declared them fit for the study.

The variables were selected after considering the feasibility and availability of proper techniques and instruments. In this experimental study, three experimental (ITG, CTG, and COMG) groups with different loads of training were given while one group was kept as a control group to assess the difference.

## 2.1. Criterion Variables

### 2.1.1. Dependent variables

Variables	
Physical fitness variables	Speed
	Agility
	Explosive power
	Balance
	Coordination
Performance variables	Cardiorespiratory endurance
	Kicking
	Dribbling
	Passing

### 2.1.2. Independent variables

The following training methods were selected as independent variables.

- Interval training
- Circuit training
- Combined interval and circuit training.

## 2.2. Selection of Tests

Variables	Test	Unit of measurement
Physical fitness variables		
Speed	50 m dash	In seconds
Agility	30' shuttle run	In seconds
Explosive power	Sargent vertical jump	In centimeters
Balance	Stroke stand	In seconds
Coordination	Alternate hand wall toss test	In number of catches in 30 s
Cardiorespiratory endurance	9 min run/walk	In meters
Performance variables		
Kicking	Mor. Christian Skill Test	In meters
Dribbling	Punt for distance	In seconds
Passing	Mor. Christian Skill Test	In points

## 2.3. Training Program

During the training period, the experimental groups underwent their respective training programs 3 days/week on alternate days for 12 weeks in addition to their regular physical education activities. Experimental Group I (ITG) underwent interval training and Group II (CTG) underwent circuit training and Group III (COMG) underwent a combination of interval and circuit training. Before the commencement of the experimentation and at the middle of the training period (after 5<sup>th</sup> week), the investigator recorded the target heart rate for interval training, 1RM tests for circuit and target heart rate and 1RM for combined training subjects.

## 2.4. Collection of Data

The data on selected dependent variables for pre-tests and post-tests were collected 2 days before and after the training program, respectively. On the 1<sup>st</sup> day speed, agility, balance, coordination, and explosive power were tested, whereas cardiorespiratory endurance, kicking, passing, and dribbling were tested on the second day.

## 2.5. Experimental Design

The experimental design used for this study was pre-test and post-test random group design involving sixty subjects, who were divided at random into four groups of 15 each. This study consisted of three experimental groups. Group I underwent interval training, Group II underwent circuit training, Group III underwent combined training, and Group IV acted as control group. All the subjects were tested prior to and after the experimentation on physical fitness and performance parameters.

## 2.6. Statistical Techniques Used

The data collected from the four groups before and after the experimental period were statistically examined for significant improvement using analysis of covariance. Whenever the "F" ratio for adjusted post-test was found to be significant, Scheffe's test was used as *post-hoc* test to determine which of the paired means differed significantly. In all cases, the criterion for statistical significance was set at 0.05 level of confidence ( $P < 0.05$ ).

## 3. RESULTS OF THE STUDY

The results of the study revealed that there existed significant difference among the football players of

experimental groups such as interval training, circuit training, combined interval and circuit training, and control group on physical fitness variables such as speed, agility, explosive power, balance, coordination, and cardiorespiratory endurance and performance variables such as dribbling, kicking, and passing. It is found that the experimental groups performed better on physical fitness variables such as speed, agility, explosive power, balance, coordination, and cardiorespiratory endurance and performance variables such as dribbling, kicking, and passing than the control group. This might be due to the effect of specified training given to the experimental groups.

When compared with interval training and circuit training group, circuit training group performed better on physical fitness variables such as speed, agility, explosive power, balance, and coordination and performance variables such as kicking and passing than that of interval training group.

When compared with interval training and circuit training group, interval training group performed better on physical fitness variable cardiorespiratory endurance and performance variable dribbling than that of circuit training group.

Further, the analysis of the study revealed that the football players of combined interval and circuit training group performed better on physical fitness variables such as speed, agility, explosive power, balance, coordination, and cardiorespiratory endurance and performance variables such as dribbling, kicking, and passing than the football players of interval training, circuit training groups, and control group.

#### 4. CONCLUSIONS

From the results of the present research work, the following conclusions were drawn.

There was significant difference among the football players of experimental groups such as interval training, circuit training, combined interval and circuit training groups, and control group on physical fitness variables such as speed, agility, explosive power, balance, coordination, and cardiorespiratory endurance and performance variables such as dribbling, kicking, and passing. The result of the present study showed that the interval training, circuit training, and combined interval and circuit training groups performed better on physical fitness variables such as speed, agility, explosive power,

balance, coordination, and cardiorespiratory endurance and performance variables such as dribbling, kicking, and passing than the control group. This might be due to the effect of specified training (interval training, circuit training, and combined interval and circuit training) were given to the experimental groups. Further, this study also revealed that the football players of combined interval and circuit training group performed better on physical fitness variables such as speed, agility, explosive power, balance, coordination, and cardiorespiratory endurance and performance variables such as dribbling, kicking, and passing than the football players of interval training, circuit training groups, and control group.

When compared interval training with circuit training group, the football players of circuit training group performed better on physical fitness variables such as speed, agility, explosive power, balance, and coordination and performance variables such as kicking and passing than that of interval training group, and the football players of interval training group performed better on physical fitness variable cardiorespiratory endurance and performance variable dribbling than that of circuit training group.

#### REFERENCES

- Dawson, B. *Speed, Agility and Quickness in Football, World Congress on Science and Football-5: Book of abstracts*. Lisbon: Faculty of Human Kinetics: Technical University of Lisbon; 2003.
- Singh, H. *Sports Training*. Patiala: NIS Publications; 1991.
- Verstegen, M., and Marcello, B. Agility and coordination. In: Foran, B., (ed). *High Performance Sports Conditioning*. Champaign, Illinois: Human Kinetics; 2001.
- Weinberg, R.S., and Gould, D. *Foundations of Sport and Exercise Psychology*. Champaign, Illinois: Human Kinetics; 1995.
- Katis, A., and Kellis, E. Effects of small-sided games on physical conditioning and performance in young soccer players. *J Sports Sci Med*, 2009, 8, 374-380.
- Cadore, E.L., Izquierdo, M., Alberton, C.L., Pinto, R.S., Conceição, M., Cunha, G., Radaelli, R., Bottaro, M., Trindade, G.T., and Krue, L.F. Strength prior to endurance intra-session exercise sequence optimizes neuromuscular and cardiovascular gains in elderly men. *Exp Gerontol*, 2012, 47(2), 164-9.
- Chelly, M.S., Fathloun, M., Cherif, N., Ben Amar, M., Tabka, Z., and Van Praagh, E. Effects of a back squat training program on leg power, jump, and sprint performances in junior soccer players. *J Strength Cond Res*, 2009, 23(8), 2241-9.
- Falatic, J.A. *The Effects of Kettlebell Training on Aerobic Capacity*. California: San José State University; 2011.

Helgerud, J., Rodas, G., Kemi, O.J., and Hoff, J. Strength and endurance in elite football players. *Int J Sports Med*, 2011, 32(9), 677-82.

Hoff, J., Wisløff, U., Engen, L.C., Kemi, O.J., and Helgerud, J. Soccer specific endurance training. *Br J Sports Med*, 2002, 36(3), 218-221.

Holviaala, J., Kraemer, W.J., Sillanpää, E., Karppinen, H.,

Avela, J., Kauhanen, A., Häkkinen, A., and Häkkinen, K. Effects of strength, endurance and combined training on muscle strength, walking speed and dynamic balance in aging men. *Eur J Appl Physiol*, 2012, 112(4), 1335-1347.

Iaja, F.M., Rampinini, E., and Bangsbo, J. High-intensity training in football. *Int J Sports Physiol Perform*, 2009, 4(3), 291-306.



# Effect of Yoga Asanas Practice on Obesity of School-Going Students in Yavatmal City

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## ABSTRACT

The study was designed to investigate the effect of yogic practices on "Effect of Yoga Asanas Practice on Obesity of School-Going Students in Yavatmal City." For this study, 40 female students were selected randomly from Yavatmal city. Their age ranges from 12 to 18 years. The yogic practices were employed for 6 weeks, 6 days training in a week for 45 min. The results of the study revealed that the effect of yogic practices had shown insignificant difference on obesity of school-going students.

## 1. INTRODUCTION

The word "Yoga" is generally associated with the term "Yogi," a Hindu Saint and sounds rather religious. However, Hatha yoga includes Pranayama. It is now being practiced by many people purely as a part of physical exercises devoid of religious or spiritual considerations. It is being used as an additional system to tone up the body and mind. There is no set of physical exercises that can equal yoga.

Yoga is a scientific process to reach the ultimate state of perfection. However, yoga is defined also to be the states of higher powers and potentialities and even as the ultimate state of silence. Further, yoga is also described as the power of creation. In various yoga tests, yoga is defined as a state. Through the practice of yoga, man leaps into higher stages of consciousness and learns to stay peacefully and to act tuned to these states.

Yoga means the experience of oneness or unity with inner being. This unity comes after dissolving the duality of mind and matter into the supreme reality. It is a science by which the individual approaches truth. The aim of all yoga practice is to achieve truth where the individual soul identifies itself with the supreme soul or god. The attitude toward yoga and its acceptance has undergone a sea change over the past 20 years. This is true not only of our country where yoga originated a 1000-year ago but also of far-flung countries all over the world.

Yoga is capable to bring about natural changes in query signal individual in the world and that would be a great revolution indeed, it offers us a conscious process to solve such problems as depression, unhappiness, restlessness, emotional conflicts, hyperactivity, etc., it helps to evoke the hidden potentialities of human beings in systematic and scientific way so that the human being can rise intellectually. It makes the mind and the body so disciplined that one can effectively face the challenges of the modern technologically era with its hectic speed and live happily without frustrations.

Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy and/or increased health problems. People are considered as obese when their body mass index (BMI), a measurement obtained by dividing a person's weight in kilograms by the square of the person's height in meters, exceeds 30 kg/m<sup>2</sup> [3].

The escalation of obese children is due to the upsurge of technology, increase in snacks and portion size of meals, and the decrease in the physical activity of children. If children were more mobile and less sedentary, the rate of obesity would decrease. Children have to put down the electronic devices and spend more time outside playing or exploring other options of physical activity. Dieting and physical exercise are the mainstays of treatment for obesity. Diet quality can be improved by reducing the consumption of energy-dense foods such as those high

in fat and sugars and by increasing the intake of dietary fiber. Antiobesity drugs may be taken to reduce appetite or inhibit fat absorption together with a suitable diet. If diet, exercise, and medication are not effective, a gastric balloon may assist with weight loss, or surgery may be performed to reduce stomach volume and/or bowel length, leading to earlier satiation and reduced ability to absorb nutrients from food. The purpose of this study was to find out the effect of yoga asanas on obesity of school students.

## 2. METHODS

For this study, a group of 40 female students from Yavatmal city Maharashtra were randomly selected as subjects; age of subjects was between 12 and 18 years. Pre- and post-tests were administered on the subjects for measuring lean body mass and fat percentage. BMI test is used assessing lean body mass and skin fold calipers are used for measuring fat percentage. The yogic practices were employed for the 6 weeks, 6 days training in a week and 1 day rest, 45 min of training session. The statistical tools of mean, standard deviation, and "*t*"-test were used for the analysis of the data.

## 3. RESULTS

The below tables show the analysis of data pertaining to the effect of yoga practices on obesity of school-going student.

Table 1 reveals that lean body weight of school girls mean difference between the pre-test and post-test of control group is not significant because the calculated *t*-value of 0.019 is less than the tabulated *t*-value of 2.093 at 0.05 level of confidence of 19 degree of freedom. Lean body weight of school girls means between the pre- and post-tests of control group is graphically shown in Figure 1.

Table 2 shows that percentage of fat weight of school girls mean difference between the pre-test and post-test of control group is not significant because the calculated *t*-value of 0.033 is less than the tabulated *t*-value of 2.093 at 0.05 level of confidence of 19 degree of freedom.

Percentage of fat weight of school girls means between the pre- and post-tests of control group is graphically shown in Figure 2.

Table 3 reveals that lean body weight of school girls mean difference between the pre-test and post-test

of experimental group is not significant because the calculated *t*-value of 0.077 is less than the tabulated *t*-value of 2.093 at 0.05 level of confidence of 19° of freedom.

Lean body weight of school girls means between the pre- and post-tests of experimental group is graphically shown in Figure 3.

**Table 1:** Summary of mean, standard deviation, and *t*-ratio for the data on lean body weight of school girls between the means of pre- and post-tests of control group

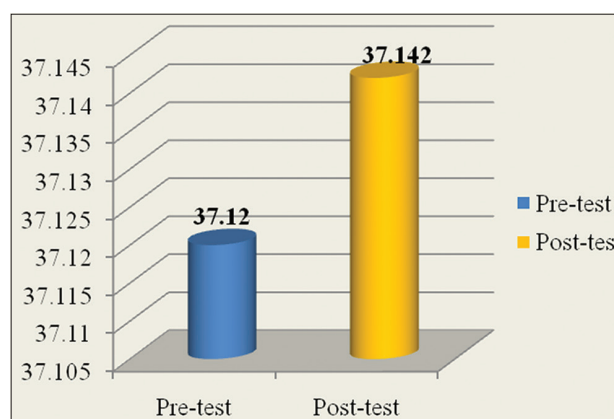
Group	Mean	S.D	M.D	S.E	t-ratio
Pre-test	37.120	3.772	0.022	1.200	0.019@
Post-test	37.142	3.819			

**Table 2:** Summary of mean, standard deviation, and *t*-ratio for the data on percentage of fat weight of school girls between the means of pre- and post-tests of control group

Test	Mean	S.D	M.D	S.E	t-ratio
Pre-test	8.380	2.181	0.022	0.682	0.033@
Post-test	8.358	2.135			

**Table 3:** Summary of mean, standard deviation, and *t*-ratio for the data on lean body weight of school girls between the means of pre- and post-tests of experimental group

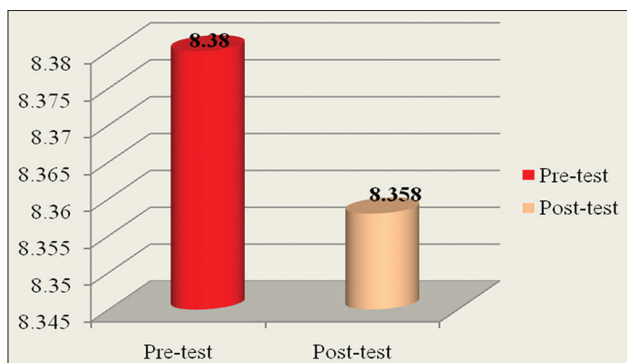
Test	Mean	S.D	M.D	S.E	t-ratio
Pre-test	37.637	3.845	0.090	1.171	0.077@
Post-test	37.547	3.557			



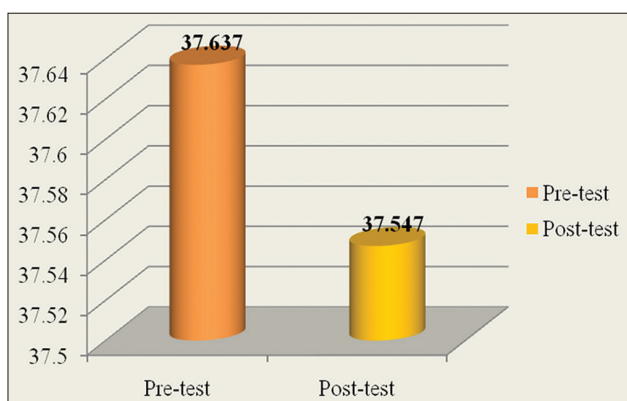
**Figure 1:** Mean difference for the data on lean body weight of school girls between the means of pre- and post-tests of control group

**Table 4:** Summary of mean, standard deviation, and *t*-ratio for the data on percentage of fat weight of school girls between the means of pre- and post-tests of experimental group

Test	Mean	S.D	M.D	S.E	t-ratio
Pre-test	8.513	1.947	0.010	0.605	0.016@
Post-test	8.503	1.881			

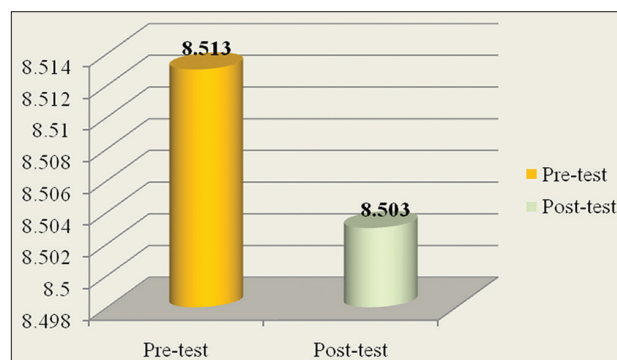


**Figure 2:** Mean difference for the data on percentage of fat weight of school girls between the means of pre- and post-tests of control group



**Figure 3:** Mean difference for the data on lean body weight of school girls between the means of pre- and post-tests of experimental group

Table 4 shows that percentage of fat weight of school girls mean difference between the pre-test and post-test of experimental group is not significant because the calculated *t*-value of 0.016 is less than the tabulated



**Figure 4:** Mean difference for the data on percentage of fat weight of school girls between the means of pre- and post-tests of experimental group

*t*-value of 2.093 at 0.05 level of confidence of 19 degree of freedom.

Percentage of fat weight of school girls means between the pre- and post-tests of experimental group is graphically shown in Figure 4.

#### 4. CONCLUSION

On the basis of findings researcher concluded as – insignificant difference found between pre- and post-test of control group in percentage of fat weight and lean body weight and because there is no training provided to control group.

#### REFERENCES

1. Anandhan, P., and Balamurugan, K.V. Effect of selected asanas training on lipids and lipoproteins of obese men. *Int J Phys Educ*, 2011, 4(1), 124-126.
2. Barness, L.A., Opitz, J.M., and Gilbert-Barness, E. Obesity: Genetic, molecular, and environmental aspects. *Am J Med Gen A*, 2007, 143(24), 3016-3034.
3. Bera, T.K., and Rajapurkar, M.V. Body composition, cardiovascular endurance and anaerobic power of yogic practitioner. *Indian J Physiol Pharmacol*, 1993, 37(2), 225-228.
4. Dhananjai, S., Sadashiv, Sunita, T., Krishna, D., and Rajjan, K. Reducing psychological distress and obesity through yoga practice. *Int J Yoga*, 2013, 6(1), 66-70.

# Comparative Study of Physical Fitness Variables between Middle-Distance and Long-Distance Runners of Kashmir Division in Jammu and Kashmir

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## ABSTRACT

The main purpose of this study was to compare selected physical fitness variables of middle-distance runners and long-distance runners of Kashmir division in Jammu and Kashmir. The necessary data on the selected physical fitness variables were collected at different times of day by administering the specific test on the same day. The data of some physical fitness variables were collected by 40 yard Shuttle run, 50 yard dash/sprint test, goniometry and stopwatch, and dairy and pen at the athletic track. The researcher took the male subjects for the study. The sources of the data were made from the long-distance runners and middle-distance runners, from Kashmir division. Sixty subjects were selected for this study. Thirty subjects were taken from long-distance runners while the remaining 30 were taken from middle-distance runners. It was hypothesized that there would be significant difference in physical fitness and physiological variables of middle-distance runners and long-distance runners of Kashmir division. The 60 subjects were selected by the simple random sampling method.

**Keywords:** Middle-distance and long-distance runners, Physical fitness variables.

## 1. INTRODUCTION

Physical fitness is the positive state of well-being allowing you enough strength and energy to participate in a full, active lifestyle of your choice. Physical fitness is the general capacity to adapt favorably to physical effort. Individuals are physically fit when they are able to meet both the usual and unusual demands of daily life, safely and effectively with undue stress or exhaustion. Physical fitness is the capacity to carry out reasonably well various forms of physical activities without being unduly tired and includes qualities important to the individual's health and well-being. The fit person is one who is free of limiting and debilitating ailments, who has the stamina and skill to do the day's work, and who has sufficient reserve of energy not only to meet emergencies but also to participate in leisure time activities. Physical fitness is one phase of total fitness, and it may be used interchangeably with motor fitness. Other phases of total fitness include social fitness, emotional fitness, and mental fitness.

Physical fitness is a general state of health and well-being and, more specifically, the ability to perform aspects

of sports or occupations. Physical fitness is generally achieved through correct nutrition, moderate-vigorous physical exercise physical activity, and sufficient rest. Before the industrial revolution, fitness was the capacity to carry out the day's activities without undue fatigue. However, with automation and changes in lifestyles, physical fitness is now considered a measure of the body's ability to function efficiently and effectively in work and leisure activities, to be healthy, to resist hypo kinetic diseases, and to meet emergency situations. Fitness is defined as the quality of being suitable to perform a particular task.

### 1.1. Agility

The speed with which an individual may change his body positions or fastness in changing directions while moving is known as agility.

### 1.2. Speed

The rapidity of muscle movement or the rate of change of body movement is known as muscular speed. Literality speed is measured by dividing distance by time in short

run. However, in sports, time of sprint of 60 yard dash itself is considered as a measure of one's speed instead of converting it in meters per second it is recorded as seconds per 60 yard or per 30 M, etc.

### 1.3. Flexibility

It is the range of movements around skeletal joints. It is a measure of the ability of the muscle tendon units to elongate within the physical restrictions of the joints.

### 1.4. Balance

The ability to hold the body position in comparatively less stable positions is known as body balance. Balance is of two types' static balance and dynamic balance.

### 1.5. Middle-Distance Running

In athlete (track and field) races that range in distance from 800 m (roughly one half miles) to 3000 m (almost 2 miles) in international competition, middle-distance races include in 800 m, the 1500 m metric miles, and the 3000 m (steeplechase events for men but a regular run for women). An early favorite among middle-distance races was the mile, which in the first half of the 20 century was run in times exceeding 4 min, breaking the 4 min barriers was considered unlikely. On May 6, 1954, however, the 25-year-old races Bannister of great Brittan set a record of 3 min 59.4 s in a dual meet at Oxford with increasingly controlled climatic and surface conditions and increasingly accurate timing device; however, the record was scored many times thereafter.

### 1.6. Long-distance Running

In modern human society, long-distance running has multiple purposes: People may engage in it for physical exercise, for recreation, as a means of travel, for economic reasons, or for cultural reasons. Long-distance running can also be used as a means to improve cardiovascular health. Running improves your aerobic fitness by increasing the activity of enzymes and hormones that stimulate the muscles and the heart to work more efficiently. Long-distance running as a form of tradition or ceremony is known among the Hopi and Tarahumara people, among others. In the sport of athletics, long-distance events are defined as races covering 3 km (1.86 miles) and above. The three most common types are track running, road running, and cross country running, all of which are defined by their

terrain – all-weather tracks, roads, and natural terrain, respectively.

### 1.7. Sources of Data

The researcher took the male subjects for the study. The sources of the data were made from the long-distance runners and middle-distance runners, from Kashmir division during the session of 2018–2019.

### 1.8. Selection of Subjects

Sixty subjects were selected for this study. Thirty subjects were taken from long-distance runners while the remaining 30 subjects were taken from middle-distance runners.

### 1.9. Sampling Method

The 60 subjects were selected by the simple random sampling method.

### 1.10. Equipment Used for Collection of Data

Agility: It was measured with 40 yard shuttle run

Speed: 50 yard dash/sprint test

Flexibility: It was measured with goniometer or flexiometer

Dynamic balance: Stopwatch, dairy and pen, the test was used to measure one's ability to jump accurately and to maintain balance during repeated jumping.

### 1.11. Selection of Test

The following tests and their measurement criteria were adopted for the purpose of this study.

### 1.12. Physical Fitness Variables

Agility, speed, flexibility, and dynamic balance were being measured.

The necessary data on the selected physical fitness variables were collected at different times of day by administering the specific test on same day at following timings.

The data of some physical fitness were collected by 40 yard shuttle run, 50 yard dash/sprint test, goniometry, and stopwatch, dairy and pen at the athletic track of Kashmir division in Jammu and Kashmir and then "t-test" was applied for the statistical treatment in the Microsoft Excel.

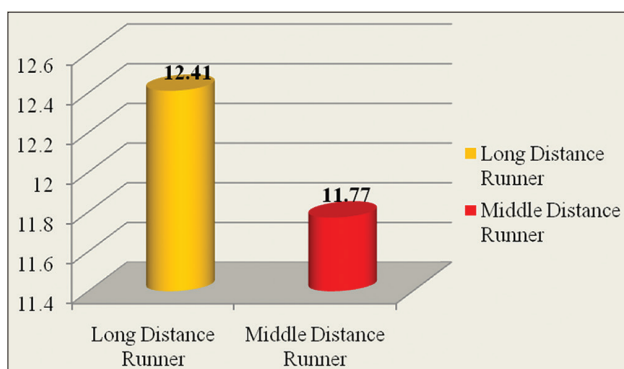


## 2. ANALYSIS AND INTERPRETATION OF DATA

The data shall be collected from the subjects by the researcher under the guidance of experts and guide and analysis and interpretation will be carried out on the

**Table 1:** Comparisons of agility between long-distance and middle-distance runners of Kashmir division

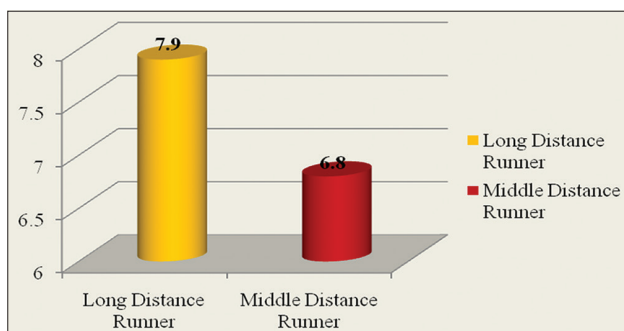
Group	Mean	S.D.	M.D.	O.T.	T.T.
Long-distance runner	12.41	1.37	0.64	1.48	2.02
Middle-distance runner	11.77	1.37			



**Graph 1:** Graphical representation of mean value agility between long-distance and middle-distance runners of Kashmir division

**Table 2:** Comparison of speed between long-distance and middle-distance runners of Kashmir division

Game	Mean	S.D.	M.D.	S.E.	O.T.	T.T.
Long-distance runner	7.90	0.69	0.23	0.07	3.177*	1.96
Middle-distance runner	6.80	0.57				



**Graph 2:** Graphical representation of mean value speed between long-distance and middle-distance runners of Kashmir division

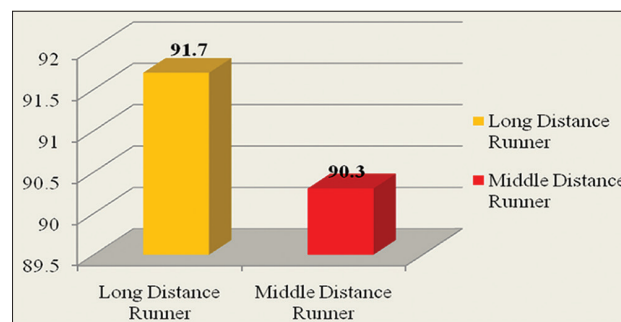
basis of special statistical techniques, namely, mean, standard deviation, and “t-test.”

### 2.1. Level of Significance

The level of significance will be set at 0.05, for the present study to test the hypothesis given by

**Table 3:** Comparisons of flexibility between long-distance and middle-distance runners of Kashmir division

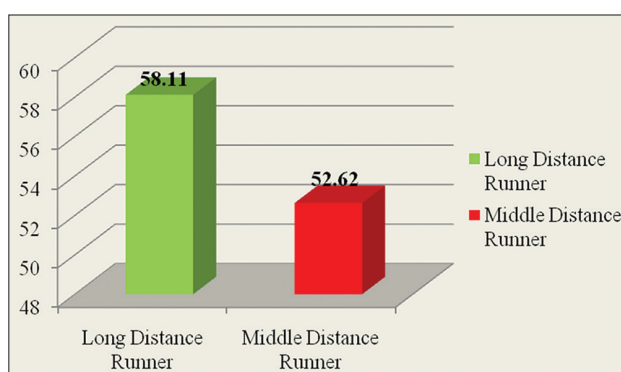
Group	Mean	S.D.	M.D.	O.T.	T.T.
Long-distance runner	91.7	7.34	1.4	0.54	2.02
Middle-distance runner	90.3	9.02			



**Graph 3:** Graphical representation mean value of flexibility between long-distance and middle-distance runners of Kashmir division

**Table 4:** Comparison of dynamic balance between long-distance and middle-distance runners of Kashmir division

Game	Mean	S.D.	M.D.	S.E.	O.T.	T.T.
Long-distance runner	58.11	18.50	5.49	2.18	2.514*	1.96
Middle-distance runner	52.62	19.29				



**Graph 4:** Graphical representation mean value of dynamic balance between long-distance and middle-distance runners of Kashmir division

the researcher on the basis of his experience and observation.

### 3. CONCLUSION

The researcher compared long-distance and middle-distance runners, within the limitations of the present study and on the basis of findings, it is concluded that there is a significant difference in physical fitness variables (agility, speed, flexibility, and dynamic balance) insignificant difference between agility and flexibility between long-distance and middle-distance players. The researcher compared the particular physical fitness variables during the particular events; it is found that there is also a significant result in speed and dynamic balance, insignificant difference in between agility and flexibility. Hence, the researcher's pre-assumed hypothesis is partially accepted.

### REFERENCES

1. Shyam, A. *UGC NET/JRF/SET Physical Education*. Agra: Upkar Prakashan; 2012.
2. Anonymous. Motor behavior and measurement. *J Res Q Exerc Sport*, 2015, 86(2), 73.
3. Rachel, A.G., Kenny, G.P., Green, G., and Seely, A.J. Diurnal variation in heart rate variability before and after maximal exercise testing. *J Int Chronobiol*, 2011, 28(4), 344-351.
4. Athanimath, K.M. The effect of six weeks resistance training program on physical fitness variables. In: *National Conference on Role of Physical Activities and Sports in Balancing Education*. New Delhi: AR Graphics; 2013.
5. Balwal, R., Laxmi, K., and Kanchan, R. *A New Book of Physical Education*. Jammu: Narendera Publishing House; 2012.
6. Garcin, M., Fleury, A., Ansart, N., Mille-Hamard, L., and Billat, V. Training content and potential impact on performance a comparison of young male and female endurance-trained runners. *Res Q Exerc Sport*, 2006, 77(3), 351-361.
7. Eliakim, A., Nemet, D., and Shenkman, L. Serum enzyme activities following long-distance running: Comparison between Ethiopian and white athletes. *J Med Sci*, 2013, 22(1), 657-659.
8. Gautam, P.G., and Uppal, A.K. *Physical Education and Health*. New Delhi: Friends Publication; 2010.
9. Kansal, K.D. *Textbook of Applied Measurement Evaluation and Sports Selection*. New Delhi: Sports and Spiritual Science Publications; 2008.
10. Gray, K.A. *Encyclopaedia Exercise and Physical Fitness*. Vol. 5. Guilford: The Dustitin Publication Group Inc.; 1998.
11. Kumar, V. Investigation of selected physical and physiological variables track runners. *Int Educ E J*, 2013, 2(4), 66.
12. Lara, B., Salinero, J.J., and Del Coso, J. Altitude is positively correlated to race time during the marathon. *High Alt Med Biol*, 2014, 15(1), 64-69.

# Comparative Study of Emotional Intelligence between Male and Female Players of Srinagar District of Jammu and Kashmir

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## ABSTRACT

The main purpose of the study was to investigate the emotional intelligence (EI) between male and female players of Srinagar district of Jammu and Kashmir. The data obtained from the responses given by secondary school male and secondary school female on the EI through standard questionnaire prepared by Dr. Sheetal Prasad were used. For the present study, the data were collected from male and female of secondary schools of Jammu and Kashmir. Forty subjects were selected for the present study, 20 student's male and 20 student's female from each group have been selected. The subjects were selected using purposive sampling method. The analysis and interpretation have carried out on the basis of data collection. The data have been analyzed and interpreted by "t-test." It was hypothesized that there would be a significant difference of both EI between male and female players of Srinagar district of Jammu and Kashmir.

**Keywords:** Emotional intelligence, Female and secondary school, Male.

## 1. INTRODUCTION

Intelligence is a general capacity of individual consciously to adjust his thinking to new requirement. It is the general mental adaptability to new problems and conditions of life. Intelligence must be understood as the mental capacity or mental energy available with an individual at a particular time in a particular situation. This mental capacity helps him in the task of theoretical as well as practical manipulation of things, objects, or events present in her environment to adapt to or face new challenges a problem of life as successful as possible.

Emotional intelligence (EI) can be defined as "the ability to perceive emotions, to access and generate emotions so as to assist thought, to understand emotions and emotional knowledge, and to reflectively regulate emotions so as to promote emotional and intellectual growth. EI is all about performance. Developing ones EI will improve performance. Developing EI will take time, but will lead to sustainable behavior changes that will improve the ways to manage one and to work with others.

An intelligence quotient (IQ) is a score derived from one of several standardized tests designed to assess human intelligence. The abbreviation "Emotional Intelligence" was coined by the psychologist William Stern for the German term IQ, his term for a scoring method for intelligence tests he advocated in a 1912 book. IQ scores are used for educational placement, assessment of intellectual disability, and evaluating job applicants. In research contexts, they have been studied as predictors of job performance and income. They are also used to study distributions of psychometric intelligence in populations and the correlations between it and other variables.

## 2. METHODOLOGY

The main purpose of the study was to investigate the EI between male and female players of Srinagar district of Jammu and Kashmir. It was hypothesized that there would be a significant difference of EI between male and female players.

## 2.1. Source of Data

For the present study, the subjects were selected from the male and female of Jammu and Kashmir.

## 2.2. Selection of Subjects

Forty subjects were selected for the present study, 20 male secondary school students and 20 female secondary school students from each group have been selected.

## 2.3. Sampling Method

The players were selected using purposive sampling method.

## 2.4. Equipment's Used for Collection of Data

### 2.4.1. EI

The standard questionnaire of EI scale is a cluster of traits or abilities relating to emotional side of life, compiled or developed by Dr. Sheetal Prasad who was used for the collection of data it contains 40 items. The EI scale is the set of 40 questions and each question has five responses, namely, self-confident, trustworthy, innovative, conscientious, and adjusted.

## 3. STATISTICAL ANALYSIS AND INTERPRETATION OF DATA

The data obtained from the responses given by male and female players on the EI questionnaire prepared by Dr. Sheetal Prasad which was marked according to the key and analyzing using statistical technique *t*-test to compare EI between male and female of secondary school players of Srinagar district of Jammu and Kashmir.

### 3.1. Findings

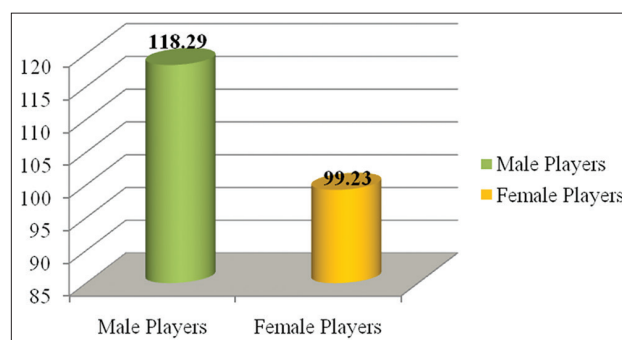
For the present study, the data were collected from male and female secondary schools players of Srinagar district of Jammu and Kashmir. The statistical result of the subjects was taken from male and female selected from players of Srinagar district of Jammu and Kashmir. The data collected from the subjects have been statistically analyzed and have been shown in separate tables given below.

The analysis and interpretation of data pertaining to the score of EI of male and female have been presented in

this chapter. To find out comparative difference of EI of male and female, *t*-test was applied which is given below.

**Table 1:** Comparison of emotional intelligence between male and female players of Srinagar district of Jammu and Kashmir

Group	Mean	S.D.	M.D.	S.E	O.T.	T.T.
Male players	118.29	62.43	19.06	14.48	1.316	2.00
Female players	99.23	48.49				



**Graph 1:** Graphical representation of mean value of emotional intelligence between male and female players of Srinagar district of Jammu and Kashmir

## 4. CONCLUSION

With the limitations of the study and from the statistical analysis of the collected data, it is concluded that there is found insignificant difference in EI and found significant difference in between male and female players of Srinagar district in Jammu and Kashmir. The girls are sharp minded and have more quotient than males.

## REFERENCES

1. Bharwaney, G. *Increase Your Emotional Intelligence*. 1<sup>st</sup> ed. New Delhi: Jaico Publication; 2008.
2. Dann, G. *Understanding Emotion Intelligence in a Weak*. 1<sup>st</sup> ed. London: British Library; 2001.
3. Kanwar, and Chand, R. *Educational and Sports Psychology*. Nagpur: Amit Brothers Publication; 2007.
4. Singh, A., Bains, J., and Gill, J.S. *Essentials of Physical Education*. New Delhi: Kalyani Publishers; 2012.
5. Whitaker, S. *Intellectual Disability: An Inability to Cope with an Intellectually Demanding World*. Hampshire, UK: Palgrave Macmillan; 2013.
6. Ozlem, A. Emotional intelligence or mental intelligence more important in language learning. *J Appl Sci*, 2006, 6(1), 66-70.

# Comparative Study of Aggression and Will to Win between Defenders and Attackers in Soccer

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## ABSTRACT

The study was frame to compare the aggression and will to win between defenders and attackers in soccer of Jammu and Kashmir. The subjects for this study were taken 50, in which 25 defenders and 25 attackers. The aggression and will to win of subjects are gauged by standard questionnaires. The aggression questionnaire developed by R. L. Bhardwaj is used for the collection of data it contains 28 items and the will to win developed by Anand Kumar and Prem Shankar Shukla is used and contains 14 items. It was hypothesized that there will be significant difference of was to win and aggression between defenders and attackers in soccer. The analysis of the data was done by applying “*t*-test.” The level of significance was set at 0.05 levels. The analysis of data has been presented in the following order means, standard deviations, the range of scores was calculated and represented in tabular and graphical form. For testing the hypothesis and to find out the significant differences between the means of the both groups, the “*t*-test” for independent samples was applied.

**Keywords:** Aggression, Attackers, Defenders, Will to Win.

## 1. INTRODUCTION

Sports have developed into a distinct scientific discipline in itself and each nation vying with each other to competitions. Nowadays, sports have become an essential part of life millions of fans follow different sports events all over the world with an enthusiasm boarding on devotion. The soccer is the most popular and most attended spectacular game in the world. It is not merely a game. It is a part of one is life. The game of soccer is a very vigorous and strenuous one, the need physical fitness of all the players. Psychology is an academic and applied discipline involving the scientific study of mental processes and behavior. It is critical that the practitioner understands the effect of sports psychology on the individual's body to plan the programmers' to achieve the desired outcomes and to maintain the effect of such programmers on the individuals. Psychological parameters such as aggression and will to win play an important requisite for outstanding performance in any sports activity. Aggression and will to win have close relationship with each other. Both aggression and will to win are a natural part of competition at any level. It may be at international level, national level, interuniversity

level, or intercollegiate level. Aggression may help the athlete to give the high performance during the competition. If a player has curiosity to win, then he is aggressive during the game. The researcher always observes that the soccer players or the famous players are more aggressive and they have tendency to win the game. That is why the researcher wants to know the aggression and will to win of the soccer players. Hence, the researcher has taken the study.

### 1.1. Attacker

A player whose job is to play the ball forward toward the opponent's goal area to create scoring opportunity.

### 1.2. Defenders

A defender is an outfield player whose primary role is to prevent the opposition from attacking.

### 1.3. Aggression

The term aggression refers to a range of behaviors that can result in both physical and psychological harm to oneself, other, or objects in the environment.



### 1.4. Will to win

The will to win, the desire to success the urge to reach your potential these are the keys that will unlock the door to personal excellence. The excellence comes from your desire.

Therefore, the study was undertaken for the selected psychological variables, i.e., aggression and will to win among defenders and attackers in soccer.

## 2. METHODOLOGY

Fifty subjects were selected from Jammu and Kashmir, 25 defenders and 25 attackers of soccer. Age of the subjects ranging from 18 to 28 years. The subjects were taken by available sampling method. They were the current soccer players of affiliated colleges of Jammu and Kashmir in the year 2019. The tests were administered on each player individually with the help of standard scientific questionnaire.

### 2.1. Collection of Data

The data obtained from defenders' and attackers of soccer were taken by standard questionnaire. While as aggression questionnaire constructed by R. L. Bhardwaj is used for the collection of data, it contains 28 items and will to win questionnaire constructed by Anand Kumar and Prem Shankar Shukla is used and contains 14 items.

### 2.2. Statistical Techniques

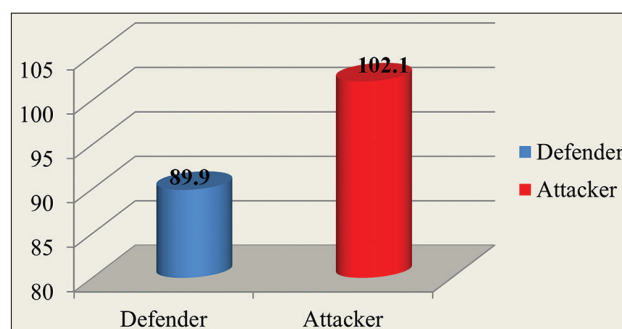
The data will be analyzed using independent "*t*-test" and interpretations will be drawn.

**Table 1:** Comparison of aggression between defenders and attacker of soccer players

Group	Mean	S.D.	M.D.	D.F.	O.T.	T.T.
Defender	89.9	7.52	12.22	38	4.94	2.02
Attacker	102.1	8.08				

Table 1 reveals that there is difference between means of defenders and attacker of soccer players because the mean of defenders is 89.9, less than attacker which is 102.1, and their mean difference is 12.22. To check the significant difference of aggression level of defender and attacker of soccer players, the data are analyzed by applying "*t*-test." Before applying test, standard

deviation is calculated between defenders and attacker of soccer players which is 7.52 and 8.08, respectively. After applying "*t*-test," it was found that there is a significant difference in aggression level between defenders and attacker of soccer players because value of calculated "*t*" (4.94) which is greater than tabulated "*t*" (2.02) at 0.05 level of significance, which indicates or shows that there is a significant difference in aggression between defenders and attacker of soccer players. Hence, the researcher's pre-assumed has been accepted.

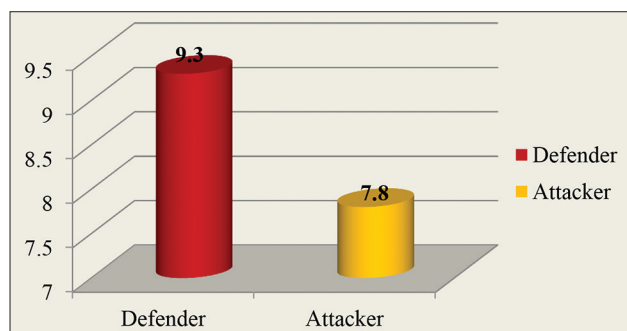


**Graph 1:** Graphical representation of mean difference aggression between defenders and attacker of soccer players

**Table 2:** Comparison of will to win between defenders and attackers of soccer players

Group	Mean	S.D.	M.D.	D.F.	O.T.	T.T.
Defender	9.3	2.03	1.5	38	2.39	2.02
Attacker	7.8	1.94				

Table 2 reveals that there is a difference between means of defenders and attacker of soccer players because the mean of defenders is 9.3, greater than attacker which is 7.8, and their mean difference is 1.5. To check the significant difference of will to win of defender and attacker of soccer players, the data are analyzed by applying "*t*-test." Before applying test, standard deviation is calculated between defenders and attacker of soccer players which is 2.03 and 1.94, respectively. After applying "*t*-test," it was found that there is a significant difference in will to win between defenders and attacker of soccer players because value of calculated "*t*" (2.39) which is greater than tabulated "*t*" (2.02) at 0.05 level of significance, which indicates or shows that there is a significant difference in will to win between defenders and attacker of soccer players. Hence, the researcher's pre-assumed has been accepted.



**Graph 2:** Graphical representation of mean difference will to win between defenders and attacker of soccer players

### 3. CONCLUSION

Finally, researcher concludes that in this study, aggression of attacker player is high than defender players, according to the analysis of data. Hence, here, we can say that aggression plays an important role in every competition because when serious conditions arise during game the aggression of players dominant the others and they achieve their goal. Aggression is must for both players, especially for attacker players in critical situations to face the hardships.

### 4. REFERENCES

1. Arnold, P. *Education, Physical Education and Personality Development*. London: Heinerman Education Book Ltd.; 1972. p. 123-127.
2. Barrow, H.M., and McGee, R. *A Practical Approach to Measurement in Physical Education*. Philadelphia, PA: Lea and Febiger; 1979. p. 191-193.
3. Brewer, B.W. Psychology of sports injury rehabilitation. In: *Handbook of Sports Psychology*. New York: Wiley; 2001. p. 122-125.
4. Cathy, H. Self-reported aggression and the perception of anger in facial expression photos. *J Psychol*, 2006, 140(3), 176-182.
5. Dorsey, B. The relationship between women's basketball performance and will to win. *Can J Appl Sports Sci*, 1980, 5(2), 193.
6. Ekramlevent, E. Aggressive tendency and emotional adjustment levels of primary school students who participate and do not participate in school sports. *J Kirsehir Educ Fac*, 2011, 12, 4.
7. Reuben, B.F. *Psychological Concept Applied To Physical Education and Coaching*. London: Addison Wesley Publishing Company; 1971.

# Study of Psychological Variables between Boys and Girls of Secondary Schools of Jammu Division of Jammu Division

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## ABSTRACT

The main purpose of the study was to investigate the psychological variables (intelligence quotient [IQ]) between boys and girls of secondary schools of Jammu division. The data obtained from the responses given by secondary school boys and secondary school girls on the IQ through standard questionnaire prepared by S. K. Pal and K. S. Mishra were used. For the present study, the data were collected from boys and girls of secondary schools of Jammu division. Fifty subjects were selected for the present study, 25 student's boys and 25 student's girls from each group have been selected. The subjects were selected using purposive sampling method. The analysis and interpretation have carried out on the basis of data collection. The data have been analyzed and interpreted by "t-test." It was hypothesized that there would be a significant difference of IQ between boys and girls.

**Keywords:** Boys, Girls and secondary school, Intelligence quotient.

## 1. INTRODUCTION

Intelligence is a general capacity of individual consciously to adjust his thinking to new requirement. It is the general mental adaptability to new problems and conditions of life. Intelligence must be understood as the mental capacity or mental energy available with an individual at a particular time in a particular situation. This mental capacity helps him in the task of theoretical as well as practical manipulation of things, objects, or events present in her environment to adapt to or face new challenges a problem of life as successful as possible.

Emotional intelligence (EI) can be defined as "the ability to perceive emotions, to access and generate emotions so as to assist thought, to understand emotions and emotional knowledge, and to reflectively regulate emotions so as to promote emotional and intellectual growth." EI is all about performance. Developing ones EI will improve performance. Developing EI will take time, but will lead to sustainable behavior changes that will improve the ways to manage one self and to work with others.

An intelligence quotient (IQ) is a score derived from one of several standardized tests designed to assess human intelligence. The abbreviation "IQ" was coined by the psychologist William Stern for the German term IQ, his term for a scoring method for intelligence tests he advocated in a 1912 book. IQ scores are used for educational placement, assessment of intellectual disability, and evaluating job applicants. In research contexts, they have been studied as predictors of job performance and income. They are also used to study distributions of psychometric intelligence in populations and the correlations between it and other variables.

## 2. METHODOLOGY

The main purpose of the study was to investigate psychological variables IQ between boys and girls of secondary schools. It was hypothesized that there would be a significant difference of IQ between boys and girls.

### 2.1. Source of Data

For the present study, the subjects was selected from the higher secondary schools of Jammu division.

## 2.2. Selection of Subjects

Fifty subjects were selected for the present study, 25 student's boys and 25 student's girl from each group have been selected.

## 2.3. Sampling Method

The players were selected using purposive sampling method.

## 2.4. Equipment's Used for Collection of Data

### 2.4.1. IQ

The standard questionnaire of IQ scale is a cluster of traits or abilities relating to intelligence side of life, compiled or developed by S. K. Pal and K. S. Mishra which was used for the collection of data it contains 40 items. The EI scale is the set of 25 questions.

## 3. STATISTICAL ANALYSIS AND INTERPRETATION OF DATA

The data obtained from the responses given by secondary school boys and secondary school girls on the psychological variables IQ questionnaire prepared by S. K. Pal and K. S. Mishra which was marked according to the key and analyzing using statistical technique *t*-test to compare IQ between boys and girls of secondary schools of Jammu division.

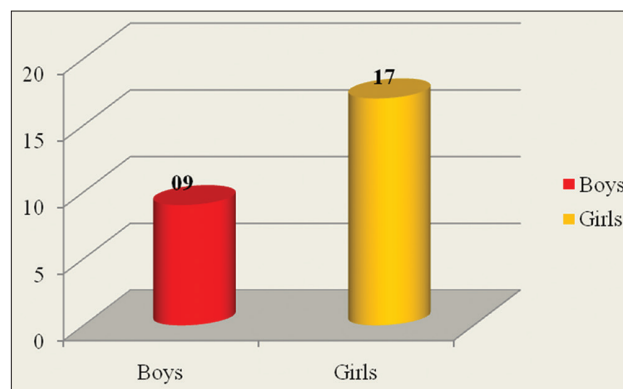
### 3.1. Findings

For the present study, the data were collected from boys and girls of secondary schools of Jammu division. The statistical result of the subjects was taken from boys and girls selected from secondary schools of Jammu. The data collected from the subjects have been statistically analyzed and have been shown in separate tables given below.

**Table 1:** Comparison of psychological variables intelligence quotient between secondary school boys and girls of Jammu division

Group	Mean	S.D.	M.D.	D.F	S.E	O.T.	T.T.
Boys	9	14.84	8.9	58	3.12	2.844	2.00
Girls	17	8.5					

The analysis and interpretation of data pertaining to the score of psychological variables of boys and girls have been presented in this chapter. To find out comparative difference of IQ of boys and girls, *t*-test was applied which is given below.



**Graph 1:** Graphical representation of mean value of intelligence quotient of secondary school boys and girls of Jammu division

## 4. CONCLUSION

With the limitations of the study and from the statistical analysis of the collected data, it is concluded that there is found insignificant difference in psychological variables and found significant difference in IQ between boys and girls of secondary schools of Jammu division. The girls are sharp minded and have more quotient than boys.

## REFERENCES

1. Bharwanym, G. *Increase Your Emotional Intelligence*. 1<sup>st</sup> ed. New Delhi: Jaico Publication; 2008.
2. Dann, G. *Understanding Emotion Intelligence in a Weak*. 1<sup>st</sup> ed. London: British Library; 2001.
3. Kanwar, Chand, R. *Educational and Sports Psychology*. Nagpur: Amit Brothers Publication; 2007.
4. Singh, A., Bains, J., and Gill, J.S. *Essentials of Physical Education*. New Delhi: Kalyani Publishers; 2012.
5. Whitaker, S. *Intellectual Disability: An Inability to Cope with an Intellectually Demanding World*. Hampshire, UK: Palgrave Macmillan; 2013.
6. Aki, O. Emotional intelligence or mental intelligence more important in language learning. *J Appl Sci*, 2006, 6(1), 66-70.
7. Daramola, O.O., Ayoola, O.O., and Ogunbiyi, A.O. The comparison of intelligence quotients of atopic and nonatopic children in Ibadan Nigeria. *Indian J Dermatol*, 2010, 55(3), 221-224.

# Relationship of Anthropometric Measurement with Performance of Intercollegiate Handball Players

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## ABSTRACT

The main purpose of the study is to find out the relationship of anthropometric measurement with performance of intercollegiate handball players of Jammu and Kashmir. This study was hypothesized the positive relationship between anthropometric measurements with performance of handball players. The sources of data were collected from intercollegiate handball players during the intercollegiate handball tournament organized by Jammu and Kashmir. The researcher had selected 60 handball players representing the intercollegiate handball tournament, who were taken as the subject for the study. The subjects were selected using simple random sampling method. The data were analyzed and interpreted using multiple regression correlation and the level of significance at 0.05 was adequate for testing the hypothesis. Conclusion: There was a positive relationship in between the anthropometric measurement and fitness level with the performance of handball players.

**Keywords:** Anthropometric, Handball players, Measurement, Physical fitness.

## 1. INTRODUCTION

Anthropometry is derived from two Greek words anthropos (“man”) and metron (“measure”); therefore, “measurement of man” refers to the measurement of the human individual. An early tool of physical anthropology, it has been used for identification, for the purposes of understanding human physical variation in paleoanthropology and in various attempts to correlate physical with racial and psychological trait.

Anthropometry is a very old science, and, like many old sciences, it has followed a variety of paths. One of the consequences of multiple anthropometric traditions has been the lack of standardization in the identification of measurement sites and in measurement techniques. This makes comparisons across time and space extremely difficult. Anthropometric measurements were central concerns of the first phase of the scientific area of measurement, which began in the 1860s. The current interest in anthropometric measurements focuses on three areas growth measures, body type, and body composition. The uses of such measure include classification, prediction of growth patterns, and prediction of success in motor ability.

Anthropometric measurements form the basis of anthropology which is the science of measuring the human body and its parts.

One of the fundamentals of this approach is the study of human measurements or anthropometry. Anthropometry plays an important role in deciding the particular built of the body with various measurements of the body segments, suitable for a particular game and sports and essentially helpful to excel in that game.

## 2. METHODOLOGY

The sources of data were collected from intercollegiate handball players during the intercollegiate handball tournament organized by Jammu and Kashmir. The researcher had selected 60 handball players representing the intercollegiate handball tournament, who were taken as the subject for the study. The subjects were selected using simple random sampling method.

### 2.1. Collection of Data

The necessary data were collected by administrating the tests for measuring the selected anthropometric measurement. Before collecting the data, the subjects were given a chance to practice the prescribed test so that they should become familiar with tests and know exactly what is to be done. To ensure the uniform testing conditions, the tests for obtaining the required data were conducted during the time of intercollegiate handball tournament.



**Table 1: Intercorrelation matrix**

	Ht.	Wt.	A.L.	L.L.	F.L.	Shooting	Passing	Guarding	Perform
Height	1000								
Weight	0.25	1.000							
A. length	-0.055	-0.308	1.000						
L. length	0.037	-0.0137	0.017	1.000					
F. length	0.0069	0.102	0.060	0.058	1.000				
Shooting	-0.323	0.105	-0.268	-0.058	0.006	1.000			
Passing	-0.028	0.106	-0.335	0.228	0.031	-0.038	1.000		
Guarding	-0.138	-0.076	0.066	0.059	0.123	0.085	-0.114	1.000	
Perform	-0.266	0.067	-0.307	0.155	0.122	0.568	0.534	0.582	1.000

**Table 2: Summary of different correlation**

Coefficient (r)	Relationship
0.00–0.20	Negligible
0.20–0.40	Low
0.40–0.60	Moderate
0.60–0.80	Substantial
0.80–1.00	High to very high

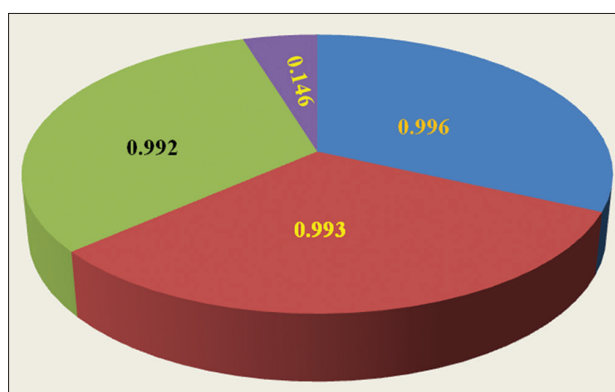
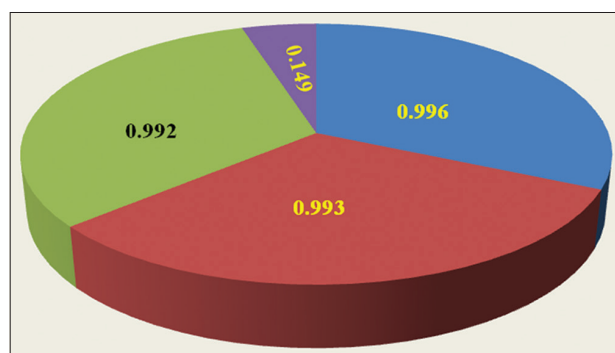
## 2.2. Analysis of the Data

The statistical analysis of the data gathered for the relationship of anthropometric measurement with performance. The data collected qualitatively on different test of anthropometric measurement performance. The data were analyzed and interpreted using multiple regression correlation statistical technique and the level of significance at 0.05 was adequate for testing the hypothesis. Multiple regression analysis tables had been given below.

From the above tables, the under mentioned summary had drawn in respect of the interrelationship of each component to other. The results which were statistically analysis with the help of multiple regression analysis formula were verified up to which how extent they were interrelated to each other with the help of standard norms propounded by “GLASS AND HOPKINS” (1996) for interpreting the data which are analysis with multiple regression correlation equation method. The following standard norms are as follows:

Multiple R	0.996
R square	0.993
Adjusted R	0.992
Standard E	0.146

From the above given Table 2 after doing its minute observation, it is clear the multiple R (0.996), R square (0.993), adjusted R (0.992), and standard E of the scores of handball players is 0.146.

**Graph 1: The value of different correlation****Graph 2: Summary of different correlation**

From the above table, it is clear that the  $\gamma$ -intercept, i.e.,  $\alpha = -0.225$ ,  $\beta_1 = 0.003$ ,  $\beta_2 = -0.003$ ,  $\beta_3 = 0.001$ ,  $\beta_4 = 0.001$ ,  $\beta_5 = 0.016$ ,  $\beta_6 = 0.968$ ,  $\beta_7 = 0.986$ , and  $\beta_8 = 0.981$

Hence, the perdition equation is given as  $\gamma = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8$

which can be written in numerical form as given below:

$$\gamma = -0.225 + 0.003 * 176 + -0.003 * 62 + 0.001 * 77 = 0.001 * 95 + 0.016 * 22 + 0.968 * 8 + 0.986 * 7 + 0.981 * 8$$

**Table 3: Regression equation analysis**

Groups	Coefficients	S. E.	t-test	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0 %
Intercept	-0.225	1.112	-0.203	0.841	-2.481	2.031	-2.481	2.031
Height	0.003	0.004	0.740	0.464	-0.005	0.010	-0.005	0.010
Weight	-0.003	0.004	-0.883	0.383	-0.011	0.004	-0.011	0.004
A. length	0.001	0.005	0.206	0.838	-0.009	0.0012	-0.009	0.012
L. length	0.001	0.005	0.171	0.865	-0.010	0.0012	-0.010	0.012
F. length	0.016	0.008	1.891	0.067	-0.010	0.032	-0.001	0.032
Shooting	0.968	0.026	37.458	0.000	-0.001	1.021	0.916	1.021
Passing	0.986	0.023	43.061	0.000	0.916	1.032	0.939	1.032
Guarding	0.981	0.022	45.231	0.000	0.957	1.025	0.937	1.025

**Table 4: Summary of different correlation**

Multiple R	0.996
R square	0.993
Adjusted R	0.992
Standard E	0.149

**Table 7: Summary of different correlation**

Multiple R	0.996
R square	0.993
Adjusted R	0.992
Standard E	0.146

**Table 6: Summary of intercorrelation matrix**

Variable	Calculated r	Relationship
Passing-shooting	-0.038	Negligible
Guarding-shooting	0.085	Negligible
Performance-shooting	0.568	Moderate
Guarding-passing	-0.114	Negligible
Performance-passing	0.534	Moderate
Performance-guarding	0.582	Moderate

From the above given Table 5 after doing its minute observation, it is clear the multiple R (0.996), R square (0.993), adjusted R (0.992), and standard error of the score of handball players is 60.

Coefficient (r)	Relationship
0.00–0.20	Negligible
0.20–0.40	Low
0.40–0.60	Moderate
0.60–0.80	Substantial
0.80–1.00	High to very high

Form the Table 1 after doing it's minutely observation, it is clear that the relationship of passing with shooting (-0.038) is negligible, guarding with shooting (0.085) is negligible, performance with shooting (0.568) is moderate, guarding with passing (-0.114) is negligible, performance with passing (0.534) is moderate, and performance with guarding (0.582) is moderate.

From the above given Table 8 after doing its minute observation, it is clear the multiple R (0.996), R square (0.993), adjusted R (0.992), and standard error of the score of handball players is 0.146.

### 3. CONCLUSION

On the basis of the result drawn with the mentioned methodology, the following conclusions were sougheed out. There was a positive relationship in between the anthropometric measurement with the performance of handball players.

### REFERENCES

1. Wiki Anthropometric History. Available from: <http://www.google.com/en.wikipedia.org>.
2. Clarke, H. *Application of Measurement to Physical Education*. New Jersey, Englewood: Prentice Hall Inc.; 1986.
3. Gabbett, T., Kelly, J., and Pezet, T. Relationship between physical fitness and playing ability in rugby league players. *J Strength Cond Res*, 2007, 21(4), 1126-1133.
4. Clarke, H.H. The relationship of strength and anthropometrics measurement to physical performance involving the and legs. *Res Q*, 1957, 28(3), 223-232.
5. Kamlesh, M.L. *Foundation of Physical Education*. New Delhi: Metropolitan Book Co., Private Ltd.; 2002.
6. Kansal, D.K. *Applied Measurement Evaluation and Sports Selection*. New Delhi: Sports and Spiritual Science Publications; 2008.

# A Study on Drug Addiction

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## ABSTRACT

Drug addiction is defined as chronic, relapsing disorder characterized by compulsive drug seeking and use despite adverse consequences. In this paper, we will study about drug abuse, census, ratings, and behavioral problems, and alarming offshoot is a manifestation of drug dependency, we will also put emphasis about drug de-addiction management.

**Keywords:** Cannabis, De-addiction, Rehabilitation, Speedball, Substance abuse.

## 1. INTRODUCTION



- Drug addiction is defined as a chronic, relapsing disorder characterized by compulsive drug seeking and use despite adverse consequences
- It is considered a brain disorder
- It involves functional changes to the brain
- June 26 is celebrated as International Day against drug abuse and illicit trafficking every year
- The Union Territories of Jammu and Kashmir are facing a problem where the youth is trying to come to grips with a background of violence and uncertainty that marred their growing years. This apart, they are dealing with issues such as lack of unemployment, bleak prospects for the future, family tensions, relationship tensions, and peer pressure which are adding to their woes. An alarming offshoot is a manifestation of drug dependency, particularly in the Kashmir region.

## 2. DEFINITION

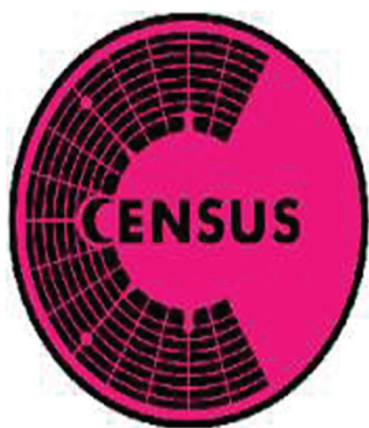


### 2.1. Addiction

Addiction is a psychological and physiological dependence on alcohol or other drugs of abuse that affects the central nervous system in such a way that withdrawal symptoms are experienced when the substance is discontinued.

### 2.2. Census

- Every year 2.5 million people die due to alcohol use disorder worldwide
- 732 lakh persons in India were users of alcohol and drugs. (Ministry of Social Justice and Empowerment)
- Global illegal drug abuse is expected to increase by 25% in just a few decades



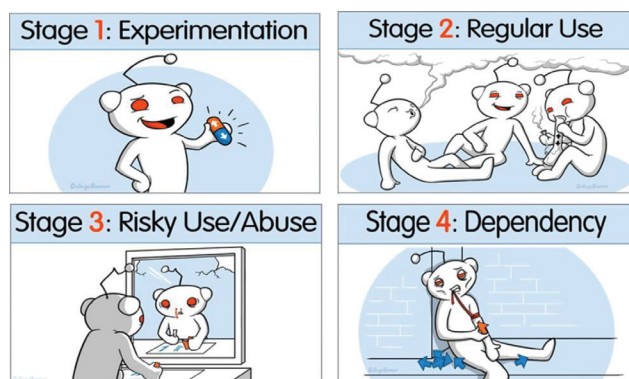
### 3. TOP TEN DRUGS

- Alcohol
- Heroin
- Cocaine
- Tobacco
- LSD
- Speedball
- Ketamine
- Crystal meth.

### 4. CAUSES OF DRUG ABUSE

- United Nations Drug Control Program (UNDCP) reported that around 70,000 people are drug addicts in the Kashmir valley alone, among which 4000 are females
- Youth, particularly between the age group of 17 and 30, involved in this menace of drug addiction
- Combined cases of drug abuse and related psychological issues also went up from more than 14,500 cases in 2014–33,222 in 2016, a staggering 130% increase in 2 years. This year until April alone, this number is 13,352 (Hindustan times)
- According to the Institute of Mental Health and Neurosciences (IMHANS) of the Government Medical College Srinagar.
- Unstable home environment
- A poor relationship with parents
- Use of drugs by friends/peers
- Permissive attitude toward their own drug use and the drug use of the adolescent
- Behavioral problems combined with poor parenting
- Apparent ambivalence or approval of drug use in the school, peer group, or community
- Easy availability of drugs
- Sense of inferiority
- Poor impulse control
- Low self-esteem
- Inability to cope with the pressure of living and society
- Loneliness and unmet needs
- Desire to escape from reality
- Desire to experiment, a sense of adventure
- Pleasure seeking
- Unemployment
- Poor social support
- Effects of television and other mass media.

#### 2.3. Stages of Addiction



The most common substances of abuse in J and K are as follows:

- Nicotine (present in 94.4% of drug abusers)
- Medicinal opioids (65.7%)
- Cannabis (63.6%)
- Benzodiazepines (45.5%)
- Other prescription medications (43.4%)
- Alcohol (32.5%)
- Inhalants (11.1%)
- Cocaine (7.5%).

### 5. SIDE EFFECTS

- Headache
- Acute anxiety, depression, and profuse sweating
- Elevated BP, irregular heartbeat, and chest pain
- Changes in body temperature
- Loss of interest in daily routine
- Unsteady gait, clumsy movements, and tremors
- Frequent changing of moods and temper
- Possession of drugs, needles, syringes, etc.

### 6. HEALTH PROBLEMS

- Weakened the immune system, increased susceptibility to infection
- Causes heart problems ranging from abnormal heart rate to heart attacks



- Cause nausea vomiting and abdominal pain
- Causes damage or failure of the liver
- Causes seizures, stroke, and widespread brain damage
- Behavioral problems
- Aggressiveness
- Addiction
- Impaired judgment
- Impulsiveness
- Loss of self-control
- Paranoia.

## 7. DE-ADDICTION



It is the withdrawal of addiction to drugs. Nowadays, de-addiction centers are working for drug addicts by specially trained physicians

### 7.1. Steps for De-addiction

- Pharmacotherapy – Treatment by medicine
- Psychosocial therapy – Supportive care by family members and friends
- Health restoration – Care taken to restore health, lost due to drugs
- Psychological treatment – By experienced doctors
- Prevention of relapse – Care taken to stop the supply of drugs
- Rehabilitation
- It forms an integral part of the de-addiction program.

Inpatient rehabs offer structured treatment programs designed to address all facets of an individual's addiction. Patients reside in a substance-free facility and receive around-the-clock medical care and therapeutic support.

Outpatient rehabs are another form of comprehensive addiction care. These programs offer many of the same kinds of effective treatments and therapies as inpatient rehabs. However, outpatient rehabs allow patients to live at home during the recovery process.



## 8. REMEMBER

“Confront the dark parts of yourself and work to banish them with illumination and forgiveness. Your willingness to wrestle with your demons will cause your angels to sing.” “August Wilson.”

## REFERENCES

1. Sadock, B., and Sadock, A.V. *Kaplan and Sadock Synopsis of Psychiatry*. United States: Lippincott Williams and Wilkins; 2017.
2. Daley, C.D. *Overcoming Your Alcohol or Drug Problem: Effective Recovery Strategies Workbook*. Oxford: Oxford University Press; 2006.
3. Davis, P. *Addiction: Psychology and Treatment*. New Jersey, United States: Wiley-Blackwell; 2017.
4. Semple, D., and Smyth, R. *Oxfords Treatment of Psychiatry*. Oxford: Oxford University Press; 2013.
5. Pratima, M. *Psychosocial Intervention for Persons with Substance Use*.



# Comparison of Intelligence between Various Professional Teachers and Academic Teacher of South campus of Kashmir University

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## ABSTRACT

The main purpose of this study was to find out the comparison of intelligence between academic teachers and professional teachers of South campus of Kashmir University. The 40 subjects were selected. In this study, 20 both male and female subjects were selected from professional teachers of South campus of Kashmir University and 20 male as well as female subjects were taken from academic teachers of South campus of Kashmir University. The subjects were selected through simple random sampling method. The data pertaining to the study were collected by standard questionnaire for intelligence. The data were analyzed using appropriate statistical techniques, namely, mean, standard deviation, and “t-test” and the subjects were selected using random sampling method. There was found significant difference in intelligence of professional and M. P. Ed and academic teachers of South campus of Kashmir University, which shows that professional teacher is having more intelligence than academic teachers of South campus of Kashmir University.

**Keywords:** Education, Intelligence, Physical education.

## 1. INTRODUCTION

Today, man is not living in happy state of mind. Most of men run after money. Money is everything, for most of them, it is mother, it is future, and it is god. Some of them full prey to lust; some consider women and wine are everything for them. Some of them keep themselves busy in unhealthy competition. They want to leave others for behind. There are people who have all material comforts and modern amenities at their command but even then, they are much worried and disturbed. The condition of poor and the farmers is always pitiable. They are victimized by the politicians and the hoarders; thus, we find everyone sick having mental tension in one form or other.

Man is a social animal and the primary distinction from other animal is his ability to learn. He has been endowed with intelligence which enables him to modify his animal tendencies in accordance with the demands of the environment and the society. It is, however, the education which enhances his intelligence and capabilities so as to ensure proper progress in life. Education is a process which enables a man to acquire knowledge through conductive attitude, which is essential for being a human being.

## 2. METHODOLOGY

It is evident that the research is a systematic and careful collection, analysis, and interpretation of the data. In research work, the researcher divides the each chapter into different subtypes. In the same way, the researcher divides the methodology into the following categories. This will help the researcher in the collection of data in a very precise manner. These categories are as follows:

### 2.1. Source of Data

The subjects were selected from various professional teachers and academic teacher of South campus of Kashmir University.

### 2.2. Selection of Subjects

Twenty male as well as female subjects were selected from M. P. Ed students of postgraduate teaching department of physical education of South campus of Kashmir University, and 20 male as well as female subjects were taken from M. Ed students of South campus of Kashmir University.

### 2.3. Sampling Method

The subjects were selected through simple random sampling method.

## 3. EQUIPMENT USED FOR THE COLLECTION OF DATA

### 3.1. Intelligence

Standard questionnaire, namely, “Group test of intelligence” by S. Jalota’s used to know the intelligence of M. P. Ed and M. Ed students of South campus of Kashmir University. Furthermore, the researcher used the questionnaire of intelligence by S. Jalota which is comprised 100 questions which include general questions.

### 3.2. Collection of Data

For the collection of data, the subjects are given full administration of the tests which are used for the collection of data in the study.

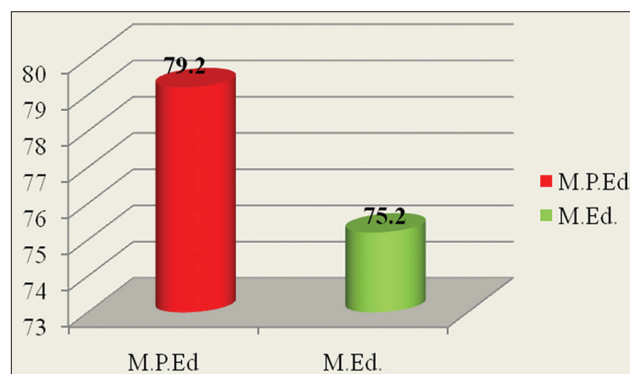
## 4. ANALYSIS AND INTERPRETATION OF DATA

This chapter consists of information of statistical technique that was used after the classification and tabulation of the data. For the present study entitled as comparison of intelligence between M. P. Ed and M. Ed students of South campus of Kashmir University.

### 4.1. Analysis of Data

The data can be obtained using the questionnaire of intelligence” by S. Jalota’s. After the collection of data from the students of M. Ed and M. P. Ed, the raw data were converted into standard one using a statistical technique “*t*-test” for testing of hypothesis.

Table reveals that there is difference between means of M. P. Ed group and M. Ed group because mean of M. P. Ed group = 79.2 is greater than the mean of M. Ed group = 75.2, and therefore, mean difference is 3.86 to check the significant difference between M. P. Ed and M. Ed group; data were again analyzed by applying “*t*-test” before applying “*t*-test” standard deviation was calculated between M. P. Ed where SD = 3.43 and M. Ed group where SD = 3.41 and there was a significant difference between M. P. Ed and M. Ed group because value of calculated “*t* = 4.371” which is greater than



**Graph 1:** The mean score of intelligence of M. P. Ed and M. Ed students of South campus of Kashmir University

**Table 1:** Comparison of intelligence between M.P. Ed and M. Ed students of South campus of Kashmir University

Group	Mean	S.D.	M.D	D.F	O.T.	T.T
M.P.Ed.	79.2	3.43	3.86	58	4.371	2.00
M.Ed.	75.2	3.41	3.86			

Level of significance = 0.05, tabulated “*t*” 0.05 (58) = 2.00

**Table 2:** Comparison of percentage of students of M. P. Ed and M. Ed. in intelligence of South campus of Kashmir University

Intelligence norms	M. P. Ed%	M. Ed%
Very superior	10.00	03.33
Superior	90.00	86.66
Bright average	0	10.00
Average	0	0
Dull average	0	0
Border line	0	0
Mental defect	0	0

tabulated “*t* = 2.00” at 0.05 level of significance which shows that M. P. Ed students are having more intelligence than M. Ed students.

The percentage of intelligence of M. P. Ed students in very superior category is 10.00% and the intelligence of M. Ed. students in the same category is 3.33%. The percentage of intelligence of M. P. Ed students in superior category is 90.00% and the intelligence of M. Ed. students in the same category is 86.66%. The percentage of intelligence of M. Ed. students in the category of Bright average is 10.00%, whereas in M. P. Ed students is 00.00%. The percentage of intelligence of M. P. Ed as well as M. Ed. students in average, dull average border line, and mental defect category is 00.00%.

## 5. CONCLUSION

With the limitations of the study and from the statistical analysis of the collected data, it is concluded that there is found significant difference in intelligence of M. P. Ed and M. Ed students of South campus of Kashmir University, which shows that M. P. Ed students are having more intelligence than M. Ed students of South campus of Kashmir University.

## REFERENCES

1. Ahlawat, N. *Principles of Psychology*. New Delhi: Vishvabharti Publications. p. 235.
2. Kamlesh, M.L. *Psychology of Physical Education and Arts*. New Delhi: Metropolitan Book Company Private Limited; 1983. p. 12.
3. Kundra, S. *Text Book of Physical Education*. New Delhi: Evergreen Publications; 2010. p. 97.
4. Mayer, J.D., and Salovey, P. *Implications for Educators*. New York: Basic Books; 1997. p. 3-31.
5. Suinn, R.M. *Visual Muter Behaviour Sepearsal for Adoptive Behaviour in Counselling Method Education*. New York: Halt; 1976. p. 49-57.
6. Clarke, H.H. The relationship of strength and anthropometrics measurement to physical performance involving the and legs. *Res Q*, 1957, 28(3), 143-152.
7. Kamlesh, M.L. *Foundation of Physical Education*. 2<sup>nd</sup> ed. New Delhi: Metropolitan Book Co., Private Ltd.; 2002. p. 91-96.
8. Kansal, D.K. *Applied Measurement Evaluation and Sports Selection*. New Delhi: Sports and Spiritual Science Publications; 2008. p. 128-133.

# Study of Mental Toughness with Reference to Body Mass Index of National Level Gymnastic Women's of Jammu

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## ABSTRACT

Mental toughness (MT) is a quality which determines, in some part, how effectively individuals perform when exposed to stressors, pressure, and challenge. Irrespective of the current situation. MT frequently used by coaches and sports psychologist; it describes a gathering of attributes that allow a person to persevere through difficult circumstances and come out without losing self-confidence. The body mass index (BMI) or Quetelet index is used to find out the dietary status of a person for decades. BMI provides trouble-free numeric figure to determine a person's "thinness" or "thickness" according to their proportion of height and weight. In sports, the physique of a sportsperson plays a key role, and BMI gives an outlook of their nourishment. Results of correlation analysis showed that the BMI does not have a significant ( $P > 0.05$ ) relationship with the MT and subvariables of MT, i.e., self-confidence, motivation, attention control, goal setting, visual and imagery control, and attitude control. The result of comparative analysis (ANOVA) showed a significant ( $P < 0.05$ ) difference between the studied groups in BMI. In contrast, MT and subvariables of MT showed insignificant ( $P > 0.05$ ) difference between the groups. In conclusion, BMI did not affect the MT of the studied players in the present study. BMI may not have a significant role in MT.

## 1. INTRODUCTION

The body mass index (BMI) or Quetelet index is used to find out the dietary status of a person for decades. BMI provides trouble-free numeric figure to determine a person's "thinness" or "thickness" according to their proportion of height and weight. In sports, the physique of a sportsperson plays a key role, and BMI gives an outlook of their nourishment. Mental toughness (MT) is a quality which determines, in some part, how effectively individuals perform when exposed to stressors, pressure, and challenge irrespective of the current situation. MT frequently used by coaches and sports psychologist; it describes a gathering of attributes that allow a person to persevere through difficult circumstances and come out without losing self-confidence. Coaches and sport commentators freely use the term MT to describe the mental state of athletes who persevere through difficult sport circumstances to succeed.

### 1.1. Objectives

The researcher aimed to evaluate the BMI and MT status of national level women gymnastic players of Jammu.

## 2. METHODOLOGY

For this study, 30 female gymnastics, with an average age of 8–18 years, were randomly selected from Jammu national level gymnastic competition held at degree colleges of Jammu city.

### 2.1. Tools

MT questionnaire (by Sandeep Tiwari)

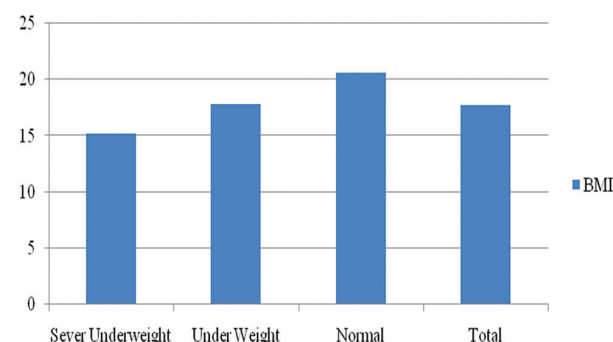
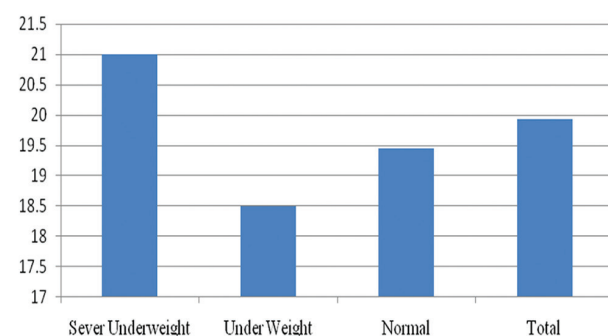
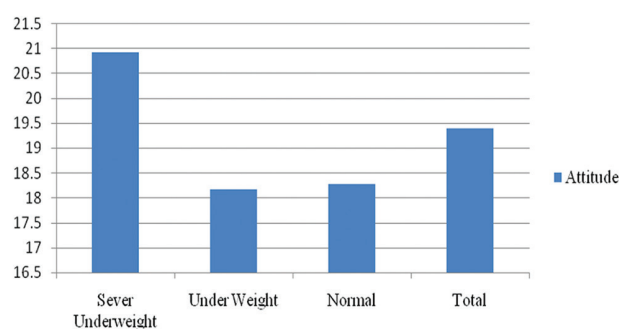
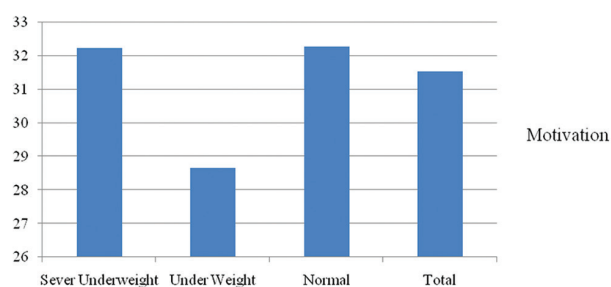
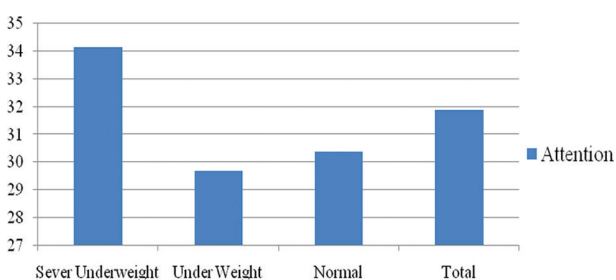
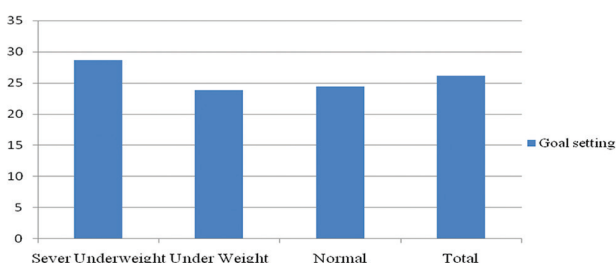
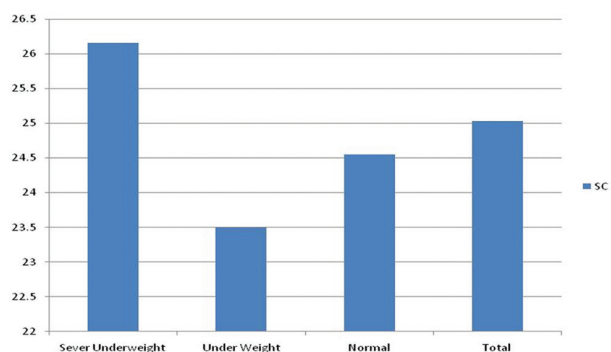


The data of height and weight had taken using standard equipments of "Lafayette" make anthropometry – stadiometer with an accuracy of 0.001 m for height;

recorded in centimeter (cm) and “Contech” make an electronic weighing machine with an accuracy of 0.01 kg for body weight.

## 2.2. Formulas

The BMI was calculated using the standard formula weight (kg)/height (m<sup>2</sup>).



## 3. RESULTS AND CONCLUSION

Results of correlation analysis showed that the BMI does not have a significant ( $P > 0.05$ ) relationship with the MT and subvariables of MT, i.e., self-confidence, motivation, attention control, goal setting, visual and imagery control, and attitude control.

The result of comparative analysis (ANOVA) showed a significant ( $p < 0.05$ ) difference between the studied groups in BMI. In contrast, MT and subvariables of MT showed insignificant ( $P > 0.05$ ) difference between the groups. In conclusion, BMI did not affect the MT of the studied players in the present study. BMI may not have a significant role in MT.



## REFERENCES

1. Brand, S., Gerber, M., Kalak, N., and Kirov, R. "Sleep well, our tough heroes!"=in adolescence, greater mental toughness is related to better sleep schedules. *Behav Sleep Med*, 2013, 12(6), 444-454.
2. Brand, S., Gerber, M., Kalak, N., Kirov, R., and Lemola, S. Adolescents with greater mental toughness show higher sleep efficiency, more deep sleep and fewer awakenings after sleep onset. *J Adolesc Health*, 2014, 54(1), 109-113.
3. Chen, M.A., and Cheesman, D.J. Mental toughness of mixed martial arts athletes at different levels of competition. *Percept Mot Skills*, 2013, 116(3), 905-917.
4. Gucciardi, D.F., and Hanton, S. The concept of mental toughness: Tests of dimensionality, nomological network and traitness. *J Pers*, 2015, 83(1), 26-44.
5. Hardy, L., Bell, J., and Beattie, S. A neuropsychological model of mentally tough behavior. *J Pers*, 2014, 82(1), 69-81.
6. Meggs, J., Ditzfeld, C., and Golby, J. Self-concept organisation and mental toughness in sport. *J Sports Sci*, 2014, 32(2), 101-9.
7. Onley, M., Veselka, L., Schermer, J.A., and Vernon, P.A. Survival of the scheming: A genetically informed link between the dark triad and mental toughness. *Twin Res Hum Genet*, 2013, 16(6), 1087-1095.

# Comparative Study on Mental Toughness among National Level Athletes from Individual and Team Sports

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## ABSTRACT

The purpose of the study is to assess the mental toughness of national level athletes from individual and team games by comparing their scores. The study also verifies if there is any significant difference exists between males and females in the above said categories. The subjects of the study included 120 individuals, consisted of athletes from volleyball and track and field. The subjects were from 18 to 24 years of age. Classification of the subjects was Volleyball ( $n = 60$ ) and track and field ( $n = 60$ ). Volleyballers were considered as team athletes as it is a team game and athletes from track and field were considered as individual athletes. The data were collected using sports mental toughness questionnaire (SMTQ Sheard *et al.*, 2009) on selected subjects with national level participation from the state of Kerala. Statistical technique used to compare the means was ANOVA. Within the limits and limitations of the present study, the results indicate that there is a significant difference between team and individual athletes in all factors of mental toughness. Males and females also differ in all factors except constancy.

## 1. INTRODUCTION

The performance of a player not only depends on his physical abilities or efficiency of the skill rather but it also depends to a great extent on his psychological training. According to Weinberg and Florenza (2010), the best athletes need to be both physically and mentally tough to produce success in competition. According to Jones *et al.* (2002), mental toughness is the ability to cope with both the stressors of sport and also allows one to perform with consistency and control, especially during pressure situations.

Rawat and Bangari (2013) carried out a study to compare mental toughness between volleyball and basketball players from various universities in Punjab. The results revealed that volleyball and basketball players showed a significant difference on mental toughness, though basketball players showed higher mean on mental toughness than volleyball players. Tadvil (2014) in his study on mental toughness among male and female softball players from the different state of India,

concluded that softball male and female players were mentally tough in overall observation.

In simple words, mental toughness is the ability to manage emotional responses and focus on what has to be done in pressure circumstances. The mentally tough athlete may have the capacity to control his or her emotions and may be relaxed under stress situations. Such athletes never avoid pressure, but they may challenge it. They will be at their best under these pressure situations. Mentally tough athletes are able to concentrate on the task under stressful situations while less tough athletes lose their focus of concentration. They are mentally resilient and have the ability to overcome adversity. Their level of performance seems to be steadier and they have a tendency to perform at their best when pressure is the utmost. Hence, this study was intended to find the distribution of the variables mental toughness in the sample studied and to find out if there is any significant difference in the level of mental toughness between individual and team game sportspersons, and between different genders.

### 1.1. Purpose of the Study

The aim of the study was to assess the mental toughness of national level athletes from individual and team sport by comparing their scores. The study also verifies if there is any significant difference exists between male and female in the above said categories.

## 2. METHODOLOGY

### 2.1. Sample

The subjects of the study included 120 individuals, consisted of athletes from volleyball and track and field. The subjects were from 18 to 24 years of age. Classification of the subjects was Volleyball ( $n = 60$ ) and track and field ( $n = 60$ ). Volleyballers were considered as team athletes as it is a team sport and athletes from track and field were considered as individual athletes.

### 2.2. Tool

The SMTQ – sports mental toughness questionnaire (Sheard *et al.*, 2009) was used to evaluate the participants' mental toughness. The 14-item SMTQ provides a global measure of mental toughness (i.e., the sum of the subscales scores), as well as three subscales encapsulating confidence, constancy, and control. The participants had to respond to items on a four-point Likert-type scale ranging from “not at all true”[1] to “very true.”[4] Sample items included “I interpret threats as positive opportunities” (confidence); “I give up in difficult situations” (constancy); and “I am overcome by self-doubt” (control). Confirmatory factor analysis has provided support for the three subscales and the global measure of mental toughness. In addition, Sheard *et al.* (2009) revealed support for the internal reliability of the SMTQ subscales with Cronbach  $\alpha$ 's of  $>0.72$ .

### 2.3. Statistical Analysis

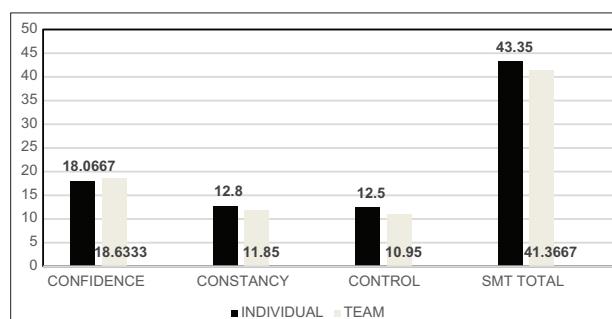
This was done using the SPSS package. Mean is used as a measure of central tendency and SD is used as a measure of dispersion. An Independent *t*-test was used to find the significance of the difference between different groups in mental toughness.

## 3. RESULTS AND DISCUSSION

This study investigated the distribution of the variables of mental toughness in the sample studied. The study also verified if there is any significant difference

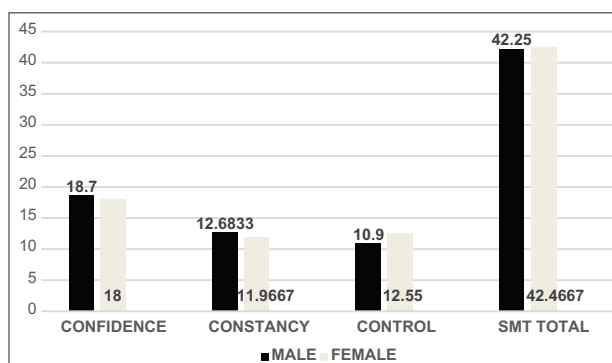
between the individual and team game national level sportspersons and also among gender. The obtained results are discussed below.

Table 1 indicates the results obtained for the sample individual and team athletes in all the dimensions of mental toughness. It is found that in all dimensions of SMTQ except subscale confidence, there is a significant difference between individual and team athletes. The total mental toughness score is significantly high for individual athletes when compared with team athletes, i.e., Volleyballers. This may be because the demands in individual and team sports are entirely different. In individual sports, success depends mainly on the psychological ability and performance of the particular athlete. Here, athletes spend more time individually for practice and mental training than a team game. Athletes in individual sports face all critical circumstances of his sports alone. Hence, individual athletes are assumed to be more mentally tough than team athletes.



**Graph 1:** Comparison of scores of Individual and team athletes in the dimensions of mental toughness

Table 2 indicates the significant difference between male and female athletes in the variable mental toughness. The results showed that there is a significant difference in the factors constancy and control but not significant in the factor confidence and total mental



**Graph 2:** Comparison of scores of male and female sportspersons in the dimensions of mental toughness

**Table 1: Significant difference between individual and team sports athletes in the dimensions of mental toughness**

	Group	n	Mean	Standard deviation	t value	Sig. (2-tailed)
Confidence	Individual	60	18.0667	2.72382	-1.289	0.200
	Team	60	18.6333	2.04166	-1.289	0.200
Constancy	Individual	60	12.8000	1.25954	3.552	0.001
	Team	60	11.8500	1.64497	3.552	0.001
Control	Individual	60	12.5000	1.92662	4.348	0.000
	Team	60	10.9500	1.97806	4.348	0.000
Total – mental toughness	Individual	60	43.3500	3.65840	2.927	0.004
	Team	60	41.3667	3.76409	2.927	0.004

**Table 2: Significant difference between male and female sportspersons in the dimensions of mental toughness**

	Group	n	Mean	Standard deviation	t value	Sig. (2-tailed)
Confidence	Male	60	18.7000	2.63162	1.599	0.113
	Female	60	18.0000	2.13922	1.599	0.113
Constancy	Male	60	12.6833	1.56759	2.620	0.010
	Female	60	11.9667	1.42575	2.620	0.010
Control	Male	60	10.9000	1.90183	-4.679	0.000
	Female	60	12.5500	1.96085	-4.679	0.000
Total-mental toughness	Male	60	42.2500	4.23714	-0.309	0.758
	Female	60	42.4667	3.40223	-0.309	0.758

toughness. In this modern era, both male and female participate in competitive sports with equal spirit. Experience in sports participation and mental training from sports psychologists and coaches enhances their mental toughness ability. Nowadays, our both male and female teams are well equipped or equally blessed with efficient coaches and psychological trainers, and also equal opportunities are opened for both men and women too. This may be the reason that both men and women players showed almost equal scores in total mental toughness parameters.

#### 4. CONCLUSIONS

The study intended to have a comparison of the mental toughness and its dimensions in both male and female, individual, and team sports. The results showed that there is a significant difference in all dimensions of sports mental toughness except in the subscale confidence between individual and team athletes,

i.e., constancy, control, and total mental toughness. Individual sportspersons showed significantly high scores on all dimensions of SMTQ except confidence. In verifying gender differences, the results indicated that there is no significant difference in the scores of confidence and total mental toughness.

#### REFERENCES

1. Rawat, B., Bangari, D. Comparison of mental toughness between volleyball and basketball players. *Int J Mov Educ Soc Sci*, 2013, 2(1), 81-82.
2. Tadv HS. A survey of mental toughness among softball players. *Int J Phys Educ*, 2014, 1(1), 1.
3. Jones, G., Hanton, S., Connaughton, D. What is this thing called mental toughness? An investigation of elite sport performers. *J Appl Sport Psychol*, 2002, 14, 205-218.
4. Sheard, M., Golby, J., Van Wersch, A. Progress towards construct validation of the sports mental toughness questionnaire (SMTQ). *Eur J Psychol Assess*, 2009, 25, 186-193.

# Effect of Pranayama on Vital Capacity, Inspiratory Reserve Volume, and Expiratory Reserve Volume of High Schoolgirls

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## ABSTRACT

The purpose of the study was to find out the effects of pranayama on vital capacity, inspiratory reserve volume, and expiratory reserve volume among high school-girls. To facilitate the study, randomly selected 30 health high school level girls were selected as subjects, and their age ranged between 13 and 15 years that they were further divided into two groups, namely, pranayamas group and control group on a random basis, each group consisting of 15 subjects. It was concluded that 12 weeks pranayama for high schoolgirls significantly influenced their vital capacity compared to the the control group. It was concluded that 12 weeks pranayama for high schoolgirls significantly influenced their inspiratory reserve volume compared to the control group. It was concluded that 12 weeks pranayama for high schoolgirls significantly influenced their expiratory reserve volume compared to the control group.

**Keywords:** Expiratory reserve volume, Inspirator reserve volume, Pranayama

## 1. INTRODUCTION

Pranayama means to control and regulation of breath. "Prana" is Sanskrit word, which means "vital force," "Ayana," means the control of the prana, so pranayama means the control of vital force (prana) by concentration and regulated breathing. Prana is the vital power or force which is motivating every element on the earth and is the origin of the force of thought that there is a deep affinity between prana and mental force, between mental force and intellect, between intellect to soul, and between soul and God. The control of prana through pranayama that each part of the body can be filled with prana.

## 2. STATEMENT OF THE PROBLEM

The purpose of the study was to find out the effects of pranayama on vital capacity, inspiratory reserve volume, and expiratory reserve volume among high schoolgirls.

## 3. HYPOTHESIS

1. It was hypothesized that the pranayama would significantly influence selected physiological

variable, the vital capacity of high schoolgirls compared to the control group.

2. It was hypothesized that the pranayama would significantly influence selected physiological variable, inspiratory reserve volume of high schoolgirls compared to the control group.
3. It was hypothesized that the pranayama would significantly influence selected physiological variable, expiratory reserve volume of high schoolgirls compared to the control group.

## 4. DELIMITATIONS

To achieve the objectives of the study, the investigator delimited the research for the following factors.

- i. This study was conducted only on randomly selected 30 high school level girls in Andhra Pradesh.
- ii. The age group of the subjects was between 13 and 15 years.
- iii. The pranayama program was restricted to a period of 12 weeks.
- iv. The study was restricted to the following variables.
  1. Vital capacity
  2. Inspiratory reserve volume
  3. Expiratory reserve volume.



## 5. SELECTION OF SUBJECTS

To facilitate the study, randomly selected 30 health high school level girls were selected as subjects, and their age ranged between 13 and 15 years; they were further divided into two groups, namely, pranayamas group and control group on a random basis, each group consisting of 15 subjects.

Before the commencement of the training, the purpose of the study and method of performing pranayama practices were explained to the subjects for their cooperation.

## 6. STATISTICAL TECHNIQUE

Design is the key for controlling the outcomes from the experimental research. The independent variables are manipulated in an attempt to judge their effects on the dependent variable. The experimental design used in this study was pre-test and post-test random group design. Here, the groups were randomly formed, but the groups were taken a pre-test and post-test. The major purpose of this type of design was to determine the amount of change produced by the treatment, that is, does the experimental group change more than the control group.

The pre-test mean on the experimental group was 3350 and control group was 3216.67 and the obtained F value was 0.63, which was less than the required F value of 4.19 to be significant. Hence, it was not significant and the groups were equal at the initial stage [Table 1].

The comparison of post-test means, experimental group 3728.00, and control group 3238.00 proved to be significant at 0.05 level as the obtained F value 9.45 was greater than the required table F value of 4.19 to be significant at 0.05 level.

Taking into consideration, the initial and final mean values adjusted post-test means were calculated, and the obtained F value of 163.97 was greater than the required F value to be significant 4.21, and hence, there was a significant difference.

Thus, it was proved that the experimental group gained mean difference in physiological variable, vital capacity 378.00 was due to pranayama given to high schoolgirls, which was found to be significant at 0.05 level.

The pre-test mean on the experimental group was 1988 and the control group was 2016.67, and the obtained F value was 0.35, which was less than the required F value of 4.19 to be significant. Hence, it was not significant and the groups were equal at the initial stage [Table 2].

The comparison of post-test means, experimental group 2149.33, and control group 2045.00 proved to be significant at 0.05 level as the obtained F value 7.18 was greater than the required table F value of 4.19 to be significant at 0.05 level.

Taking into consideration, the initial and final mean values adjusted post-test means were calculated, and the obtained F value of 7.35 was greater than the required F value to be significant 4.21, and hence, there was a significant difference.

Thus, it was proved that the experimental group gained a mean difference on physiological variable, inspiratory reserve volume 161.33 was due to pranayama given to high schoolgirls, which was found to be significant at 0.05 level.

The pre-test mean on the experimental group was 1138 and the control group was 1166.67, and the obtained F value was 0.37, which was less than the required F value of 4.19 to be significant. Hence, it was not significant and the groups were equal at the initial stage.

**Table 1: Computation of analysis of covariance on vital capacity**

	Experimental group	Control	Source of variance	Sum of squares	DF	Mean squares	Obtained F- ratio
Pre-test mean	3350	3216.67	Between	133333.33	1	133333.33	0.63
			Within	5936933.33	28	212033.33	
Post-test mean	3728.00	3238.00	Between	1800750.00	1	1800750.00	9.45*
			Within	5337680.00	28	190631.43	
Adjusted post-test mean	3665.75	3300.25	Between	979920.95	1	979920.95	163.97*
			Within	161354.24	27	5976.08	
Mean diff	378.00	21.33					

Table F-ratio at 0.05 level of confidence for 1 and 28 (df)=4.19, 1 and 27 (df)=4.21. \*Significant

**Table 2: Computation of analysis of covariance on inspiratory reserve volume**

	Experimental group	Control	Source of variance	Sum of squares	DF	Mean squares	Obtained F-ratio
Pre-test mean	198.8	2016.67	Between	6163.33	1	6163.33	0.35
			Within	488423.33	28	17443.69	
Post-test mean	2149.33	2045.00	Between	81640.83	1	81640.83	7.18*
			Within	318493.33	28	11374.76	
Adjusted post-test mean	2150.82	2043.51	Between	85295.44	1	85295.44	7.35*
			Within	313213.88	27	11600.51	
Mean diff	161.33	28.33					

Table F-ratio at 0.05 level of confidence for 1 and 28 (df)=4.19, 1 and 27 (df)=4.21. \*Significant

**Table 3: Computation of analysis of covariance on expiratory reserve volume**

	Experimental group	Control	Source of variance	Sum of squares	DF	Mean squares	Obtained F-ratio
Pre-test mean	1138	1166.67	Between	6163.33	1	6163.33	0.37
			Within	461423.33	28	16479.40	
Post-test mean	1292.67	1158.33	Between	135340.83	1	135340.83	13.70*
			Within	276526.67	28	9875.95	
Adjusted post-test mean	1298.00	1153.00	Between	155616.23	1	155616.23	19.76*
			Within	212600.73	27	7874.10	
Mean diff	154.67	-8.33					

Table F-ratio at 0.05 level of confidence for 1 and 28 (df)=4.19, 1 and 27(df)=4.21. \*Significant

The comparison of post-test means, experimental group 1292.67, and control group 1158.33 proved to be significant at 0.05 level as the obtained F value 13.70 was greater than the required table F value of 4.19 to be significant at 0.05 level [Table 3].

Taking into consideration, the initial and final mean values adjusted post-test means were calculated, and the obtained F value of 19.76 was greater than the required F value to be significant 4.21, and hence, there was a significant difference.

Thus, it was proved that the experimental group gained a mean difference in physiological variable, expiratory reserve volume 154.67 was due to pranayama given to stress software executives, which was found to be significant at 0.05 levels.

## 7. CONCLUSIONS

Within the limitations and delimitations of this study, the following conclusions were drawn.

1. It was concluded that 12 weeks pranayama for high schoolgirls significantly influenced their vital capacity compared to the control group.
2. It was concluded that 12 weeks pranayama for high schoolgirls significantly influenced their inspiratory reserve volume compared to the control group.
3. It was concluded that 12 weeks pranayama for high schoolgirls significantly influenced their expiratory reserve volume compared to the control group.

### 7.1. Recommendations

The findings of this study proved that pranayama significantly influenced selected physiological variables; hence, educational authorities may consider for the introduction of yogasanas and pranayama in school and college curriculum for the all-round development of the students.

1. It was recommended that fitness centers can introduce yogasanas and pranayama in their fitness programs for the benefit of people approaches them.
2. It was recommended that physical educationists and coaches to include yogasanas and pranayama in their training schedule wherever players show deficiency in selected biochemical and physiological fitness.

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