



**RELATIONSHIP OF SELECTED PHYSIOLOGICAL  
VARIABLES WITH SWIMMING PERFORMANCE:  
A PILOT STUDY**

**Meriline Gogoi<sup>1</sup> and Kiriti Kamal Bora<sup>2</sup>**

**Affiliations**

- <sup>1</sup> Assistant Professor, L.N.I.P.E, NERC Guwahati Email: merilinegogoi@gmail.com,  
<sup>2</sup> Lecturer, DIET, Morigaon, Assam Email: borakiriti@gmail.com
- 

**ABSTRACT**

A pilot study was undertaken to see the relationship of heart rate, core temperature and blood lactate to 100m swim performance. Ten male collegiate swimmers of L.N.I.P.E., NERC, actively participated in the study. After a standard warm-up and prior to 100m swim performance the participants were given a recovery of 30 minutes. The selected physiological variables were measured in completion of post warm-up recovery time i.e. after 30 minutes recovery post warm-up but 3 minutes prior to performance. Immediately in completion of the post warm-up recovery time, the swimmers were required to complete a 100m swim performance at maximal effort. The result of the study showed that heart rate and blood lactate had a positive correlation to swim performance, which determines increase in heart rate and blood lactate will increase the swim time whereas core temperature has shown to have a negative correlation to swim time which determines increase in core temperature will decrease swim time. Though, the results were non-significant, the effect of the physiological variables selected, may not be completely disregarded as the nature of correlation seemed to be justified in determining a better swim performance.

**Keywords:** Swimming, Performance, Heart Rate, Temperature, Blood lactate, Males

---

## 1. INTRODUCTION

Swimming is an art of self-supported movement that takes place in a medium with different gravitational pull and resistive forces, cardiovascular and thermal stress compared to air. To propel forward in water, swimmers expend high energy but, with regular training, a considerable reduction occurs at given velocity or speed.

The knowledge of exercise physiology is a fundamental determinant to design a training programme (Holmer, 1992) which helps the swimmers and coaches to understand the effects of various modes of training on biomechanical, hormonal, muscular, cardiovascular, neural and immunological adaptations. These adaptations are related to the training level of the swimmers and their impact on performance.

The warm up is an integral part of the pre-practice or pre-game routine and does not require a large allocation of time. However, the warm-up should be of sufficient duration to allow the athlete to begin to perspire. The benefits of performing a warm-up include increased blood flow to the exercising muscles, which increases muscle temperature and core body temperature. (Hoffman, 2002)

In every sport, warm-up plays a vital role in determining the performance of an athlete. No sportsperson can immediately jump into a specific training or perform well in an event or match without preparing himself for the same. This is why it is seen and observed that athletes perform certain movements before moving to the specific workouts or prior to their competition. It is also observed that merely making certain movement is not sufficient. A sportsman has to perform very systematic and gradual progress in the exercises done. For most of athletes a gradual progress in warm up remains very beneficial as it helps to prepare their body for more intense exercises. A proper and systematic warm up helps increase the blood flow to working muscles which results in decreased muscle stiffness, reduced risk of injury and often improved performance (Elizabeth Quinn, 2020).

Physiologically, a good warm up enables the circulatory system to supply more amount of oxygen to the muscles allowing it to use the oxygen more rapidly. The warm up activates the joints and muscles, increasing the range of motion so that an athlete can perform the skills of swimming more efficiently and economically (Maglischo, 2003). Warming up increases the rate of muscle contractions which helps the swimmers to make powerful movements immediately when the race begins.

A recovery after warm-up and prior to swim performance is very much essential to maintain certain physiological factors which aids in efficient performance of the swimmers. Warm-ups are done with varied intensities which tend to be lower than the main competition effort. The metabolic rates that increased during warm-up have to decrease to a certain level so that the energy expenditure during the actual performance is adequate.

Warm-up followed by a recovery interval is also likely to affect performance depending on the intensity, duration and pattern of warm-up. Improvement of performances are observed after an active warm up with recovery times up to 20 minutes, mainly related to temperature mechanisms (Bishop, 2003 & West, 2013). In various research studies, the recovery time gaps between the end of water warm-up and the start of the competition/ test were 3 min (Balilionis, et.al., 2012 & Arnett, 2012) 5 min (Mitchell, 1993 & Bobo 1999), 8 min (Kilduff et.al., 2010), and 10 min (Henrique & Neiva, 2014) (Henrique & Neiva, 2011). The effect of different time intervals between warm-up and the main task was only studied by ( Zochowski, 2007) and (Daniel & West, 2013). In real competition venues, it is almost impossible to take less than 8–10 min between finishing the warm-up and the swimming event. Warming up is more

effective when it is sufficiently intense to activate the physiological processes that will be required in the competition event, with a recovery time that should be between 8 and 20 min, allowing for replenishment of phosphocreatine (O' Zyener, et.al., 2001). Considering the studies of Villarreal et al. ( 2007 ) it would be interesting to know how different muscle activations (e.g. using high-intensity exercises or loaded concentric actions) can extend the effects of warm-up as well as how swimmers can benefit from improved performance after a longer rest.

The present study is conducted to determine the relationship of heart rate, core temperature and blood lactate with 100m swim performance.

## 2. METHODOLOGY

Ten male collegiate swimmers age ranging between 18-21 years with 5 years of minimum experience in competitive swimming were randomly selected for the present study. The participants were recruited from L.N.I.P.E., NERC, Guwahati based on their individual consent. After a standard warm-up and prior to 100m swim performance the participants were given a recovery of 30 minutes. Tests were performed in a 25m swimming pool of LNPE, NERC. Upon arrival to the pool, the participants were acquainted with the testing protocol.

Core temperature was measured orally utilizing digitalized oral thermometer provided by Ozocheckthermometer, blood lactate by lactate analyser (Stat Strip Xpress Lactate meter, pricking needles and Lactate Strips manufactured by Nova Biomedical) and heart rate was measured manually. The selected physiological variables were measured in completion of post warm-up recovery time i.e. after 30 minutes recovery post warm-up but 3 mins prior to performance. Immediately in completion of the post warm-up recovery time, the swimmers were required to complete a 100m swim performance at maximal effort. Swimmers started on the racing blocks, beginning with a dive. Efforts were made to simulate actual race conditions.

Pearson's Product moment Correlation was employed as statistical tool to determine the relationship of heart rate, core temperature and blood lactate with 100m swim performance. The level of significance was set at 0.05. Statistical analyses were performed using SPSS version 20.

## 3. RESULTS

Though the findings did not show any significant results ( $p > .05$ ) but, the results demonstrated to have a justified correlation of heart rate, core temperature and blood lactate to 100m swim performance.

**TABLE 1**  
**RELATIONSHIP BETWEEN 100M SWIM PERFORMANCE AND SELECTED**  
**PHYSIOLOGICAL VARIABLES**

		100m Swim Performance (time)	Heart Rate (beats/min)	Core Temperature (Fahrenheit)	Blood Lactate (mmol/l)
100m Swim Performance (time)	Pearson Correlation	1	.095	-.258	.381
	Sig. (2-tailed)		.794	.471	.277
	N	10	10	10	10

Performances in swimming are analysed in time; lesser the time taken to accomplish a distance, better the performance of a swimmer. The results of correlation in Table 1 displays to have a positive correlation of heart rate and blood lactate to 100m swim time from which it can be understood that there is a direct positive relationship of these variables with the swim time i.e.

increase in heart rate and blood lactate will result in the increase of the swim time and vice versa. Hence, it indicates that if the heart rate or blood lactate remains elevated prior to a specific event, the swim time will increase resulting in a lower performance.

Whereas, core temperature is shown to have a negative correlation to 100m swim time which indicates that increase in core temperature will decrease swim time and vice versa. The result reveals that elevated core temperature before swim performance assist to enhance performance.

#### **4. DISCUSSION**

This study was conducted to see if there occurs any relationship among heart rate, core temperature and blood lactate to 100m swim performance wherein the results demonstrated to have a justified nature relationship among the physiological variables to the swim performance.

##### **4.1 Heart Rate**

Heart rate was found to be in a normal state when measured in 30 minutes of post warm recovery prior to the swim performance (mean= 91.8) stating a full recovery after the warm-up. This might have benefited the swimmers to elicit faster swim time in the final 100m swim performance.

##### **4.2 Blood Lactate**

Blood lactate was also found to be low when measured before the swim performance which indicates that the cardio-respiratory system could meet the oxygen demands of the active muscles (Services, 1996). However, lactic acid concentration in capillary blood and work load has direct correlation in exercises which involve aerobic as well as anaerobic metabolism (Olbrecht, 1985). The participants of the study applied their maximum effort without undue fatigue to have a better performance.

##### **4.2 Core Temperature**

Prior to performance and after post warm-up recovery core temperature of the swimmers was in elevated form but, near to the normal core body temperature. The maintenance of an elevated core temperature prior to swim performance is the likely mechanism for the better swim time. (West, 2013).

#### **5. CONCLUSION**

In conclusion, the relationship of heart rate, core temperature and blood lactate to 100m swim performance were assessed in a group of collegiate swimmers. Though, the results were non-significant, the effect of the physiological variables selected ,may not be completely disregarded as the nature of correlation seemed to be justified in determining a better swim performance provided, the limitations aroused in this study are minimised.

#### **6. RECOMMENDATIONS**

The study has an enlarged scope widening to conduct other related studies. The study might help the coaches to prescribe the pre-race recovery after warming-up implementing the implications of the physiological variables to enhance the performance of their swimmers. Similar studies might be conducted with different post warm-up recovery times and other related physiological variables. Similar kind of study might be conducted with elite swimmers.

#### **REFERENCES**

- Arnett, M.G. (2012). Effects of prolonged and reduced warm-ups on diurnal variation in body temperature and swim performance. *Journal of Strength and Conditioning Research*, 16(2): 256-261.
- Balilionis, G., Nepocatyh, S., Ellis, C.M., Richardson, M.T., Neggers, Y.H., & Bishop, P.A. (2012). Effects of Different Types of Warm-Up on Swimming Performance, *Reaction*

- Time, and Dive Distance. *Journal of Strength and Conditioning Research*, 26(12): 3297-303.
- Bobo, M. (1999).** The effect of selected types of warm-up on swimming performance. *International Sports Journal*, 3(2) : 37-43.
- Bishop, D. (2003).** Warm Up II: Performance Changes Following Active Warm-up and How to Structure the Warm up. *Journal of Sports Medicine*, 33(7): 483-98.
- Daniel J West, R. M. (2013).** Influence of Post Warm-up Recovery Time On Swim Performance in International Swimmers. *Journal of Science nad Medicine in Sport*, 172-176.
- Elizabeth Quinn (2020),** A Proper Warm-Up Has Important Exercise Benefits, <https://www.verywellfit.com/how-to-warm-up-before-exercise-3119266>
- Henrique P. Neiva, M. C. (2014).** Does Warm-up Have a Beneficial Effect on 100m Freestyle? *International Journal of Sports Physiology and Performance*, 9(1): 145-150.
- Henrique P. Neiva, P. M. (2011).** The Effect of Warm-up on Teherd Front Crawl Swimming Forces. *Journal of Human Kinetics*, 29A: 113-119.
- Hoffman, J. (2002).** Physiological Aspects of Sports Training and Performance. *Human Kinetics*.
- Holmer, I. (1992).** Swimming Physiology. *The Annals of Physiological Anthropology*, 11(3): 269-276.
- Kilduff, L. P., Cunningham, D. J. , Owen, N. J., West, D. J., Bracken, R. M., & Cook, C. J. (2010).** Effect of postactivation potentiation on swimming starts in international sprint swimmers. *Journal of Strength and Conditioning Research*, 25(9): 2418-23.
- Mitchell, J. B., & Huston, J. S. (1993).** The effect of high- and low-intensity warm-up on the physiological responses to a standardised swim and tethered swimming performance. *Journal of Sports Sciences*, 11: 159-165.
- Ozyener F, Rossiter HB, Ward SA, et al. (2001),** Influence of exercise intensity on the on- and off-transient kinetics of pulmonary oxygen uptake in humans. *J Phys.* 533 ( 3):891–902.
- Olbrecht, J. (1985).** Relationship between Swimming Velocity and Lactic Concentration During Continuous and Intermittent Training Exercises. *International Journal of Sports Medicine*, 6(2) :74-77.
- Services, U. D. (1996).** Physiologic Response and Long Term Adaptations to Exercise. In U. D. Services, *Physical Activity and Health: A Report of the Surgeon General*, pp. 59-80). Atlanta: Superintendent of Documents.
- Thomas Zochowski, E. J. (2007).** Effects of Varying Post-Warm-up Recovery Times on 200m Time-Trial Swim Performance. *International Journal of Sports Physiology and Performance*, 2: 201-211.
- Villarreal, E, Saez Saez de., Gonza'lez-Badillo JJ., Izquierdo M. (2007),** Optimal warm-up stimuli of muscle activation to enhance short and long-term acute jumping performance. *Eur J Appl Physiol.* 100(4):393–401.
- West D.J., R. M. (2013).** Influence of Post Warm-up Recovery Time on Swim Performance in International Swimmers. *Journal of Science and Medicine in Sport*, 172-176.



## COMPARISON OF AGILITY BETWEEN FOOTBALL AND VOLLEYBALL NORTH ZONE PLAYERS

Deepak Prakash<sup>1</sup>

### Affiliation:

<sup>1</sup>. Research scholar, Gurukul Kangri Vishwavidyalaya, Haridwar-249404 U. K. , 9760383225, deepakprakashdp1994@gmail.com

---

### ABSTRACT

The purpose of this study was to find out the significant difference of "AGILITY" between football north zone players and volleyball north zone players. Researcher collected the data from 30 students (N=30) male zone players between the age group of 18 to 25 years. The subjects were assigned in to two groups. Group A- volleyball north zone players (N1=15) and group B- football north zone players (N2=15). Student's t-test for independent data was used to determine the significant difference between football north zone players and volleyball north zone players. Unpaired t-test was employed for data analysis. To test the hypothesis, the level of significance was set at 0.05. Statistically significant difference was found between Football and Volleyball players. Male University Football players are more Agile (good agility) in Comparison to male University Volleyball players.

**Keywords:** Agility, football north zone players, volleyball north zone players, Agility T-Test.

---

## 1. INTRODUCTION

Football and volleyball are sports that can be played teams either men or women. But that's about where the similarities between the two end. The fundamentals for playing, rules, player's positions and physical requirements for each sport are very different. There are some similarities in both of Football and Volleyball, "these games require agility, reaction ability, coordination, flexibility, strength, power and endurance. (Junious, 2018))

Football is unarguably the world's most popular sports. The common aspect of the game is the necessity of teamwork to complement individual skill. In adopt to the technical evolutions within the game and players have to must the physical demand of for the geens. Further growth and development phase of life for players (Gil, et. al., 2007) mainly contact sports, football involves a verity of kicking, sprinting, throwing, shooting, trapping, drillings, dodging etc. Chowdhary, et.al., 2015).

In football and Volleyball agility is a most important movement for attacking as well as defensive players. In case of Volleyball, the front row must be blocking position ready to suddenly jump or move each time the opponent touches the ball in the time of attack horizontal and diagonal footwork normally fills this position and simultaneously Defensive players suddenly jump and blocking (Mohan, Tiwari and Rai, 2015).

Football is a game requires very fast body movement which is determined by situation within the match such as; modern football game is characterized by fast movements. Which become prominent in short and long sprints (Sahu and Nayek, 2015).

So, both the game of football and volleyball required agility which is influence the performance of the game (Bag, et.al., 2015).

## 2. METHODOLOGY

### 2.1 SAMPLE

A total number of the 30 male north zone players studying in the college of gurukul kangri vishwavidyalaya of Haridwar district, Uttarakhand. 15 are football players and 15 are volleyball players. The age range of the subject will be 18 to 25 years.

### 2.2 Sampling Technique

A purposive sampling technique will be used to collect the reliable data.

### 2.3 Tool Used

To measure the agility, Shuttle run test was used and it was recorded in one tenth of Sec.

### 2.4 Criterion Measure:

Comparison of Agility between football and volleyball players.

### 2.5 Statistical Techniques

The collected data were tabulated and statistically analyzed. Mean, Standard Deviation, Standard Error Deviation and "t" ratio were used as statistical technique and tools. To compare agility measurements "t" test was used as devised by Garrett (1981). (Independent t-Ration as two groups are compressing different sets of players).

TABLE 1

### COMPARISON OF AGILITY BETWEEN FOOTBALL AND VOLLEYBALL PLAYERS

Variable	Group	N	Mean	S.D.	SE <sub>D</sub>	't'-ratio
Agility	Volleyball	15	10.74	0.599446	0.1950	3.6410
	Football	15	10.03	0.460775		

The above table shows the comparison of Agility between Male University Volleyball and Football players. The mean score of Volleyball players found to be 10.74 and Football players is 10.03 The Mean score value of Volleyball players is more than Football players.

The S.D. was 0.599446 and 0.460775 of Volleyball and Football players. The 't'- ratio between Volleyball and Football players was 3.6410, which is higher than the tab value i.e. 2.048 at 0.05 level of significance so the difference of mean values are statistically significant at 0.05 level of significance .it indicated the male Volleyball players have taken more time in completion of given test related to Agility measurement.

#### 4. DISCUSSION

The study was to "compare agility between volleyball players and football players".The subjects for the study were 15male players of north zone volleyball and 15 male players of north zone football their age range from 18 to 25 years. All subjects were studied in Gurukul Kangri Vishwavidyalaya. On the basis of the finding The Null Hypothesis is rejected because the difference in mean scored of Agility in found between the volleyball players and football players. Football players are better than comparison to volleyball players.

It can be interpreted that the male University Football players are more Agile (good agility) in Comparison to male University Volleyball players. Similar kinds of inferences were made by various researchers in the past studies conducted by them. However this difference may be attributed to the fact that the nature of Volleyball game is more stationary and with limited movement in a smaller space (court). On the other hand Football game includes Variance of movements with more unpredictability in a larger space (Football ground). Que to these players of the respective game develop certain type of neuromuscular Co-ordination pattern which player's vital role in determining the Agility of any individual or a player.

#### 5. CONCLUSION

Statistically significant difference was found between Football and Volleyball players. Male University Football players are more Agile (good agility) in Comparison to male University Volleyball players.

#### REFERENCES

- Bag, Ajoy., Borman, Alope., Sen Das, Suprakash and Chawdhury, Binod (2015),** Comparative Study on Physical Fitness of Volleyball and Football Players in University Level, IOSR Journal of Sports and Physical Education (IOSR), 2( 5) : 01-05.
- Chowdhary, Binod., Bhowmik, Anindya and Mahapatra, Nilanjan (2015),** Comparison of Explosive Strength between Football and Volley Ball Players of Jamboni, Journal of Sports and Physical (IOSR), 2(2): 12-13, DOI: 10.9790/6737-0221213.
- Gil, Susana Maria., Gil, Javier., Ruiz, Fatima., Irazusta, Amaia and Irazusta, Jon (2007),** Physiological and Anthropometric Characteristics of Young Soccer Players According to Their Playing Position: Relevance for the Selection Process The Journal of Strength and Conditioning Research 21(2):438-45 DOI: 10.1519/R-19995.1
- Garrett, Henry E. (1981),** Statistics in Psychology and Education, Kalyani Publishers, New Delhi
- Junious, Brandi (2018)** Difference between soccer volleyball, Sports Recreation, <https://www.sportsrec.com>.
- Mohan, Lalit., Tiwari, Lalit M. and Rai, Vaibhav (2015),** Diurnal variation on the performance of selected motor fitness components of volleyball Players International Journal of Physical Education, Sports and Health 2015; 2(2): 86- 88
- Sahu, D. P. and Nayek, Biswabandhu ( 2015),** Comparison of explosive strength between football and volley ball players of Purba Medinipur district, International Journal of Physical Education, Sports and Health, 1(3): 4-5.





## COMPARISON OF BODY FAT PERCENTAGE OF U/21 SOCCER TEAMS OF BHUTAN, BANGLADESH AND INTER-UNIVERSITY TEAM OF INDIA

Avinash Kharel<sup>1</sup> & Dr. Sujay Bisht<sup>2</sup>

### Affiliations:

1. Assistant Professor, Swarnim Gujrat Sports University, Vadodara, Gujrat, India
2. Assistant Professor, Lakshmibai National Institute of Physical Education, N.E.R.C, Guwahati, Assam, India.

---

### ABSTRACT

The Body fat percentage (BF%) is a factor contributing to the soccer performance and athlete health. Body fat percentages have been widely studied in soccer, with its impact in playing performance of athlete observed over time. However, a paucity of current data exists in comparing body fat percentage among different national and university athletes playing soccer. The purpose of this descriptive study was to compare Body fat percentage among three different soccer teams. A total of 33 athletes from 3 different countries participated: Bhutan(n=11), Bangladesh(n=11) and Inter-university team from India (n=11). Body Height(BH) and Body Mass(BM) were measured using stadiometer and calibrated digital scale, respectively. Body Fat Percentage (BF%) was assessed using Bio-electrical Impedance Analysis (BIA). One -way analysis of variance(ANOVA) was used to assessed difference among the teams. Least Squares Difference (LSD) post hoc analysis were performed when a significant finding ( $p \leq 0.05$ ) was identified. Bhutan team had the lowest BF%(7.30±1.84) in comparison to Bangladesh team (8.57±1.87) and Inter-university team of India (10.05±1.38). Assessment of body composition is an important component of an ongoing monitoring of athletes interested to improve soccer performance. These data may assist in the establishment of descriptive values for use in goal setting and exercise programming.

**Key word:** - Fat percentage, Bio Scan 916, Impedance. Performance, Athlete, Soccer

---

## 1. INTRODUCTION

The body composition is a factor contributing to the soccer performance. The body composition varies with age and sex are the desirable body composition athletes can vary depending on the sport, training load and energy intake. Professional and amateur athletes care about body fat for aesthetic and health reasons and perhaps, most importantly to gain a competitive edge. The physiological composition of the athletes is also important in the preparation of players for competitive performance. The measurement of body composition provides additional information for counseling clients on diet and exercise programs. If the percentage body fat is known, it is possible to calculate the desired weight:  $\text{Desired weight} = \text{current weight} - [(\text{current weight} \times (\% \text{ fat}/100))] / [1.00 - (\text{ideal } \% \text{ fat}/100)]$  (Jackson & Pollock, 1985). Optimal percentage body fat varies with the goal of the client. For example, an athlete's optimal percentage fat could depend on his or her particular sport. For the average person, the acceptable ranges for body fat are fairly broad: 12-25% for men, 18-30% for women (Gohlke, 1991).

Many methods of body composition analysis have been developed such as hydrostatic weighing, total body water, determination by isotope dilution, computed tomography, and measurement of total body potassium. In the game of soccer, where excess adipose tissue acts as a dead weight, it not only can lead to the effect on energy expenditure but also hampers the ability of the body to lift repeatedly against gravity (Sergej M. Ostojic, 2002). The several published studies exist in which body composition was measured between different soccer teams also considered substitution player samples, which makes it difficult to analyse the actual impact of body compositions on the main playing members of a team which consists of 11 players. Therefore, the additional research is needed to expand on previous findings involving the impact of body composition on playing 11 members of a soccer team.

## 2. METHODOLOGY

### 2.1 Sample

A total of 33 male athletes of u-21 age category participated from the following teams: Bhutan (n=11), Bangladesh(n=11) and University athletes of India (n=11). Data was collected from Dr. Tao memorial tournament held at Guwahati in 2019 in the same institution where the tournament was held. Data for each participant was collected within one visit at the institution prior to the match. The participants in this study were all trained athlete of U/21 age category from three countries; Bhutan, Bangladesh and India (collegiate athletes), who were following soccer specific training regimen and were involved in regulation competition in both international and national tournament.

### 2.2 Selection of Variable

All athletes had access to a qualified soccer coach and nutrition experts. On the available literature, reviewed and accordance with professional educator the body fat % selected as a variable of the study.

### 2.3 Instrumentation

Maltros Bio- electrical impedance Analyzer (BIA) were used to measured body fat % in three different soccer teams. Comprehensively, evaluate body composition parameters amongst athletes, body height, body mass and body fat percentage (BF%) were evaluated at one point of time per athlete per team within prior to their matches being played in the tournament. At a minimum, athletes were instructed to refrain from exercise, eating and drinking for at least 2 hours prior to testing. However, the majority of testing was conducted in the early morning prior to the match.

Upon arrival to the competition arena, height and body mass were recorded to the nearest 0.01 cm and 0.02 kg, respectively using a stadiometer and digital calibrated according to manufacturer guidelines with subjects barefoot. All subjects were placed in a spine position on a mat, with limbs away from the trunk. Determination of resistance and reactance were measured using electrodes placed on ipsi lateral and contra lateral sides of the body.

**2.4. Statistical Analysis**

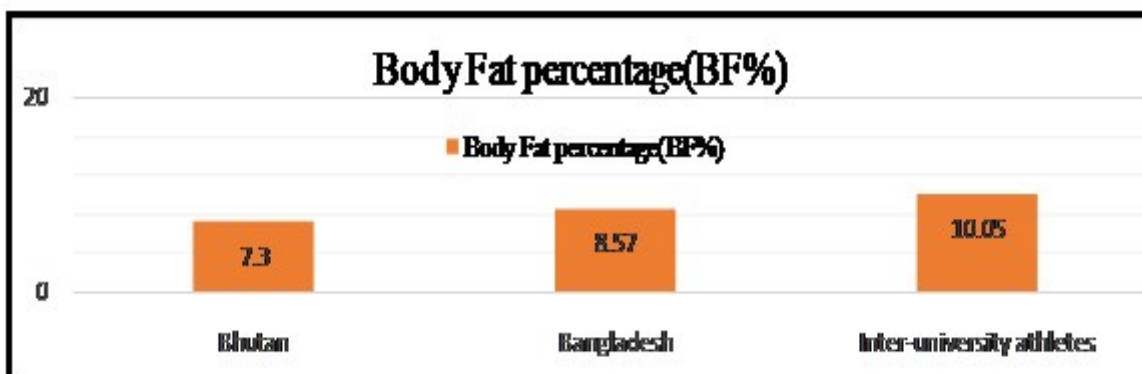
The obtained data in the experiment were analyzed and processed by using 17.0 SPSS statistical program. The tests for significance difference across teams performed via one -way analysis of variance (ANOVA). Least Significance Difference (LSD) post hoc analysis were performed when a significant finding ( $p < 0.05$ ) was identified and level of significant was set at 0.05.

**3. RESULTS**

Various descriptive measures like mean, standard deviation of selected variable were calculated and presented in Table 1 and graphical presentation in figure 1. The result pertaining Analysis of Variance and L.S.D Post Hoc Test for the selected variable is presented in table 2 and 3 respectively.

**TABLE 1  
DESCRIPTIVE STATISTIC OF FAT PERCENTAGE OF SELECTED TEAM**

Group	N	Mean	SD
Bhutan	11	7.30	1.84
Bangladesh	11	8.57	1.87
Inter-University	11	10.05	1.38
Total	33	8.64	2.01



**Figure -1: Graphical representation of Fat percentage.**

**TABLE-2  
ONE WAY ANALYSIS OF VARIANCE (ANOVA) OF FAT % AMONG GROUPS**

Group	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	41.925	2	20.962	7.095	0.03
Within Groups	88.642	30	2.955		
Total	130.566				

One way analysis (ANOVA) was applied to find out the difference among the groups. The result presented in Table 2, showed that there was a significance difference in body fat percentage among the three teams at the  $p < .05$  level [  $F(2,30) = 7.09$ ;  $p = 0.03$  ]

As the result of one way analysis of variance was significance at the level of 0.05, showed that there was a significance difference in body fat percentage among the three teams at the  $p < .05$  level [  $F(2,30)=7.09$ ;  $p=0.03$ ]. In that case L.S.D Post Hoc test was used to compare of each group and is presented in Table 3.

**TABLE-3**  
**PAIR WISE COMPARISON OF FAT PERCENTAGE AMONG TEAMS.**

(I) Teams	(J) Teams	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Bhutan	Bangladesh	-1.27273	.73295	.093	-2.7696	.2242
	Collegiate	-2.75818*	.73295	.001	-4.2551	-1.2613
Bangladesh	Bhutan	1.27273	.73295	.093	-.2242	2.7696
	Collegiate	-1.48545	.73295	.052	-2.9823	.0114
Collegiate	Bhutan	2.75818*	.73295	.001	1.2613	4.2551
	Bangladesh	1.48545	.73295	.052	-.0114	2.9823

\* **p-value < 0.05 is significant**

The L.S.D Post Hoc comparison indicate that the mean score for the Bhutan Team ( $M=7.30$ ,  $SD=1.87$ ) was significantly different than the inter-university team of india ( $M=10.05$ ,  $SD=1.38$ ). However, Bangladesh ( $M=8.52$ ,  $SD=1.87$ ) did not differ significantly from both Bhutan and Inter-university athlete of India.

In summarization, from the above Table 2 and 3, a one -way ANOVA was performed to compare the body fat percentage (BF %) on Bhutan, Bangladesh and Inter-university athletes. Athletes were divided into three groups based upon their country (Bhutan=11; Bangladesh=11; Inter-university (India=11). The outcome variable was found to be normally distributed and equal variance are assumed based upon results of Levene's test ( $F=.744(df=2, 30)$  with resulting  $p =.484$ ). There was a statistically significant difference in body fat percentage (BF%) for the three teams ( $F(2,30) =7.095$ ,  $p=.484$ ). Post-hoc comparison using the LSD test indicated that the mean for Bhutan ( $M=7.30$ ,  $SD=1.84$ ) was significantly different from Inter-university athletes of India ( $M=10.05$ ,  $SD=1.38$ ). However, Bangladesh ( $M=8.52$ ,  $SD=1.87$ ) did not differ significantly from both Bhutan and Inter-university athletes of India. Taken together, these results suggest that Bhutan as a soccer team has the lowest body fat percentage (BF %) compare to both the team. It also suggests that Inter-university athletes have the highest body fat percentage (BF %) compared to other two teams.

#### 4. DISCUSSION

A lack of descriptive body fat percentage data exists on different national and collegiate athletes playing soccer. Therefore, the purpose of the current study was to establish descriptive data and compare body fat percentage in a national and inter-university teams playing soccer in order to assist coaches and strength practitioners in goal setting and exercise prescription for their athletes. We hypothesized that body fat percentage would vary among different teams depending upon training and physiological nature of the teams. This study can add to the available data and provide a foundation for the establishment of national teams and collegiate athletes descriptive data for body fat percentage (BF%). The result of the study indicates that there is a significant difference in body fat percentage (BF%) among Bhutan, Bangladesh and Inter-university soccer teams. Results from the current study are in support of previously reported data on body fat percentage that clearly distinguished higher from lower-level soccer

players. As in this case the comparison between competitive levels strongly that the collegiate soccer team athletes need a higher amount and intensity of training to achieve a physique and body composition similarly those of national teams in order to gain a competitive edge on their opponents during the major inter-university competitions.

## **5. CONCLUSION**

From the above result it was clearly revealed that there was a statistically significant difference in body fat percentage (BF%) for the three teams ( $F(2,30) = 7.095, p = .484$ ). Post-hoc comparison using the LSD test indicated that the mean for Bhutan ( $M = 7.30, SD = 1.84$ ) was significantly different from Inter-university athletes of India ( $M = 10.05, SD = 1.38$ ). However, Bangladesh ( $M = 8.52, SD = 1.87$ ) did not differ significantly from both Bhutan and Inter-university athletes of India. In a concluding way the results suggest that Bhutan as a soccer team has the lowest body fat percentage (BF %) compare to both the team.

## **REFERENCES**

- Gohlke (1991)**, "Comparison of Body Assessment Using Bioelectrical Impedance and Skinfold Measurements in the Critically Ill" Unpublished Master's Theses. Human Performance and Health Education, Western Michigan University, Kalamazoo,
- Jackson, A. S., & Pollock, M. L. (1985)**, Practical Assessment of Body Composition. *The Physician and sports medicine* , 13 (5): 76–90. <https://doi.org/10.1080/00913847>.
- Sergej M. Ostojic. (2002)**, Changes in Body Fat Content of Top-Level Soccer Players. *Journal of Sports Science and Medicine*, 1(2) : 54 - 55 .



## COMPARATIVE STUDY OF LEADERSHIP QUALITIES BETWEEN PROFESSIONAL AND NON-PROFESSIONAL STUDENTS

Tasleem Arif Sheikh<sup>1</sup> & Dr.Minakshi Pathak<sup>2</sup>

### Affiliations:

- <sup>1</sup>. Research Scholar Sri Satya Sai University of Technology & Medical Science, Sehore (MP) India. Email: sheikharif883@gmail.com, Mobile -7006973423
- <sup>2</sup>. Dean, Physical Education, Sri Satya Sai University of Technology & Medical Science, Sehore (MP)

### ABSTRACT

The purpose of the study was to investigate and compare the leadership qualities between professional and non-professional students, physical education students were taken as professionals and MA, education and M.sc chemistry students were taken as non-professionals. Total 240 subjects were taken for study professional 120 and 120, Non-professional of Kashmir University (Jammu and Kashmir) their age ranged from 22 to 28 years were selected as the subjects. For collection of the data Leadership Questionnaire constructed by (Dr. Poorva jain and Ms. Pratibha Dwivedi) having 3 open ended questions were selected among 36 questions, question papers were given to the students. responses were obtained numerical in the 5 point scale such as 5, represents strongly agree, 4, agree, 3, undecided, 2, disagree and 1, totally disagree. The collected data were analyzed statistically through chi-square or ( $\chi^2$ ) test and the level of significance were observed at 0.05 level of confidence. On the basis of statistical findings it was concluded that the percentage of responses are found difference between the professional and non-professional students towards leadership qualities, like, communication skill, decision making, co-operation etc. as the calculated Chi-square ( $\chi^2$ ) values are greater than the tabulated values on .05 level of confidence. It is also indicated that professional students have positively higher leadership qualities in comparison to non-professional students.

**Key words:** Leadership, profession, professional, non-professional, games.

## 1. INTRODUCTION

From the beginning of human history, skillful leaders have been required. Most likely during cave dwelling times, leaders developed to coordinate their tribes in the quest for nourishment and security, fights against different tribes, and the straight forward activities. Competition for leadership positions was without a doubt as clear then as now. For whatever length of time that the leader was capable and held a concern for his constituency above his very own wants, dislodging him could have been troublesome. Be that as it may, in the event that individual greed turned into a need and his leadership was without fairness, at that point he may before long be replaced by whatever means essential possible a battle unto death. Challenges' consistently have existed and consistently will exist for well prepared, able, and committed leader. In the field of physical education, health, and sports, the open doors are more diligently than any time in recent memory.

Leadership is a lively procedure, without right administration, no home, network, association, discipline, and establishment, profession lastly country can proceed onward the way of progress. It implies that the advantage just as progress of society or a profession relies on subjective leadership; Leader goes about as a model for other people, give directions, which are esteemed and respected. In every one of the cases, what a leader affects others more than oneself. Without the participation of his followers, no leader can hold his position and high respect for a long period. Therefore he ought not to embrace oppressive methodology. Subsequently we can say the administration is the act of impact that animates subordinates or supporters to put forth a valiant effort towards the accomplishment of supported objectives (**Jha, 2017**).

The word professional by convention implies an individual who has acquired a degree in an expert field. The term professional is utilized more when all is said in done to signify a competent working individual, or an individual who performs industrially in a field regularly hesitant for hobbyists or novices.

In western nationals, for example, the United State the term ordinarily depicts profoundly instructed, for the most part paid laborers, who appreciate significant work self-governance, an agreeable compensation, and are regularly occupied with inventive and intellectually testing work. Less in fact, it might likewise allude to an individual having amazing capability in a specific action.

As a result of the individual and private nature of numerous expert administrations and along these lines the need to put a tremendous understanding of trust in them, most experts are held up to firm moral and good order (**Kast and Karmaker, 2002**).

In spite of the fact that physical education has consistently stayed labeled with training however physical teachers needed to place in a lot harder undertaking for a considerable length of time despite seemingly insurmountable opposition to win an expert status than did the homeroom instructors. It is so in light of the fact that both the general public and the Educationists themselves when in doubt considered physical development something dark to formal examination corridor learning. A profession is perceived by certain specific capacities its people need to get. Explicit capacities, records and execution methodologies are unique to each profession. Specialists complete things capable precision. The physical educators must be very much aware of their commitments and obligations towards the students and society and their approach to manage giving records and bent in physical development and sports must be extremely capable with humanistic approach to manage issues of human prosperity, wellbeing and execution. The physical educator hopes to develop productive man through viable advancement. There is an inclination of achievement in what physical teachers do to the making

adolescent and the performing youth. With prosperity and health as their critical objective, they serve society supporting the master convictions and ethics (**Kamlesh and Sangral2017**).

The conviction the physical training profession has, by favorable position of its aptitude in youngsters and physical movement, the possibility to move a wide decision of beneficial instructive and wellbeing related result its capacity to help its 'supporter'; kids and youngsters. So as to help its customers adequately, along these lines, every individual from the profession has a power to put together its practices with respect to the best information accessible at some random time on being a profession. The idea of professions is then investigation a comprehensive perspective on the physical training profession is suggested; which places educators at the focal point of a network of training. Career long professional development (CPD) is perceived as a basic attribute all things considered, Health and positive youth advancement. PE profession is developing, broadly and globally, in two regions of open trepidation – wellbeing and positive youth advancement (**Armour, 2010**).

A group game is an action wherein a group of people, on a similar group, cooperate to achieve an extreme objective which is as a rule to win. This should be possible in various manners, for example, outscoring the opposing group. Team members set objectives, decide, convey, oversee struggle, and tackle issues in a supportive, trusting environment so as to finish their objectives. This can be found in sports, for example, hockey, football, volleyball, tennis, water polo, possible, lacrosse, paddling, cricket, handball and numerous others.

Each group activity is distinctive some group activities are rehearsed between opponent groups, where the players interface legitimately and simultaneously between them to accomplish an objective. The objective for the most part includes team members encouraging the group of a ball or comparable thing as per a lot of rules, so as to score points. This regularly includes vigilant key arranging, great readiness, and a psychological and physical firmness of every person that is a part of the team. Team sports depend on the entirety of the players cooperating similarly so as to prevail at the task at hand. Being part of a group activity necessitates that every competitor has resilience and assurance since the objectives set forth to finish, Might set aside some effort to meet. This includes a decent arrangement of commitment, difficult work, and great authority over that length of time.

In any case, different kinds of group activities don't include partners encouraging the development of a ball or comparable thing as per a lot of rules, so as to score points. For model, Swimming, Rowing, Sailing, Dragon Boat Racing, Track and Field among others are likewise group sports. In different sorts of group activities there may not be a contrary group or point scoring, for instance, Mountaineering. As an option of focuses scored against an opponent group, the overall trouble of the climb or walk is the proportion of the achievement (**Kundra, 2011**).

A leader is an important person with leads the society to new heights and helps the society to organize a particular goal. There are various qualities which are responsible for all this. These all qualities are known as leadership qualities. These leadership qualities, like decision, cooperation, commination, for an individual to become a better leader, but these qualities varies from person to person so it is necessary to know these qualities to select the best leader. In games and sports leadership is needed in bringing people of same efficiency at a common place to achieve the common goal. An effective leadership is required for managing a good sports team. A leader may be the expert, the one who's in-change; the most respected by her/his followers, the man that controls aversive power or the individual that has the capacity to dispense rewards. In fact, a leader may possess any one or any combination of the above described sources of leadership powers.



The purpose of the study was to compare leadership qualities between professional and non-professional students

## **2. METHODOLOGY**

### **2.1 Selection of Subjects**

To estimate the leadership qualities between professional and non-professional student's leadership scale was used on 240 PG students those who are pursue their degrees in the University of Kashmir. Professional students are taken from Kashmir University and affiliated colleges; Ganderbal College of physical education and non-professional's are selected from university campus and affiliated colleges in Kashmir region.

#### **2.1.1 Professional Students**

Professional students are those what are pursue the Professional degrees. These remember for physical education. Professional students need to confront solid challenge as they are relied upon to be fruitful in their activity. In addition society when all is said in done has high expectation from professional students. Parental or family desires on one hand and their own yearning to prevail in their picked course assembles a great deal of weight on professional students those outcomes in high anxiety.

#### **2.1.2 Non Professional Students**

Non-Professional students are the individuals who seek after their degree in liberal Courses, for example, expressions, fundamental sciences and so on. There is less challenge in liberal courses. The desires for guardians by and large and society specifically are not high from non-professional students. The likelihood of high pressure, tension, sorrow, psychosomatic issue are likewise less among non-professional students as they are not presented to a similar level of battle and social weight.

### **2.2 Source of Data**

For the purpose of the study, the researcher selected the subjects from University of Kashmir and affiliated College of Kashmir University. The selected subjects are those who pursue their MA Edu.M.Sc, Chemistry and M.PEd. In masters, and participate in intercollege sports competition in various team games like volleyball, basketball, cricket, football, and hockey.

### **2.3 Sampling design**

In this study we use simple random sampling method or chance sampling method is a probability sampling method which gives each possible sample combination an equal probability of being picked up and each item in the entire population to have an equal chance of being included in the sample.

### **2.4 Criterion Measures**

For the present study the researcher measured the leadership qualities between professional and non-professional students.

### **2.5 Collection of Data**

The tool used for this study is leadership quality standard questionnaire of Dr. Poorva Jain and Ms. Pratibha Dwivedi is used for the collection of data. It contains 36 items, among these 3 questions were selected.

### **2.6 Administration of questionnaire:**

The researcher uses leadership quality scale Instrument of Dr. Poorva Jain and Ms. Pratibha Dwivedi which would then be given to the subjects, 240 students studying at post graduate level. After selection of the subject the questionnaire is giving to the students both professional/non-professional students, and test administrator giving them instruction regarding

how to tick the option you prefer most, after felling the questionnaire by the students were collected and used for analyses.

### 3. RESULTS

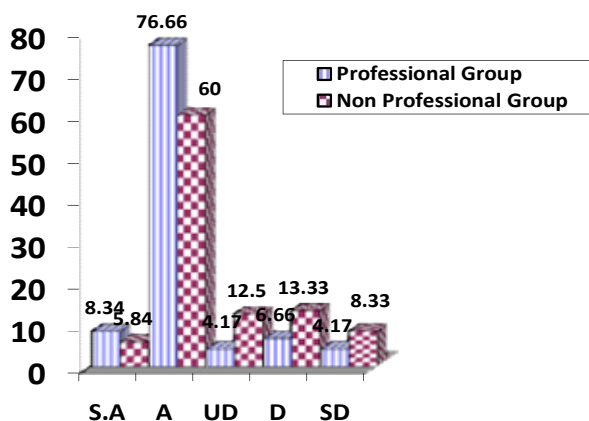
After collection of data from the students both professional/non- professional students is used for data analysis and interpretation. Chi-square ( $\chi^2$ ) test or non-parametric tests not based on any parameter like mean, variance or proportion. Were used for analyses and interpretation of data.

**TABLE 1**  
**SHOWING THE CHI-SQUARE AMONG THE OPINION OF STUDENTS TOWARDS LEADERSHIP QUALITIES REGARDING STATEMENT -1**

Statement	Group	S.A	A	UD	D	SD	N	$\chi^2$ Value
1.Communicate effectively with others	P. G.	50 8.34%	368 76.66%	15 4.17%	16 6.66%	5 4.17%	120	38.38*
	N.P.G	35 5.83%	288 60%	45 12.5%	32 13.33%	10 8.33%	120	

**\*Significant at .05 level Note:** Scores of percentages indicate composite score of responses and Percentages (%) indicate number of respondent responses

The above table-1 revealed that in the first statement the professional student’s of opinion regarding the leadership quality ‘communicate effectively with others’ with respect to ‘S.A’, ‘A’, ‘UD’, ‘D’, and ‘SD’ category, the percentage are 8.34 %, 76.66% 4.17%, 6.66% and 4.17% respectively. In case of non-professional student’s of opinion regarding the leadership quality ‘communicate effectively with others’ with respect to ‘S.A’, ‘A’, ‘UD’, ‘D’, and ‘SD’ category, the percentage are 5.84 %, 60.0% 12.5%, 13.33% and 8.33% respectively. As the computed  $\chi^2$  value of 38.38 was greater than the tabulated value of  $\chi^2$  .05(4)df. = 9.49. It might be indicated that significant difference was found between the opinions of professional and non-professional student’s with respect to ‘S.A’, ‘A’, ‘UD’, ‘D’, and ‘SD’ category on the first statement. It was also indicated that leadership quality ‘communicate effectively with others’ are found positively in the professional students of Kashmir University. Thus the null hypothesis is rejected with respect to the opinion of the students for the statement 1. The comparisons of percentage about the statement-1 graphically presented below in fig-1.



**Fig-1** Percentage Score regarding the opinion of students towards Leadership Qualities (statement -1)

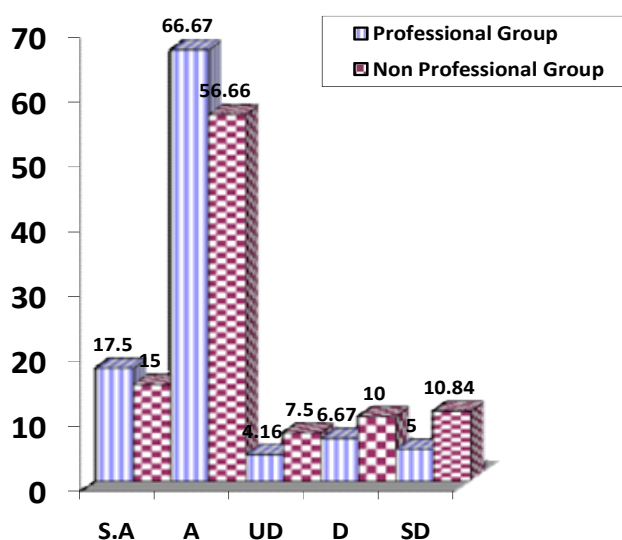
**TABLE 2**  
**SHOWING THE CHI-SQUARE AMONG THE OPINION OF STUDENTS TOWARDS LEADERSHIP QUALITIES REGARDING STATEMENT -2**

Statement	Group	S.A	A	UD	D	SD	N	$\chi^2$ Value
2. Stay firm on my decision	P. G.	105 17.5%	320 66.67%	15 4.16%	16 6.67%	6 5.0%	120	11.18*
	N.P.G	90 15.0%	272 56.66%	27 7.5%	24 10.0%	13 10.84%	120	

\*Significant at .05 level Note: Scores of percentages indicate composite score of responses and Percentages (%) indicate number of respondent responses.

The above table-2 shows that in the 4th statement the professional student's of opinion regarding the leadership quality 'Stay firm on my decision' with respect to 'S.A', 'A', 'UD', 'D', and 'SD' category, the percentage are 17.5 %, 66.67% 4.16%, 6.67% and 5.0% respectively. In case of non-professional student's of opinion regarding the leadership quality 'Stay firm on my decision' with respect to 'S.A', 'A', 'UD', 'D', and 'SD' category, the percentage are 15.0%, 56.66% 7.5%, 10.0% and 10.84% respectively. As the computed  $\chi^2$  value of 11.18 was greater than the tabulated value of  $\chi^2$  .05(4) df. = 9.49. It might be indicated that significant difference was found between the opinions of professional and non-professional student's with respect to 'S.A', 'A', 'UD', 'D', and 'SD' category on the 4th statement. It was also indicated that leadership quality 'Stay firm on my decision' are found difference between the professional and non professional students of Kashmir University.

Thus the null hypothesis is accepted with respect to the opinion of the students for the statement -2. The comparisons of percentage about the statement- 2 graphically presented below in fig-2.



**Fig-2** Percentage Score regarding the opinion of students towards Leadership Qualities Statement -2)

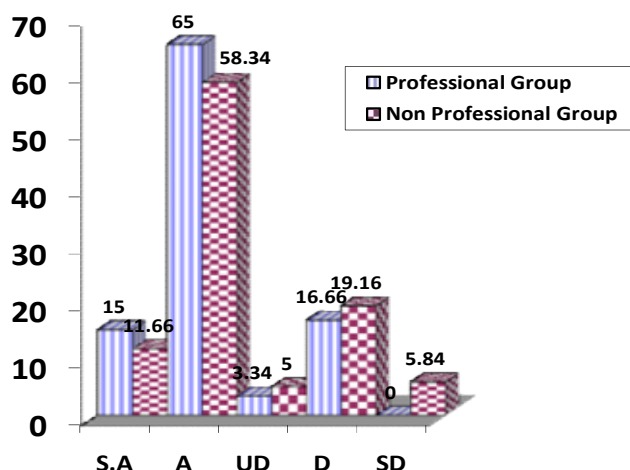
**TABLE 3**  
**SHOWING THE CHI-SQUARE AMONG THE OPINION OF STUDENTS TOWARDS LEADERSHIP QUALITIES REGARDING STATEMENT - 3**

Statement	Group	S.A	A	UD	D	SD	N	$\chi^2$ Value
3. I discuss my planning in detail with my team members	P. G.	90	312	12	40	0.0	120	11.61*
	N.P.G	15.0%	65.0%	3.34%	16.66%	0.0%		
		70	280	18	46	7	120	
		11.66%	58.34%	5.0%	19.16%	5.84%		

\*Significant at .05 level Note: Scores of percentages indicate composite score of responses and Percentages (%) indicate number of respondent responses.

Table-3 indicated that in the 3rd statement the professional student's of opinion towards the leadership quality regarding 'I discuss my planning in detail with my team members' with respect to 'S.A', 'A', 'UD', 'D', and 'SD' category, the percentage are 15.0%, 65.0%, 3.34%, 16.66% and 0.00% respectively. In case of non-professional student's of opinion towards the leadership quality regarding 'I discuss my planning in detail with my team members' with respect to 'S.A', 'A', 'UD', 'D', and 'SD' category, the percentage are 11.66%, 58.34%, 5.0%, 19.16% and 5.84% respectively. As the computed  $\chi^2$  value of 11.61 was greater than the tabulated value of  $\chi^2$  .05(4) df. = 9.49. It might be indicated that significant difference was found between the opinions of professional and non-professional student's with respect to 'S.A', 'A', 'UD', 'D', and 'SD' category on the 35th statement. It was also indicated that leadership quality regarding 'I discuss my planning in detail with my team members' are found different opinions between the professional and non-professional students of Kashmir University.

Thus the null hypothesis is accepted with respect to the opinion of the students for the statement -3. The comparisons of percentage about the statement- 3 graphically presented below in fig-3.



**Fig-3** Percentage Score regarding the opinion of students towards Leadership Qualities Statement -3)

#### 4. DISCUSSION

Findings made the present researcher to conclude that most of the statements towards leadership qualities there is significant difference between the responses of professional and non-professional students of Kashmir University beside the statements of 1, 2 and 3 respectively. It is concluded that the percentage of responses are found difference between the professional and non-professional students towards leadership qualities, like, communication skill, decision making, co-operation, etc. as the calculated Chi-square ( $\chi^2$ ) values are greater than the tabulated values on .05 level of confidence.

#### 5. CONCLUSION

1. Professional students have positively higher leadership qualities in comparison to non-professional students.
2. Percentage of responses are found difference between the professional and non-professional students towards leadership qualities

#### REFERENCES

- Armour, Kathleen M. (2010)**, physical education profession and its professional responsibility, physical education and sports pedagogy, 15(1): 1-13.
- Jha, K.N. (2017)**, UGC NET /SET/ JRF Physical education. New Delhi, Ramesh publication, pp.209-2010.
- Kast, Govind and Karmaker, A.J. (2002)**, Professional Preparation in Physical Education and Sports”, (Amravati, Speed Publication,), pp.7-8.
- Kamlesh, M. L. and Sangral, .M. S. (2017)**, Principles and history of physical education. New Delhi friends. Publication.,pp.140-142
- Kundra, Sanjay (2011)**, Textbook of Physical Education, New Delhi: Evergreen Publications, , p. 150.



## COMPARATIVE STUDY OF PHYSICAL FITNESS VARIABLES OF SCHOOL LEVEL RURAL AND URBAN FOOTBALL PLAYERS

Gayas Ul Din Wani<sup>1</sup> & Dr. Minakshi Pathak<sup>2</sup>

### Affiliations:

- <sup>1</sup> Research scholar Sri Satya Sai University of Technology & Medical Science, Sehore (MP) India. Email: [gayaswani123@gmail.com](mailto:gayaswani123@gmail.com), ph.6005716942
- <sup>2</sup> Dean, Physical Education, Sri Satya Sai University of Technology & Medical Science, Sehore (MP) India

### ABSTRACT

The main purpose of this study was to find out the Physical Fitness Variables of School Level Rural and Urban Football Players for Kashmir Division. For the present study the source of subjects were selected from Physical Fitness Variables (Shoulder strength, Abdominal Strength, Leg Strength, Agility, Speed, and Cardio-vascular Endurance, of School Level Rural and Urban Football Players of Kashmir City. The study was delimited to school level male football players of Kashmir city only and 100 players were selected from rural and 100 players from urban football players. The age of the subjects ranging from 12 to 18 years of School level players. The data pertaining to each of the Physical Fitness Variables (Shoulder strength, Abdominal Strength, Leg Strength, Agility, Speed, and Cardio-vascular Endurance) were examined by the special statistical techniques. To test the hypothesis, t- test was employed which was given by the researcher previously. The level of significance for the present study is kept at 0.05 level. Researcher stated earlier hypothesis that, there would be a significant difference in the physical fitness of rural and urban football players. From the finding of the study it was reveal that significant difference found in between Rural and Urban Football players Hence the researcher stated hypothesis is accepted. Further it is hypothesized that the rural football players would be better than and urban football players in physical fitness. From the finding of the study it was observed that Rural Football players are better than the and Urban Football players in physical fitness variables, Hence the researcher stated hypothesis is accepted

**Keywords:** Urban, Rural, Physical Fitness, Football Players, Males

## 1. INTRODUCTION:

Education has been characterized as a change, an adjustment, or a modification on the part of the student as a result of educational experience. These alterations lead to some end and when these finishes are looked for, they become objectives. There must be rules to provide guidance to these progressions or adjustments. Educators and physical teachers under pressure from different individuals and teams' master the issue of setting up objectives which are connected with these necessities, advantages and capacities (**Barrow, 198**).

Physical education has been considered as an essential part of human life. Physical training is certainly not another word in Indian setting. From time immemorial Indians have laid emphasis on 'yoga' and physical exercise not exclusively to stay in shape yet to forestall and treat the physical afflictions. Training in physical education encourages students to be a decent student and a decent mover. Physical training helps showing physical aptitudes to create flawless, skilful, very much controlled flexible development. 'Physical' when joined with 'training' makes the instruction a total procedure, which focuses on the instruction of a person through huge muscle movement. As a result, one is truly fit, intellectually cautious, sincerely adjusted, socially balanced, ethically obvious and profoundly elevated (**Jha, 2013**).

Youth that needed physical fearlessness stamina and expertise were a threat to the community. In the odds of team survival, the clan urged both to build up the strength, endurance, agility and aptitudes expected to withstand the rigors of open air life, to acquire the necessities of life and to participate in forceful and protective activities (**Sheokhand, 2007**).

Physical fitness is the ability to complete sensibly well different types of physical exercises without being unduly worn out and incorporates characteristics critical to the person's health and prosperity. Physical fitness is one period of absolute fitness, and it might be utilized between variably with motor fitness (**Bucher, 1960**).

**Gill, Deol and Kaur (2010)** found that rural female students were superior in strength, endurance, speed and agility. Urban female students on the other hand, were found to be heavier and superior in tasks like flexibility. **Chauhan (2018)** observed the significant difference between Rural and Urban basketball players in their AHPPER youth physical fitness components. **Tinazci & Emiroglu (2009)** indicated the differences in cardiopulmonary and motor fitness between rural and urban children. The flexibility and muscle endurance were significantly higher in the rural children. The significantly lower flexibility, muscle endurance and strength of urban children may indicate lower habitual physical activity level. **Ozdirenc, et.al. (2015)** showed that the cardiopulmonary and motor fitness had no difference between rural and urban children. In contrast, flexibility and muscle endurance were significantly higher in the rural children. **Kanwar (2017)** revealed that the rural children were found to have significantly greater speed, standing broad jump, grip strength of both left and right hand than the urban children. He concluded that the rural children were better in some physical fitness parameters

**Aleem (2018)** concluded that the several attributes of Physical fitness were compared of urban football players and rural football players revealed better performance on some of the physical fitness test compare to rural football players. **Aleem, M.A. (2018)** concluded that rural football players have shown significant difference in some of the test compare to urban football players where as urban football have shown better performance on some of the test compare to rural football players **Prasanna and Isaac (2018)** proved that there is significant difference on speed, agility, vital capacity and there was no significant difference on cardio-respiratory endurance and pulse rate of among rural and urban higher secondary school football players

The main purpose of this study was to find out the Physical Fitness Variables of School Level Rural and Urban Football Players for Kashmir Division

## **2. METHODOLOGY**

### **2.1 Selection of the Subjects**

The researcher selected school level 100-100 male football players from rural and urban areas. The age team range between 12 to 18 years. The researcher divided the 200 high school students into two equal teams on the basis of the mean performance of pre-test score. The teams were equated and distributed into two homogeneous teams i.e. Experimental Team and Control Team.

### **2.2 Research Design**

Simple random sampling method was employed for the selection of subjects for the study.

### **2.3 Criterion Measures**

The criterion measures chosen for testing the hypothesis in this study was numerical scores obtained from AAHPER Youth Physical Fitness Test.

### **2.4 Administration of the Test**

#### **2.4.1 Pull Up**

Purpose: To measure the Shoulder strength, Equipment: A horizontal metal bar, Procedure- The bar was high enough so that the subject could hang with his arms and legs fully extended and his feet free off the floor. The subjects asked to use overhand grasp. After assuming the hanging position, the subject raised his body by his arms until his chin could be plastered over the bar and then lowered his body to a full hang as in the starting position. The exercise was repeated as many times as possible. The swing and raising of the knees and kicking of the legs was not permitted. Scoring: The number of completed pull up to the nearest whole number was recorded.

#### **2.4.2 Bent Knee Sit up**

Purpose: To measure the Abdominal Strength. Equipment: Floor, mat score card pen etc. Procedure- The subjects asked to lie down on their back on the floor, with bent knees. Their hands plastered on the back of their neck with the fingers interlocked Elbows retracted. A partner asked to hold the ankles down, the heels being in contact with floor at all times. The subjects asked to start to do sit up, turning the trunk to right and touching the left elbow to the right knee. The exercise was repeated by alternating sides. Scoring: The number of completed sit ups to the nearest whole number was recorded as a score for the strength of abdominal muscles.

#### **2.4.3 Shuttle Run**

Purpose: To measure the Agility of players. Equipment: Two blocks of wood, five centimeters by ten centimeters and a stop watch. Two parallel lines marked on the ground, 10 yards apart. Two blocks of wood was plastered behind one of the lines. The subject started from behind the other line on the signal, "Are you ready?", "Go". The subject ran back to the starting line and plastered the block behind the line; he then run back and picked up the second block which he carried back across the starting line. Two trials were given with some rest between them. Scoring – Time of the better of two trials was recorded to the nearest one tenth of a second.

#### **2.4.4 Standing Broad Jump**

Purpose: To measure the Leg Strength of the players. Equipment: Outdoor jumping pit and measuring tape. The subject stands with the feet several inches apart and toes just behind the



take off line preparatory to jump; the subject swings the arms backwards and bent the knees. The jump was accomplished by simultaneously extending the knees and swinging forward the arms. Three trials were given. Scoring: Best of three trials was recorded in feet and inches to the nearest inch.

**2.4.5 50 Yard Dash**

Purpose: To measure the Speed of players. Equipment: 50 meter marked ground, stop watches etc. Procedure-This test was administered to two subjects at a time. Both subjects took position behind the starting line. The starter used the commands, “Are you ready?” and “Go”. The score was the amount of time between the starter’s signal and the instant the subject crossed the finish line. Scoring: Time was recorded in seconds to the nearest tenth of a second as the score in speed.

**2.4.6 600 Yard Run/Walk**

Purpose: To measure the Cardio-vascular Endurance of players. Equipment: Marked track, stop watches, score card etc. Procedure-The subject used a standing start. At the signal, “ready”, “go”, the subjects started to run 600 yards distance. The running allowed to be interspersed with walking. The timer called out the time as the subjects cross the finishing line. Walking was permitted but the subject was to cover the distance in the shortest possible time. Scoring: Time was recorded in minutes and second is as the score for endurance.

**3. RESULTS**

To find out the significant difference between rural and urban football players on AAHPER Youth Fitness Test, t-test was employed and analysis of data presented in Table 1 to 6 and depicted in figure 1 to 6.

**TABLE 1  
SIGNIFICANCE OF DIFFERENCE BETWEEN MEAN SCORES OF ARM STRENGTH  
OF RURAL AND URBAN SCHOOL FOOTBALL PLAYERS  
OF KASHMIR REGION**

Team	N	Mean	MD	σ DM	‘t’ value
Rural Players	100	9.72	1.74	0.29	5.98*
Urban Players	100	7.98			

\*Significant at .05 level

t.05(198) = 1.97

Table 1 reveals the significant difference between the Rural and Urban school football players an arm strength, as the obtained t-value of 5.98 was greater than required t.05 (198)=1.97 It was also indicated that rural school football players of Kashmir region have more arm strength than the urban school football players of Kashmir region.

**TABLE 2  
SIGNIFICANCE OF DIFFERENCE BETWEEN THE RURAL AND URBAN SCHOOL  
FOOTBALL PLAYERS OF KASHMIR REGION ON  
ABDOMINAL STRENGTH (SIT-UPS)**

Team	N	Mean	MD	σ DM	‘t’ value
Rural Players	100	21.37	1.47	0.35	4.15*
Urban Players	100	19.90			

\*Significant at .05 level,

t .05(198) = 1.97

Table 2 reveals the significant difference between the Rural and Urban school football players in their abdominal strength, as the obtained t-value of 4.15 was greater than required t.05

(198)=1.97 It was also indicated that rural school football players have more abdominal strength than the urban school football players.

**TABLE 3**  
**SIGNIFICANCE OF DIFFERENCE BETWEEN THE RURAL AND URBAN SCHOOL FOOTBALL PLAYERS OF KASHMIR REGION ON AGILITY (SHUTTLE RUN)**

Team	N	Mean	MD	$\sigma$ DM	't' value
Rural Players	100	19.96	0.99	0.33	2.98*
Urban Players	100	20.95			

\*Significant at .05 level

t .05(198) = 1.97

Table-3 reveals the significant difference between the Rural and Urban school football players in their agility, as the obtained t-value of 2.98 was greater than required t.05 (198)=1.97 It was also indicated that urban school football players have more agility than the urban school football players.

**TABLE 4**  
**SIGNIFICANCE OF DIFFERENCE BETWEEN RURAL AND URBAN SCHOOL FOOTBALL PLAYERS OF KASHMIR REGION ON LEG STRENGTH (STANDING BROAD JUMP)**

Sr.No	Team	N	Mean	MD	$\sigma$ DM	't' value
1	Rural F.P.	100	5.69	0.25	0.04	5.87*
	Urban F.P.	100	5.44			

\*Significant at .05 level

t .05(198) = 1.97

Table-4 found the significant difference between the Rural and Urban school football players in their leg strength, as the obtained t-value of 5.87 was greater than required t.05 (198)=1.97 It was also shows that rural school football players are more leg strength than the urban school football players.

**TABLE 5**  
**SIGNIFICANCE OF DIFFERENCE BETWEEN RURAL AND URBAN SCHOOL FOOTBALL PLAYERS OF KASHMIR REGION ON SPEED (50 YARD DASH)**

Sr.No	Team	N	Mean	MD	$\sigma$ DM	't' value
1	Rural F.P.	100	9.60	11.01	10.33	1.06
	Urban F.P.	100	20.61			

Insignificant at .05 level

t .05(198) = 1.97

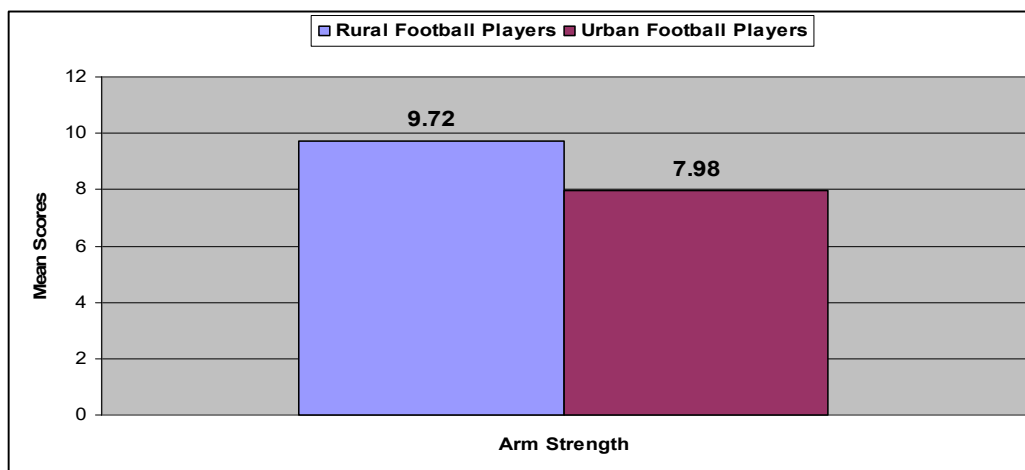
Above Table-5 reveals the insignificant difference between the Rural and Urban school football players in their abdominal strength, as the obtained t-value of 1.06 was lesser than required t.05 (198)=1.97 It was also found that rural school football players have less speed components than the urban school football players.

**TABLE 6**  
**SIGNIFICANCE OF DIFFERENCE BETWEEN RURAL AND URBAN SCHOOL**  
**FOOTBALL PLAYERS OF KASHMIR REGION ON CARDIOVASCULAR**  
**ENDURANCE (600 Y. RUN & WALK)**

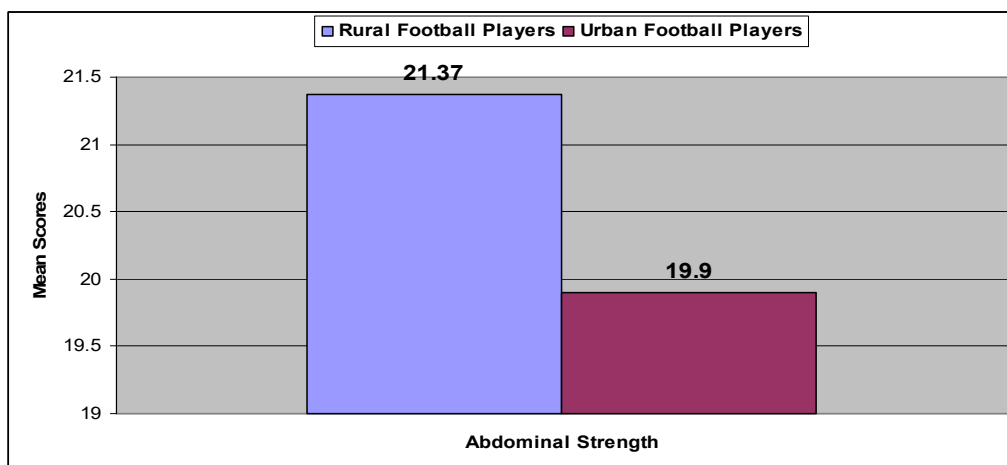
Sr.No	Team	N	Mean	MD	$\sigma$ DM	't' value
1	Rural	100	2.61	0.12	0.97	0.61
	Urban	100	2.73			

Insignificant at .05 level ,  $t_{.05(198)} = 1.97$

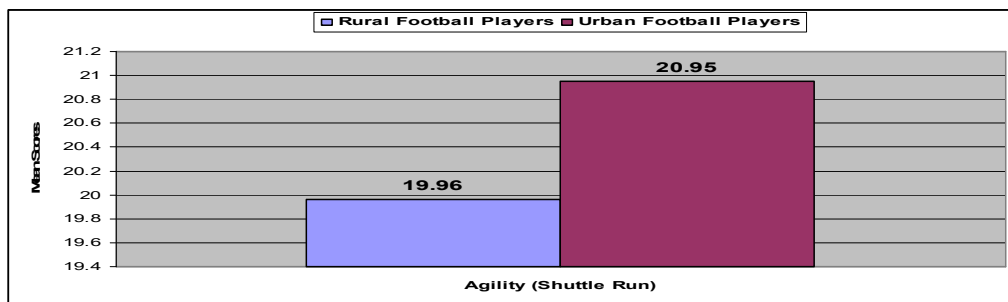
Above Table-6 shows the insignificant difference between the Rural and Urban school football players in their abdominal strength, as the obtained t-value of 0.61 was lesser than required  $t_{.05(198)}=1.97$ . It was also indicated that rural school football players have less cardiovascular endurance than the urban school football players.



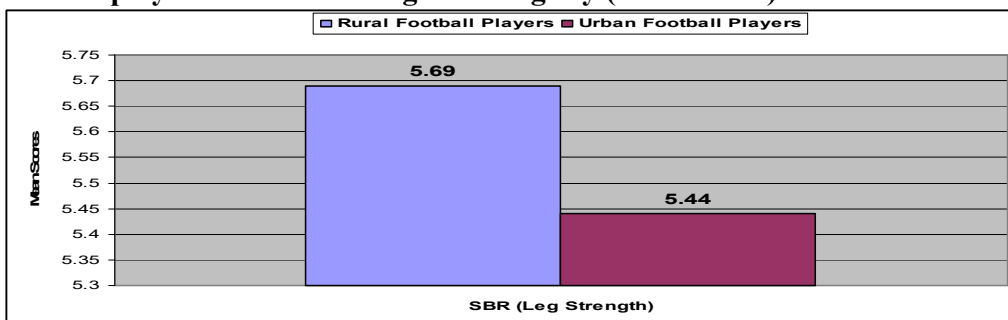
**Fig-1-Comparison of mean differences between the Rural and Urban school football players on arm strength (Pull Ups)**



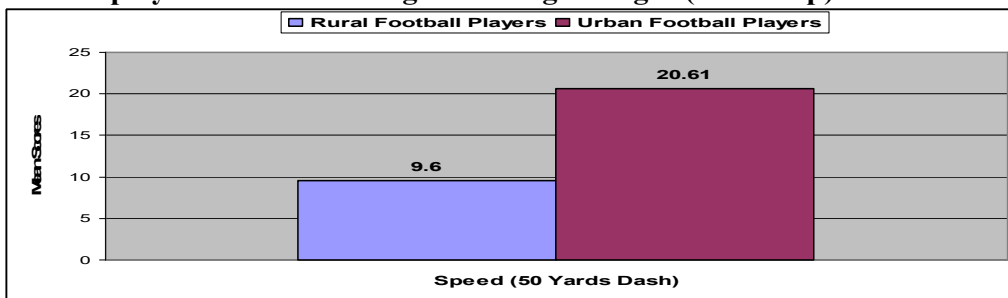
**Fig-2 Comparison of mean differences between the Rural and Urban school football players on abdominal strength (Sit-ups)**



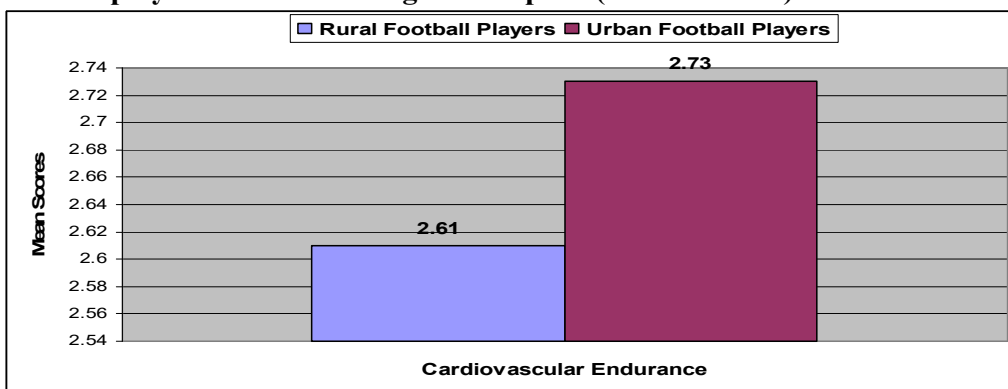
**Fig-3-Comparison of mean differences between the Rural and Urban school football players of Kashmir region on Agility (Shuttle run)**



**Fig-4-Comparison of mean differences between the Rural and Urban school football players of Kashmir region on Leg strength (S B Jump)**



**Fig-5: Comparison of mean differences between the Rural and Urban School football players of Kashmir region on Speed (50 Yard dash)**



**Fig-6: Comparison of mean differences between the Rural and Urban School football players of Kashmir region on cardiovascular endurance (600 Y. run & walk)**

#### 4. DISCUSSION

Statistically significant differences were observed in Pull ups, Bent Knee Sit ups, Shuttle Run and Standing Broad Jump of Rural and Urban Football players, as the calculated values of t-ratio were higher than the required value to be significant. It was also indicated that rural school football players have more Arm strength, abdominal strength and leg strength. than urban football players.

Statistically insignificant differences were observed in Pull ups, Bent Knee Sit ups, Shuttle Run and Standing Broad Jump of Rural and Urban Football players, as the calculated values of t-ratio were lesser than the required value to be significant. It was also indicated that rural school football players have less amount of agility, speed and cardiovascular endurance. than urban football players.

#### 5. CONCLUSION

On the basis of the results and findings it was concluded that there are significance differences in physical fitness variables between the Rural and Urban school level football players on Kashmir region. It was found that rural school level football players are highly arm strength, abdominal strength, agility, that of urban school level football players. It was also found that rural school level football players are highly physical fitness then that of urban school football players. It might be reason that their duration of play, nutritional difference and body size, playground facilities and others factors may be differ to each other.

#### REFERENCES

- Aleem, M.A. (2018)**, A comparative analysis on health related physical fitness among football players of Mahatma Gandhi University, Telangana, *International Journal of Physiology, Nutrition and Physical Education*, 3(1): 537-539
- Aleem, M.A. (2018)**, A comparison variable on physical efficiency training among the rural & urban football players in secondary schools in Nalgonda Dist. Telangana *International Journal of Yogic, Human Movement and Sports Sciences*, 3(1): 473-476
- Barrow, Harold M. (1983)**, "Man and Movement: Principle of Physical Education", (Philadelphia: Lea And Febigar, Third Edition, p. 37.
- C.A. Bucher (1960)**, *Foundation of Physical Education*, (St. Louis: The C.V. Mosby Corporation, p. 26.
- Chauhan, D. S. (2018)**, Comparative Study of Physical Fitness Variables of Urban and Rural Area Players, *International Journal of Physical Education & Sports Sciences | Physical Education, Health, Fitness & Sports* 13 (4) : 31 – 34.
- Gill, M., Nishan, S., and Kaur, R. (2010)**, Comparative Study of Physical Fitness Components of Rural and Urban Female Students of Punjabi University, Patiala, *Anthropologist* 12(1) :17-22.
- Jha, K.N. (2013)**, UGC-NET/SET Junior Research Fellowship and Lectureship Examination Physical Education, (New Delhi: Ramesh Publishing House, p. 3.
- Kanwar, Mandeep Singh (2017)**, Comparative study of physical fitness parameters among 12 years old rural and urban children, *European Journal of Physical Education and Sport Science*, **3,(10):188-196.**
- Ozdirenc, M., Ozcan, A., Akin, F. and Gelecek, N. (2015)**, Physical fitness in rural children compared with urban children in Turkey, *Pediatr Int*, 47(1):26-31.
- Prasanna, M. and Isaac, L. P. (2018)**, Comparative study of the football performance among rural and urban higher secondary school of Vellore District, *Asian Journal of Multidimensional Research (AJMR)*, 7( 2):927-931
- Sheokhand, Daisy (2007)**, *Physiology of Physical Fitness*, (New Delhi: Sports Publication, p. 1.
- Tinazci, C. & Emiroglu, O. (2009)**, Physical fitness of rural children compared with urban children in North Cyprus: a normative study, *J Phys Act Health* 6(1):88-92.



## ESTIMATION OF BLOOD LACTATE WITH THE PROGRESSION OF A FOOTBALL MATCH.

Sumit Kumar Murmu<sup>1</sup>, Dr Kallol Chatterjee<sup>2</sup>

### Affiliations:

<sup>1</sup> Research Scholar, Department of Physical Education, Viswa-Bharati University, West Bengal, India, Email: sumit.krmurmu@gmail.com

<sup>2</sup> Assistant Professor, Department of Physical Education, Viswa-Bharati University, West Bengal, India,, Email: kallolchatterjee1980@gmail.com

---

### ABSTRACT

The purpose of the study was to describe and quantify the changes in blood lactate concentrations with the progression of a football match in the district level football santhal tribe players. For the purpose of the study ten male tribal football players were taken as subjects of the local club team at district level tournament. The subject's age ranged between 19 to 27 years. For this study portable blood lactate analyzer-Lactate pro-2 was used for data collection. Data were collected during semifinal match. Data were collected just prior to the match, post first half time and after completion of the match. The hypothesis selected for this study was that there would be no significant variation on the concentration of blood lactate with the progression of the football match. For analysis of the data repeated measures ANOVA statistical treatment was used. The level of significance was set at 0.05. As Descriptive Statistics mean, standard deviation and standard error of means were calculated. Further, all statistical analyses were computed on IBM SPSS software; Version: 25. The mean of blood lactate concentration of tribal football players prior to the match was  $02.55 \pm 01.09$ mmol/L (mean  $\pm$  SD), after half time it was  $(06.77 \pm 03.52)$  mmol/L and just after completion of match was  $(11.20 \pm 03.86)$  mmol/L. From the results of this study it revealed that there is a significant change in the concentration of blood lactate with the progression of a football match

**Keywords:** Blood Lactate, Santhal Tribe, Portable Blood Lactate Analyzer

---

## 1. INTRODUCTION

Football, also called association football or soccer, game in which two teams of 11 players, using any part of their bodies except their hands and arms, try to maneuver the [ball](#) into the opposing team's goal. Only the goalkeeper is permitted to handle the ball and may do so only within the penalty area surrounding the goal. The team that scores more goals wins. The sport of soccer called football in most of the world is considered to be the world's most popular sport. In soccer there are two teams of eleven players. Soccer is played on a large grass field with a goal at each end. The object of the game is to get the soccer ball into the opposing team's goal. The key to soccer is that, with the exception of the goalie, players cannot touch the ball with their hands, they can only kick, knee, or head the ball to advance it or score a goal (<https://en.wikipedia.org>).

Soccer is played at all levels throughout the world from small kids leagues to professional and international teams. Soccer is such a game which demands almost all physical fitness components like speed, strength, agility, coordination, endurance, balance, perception, reaction time, power, aerobic and anaerobic capacity too (Weil and Herald, 2020).

Though football being most popular game of the world but it is not that much popular in the India, here in India football is most popular in North-Eastern part of the country. This sport is also the most popular sport for tribal people of rest of the state of India. Santhal Pargana is one of the divisions or commissionerates of Jharkhand, under which six districts come. Most of the population of these six district are of santhal tribe. Santhal tribe are known for playing football more than anything. Santhal community is known for their folk dance, songs and playing football. Every year many local tournaments are being organized by santhal community. Among these tournaments, tournament organized in the district level has its standard.

Science and technology have leaved much impact in the field of sports. Science and technology have made us understand sports in much better way than in last few decades back. Invention of portable gadgets has made it easy to understand the reason behind any physiological stress during any physical activity or in sports event. Lactic acid accumulation or lactate accumulation plays a very important role in the training process of athletes. A coach and players have to understand the physiology of blood lactate, its production and clearance in general as well as in specific. Lactate accumulates if pyruvate formation exceeds pyruvate oxidation. Accelerated glycogenolysis is essential for lactate production. Glycogen and epinephrine enhance glycogen phosphorylase activity and this is higher in type II b than in type I fibers. Pyruvate oxidation is enhanced by exercise-induced increase in pyruvate dehydrogenase activity and is relatively impaired by low oxygen availability and low mitochondrial oxidative capacity. During exercise lactate is eliminated in liver, heart, and resting and working muscle. In muscle, elimination depends on plasma concentration, fiber type, and fiber conditions. Due to influence on hormonal response, mitochondrial oxidative capacity and fiber recruitment, training diminishes glycogenolysis and lactate production. Training also increases lactate clearance. This reflects increased hepatic capacity for gluconeogenesis as well as increased lactate transport capacity and oxidative capacity and reduced glycogenolysis in muscle. The fact that endurance performance can be predicted from the plasma lactate versus exercise intensity relationship illustrates that the plasma lactate level is a finely balanced result of the interplay between many factors of importance for endurance exercise. (Stallknecht, Vissing, and Galbo, 1998)

The purpose of the study was to investigate the variation in blood lactate concentration with the progression of football match of tribal football players at district level tournament.

## 2. METHODOLOGY

### 2.1 Selection of Subjects

For This Study, purposively ten (10) tribal football players from a team, playing semifinal match at district level tournament in Dumka, jharkhand, India, were selected as subjects for this study. The subject age was ranged between 19 to 27 years.

### 2.2 Collection of Data

The data on selected physiological variable- blood lactate were collected by employing the standard testing procedures available in the literature with the help of portable blood lactate analyzer-Lactate pro-2. Players were briefed about the purpose of the study. Blood samples were collected just prior to the beginning of match, post half time and just after completion of full time of the semifinal match, by pricking the finger. Reading shown by the Lactate pro-2 in mmol/L was recorded as data.

### 2.3 Selection of variable

TABLE 1

REPRESENTS THE BLOOD LACTATE WHICH WAS SELECTED AS VARIABLE

S. No.	Variable	Unit	Criterion Measure
1	Blood Lactate	mmol/L	Portable Blood Lactate Analyzer-(Lactate pro-2)

### 2.4 Statistical Treatment

Repeated measures Analysis of Variance statistical technique is used at 0.05 level of significance ( Verma, and Mohammad, 2012).

## 3. RESULTS

TABLE 2

DESCRIPTIVE STATISTICS OF BLOOD LACTATE IN PRE-TEST, POST-HALF TIME AND POST -FULL TIME

Unit		M	SD	N
mMol/L	Pre Test	02.55	01.09	10
	Post Half Time	06.77	03.52	10
	Post Full Time	11.20	03.86	10

In the table no.-2, means of Blood Lactate in Pre Test, Post Half Time and Post Full Time in case of Blood Lactate are 0 2.55, 06.77 and 11.20 respectively, whereas SD are 01.09, 03.52 and 03.86.

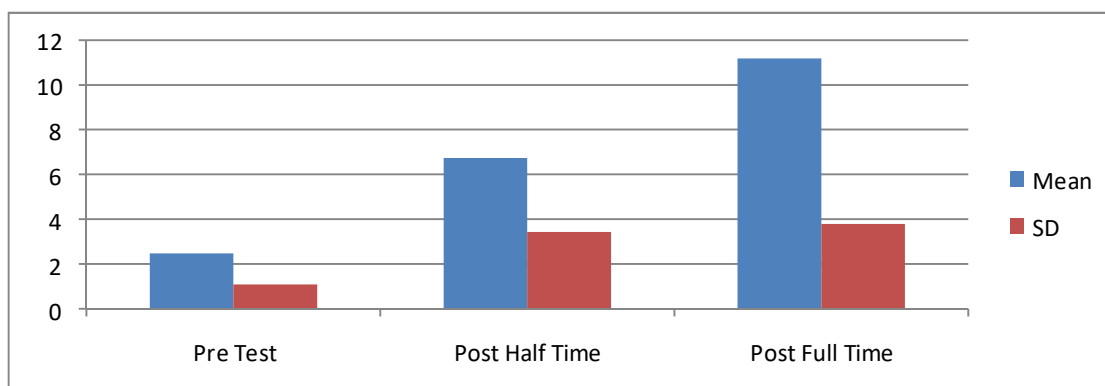


FIGURE -1: GRAPHICAL REPRESENTATIONS OF MEAN AND STANDARD DEVIATION SCORES OF BLOOD LACTATE AT PRE TEST, POST HALF TIME & POST FULL TIME.



**TABLE 3  
MAUCHLY'S TEST OF SPHERICITY**

Variable	Approx. Chi-Square	df	Sig.	Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Blood Lactate	1.564	2	.457	.849	1.000	.500

In the above table no. 3 (Mauchly's Test of Sphericity) the p-value or significance value is .457 which is greater than 0.05 ( $P > 0.05$ ), so we do not accept the hypothesis that the variances of the differences between levels were not significantly different. In other words the assumption of sphericity has not been violated. If it would be violated then we would have to use Greenhouse-Geisser or Huynh-Feldt or Lower-bound for making an adjustment to the degrees of freedom of the RM- ANOVA.

**TABLE 4  
REPEATED MEASURES ANOVA FOR BLOOD LACTATE AMONG THE SUBJECTS IN PRE TEST, POST HALF TIME AND POST FULL TIME**

Unit	Source of Variance	Sum of Squares	df	Mean Square	F-ratio	p-value (Sig.)
mMol/L	Blood Lactate	374.186	2	187.093	24.323*	.000
	Error (Blood Lactate)	138.454	18	7.692		

\*Significant at 0.05 level

$F_{0.05}(2,18) = 3.55$ ,

In the above table no. 4 (RM-ANOVA) it has been found that 'F' value and 'P' value are 24.323 and .000 with 2/18 degrees of freedom in Pre Test, Post Half Time and Post Full Time in case of Blood Lactate which clearly indicates that 'P' value (.000) is less than 0.05 level of significance ( $P < 0.05$ ). So there is significant difference on blood lactate within the subjects.

**TABLE: 5  
BONFERRONI POST-HOC TEST AMONG PRE TEST, POST HALF TIME AND POST FULL TIME FOR BLOOD LACTATE**

Variable	Group			SEM	Mean Difference	p- value (Sig.)
	Pre Test	Post Half Time	Post Full Time			
Blood Lactate Unit: mMol/L	2.55		11.20	1.143	8.65*	.000
		6.77	11.20	1.476	4.43*	.045
	2.55	6.77		1.063	4.22*	.010

\*Significant at 0.05 level

From the table no. 5 (Bonferroni Post-Hoc Test) it has been evident that there is significant difference between Pre Test and Post Half Time, Pre Test and Post Full Time & Post Half Time and Post Full Time.

#### 4. DISCUSSION

The purpose of the study was to investigate the variation in blood lactate concentration with the progression of a football match on tribal football players at district level tournament. Blood sample were taken and tested through Blood Lactate Analyzer- Lactate Pro-2 at just prior

to the match, after completion of first half and after completion of full time. From the findings it has been found that there is significant change in the concentration of blood lactate with the progression of a football match. Blood Lactate concentration increases from pre test value to post first half time and it is also increased after post full time of the match.[ pre set- $02.55 \pm 01.09$ mmol/L,( mean  $\pm$  SD ), post first half time- ( $06.77 \pm 03.52$ ) mmol/L, post full time- ( $11.20 \pm 03.86$ ) mmol/L].

From the results of this study it revealed that there is a significant change in the concentration of blood lactate with the progression of football match. More clearly is to be said that there is significant effect of progression of football match on blood lactate concentration of district level football players. The reason behind significant effect may be the following facts.

Accumulation of blood lactate is associated with a corresponding increase in hydrogen ion (H<sup>+</sup>) concentration in skeletal muscles, which inhibits glycolytic reactions and interferes with muscle excitation-contraction coupling (Nakamura & Schwartz, 1972). Such interference may result in limitations to muscular contractions through reduced availability of calcium (Baechle & Earle, 2000). In addition, inhibition of glycolytic reactions may result in reduced availability of ATP (Brooks et al., 2005). Therefore, lactate accumulation, and the associated accumulation of H<sup>+</sup> is generally associated with muscular fatigue. Previous researches have shown that lactate production occurs more in type II muscle fibers than type I; and is greater in high intensity, intermittent activities than low intensity, continuous activities. Type I muscle fibers are characterized by large number of mitochondria, high aerobic capacity and dense capillary concentration whereas type II muscle fibers are characterized by low mitochondria, low aerobic but high anaerobic capacity and higher force production (Lexell, Henriksson-Larsen, Wiblod, & Sjoström, 1983). Thus, the type I muscle fibers are predominant in aerobic activities, while type II muscle fibers play an important role in short duration, explosive power events and/or resistance training. Moreover, it has been observed that the muscle fibers of intermediate and large motor units, which are used in explosive power and resistance events, produce more lactate than small motor units (Jones & Ehram, 1982).

Many studies conducted by Shukla, 2018; Schuett and Grover, 2000; Menzies, & Menzies, 2010; Stallknecht, Vissing & Galbo, 1998 supported directly or indirectly to this study

## 5. CONCLUSION

Within the limitations of the present study following conclusion was drawn: There was a significant difference found on the blood lactate concentration of santhal tribal football players with the progression of a football match.

## REFERENCES

- Brooks, G. A. (1986), The lactate shuttle during exercise, evidence and possible control. In: Watkins J, Reilly T, Burwits L, editors. Sports Science. E and FN Spon Ltd; London, p. 69.
- [https://en.wikipedia.org/wiki/Association\\_football](https://en.wikipedia.org/wiki/Association_football)
- Jones, Norman L. and Ehram, Rolf. E.(1982), The Anaerobic Threshold, Exercise and Sport Sciences Reviews, 10 (1):49-83.
- Lexell, J., Henriksson-Larsén, K., Winblad, B., & Sjöström, M (1983), Distribution of different fiber types in human skeletal muscles: effects of aging studied in whole muscle cross sections, Muscle Nerve , 6(8):588-95. doi: 10.1002/mus.880060809.

- Menzies, Paul and Menzies Craig (2010).** Blood lactate clearance during active recovery after an intense running bout depends on the intensity of the active recovery. *Journal of sports sciences*, 28(9): 975-82.
- Nakamaru, Y. and Schwartz, A. (1972),** The influence of hydrogen ion concentration on calcium binding and release by skeletal muscle sarcoplasmic reticulum, *J Gen Physiol*, 59(1):22-32. doi: 10.1085/jgp.59.1.22.
- Shukla, Manish (2018).** Post-match lactic acid clearance and heart rate: differences between winners and losers. *European Journal of Physical Education and Sport Science*, 4 (1) 62-171.
- Schuett, G. W. and Grover, M. S. (2000).** Post-fight levels of plasma lactate and corticosterone in male copperheads, *Agkistrodon contortrix* (Serpentes, Viperidae): differences between winners and losers. *Physiology and Behaviour*, 71 :335-341.
- Stallknecht, B., Vissing, J. and Galbo, Henrik (1998),** Lactate production and clearance in exercise. Effects of training. A mini-review, *Scandinavian journal of medicine & science in sports*, 8 (3):127-131.
- Thomas, R., Baechle, and Earle R. W. (2000),** *Essentials of Strength Training and Conditioning*, Human Kinetics Publisher:
- Verma, J. P., and Mohammad, Ghufan. (2012),** *Statistics for psychology*. Tata McGraw Hill Education Private Limited
- Weil, E. and Herald, B. A. (2020),** *Football-World Soccer: FIFA Magazine*. Associated Press; South America, <https://www.britannica.com>



## IMPACT OF CLIMATIC PARAMETERS ON OUTDOOR SPORT ACTIVITIES IN NAMSAI, ARUNACHAL PRADESH

Dr. Biplab Tripathy<sup>1</sup> and Sandip Sinha<sup>2</sup>

### Affiliations:

<sup>1</sup> Assistant Professor, Department of Geography Arunachal University of Studies  
[tripathy.biplab@gmail.com](mailto:tripathy.biplab@gmail.com) 9315962164

<sup>2</sup> Lecturer, Department of Physical Education, Arunachal University of Studies  
[singhasandip86@gmail.com](mailto:singhasandip86@gmail.com)

---

### ABSTRACT

Physical fitness is an asset in the life span of human being. Games and sports play a major role in keeping a person fit and fine. The immunity of the body increases by participating in games and sports. Sport is embedded in the lives of people of North East India. The region is a home to some of the recognised sports persons: Baichung Bhutia, M.C. Mary Kom, L. Sarita Devi, K. Sanjita Chanu, Jayanta Talukdar, Shiva Thapa, Kunjarani Devi, Mirabai Chanu, Anshu Jamsenpa, Dipa Karmakar, Hima Das, and so many. Climate change and extreme weather supports as well as threaten the viability of sport played either in the back yard, at local grounds, or in professional tournaments. Sport is a central part to the culture and society of people in Namsai. Participation in sport improves mental and physical health, enhances community cohesion, and contributes significantly to the nation. The majority of youths in Namsai engage in sporting activities ranging from bush walking to team competition. The goal is to stimulate a broader discussion about climatic parameters and suitable sport options. To review the environmental related factors those are susceptible to increase with climatic conditions while exercising, participating in sports and recommendations to combat them appropriately. To gain the optimum results in sports performance with minimal sports injuries by understanding Sports Science and Exercise Physiology.

**Keywords:** Climate, Athletes, Sports, performance, injuries, Sports Science.

---

## 1. INTRODUCTION

The environment can significantly affect athletes and how they perform. The spectrum of the environment can facilitate or inhibit performance, or it can cause serious illness or death. The scope of environmental conditions is vast, from heat to cold and altitude to hyperbaric mediums. Participating in a diversity of activities in a variety of environmental conditions can be exhilarating and safe, provided one has a thorough understanding of the risks and is properly prepared.

As our mother earth heats up, competing in or even watching as spectators, many outdoor sports is becoming increasingly challenging as climate parameters brings harsher heat waves, intense rain, and other threats. The problem arises when things go wrong and have to fall back on our relatively primitive, unevolved, and physiological defences. The consequences of their limitations include hypothermia, cold injury, hyperthermia, and barotrauma. These pathophysiological threats can arise in an athlete due to environmental parameters. Many more athletes are hospitalised every year in various sports from tennis to cricket, and competitions are cancelled due to extreme weather conditions. So, it is the time to understand our environment better and carry out our various sporting activities while adapting scientific approaches to deal with.

Outdoor sports participants may experience to any among the above mentioned consequences during training sessions or competitions. Climate has an essential role in human life. It affects human health and habits in many different ways directly or indirectly. According to Climatic Zone, Namsai falls under Sub-Tropical Climate. The humid sub-tropical climate is unique in Namsai, Arunachal Pradesh, where the seasons are dominated by hot summers and mild winters with higher percentage of humidity. The effect of weather and climatic conditions on sports has been extensively studied over many years. Based on the geographical location of Namsai and its climatic parameters which prevail throughout the year, this study tries to locate the impact and consequences of teetering climatic conditions on sports. There is a direct impact of climate on most of the outdoor sport activities and in particular endurance sports. There are so many climatic parameters which affect sports performances and sometimes some serious consequences too.

The humid tropical climate of Namsai is characterized by consistently high monthly temperatures throughout the years except during few winter months, and rainfall that exceeds evapotranspiration for at least 270 days per year. The detrimental effect of high environmental temperature on aerobic performance is well understood, and exercise-heat acclimation involves a complex set of adaptations that reduces physiological strain and improve the ability to workout in hot climate.

This study focuses on activities such as running, jogging, cross-country race, marathon, adventure sports, trekking, swimming, football, volleyball, badminton, and athletics in Namsai. The aim of this study is to assess how many climatic variables may influence the athletic performance and the comfort level for different sports disciplines. This study is to find out the suitable conditions for different sports in various climatic parameters to boost sports performance and reducing the risk factor. The study is to find out the appropriate and inappropriate periods of time in terms of athletes comfort, to enhance sports performance, and implement necessary counter-measures in time to minimize unpleasant impacts. At the same time to enable planning committees, organizing committees, and other responsible persons including coaches to understand the climatic conditions better and closer for the betterment of sports. The study is based on meteorological parameters affecting sports activities and their possibilities in Namsai.

This paper concentrates on the Meteorological or Environmental factors determining sport activities, sports performance, and reducing sports injuries caused due to environmental variables in Namsai, Arunachal Pradesh. Here we will try to analyse and locate the physical environmental factors influencing sports activities and benefiting athlete's performance by reducing risk factors.

## 2. REVIEWS OF LITERATURE

Human temperature regulation is at the forefront of maintaining core body temperature and has the ability to do this over a narrow range even with a heightened metabolic rate and exposure to warm-hot weather (**Hardy, 1961**).

Heat stress from the environment can be detrimental to sporting performance, challenging the limits of the human cardiovascular system, temperature regulation and altering body fluid balance (**Samuel et al., 2010**).

Performing exercise in a hot environment can place a high demand on evaporative cooling. If fluids are not adequately replaced then dehydration is more likely to occur which can challenge the limits of aerobic performance. It is well known that body water deficits greater than 2% of body mass can impair aerobic exercise performance by reducing muscle blood flow and altering skeletal muscle metabolism (**Gonzalez-Alonso, Calbet & Nielson, 1998**).

**World Meteorological Organization (WMO)**, said that the previous year 2019 was on track to be among the world's hottest years on record: and this is worrying officials planning events from the 2020 Tokyo Olympics (unfortunately got cancelled due to Covid-19's world wide spread) in Japan to the 2022 Soccer World Cup in Qatar (**Matzarakis, et.al., 2019**).

**World Health Organization (WHO)** has said heat stress linked to climate change is likely to cause 38,000 extra deaths a year worldwide between 2030 and 2050, as it worsens existing health problems and provokes heat stroke and exhaustion.

**International Olympic Committee (IOC)** said change in climatic parameters is now an underlying factor in terms of selecting host city. "We are starting to live in the consequences of climate change. Summers are getting hotter, winters are getting shorter. Snow is being found at higher locations," said Michelle Lemaitre, the IOC's Head of Sustainability.

By 2050, less than half of the 21 cities that have hosted the **Winter Olympics** will be cold enough to host the games again, according to a 2018 study by Canada's University of Waterloo.

## 3. METHODOLOGY

On the basis of observation analysis of collected data, the climatic parameters in Namsai have a direct impact on various sports activities which varies throughout the year. Due to its geographical location, Namsai is unstable in means of climatic parameters, and as a result it affects all human activities including sports.

Namsai is gifted by many natural born sports talents. Sports play a major role in the culture of Namsai as well as North East India. But we cannot ignore the impact of climatic parameters on sports as they are directly connected to: Suitable timings to organize sports, Training sessions for athletes, Athlete's performance and Sports injuries.

We cannot ignore these factors, and so one should understand the local climate better to boost sports performance, organising sports, reducing sports injuries, promoting sports in future days, and encourage sports participation. It is very important to know our environment and move along with it by implementing strategies and adaptations. So, instead of challenging the environment we can collaborate with the environmental factors to promote sports and boost sports performance.

People of Namsai are very fond of sports throughout the year and engage themselves in some common sports activities such as football, badminton, volleyball, and cricket. Lack of

adequate sports infrastructure, proper climatic knowledge, scientific training and adaptations, government initiatives, and many more pulls back the youths of Namsai from excelling in sports.

A sport is not just a recreation, but it is an individual's involvement, proper training, physical fitness, mental fitness, neuro-muscular coordination, a competition, a science, and a career. We cannot ignore sports and hence we have to support sports and our youths for a healthy and prosperous future ahead.

### 3.1 Area of Study

Namsai district of Arunachal Pradesh is a foothill district carved out of Lohit District in the year 2014 to become the 18<sup>th</sup> District of the state. Namsai is situated at North Easternmost part of the country and lies between 95°45' to 96°20' East Longitudes and 27°30' to 27°55' North Latitudes with a geographical area of about 1587 square kilometres, with administrative circles of Lekang, Namsai, Piyong, Lathao, and Chowkham.

### 3.2 Demographic Informations

S.NO.	Items	Particulars
1	Name of District	Namsai
2	District Headquarter	Namsai
3	Geographical location	Between 95°45' to 96°20' East Longitudes and 27°30' to 27°55' North Latitudes
4	Geographical area	1587 square km (approximately)
5	Elevation	Avg. 156 meter from MSL
6	Climatic Zone	Sub-Tropical Climate
7	Avg. Annual Rainfall (mm)	3500-4000 mm
8	Population (2011 census)	95950
9	Literacy rate (%)	54.24%

**Source:** -Government of Arunachal Pradesh.

### 3.3 Climatic Parameters Affecting Outdoor Sports Performance

Sports performance directly depends on athletes hard workout, training load, training sessions, nutrition and diet, equipment's, mental health, physical health, and environmental factors. The impact of weather and environmental conditions on sports has been extensively studied over the past years. Most of the outdoor sport activities and most importantly endurance sports are strongly influenced by the variations of Meteorological Parameters.

The effects of weather on sports are varied, with some events or sports unable to take place while others are changed considerably. The performance of participants can be reduced or improved, and some sporting world records are invalid if set under certain weather conditions. For example in some sporting events such as Sprint, Long Jump, Triple Jump, Javelin Throw, Discuss Throw etc. record is not considered if the speed of wind is more than 2 meter/second blowing in direction favourable for the athlete. While outdoor sports are most affected, those played indoors can still be impacted by adverse or advantageous weather conditions (<https://en.wikipedia.org>)

Wind can blow the equipment in a sporting event, changing the direction or travel of a ball or any other equipment. A headwind can slow runners, while they may gain wind assistance from a tailwind. Whereas some sports rely on presence of wind, especially surface water sports.

Some sports are cancelled because of precipitation, some are deemed too dangerous to play when the ground is damp because of injury to a player. Some sport cannot be played if there is insufficient visibility. The position of the sun can be an advantage or disadvantage to some competitors. In some situations an athlete may have their vision impaired by the brightness of the sun.

Drought and changed rainfall patterns affect ground surfaces. Extreme rainfall threatens short-term ground washouts, and more extensive damage to ground surfaces, which also impact maintenance costs.

Among the meteorological variables (Pezzoli et al., 2013) that strongly influence the sporting activity,) the most important are:

- 3.3.1 **Temperature**-Temperature or heat can affect badly. It can cause dehydration and this will impact sports performance largely. Heat can make an athlete feel tired and drive to give up.
- 3.3.2 **Solar Radiation and Ultra Violet Ray Exposure**-These are incoming rays from the sun which includes X-ray, Ultraviolet Rays, Infrared Rays, Visible Rays, and have direct impact on climate, atmospheric ozone, and living beings.
- 3.3.3 **Cold**-At extremes, it can tighten muscles and also limit breathing. Having muscle contractions due to cold, can really do a lot of damage.
- 3.3.4 **Wind**-Depending on the speed of the wind, can impact athlete's performance and becomes a challenge to perform a skill too.
- 3.3.5 **Lightning**-It is one of the biggest troubles in sports as the consequences are very dangerous.
- 3.3.6 **Altitude**-It is commonly used to mean the height above sea level of a location. It is commonly used in aviation, geometry, geographical survey, sports, atmospheric pressure, and many more.
- 3.3.7 **Humidity**-Humidity is the amount of water content in the air. It can make the athlete feel hot and sticky and also lead to dehydration because humidity results in sweating.
- 3.3.8 **Precipitation**- Rain can be a disaster, if it is heavy. It can impact visibility and also can bring down the athletes core body temperature.
- 3.3.9 **Fog**- It impacts the visibility and as a result games are cancelled.]
- 3.3.10 **Atmospheric Pressure**-It is also known as barometric pressure. It is the pressure within the atmosphere of earth.
- 3.3.11 **Relative Humidity**- The amount of water vapour present in the air at any given time.
- 3.3.12 **Air Pollution**-It is a mixture of solid particles and gases in the air which changes or alters the normal state of air.

The role of the meteorological parameters becomes crucial for various sport activities carried out in an outdoor environment. The aim is to assess how much atmospheric or climatic variables may influence both the athletic performance and the comfort level for different sports disciplines in Namsai. Many factors also determine the sports performance. such as:

- (i) Personal or Psychological or Psychophysical factors.
- (ii) Agent (Materials or Opponents) factors.
- (iii) Physical Environmental (Meteorological or Environmental) factors.
- (iv) Socio-environmental (Internal and External Social Environment) factors.

### 3.4 Climatic Scenario and Sports Participation

#### 3.4.1 Temperature

Deforestation, population explosion, pollution, and global warming leads to an increased incidence of heat waves i.e. extended periods of extreme high temperatures, which substantially deteriorates human health. While elderly to a lower extent and children are primarily affected by heat stress during outdoor sport sessions, other outdoor recreational and competitive individuals may also be at risk.

The dangers of extreme heat cannot be neglected as Namsai experience very hot summers ranging from 30°C-40°C. Humans maintain a core temperature around 37°C, above 38°C



becomes uncomfortable and with each additional degree health problems progressively kick in. Organ damage may occur. When core temperature strikes 40°C death is more likely. The risk of athletes body temperature rising towards the 40°C limit in extreme heat, even with moderate humidity is very real. In conditions of 40°C and above, become an ‘un-compensable environment’ where it is impossible to lose heat, in essence overheating the body.

Average Temperature	
Winter	10°C – 25°C
Summer	28°C – 40°C
Average Relative Humidity	
Winter	62%
Summer	90%

**Source:** -Government of Arunachal Pradesh.

The hot seasons lasts for 4 months, from May to September with July as the hottest month and the cold season lasts for 3 months, from last week of November to February with January as the coldest month.

As intense or prolonged exercise is completed in both cold and hot-humid ambient conditions, the development of heat illnesses varies on a severity scale continuum ranging from mild heat rash, syncope and cramps to serious heat exhaustion, injury and stroke. Exercise-associated muscle cramps, also called heat cramps, are painful spasms of skeletal muscles occurring in the heat. Occurrence of heat cramps is more common in long distance runners (5000 Meters, 10,000 Meters, and Marathon) as well as in athletes engaged in prolonged, high intensity sports (Lawn Tennis, Rugby, Football, Cycling etc.). The main causes responsible for the development of heat cramps are dehydration, muscular fatigue, body water loss and large sweat (Na+) loss.

Dehydration often occurs long before some athletes realize it or before cramps set in. Athletes can lose as much as 2 to 8% of their body weight during high intensity exercise, and the rate of fluid absorption from the gut just can’t keep up the rate of loss. Dehydration causes a decrease in VO<sub>2</sub> max, which means the body can’t utilize oxygen as efficiently to provide energy. Dehydration also contributes to the decrease of heart blood pumping.

While hyperthermia is defined as an elevation in core temperature above 39°C, heat exhaustion commonly refers to a mild-to-moderate illness occurring at moderate to high core temperatures (38.5°C-40°C). Increased body temperature (Hyperthermia) leads to decreased muscle endurance, which means the muscle’s ability to contract repeatedly or in a sustained manner over a longer duration of time. Higher core temperature also cause a shift in energy production from the aerobic phase to anaerobic phase, when the body has to use its muscle energy stores rapidly to overcome the energy requirement. During a prolonged athletic event, the rate of adding energy through sports drinks, energy bars, etc. cannot keep up with the rate of energy lost when there is high temperature. Hence, high temperature leads to decrease in blood flow in the heart as blood pools in the limbs, and thus when the heart does not receive adequate amount of blood in result it lacks in supply of adequate amount of oxygenated blood to the working muscles when required. Heat injury is a moderate-to-severe illness i.e. injury to an organ (Liver, Kidneys, Gut, Muscle). Heat stroke is a severe illness in outdoor sport participants characterised by Central Nervous System Dysfunction, Liver damage, Rhabdomyolysis (Breakdown of Muscle Tissue), widely distributed blood clotting, water and electrolyte imbalances, and kidney failure.

### **3.4.2 Precipitation**

Namsai receives an average annual rainfall of 3500-4000 mm. And a wet day is one with at least 0.04 inches of liquid or liquid-equivalent precipitation. The chance of wet days in Namsai varies very significantly throughout the year. The wetter season lasts 4.1 months, from May to September. The drier season lasts 7.9 months, from September to May with December as the driest month. Rain alone is common for 4.8 months, from April to October with June receiving highest rainfall. But, a unique feature of Namsai on its own it is very difficult to predict rain and it is almost uncertain.

Very few research studies has ever been done to examine the effects of rain on an athlete's performance, especially in the cold. Oesophageal (body) temperature and average skin temperature significantly lowers down in rain condition than in a non-rain running session. The amount of air breathed per minute, oxygen consumption used during the running session, and the levels of blood lactate and noradrenalin were significantly higher during rain. Therefore, the higher oxygen consumption and plasma lactate in rain indicates that the energy demand in the body increases while running in cold and wet conditions resulting consumption of glycogen energy stores more quickly. To avoid this kind of circumstances, athletes are advised to load carbohydrate well before training or running.

### **3.4.3 Solar Radiation and Ultra-Violet Ray Exposure**

The length of the day in Namsai varies significantly over the course of the year. The shortest day is December 21 with 9 hours 59 minutes of daylight, and the longest day is June 21 with 14 hours 19 minutes of daylight. The earliest sunrise is at 4:28 AM on June 11, and the latest sunrise is 2 hours 12 minutes later at 6:40 AM on January 9. The earliest sunset is at 4:30 PM on December 3, and the latest sunset is 2 hours 19 minutes later at 6:49 PM on June 29.

Outdoor sport training sessions and competitions usually take place during the peak hours of UVR (Ultra-Violet Rays) i.e. between 10:00 AM and 4:00 PM. Reportedly, small doses of UVR from the sun help the body to produce Vitamin D and hence research studies say that it is good to have sunlight in early morning hours i.e. from 6:00 AM to 8:30 AM respectively. However, too intense, intermittent and total cumulative-exposure to UVR has been associated with the development of both melanoma and non-melanoma skin cancers. Skin areas presenting the highest risk for UVR exposure includes the face, neck, hands, legs, and feet (dorsal), moderate risk areas are the thorax, thighs, arms, and forearms. Finally, initial erythema (Skin redness), skin rashes, and skin damage may occur due to sun burn.

## **3.5 Impact of other Meteorological Factor on Outdoor Sports**

### **3.5.1 Wind**

The wind experienced at any given location is highly dependent on local topography and other factors, and instantaneous wind speed and direction vary more widely than hourly averages. The average hourly wind speed in Namsai experiences significant seasonal variation over the course of the year.

The windier part of the year lasts for 5.5 months, from November to April, with average wind speeds of more than 9.1 miles per hour. The windiest month recorded is February with a record of 12.8 miles per hour. Namsai experiences wind from the south for 3.0 months, from June to September with August as the peak month, and wind often from the west for 9.0 months, from September to June with January as the peak month. The impact of wind can be seen directly during some outdoor events or games such as Badminton (Outdoor), Volleyball (Outdoor), Throwing Events, and Jumping Events.

### 3.5.2 Cold

Provided adequate and appropriate thermal protection is worn by athletes and metabolism is maintained with the help of exercise, impact from cold on athletes is rarely a problem. Cold weather conditions include low air or water temperature or both, winds, low solar radiations, and less rainfall, which considerably increase convective heat transfer coefficient. Cold related injuries can be understood in three categories i.e. Hypothermia ( low core temperature i.e. less than 35°C), Frostbite (freezing injuries of the extremities) and Non-freezing injuries.

Cold induced asthma and acute cardiovascular events such as myocardial infarction represent secondary outcomes. In addition to that, hands lose dexterity or less sensitive fingers, impaired coordination, visual acuity, general alertness or reflexes are the different negative impacts of cold exposure. Prolonged exposition to cold weather conditions can lead to hallucinations, whereas the combination of cold and hypoxia exacerbate the magnitude of physiological adaptations.

The cold season in Namsai lasts for just 3.0 months i.e. last week of November to February. The coldest month is January.

Above all the individual factors modifies the magnitude of the responses to cold exposure and therefore modulates the injury risk. The main predisposing factors for hypothermia when exercising outdoor include the individual's health status, rain, wind, altitude, wet clothing, anthropometry, large surface area-to-mass ratios, fatigue, age, and gender.

### 3.5.3 Altitude

Namsai is located on the foothills of Eastern Himalayan Mountain Ranges at an altitude of 156 meter from MSL, and falls under plain area. Hence, Namsai do not fall under high altitude zone.

In mountainous environments, barometric atmospheric pressure declines with altitude ascent above sea level because barometric pressure is a functioning of the surface temperature. However, the physical and physiological effects that accompany a decline in barometric pressure can have a negative impact on prolonged duration exercise performance (Long Distance Running and Cross Country Run), as arterial oxygen pressure is impaired. Meanwhile the air density is modified by pressure changes, which would affect the motion of the human body and or projectiles through the air upon altitude ascents. Therefore, improved explosive performance (Jumping, Sprint Running) may be produced given that more energy would be available for acceleration.

Exercise carrying capacity in oxygen deficiency environments not only depends on the absolute terrestrial altitude, but also on the altitude difference with the normal height of residence, as well as other environmental conditions such as heat and cold. Apart from the above, rain also affect sports by damaging the ground quality, visibility, spectators, difficulty while handling equipment's, officiating etc.

### 3.5.4 Humidity

The thermoregulatory strain increases in the heat when humidity rises due to reduced evaporative capacity of the environment (E- max). The reduced E-max limits heat dissipation from the skin surface to the environment, leading to a decline in sweating efficiency and increased area of skin wittedness. The decline in sweating efficiency would, therefore, elevate skin temperature during exercise in humid conditions causing an increase in skin blood flow and greater circulatory strain.

Humidity is an issue for the athletes in Namsai because of high amount of water vapour present in the air. As a result, due to high rate of humidity around 90% during summers and even

more, athlete's feels awful and exercise attire gets drenched in sweat in a matter of minutes. During such conditions, there is a common psychological tendency to give-up and reduce the duration or intensity of exercise since athletes becomes hyper-focused on the palpable humidity and sweat drenched clothing's.

Humidity can be controlled and ignored by wearing Quick-Dry Technology clothing's, hydrating the body in regular intervals, using additional gears like sweat band, towels, etc., and regular interval sessions during training period.

#### 4. RESULTS

Athletes undergo training sessions, competitions are held, some athletes win and make records, some losses, and most importantly many collapses due to extreme weather or climatic conditions. It will be wrong if we neglect these climatic parameters which determine an athlete's performance and also the risk of injuries. It is the purpose of this study to describe the physiological responses to a number of environmental conditions or parameters and to offer considerations that could be given during the performance of sporting activities.

This is an advice for sportspersons, coaches, sporting clubs, organisers for having adequate knowledge about the local climatic conditions prevailing in a particular place, which includes the air temperature, humidity, wind direction and speed, altitude, and local time zones. Here are some of the ideas and hints to conduct various sports activities in Namsai:

1. When the climate index crosses 25°C and the work rate is reasonably high, coaches should be aware of the potential negative effects on athletes. When the temperature crosses beyond 28°C, the coach should abandon vigorous activities for poorly conditioned athletes.
2. During the hotter months i.e. May to September, training sessions should be scheduled in the early morning hours (4:30 AM – 8:00 AM) or in the evening instead of noon or afternoon (5:00 PM – 8:00 PM) respectively. Recovery periods of 3-6 hours should be provided for the athletes.
3. There may be some individuals or new comers in sports who have a low tolerance to heat, proper care and supervision is required from the coach's side. These categories of athletes have a very poor sweating mechanism and overheat very quickly. Coaches should monitor these athletes carefully for symptoms of heat intolerance.
4. Adaptation to heat conditions can only be achieved by actually working out in hot conditions. Therefore, the adaptation theory must be included in training sessions. Development of cardiorespiratory fitness, implementation of preventive countermeasures against heat stress, and individual hydration strategy should be adopted.
5. During exercise under hot climatic conditions, athletes must remember to wear light-colour clothing made from open-weave natural fibres. As much as possible, the skin should be exposed to the air to maximize the evaporation of sweat. Quick Dry Technology garments are also recommended.
6. Since our body loses more water than electrolytes during exercise, the body fluids become more concentrated. Therefore, there is a need to replace water than electrolytes during heavy sweating. On hot days, fluid should and must be consumed before, during, and after training sessions. This maintains the fluid level in our body during sports training or competition. Some of the sensible guidelines for hydrating or fluid replacement are to be noted down:
  - A. The fluid should be between 8°C - 10°C in temperature.
  - B. The fluid should be low in or without sugar to enhance absorption of water. The highest concentration of sugar should be 2 – 5 gram per 100 ml of water.

- C. During the time of exercise, fluid intake should not be more than 0.5 Litres per hour in doses of 100 – 200 ml in every 15-18 minutes.
  - D. At least 0.5 litres of water must be consumed prior to exercise. During cold climates, the athletes try to prevent heat loss and a fall in core body temperature. This can be tackled through two ways, either by producing more heat or by reducing the amount of heat loss.
7. Awareness of individual's skin attitudes should be understood by athletes, coaches, officials while performing during outdoor activities, in order to protect the skin from harmful solar radiations.
  8. Before engaging in outdoor sports, we must be aware of weather reports and the possibility of thunderstorms in relation to the location of playgrounds.
  9. The favourable time to organize and conduct outdoor sport events or competitions in Namsai is between November and March, when the extreme temperature declines; heavy rains are almost over followed by lesser humidity and mild colder days.
  10. Namsai can be turned out into an emerging easternmost sports hub through encouraging games and sports, uplifting sports infrastructure, government initiatives, and promoting some of the climate-friendly sports for the district such as Football, Volleyball, Cross Country Races, Road Running Races, Marathons, Race Walking, Swimming, Rowing, Boxing, Basketball, Handball, Softball, Badminton, Table Tennis, and Adventure Sports.
  11. Awareness of individual's skin attitudes should be understood by athletes, coaches, officials while performing during outdoor activities, in order to protect the skin from harmful solar radiations.
  12. Before engaging in outdoor sports, we must be aware of weather reports and the possibility of thunderstorms in relation to the location of playgrounds.
  13. The favourable time to organize and conduct outdoor sport events or competitions in Namsai is between November and March, when the extreme temperature declines; heavy rains are almost over followed by lesser humidity and mild colder days.
  14. Namsai can be turned out into an emerging easternmost sports hub through encouraging games and sports, uplifting sports infrastructure, government initiatives, and promoting some of the climate-friendly sports for the district such as Football, Volleyball, Cross Country Races, Road Running Races, Marathons, Race Walking, Swimming, Rowing, Boxing, Basketball, Handball, Softball, Badminton, Table Tennis, and Adventure Sports.

## 5. DISCUSSION

The study allowed us to look closely the various climatic or meteorological parameters in Namsai which directly or indirectly impacts various human activities including sports. Having a proper knowledge about our environment allows us to deal with the consequences related to it and set new strategies to solve the issues. The aim of the study is not only to understand the climatic parameters prevailing in Namsai, but also to facilitate the Sports persons, Sports Associations, Clubs, Coach's, Government bodies in Namsai to deal with the environmental factors and come up with new innovative scientific methodologies.

The study finds out that Namsai falls under the 'Sub-tropical Climatic Zone', with very hot summers of 4.0 months starting from May to September, very high rate of solar radiations which are angled directly due the earth's tilt or earth's axis, 3.0 months of cold season from November to February, 156 meters above the sea level, and an average annual rainfall of 3500-4000 mm. It becomes very important to study the climatic parameters of Namsai very microscopically to facilitate sports facilities with much wider prospective. The study helped us to find out the

impact of meteorological parameters on various sports activities and their consequences related to sports performances. So, meteorological parameters cannot be neglected at any cost.

## 6. CONCLUSIONS

1. Performing in odd climates can impair performance if the sporting individual is not adequately prepared for the environmental conditions.
2. Every individual can not be affected negatively by odd climatic conditions.
3. Some athletes cope better in certain circumstances than others.
4. In team sports, having just one player coping badly with environmental conditions can affect the whole team.

## REFERENCES

- Aman, Y. (2018)**, "Effect of Humidity on Athletic Performance", Thinking and Running. Retrieved from <http://marathonman7.blogspot.com/2018/07/effect-of-humidity-on-athletic.html>
- Brocherie, Franck & Girard, Olivier & Millet, Gregoire. (2015)**. Emerging Environmental and Weather Challenges in Outdoor Sports. *Climate*, (3): 492-521
- Che Muhamed, A. M., Atkins, K., Stannard, S. R., Mündel, T., & Thompson, M. W. (2016)**. The effects of a systematic increase in relative humidity on thermoregulatory and circulatory responses during prolonged running exercise in the heat. *Temperature (Austin, Tex.)*, 3(3), 455–464.
- Government of Arunachal Pradesh**, District Namsai, Digital India Retrieved from <https://www.namsai.nic.in>.
- Gupta, Sen., Swamy, YV., Pichan, G. & Dimri GP. (1984)**, Physiological responses during continuous work in hot dry and hot humid environments in Indians, *Int J Biometeorol*, 28(2):137-46.
- González-Alonso, J., Calbet, J A & Nielsen, B (1998)**, Muscle blood flow is reduced with dehydration during prolonged exercise in humans *J Physiol*, 15;513,
- Griffiths, Sarah** "The Effects of Heat on Sport Performance "Believe Perform Retrieved from <https://believeperform.com>.
- Intermountain Healthcare (2014)** What is the effect of heat and humidity on athletic performance Retrieved from <https://intermountainhealthcare.org>.
- Matzarakis, A., Fröhlich, D., Bermon, S. & Adami, P. E.. (2019)**. Visualization of Climate Factors for Sports Events and Activities–The Tokyo 2020 Olympic Games, *Atmosphere*, (10): 572.
- Olivier Hue. (2011)**, The Challenge of Performing Aerobic. Exercise in Tropical Environments: Applied Knowledge and Perspectives. *International Journal of Sports Physiolo*, 6 (4):443-454.
- Pezzoli, A., Cristofori, E., Moncalero, M., Giacometto, F. and Boscolo, A. (2013)**, Climatological Analysis, Weather Forecast and Sport Performance: Which are the Connections?, *J Climatol Weather Forecasting*, 1(1) :1-3
- Tipton, M.J. (2016)**, Environmental extremes: origins, consequences and amelioration in humans. *Exp Physiol.*, 101(1):1-14.
- Thornes, John. (1977)**. The Effect of Weather on Sport. *Weather*. 32. 258-268. Retrieved from <https://www.researchgate.net/publication/260819737>.
- Wikipedia**, Effects of weather on sport- Retrieved from <https://en.m.wikipedia.org>
- Wikipedia**, Effects of weather on sport- Retrieved from <https://en.m.wikipedia.org>
- Wikipedia**, Effects of weather on sport- Retrieved from <https://en.m.wikipedia.org> .



## COMPARISON OF ATTITUDE BETWEEN BOYS AND GIRLS STUDENTS TOWARDS PHYSICAL ACTIVITY

Harjinder Kaur<sup>1</sup>

### Affiliation:

<sup>1.</sup> Research Scholar, Department of Physical Education, Panjab University, Chandigarh, (160014) Mobile - 8728950968 Email id:- jinderbains376@gmail.com

---

### ABSTRACT

The objective of the study was to compare the general attitude, physical education and scientific basis variables in boys and girls students regarding physical activity. It was hypothesized that there might be significant gender difference between the selected variables. Fifty (twenty five girls and twenty five boys students) were randomly selected as subjects for the study. Age of the subjects ranged from 17 to 24 years. Data was collected using a Physical Activity Questionnaire by Mowatt, DePauw, & Hulac (1988) for students. The data for the study was collected by distributing the questionnaires to the subjects personally by the researcher. The data was computed as mean, Standard Deviation and 't' test and the hypothesis was tested at 0.05 level of significance. According to our findings, the variables namely general attitude ( $t=3.011$ ), physical education ( $t=2.823$ ), scientific basis ( $t=-5.172$ ), were significantly different in boys and girls students.

**Keywords:** Student, Physical activity, Attitude. Boys, Girls

---

## 1. INTRODUCTION

Now a days, youth have more leisure time and thus “an empty brain is a devil’s work shop”. It is one of the reasons why our youth is involved in drugs and other unsocial activities. It is very dangerous for our nation, if this mind is used in physical activity than our youth can get away from the menace of drugs and other unsocial activities. Physical activity is the best tool that we use in leisure time because it is not only beneficial to health, but also important to maintain the personality and mental development. It is therefore, a pressing responsibility on the part of the nations to safeguard the interest of youth and attempt to make every conceivable effort to provide them opportunities for recreational activities and thereby channelising their energy towards gaining meaningful experience. Wholesome physical activity is considered these days as one of the best means of occupying one’s leisure time. One can have a unique sense of satisfaction through participating in physical activity of one’s choice.

**Kraus (1971)** states that the word has at least four widely found meanings: the “classical” view, the view of leisure as a function of social class, the concept of leisure as a form of activity, and the concept of leisure as free time. In his study **Johnson (1972)** studied the attitude of male students at Brigham Young University towards physical education. He concluded that the male students had favorable attitude towards physical education throughout the full semester 1970-71. The earliest concept of physical activity is for the body equilibrium. The term exercise is mentioned in the work of Hippocrates and in the work of many other scholars of ancient Greece. The nature of the body even before being officially sanctioned by the Olympic Games, it is through play-activities that the child discloses its real self and clearly expresses its inner feelings. **Conti (2007)**. Physical activity is categorized as a positive leisure activity, which is linked to many health benefits. Physical activity is defined as any movement between skeletal muscles that exerts energy. It is categorized as low, moderate, vigorous and strength training activities and must be consecutive for at least 20 minutes (**Sliter & Sliter, 2014**).

Regular physical activity of moderate intensity namely walking, cycling, or playing sports is very beneficial for health. Engaging in regular physical activity is one of the best ways to improve general health. Physical activity has become the prime health indicator where it plays an essential role in enhancing physical fitness and health related behaviour that could lower the risk of morbidity and mortality from diseases (**Sundland et al., 2008**). **Caspersen et al. (2000)** viewed that in spite of well documentation of the benefits of physical activity, participation declines precipitously between 15-25 years of age. Physical activity has been labeled as one of the biggest health problems of the 21st century (**Blair, 2009**). Epidemiological evidence indicates that the level of physical activity declines from high school to college, and activity patterns in college populations are generally insufficient to improve health and fitness (**Kilpatrick, 2005**).

Physical activity is very important for all age group but this is more important for young people. In previous study they conclude that girls have more positive attitude towards physical activity rather than boys. With the help of physical activity students concentration power was increased and the other mind related factor like stress, depression was decreased.

The objective of the study was to compare the general attitude, physical education and scientific basis variables in boys and girls students regarding physical activity. It was hypothesized that there might be significant gender difference between the selected variables.



## 2. METHODOLOGY

### 2.1 Selection of Subjects

Fifty students (twenty five girls and twenty five boys) were randomly selected as subjects for the study. Age of the subjects ranged from 17 to 24 years.

### 2.2 Instrumentation

Data was collected using a Physical Activity Questionnaire by Mowatt, DePauw, & Hulac (1988) for students. The data for the study was collected by distributing the questionnaires to the subjects personally by the researcher. The researcher personally contacted the subjects and explained them the details of the questionnaires and the study. The subjects were given enough time and the researcher personally motivated the subjects to give responses honestly and freely. The data was collected from Post Graduate Government College Sec.-11, Chandigarh.

Equipment needed for fill the questionnaire is Inventory forms, Pencil/pen and Scoring key .Scoring procedure of questionnaires was positive statements are scored from +5 to +1, and negative statements are scored from +1 to -5. The total score is the sum of the points for all the statement responses. The higher score indicates more the positive attitude towards physical activity.

**TABLE 1**  
**ALLOCATION OF ITEMS OF PHYSICAL ACTIVITY QUESTIONNAIRE**

Variables	Items	Items Numbers	Remarks
General Attitudes	05	1, 3, 4, 10, 20	Represent one's personal feelings or attitudes toward physical activity.
Physical Education	06	5, 8,13,14,16, 18	Describe how one sees physical education as an offering in curriculum.
Scientific Basis	09	2,6,7,9, 11, 12, 15, 17, 19	Describe how one assessed the scientific benefits of exercise.

### 2.3 Statistical Analysis

The data was computed with mean, standard deviation and t- test. The hypothesis was tested at 0.05 level of significance.

## 3. RESULTS

**TABLE 2**  
**DESCRIPTIVE PRESENTATION OF MEAN SCORES OF GENERAL ATTITUDE OF BOYS AND GIRLS STUDENTS TOWARDS PHYSICAL ACTIVITY**

Variable	Gender	N	Mean	SD	Std. Error mean
General attitude	Girls	25	19.08	2.53	.50
	Boys	25	16.36	3.74	.74

Table no 2 presents mean scores of general attitude of students (girls and boys) towards physical activity. Girl students recorded 19.08 as mean score, 2.53 as SD and .50 as SEM for general attitude towards physical activity whereas boys registered mean score as 16.36, 3.74 as SD and .74 as SEM with regard to general attitude towards physical activity.

**TABLE 3**  
**COMPARTATIVE ANALYSIS OF MEAN SCORE OF GENERAL ATTITUDE OF BOYS AND GIRLS STUDENTS TOWARDS PHYSICAL ACTIVITY**

Variable	Groups	Mean	SD	MD	SED	t- ratio
General attitude	Girls	19.08	2.53	2.72	.90	3.011*
	Boys	16.36	3.74			

\*Significant at .05 level

't' .05(48)=2.011

From the table 3 it is clear that the higher mean score (19.08) recorded by girls is better than the boys mean score (16.36). The girls seem to have better positive attitude towards general attitude for physical activity than boys. Further the obtained t value that is 3.011 which is higher than the tabulated value that is 2.01, it becomes evident that the difference of mean score towards general attitude of boys and girls towards physical activity has been found statistically significant at .05 levels.

**TABLE 4**  
**DESCRIPTIVE PRESENTATION OF MEAN SCORES OF ATTITUDE OF BOYS AND GIRLS STUDENTS TOWARDS PHYSICAL EDUCATION**

Variable	Gender	N	Mean	Std. Deviation	Std. Error mean
Physical education	Girls	25	22.00	2.62	.52
	Boys	25	19.12	4.37	.87

Table no 4 presents mean scores of physical education of students (girls and boys) towards physical activity. Girl students recorded 22.00 as mean score, 2.62 as SD and .52 as SEM for general attitude towards physical activity whereas boys registered means score as 19.12, 4.37 as SD and .87 as SEM with regard to physical education towards physical activity.

**TABLE 5**  
**COMPARTATIVE ANALYSIS OF MEAN SCORES OF ATTITUDE OF BOYS AND GIRLS STUDENTS TOWARDS PHYSICAL EDUCATION**

Variable	Groups	Mean	SD	MD	SED	t- ratio
Physical education	Girls	22.00	2.62	.80	.59	2.823*
	Boys	19.12	4.37			

Significant at .05 levels,

't' .05(48)=2.011

From the table 5 it is clear that the higher mean score (22.00) recorded by girls is better than the boys mean score (19.12). The girls seem to have better positive attitude towards physical education than boys. Further the obtained t- value that is 2.823 which is higher than the tabulated value that is 2.011, it becomes evident that the difference of mean score towards physical education of boys and girls has been found statistically significant at .05 levels.

**TABLE 6**  
**DESCRIPTIVE PRESENTATION OF MEAN SCORES OF ATTITUDE OF BOYS AND GIRLS STUDENTS TOWARDS SCICNTIFIC BASIS OF PHYSICAL ACIVITY**

Variable	Gender	N	Mean	Std. deviation	Std. Error mean
Scientific basis	Girls	25	36.88	4.98	.99
	Boys	25	29.36	5.29	1.05

Table no 6 presents mean scores of scientific basis of students (girls and boys) towards physical activity. Girl students recorded 36.88 as mean score, 4.98 as SD and .99 as SEM towards scientific basis of physical activity whereas boys registered means score as 29.36, SD as 5.29 and SEM as 1.05 with regard towards scientific basis of physical activity.

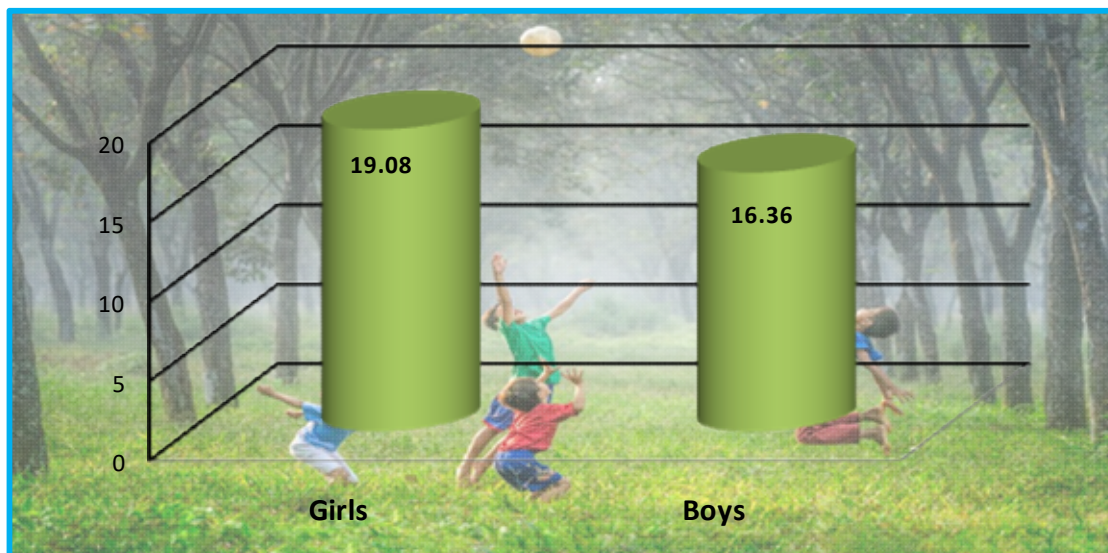
**TABLE 7**  
**COMPARATATIVE ANALYSIS OF MEAN SCORES OF ATTITUDE OF BOYS AND GIRLS STUDENTS TOWARDS SCICNTIFIC BASIS OF PHYSICAL ACTIVITY**

Variable	Groups	Mean	SD	MD	SED	t- ratio
Scientific basis	Girls	36.88	4.98	7.52	1.45	5.172*
	Boys	29.36	5.29			

Significant at .05 levels

't' .05(48)=2.011

From the table 7 it is clear that the higher mean score (36.88) recorded by girls is better than the boys mean score (29.36). The girls seem to have better positive attitude towards scientific basis of physical activity than boys. Further the obtained t-value that is 5.172 which is higher than the tabulated value that is 2.01, it becomes evident that the difference of mean score of boys and girls towards scientific basis of physical activity has been found statistically significant at .05 levels.



**Figure -1: Graphical Representation of Mean Scores of General Attitude of Boys and Girls Students towards Physical Activity**

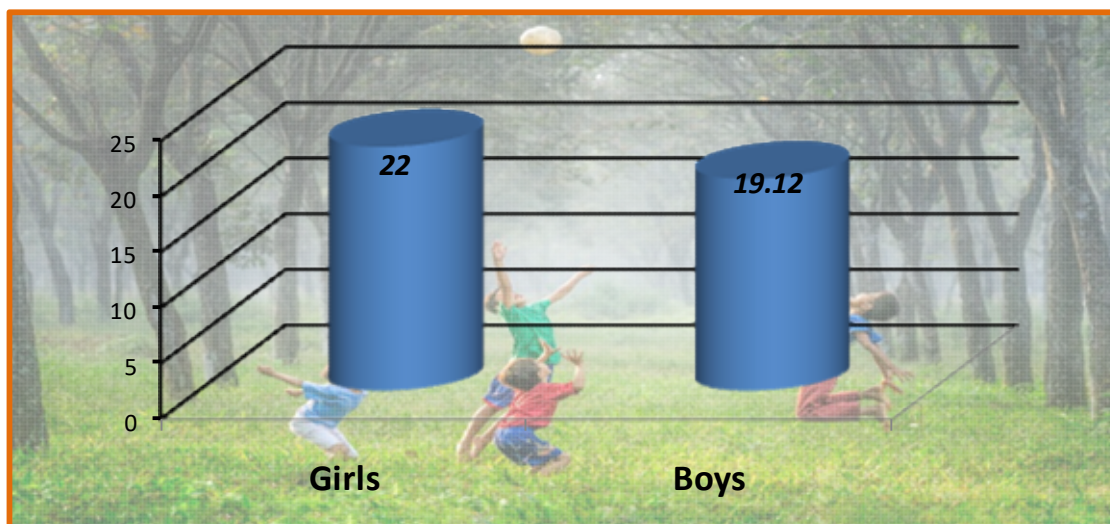


Figure -2: Graphical Representation of Mean Scores of General Attitude of Boys and Girls Students towards Physical Education

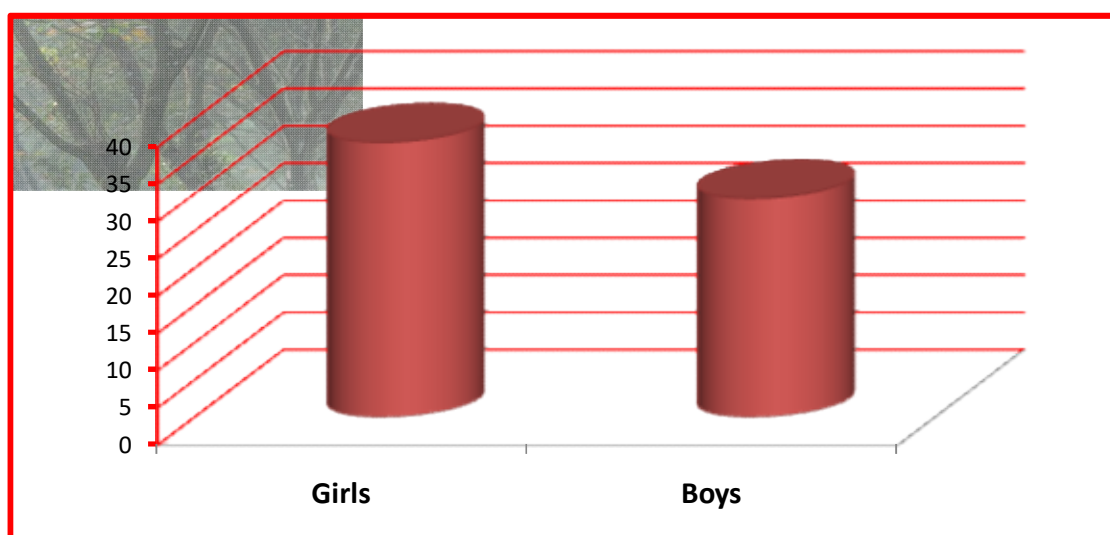


Figure -3: Graphical Representation of Mean Scores of General Attitude of Boys and Girls Students towards Scientific Basis of Physical Activity

#### 4. DISCUSSION

Girls student have more positive approach towards physical activity. There is statistically significant difference between boys and girls regarding their positive approach towards physical activity.

#### 5. CONCLUSION

On the basis of above finding it can be concluded that girls have more positive approach towards physical activity than the male students. The student girls are more active in their approach towards general attitude, physical education and scientific basis of physical activity than the boys. There for it can be concluded girls are more concerned towards their physical fitness and approach towards physical activity.

### **REFERENCES**

- Blair, S. N. (2009).** Physical inactivity: the biggest public health problem of the 21st century. *British Journal of Sports Medicine*, 43(1), 1-2.
- Caspersen, C. J., Pereira, M. A., & Curran, K.M. (2000).** Changes in physical activity patterns in United States, by sex and cross-sectional age. *Medicine and Science in Sports & Exercise*, 32(9), 1601-1609.
- Conti, C. L., Marshall, A. L., Sjostrom, M., Bauman, A. E., Booth, M. L, Ainsworth, B. (2007).** International Physical Activity Questionnaire (IPAQ): 12-country reliability and validity. *Medical Science Exercise Sport*, 35, 1381-1395.
- Johnson, R.M.(1972),** “ Attitude towards physical Education”, Diss, Abst. Int. 32:3761-A.
- Kilpatrick, M., Hebert, E., & Bartholomew, J. (2005).** College students’ motivation for physical activity: Differentiating men’s and women’s motives for sport participation and exercise. *Journal of American College Health*, 54(2), 87-94.
- Mowatt, M., Depauw, K. P., & Hulac, G. M. (1988).** Attitudes toward physical activity among college students. *Physical Educator*, 45, 103-108.
- Richard Kraus. (1971).** Recreation and leisure in modern society. New York: Appleton century crofts.
- Sliter, K. A. & Sliter, M. T. (2014).** The concise physical activity questionnaire (CPAQ): Its development, validation, and application to firefighter occupational health. *International Journal of Stress Management*, 21(3), 283.
- Sundland, G. B., Jansson, A., Saartok, T., Renstrom, P. & Engstrom, L. M. (2008).** Self-rated pain and perceived health in relation to stress and physical activity among school students: a 3-year follow up. *Pain*, 136, 239-23.



## IMPACT OF SPORTS CULTURE ON HUMAN HELATH

Dr. Ravindra Baliram Khandare<sup>1</sup>

### Affiliations:

1. Director of Physical Education & Sports, Mula Education Society's Arts, Commerce & Science College Sonai, Dist:-Ahmednagar (M.S) Email: [ravikhandare03@gmail.com](mailto:ravikhandare03@gmail.com)  
Mobile- 8888261333, 9423396407

---

### ABSTRACT

Sports and culture are widely perceived to generate impacts, sports bring competition, teach morality, integrity and ambition, are exciting amusing and challenging. But most of all they bring us hope its magnificent ability to unit people molar sports a powerful communication tool. Communities that participate in sport and recreation develop strong special bonds are stare places and people who live in them are generality healthy and happier than places where physical activity in not a priority sport and recreate in builds stronger, healthier, happier and safer communities.

**Keywords:** - Culture, Sports, Community, Society, Health, Fitness, Physical.

---

## 1. INTRODUCTION

Man in a social animal he can't live without society this statement important for every men and woman was in living in the society. There is significant evidence of number of social impacts from participation in sport and exercise. Neither a culture in the express in of a team's values, attitudes, and goals about sports, competition, and relationships culture represents the helps band practical of a group, while society represents the people who share those beliefs and practices neither society nor culture could exist without the other( **Jarvie, 2012**).

Sports form part of a nation's culture. It in global even, able to delight billions and attract their attention to periodic Olympic, world international pass Olympic Games. Sports are to be appreciated for its loon sake, as part of the nation's activities a positive aspect of our world activities (**Cashmore, 2003**). A team culture in so important because it directly influences many areas that affect team functioning and performance the culture establishes roars of acceptable behavior on a team either explicitly or implicitly conveying to members what in allowed and what in not.

Sports enhances social and cultural late by bringing together individuals and communities sports can help to overcome difference and encourages dialogue and there by helps to break. Down prejudice, stereotype, culture differences, ignorance, intolerance and discrimination (**Schirato, 2007**).It's very good impact on society and human health.

## 2 SOCIAL BONDING

Through sports, students could enjoy friendship and have a sense of belonging. Students could learn to respects other, help each other, think of other people, encourage each group members, and earn good value though strong social bonding among team members. Through sports, social bonding not only created among students but also their percent support, are of the sport team audience and these involve directly or indirectly in the sport collaboration (**Vijayan, 1951**). Their relationships could strength the social bonding and promote the sense of belonging among students and other peon involved.

Sports culture promotes good health to students and people whose by those involve in sports normally have good stamina and heather man other these students and people are normally active, more confidence and cheerful. Sports in physical activities that help human to sustain health and prevent them from chronic diseases such as obesity, anxiety depression, heart attract, diabetic, etc. Sports and games become crucial role in helping the development of human minds and body especially for children (**Agashe, 2012**). Sports activities could prevent them from involving in negative activities, yet creasing the quality of life.

Sports create a good positive culture and amazing, unique way of making a crucial impact in society. Whether it's helping children, communities or even nations, sports make differences on daily baits. Sure make a difference on a daily basis sure nothing in all sunshine and lollipops, but there in goal being done with sports as the platform. Team and player foundation are raising many for worthy causes, major even are boosting local economies and kids are encouraged to get out and get activities.

## 3. SPORTS CULTURE

Sports culture makes good relation between counties though organized games tympanic, Asian games, world cups etc. Sports and make a significant contributes to your quality of life, its impacts physical and mental health, social life opportunities.

### 3.1 Concentration

Regular physical activity helps keep your key mental skills sharper you age. This includes critical thinking learning and using good judgment. Research has shown that



doing a mix of aerobic and muscle strengthening activities' in especially helpful. Participating in this kind of activity three to five times a week for at least 30 minutes can provide these mental health benefits (**Scrambler, 2005**).

### **3.2 Leadership**

Team sports such as soccer, baseball and basketballs are breeding grounds for leadership traits. Students done in high schools reveal a correlation between sports participation and leadership qualities because of the opportunity to train, try, win or lose together, people involved in sports are naturally more inclined to allot a "team mindset" in the workplace and in social situations. The team mindset leads to strong leadership qualities over time.

### **3.3 Quality Of Life**

The regular exercise that comes with playing sports a boost your confidence and improve your self esteem. As your strength, skills and stamina increase through, playing sports, your self – image will improve as well. With the renewed vigor and energy that comes from physical activity, you may be more likely to succeed in tasks off the playing fields as well as it (**Galloway, S. 2009**).

### **3.4 Sports and Depression**

When you are physically active, you're amending in distracted from daily stress is. This can help you avoid getting bogged down by negative thoughts. Exercise reduced the levels of stress hormones in your body. At the same time, it stimulates the production of endorphins there are natural mood lifts that can keep stress and depression at bay endorphins may even leave you feeling more relaxed and optimistic after a hard workout. Experts agreed that more quality research is needed to determine relationship between sports and depression (**National Endowment for the Arts.2010**).

### **3.5 Sports and Health**

The central health ministry's recommend sports participation as a healthy way to maintain weight. Individual sports, such as running, cycling, and weight lifting are as particularly effective ways to burn calories and build muscle. Staying within a recommended weight range reduced the risk of developing diabetes, high cholesterol, and hypertension.

### **3.6 Economic and Social Culture**

The UN committee on Economic and social culture rights defines culture as follows. Culture encompasses, interacts, ways of life, language, oral and written literature, music and song, non – verbal communication, religion or belief systems, sport and games, methods of production or technology groups of individual and communities express their humanity and meaning they to their existence, and build their world view repress ending their encounter with the external forces affecting their lives. Some aspects of culture are highly visible for instance the way people dress.

## **4. CONCLUSION**

Sports is a universal element in all culture and therefore we have chosen to include it as a theme for research. Sport is popular particularly with young people sports provide young people. Sports provide young people with opportunities for social interaction through which they can develop the knowledge, skills and attitudes necessary for their key participation in civil society. Culture and sport are both human rights and related to various other human rights culture is also the lens through which we view and interpret life and society, Culture is passed over from one generation to the next, while incorporating new elements and discarding other.



### **REFERENCES**

- Agashe, Sanjay R. (2012)**, Principle and History of Physical education and sports  
Khel Sahitya Kender. New Delhi.
- Cashmore, Bills (2003)**, Sports Culture: An A-Z Guide, Routledge World Reference.
- Galloway, S. (2009)**, Theory-Based Evaluation and Social impact of the arts, Cultural Trends,  
18( 2): 125-148
- Jarvie, G. (2012)**, Sport, Culture and Society: An Introduction, Second Edition Routledge  
Publiation.
- National Endowment for the Arts.(2010)**, How Technology Influences Arts Participation.  
Washington: National Endowment for the Arts.
- Schirato, Tony (2007)**, Understanding Sport Culture, Sage Publication, New Delhi.
- Scrambler, Graham (2005)**, Sports and Society History Power and Culture, Publisher Open  
University Press Michigan
- Vijayan, Bala (1951)**, Indian sports conversation and Reflections, Zorba Books New Delhi.



**A STUDY OF KNOWLEDGE AND PRACTICE OF BALANCED DIET ON NATIONAL LEVEL MALE ATHLETES OF TEAM GAME AND INDIVIDUAL GAME**

**Basanti Bamaniya<sup>1</sup> Dr. Vivek B. Sathe<sup>2</sup> & Dr. V.F. Peter<sup>3</sup>**

**Affiliations:**

- <sup>1.</sup> Research Scholar School of physical education Devi Ahilya University Indore, Madhya Pradesh, India. 452001 & Corresponding author Email: bbamaniya90@gmail.com
- <sup>2.</sup> Asst. Professor School of physical education Devi Ahilya University Indore, Madhya Pradesh, India. 452001
- <sup>3.</sup> Professor, School of physical education Devi Ahilya University Indore, Madhya Pradesh, India. 452001

**ABSTRACT**

The purpose of this study was to investigate the knowledge and practice of balanced diet on national level male players N= 80 national level male players of team games and individual games. 40 players from team games and 40 players from individual games. N= 10 players were selected from each game. Researcher had taken total 8 games as the age of the players between 18-30 years. The sample size was reached out to the maximum team game and individual game players of India represented National level domestically. Data was collected through random sampling method (online mode), descriptive statistics were calculated in M.S. Excel. The results of the study revealed that Kho-kho, hockey, and basketball players were found to have good knowledge of balanced diet than kabaddi players. Kho-kho, and kabaddi players have good practice of balanced diet than hockey and basketball players. Athletics and tennis players were found to have good knowledge of balanced diet as compared to badminton and wrestling players. Badminton players have good practice of balanced diet than Tennis and Wrestling players.

**Keywords:** Balanced diet, knowledge, practice, National level, male players.

## 1. INTRODUCTION

Every sports men need to use proper diet before, during and after the activity. Lack of proper diet not only adversely affects the performance of athlete but it extensively affects the overall functional capacity of the body of athlete. Sports diet has been one of the basic needs of every players participating at various level of sports.

**According to Hoch et al.** sports diet enhances athletic performance by decreasing fatigue and the risk of disease and injury; it also enables athletes to optimize training and recover faster. Athletes must fuel their bodies with the appropriate nutritional foods to meet their individual energy requirements in competition, training and recovery. If these nutritional needs are not met, there is an increased risk of poor performance and health issues (**Khan et al., 2017**).

Nutrition is an important part of sport performance for young athletes, in addition to allowing for optimal growth and development. Macronutrients, micronutrients and fluids in the proper amounts are essential to provide energy for growth and activity. To optimize performance, young athletes need to learn what, when and how to eat and drink before, during and after activity **Purcell (2013)**,

Sports nutrition is a science that requires a solid understanding of the nutritional factors effecting performance, recovery and health, a knowledge of the nutritional value of food and fluids and the necessary skills to implement appropriate nutritional strategies into daily training and competition (**Srivastava, et.al., 2017**).

Sports nutrition enhances athletic performance by decreasing fatigue and the risk of disease and injury; it also enables athletes to optimize training and recover faster. Basic nutrition is important for growth, achieving good health and scholastic achievement, and providing energy (**Hoch, Goossen and Kretschmer, 2008**).

Sports and nutrition are directly related to each other. Taking into consideration the fact that sportspersons need more energy to carry out their spotting activity effectively, it becomes of prime importance to take care of the nutrition for sports performance. Track and field athletes pose a strong emphasis on diet. While only a few students have been conducted on nutrition knowledge among collegiate athletes, the majority of them have been conducted on nutrition knowledge in this population (**Supriya and Ramchandra 2013**)

Nutrition knowledge of an athlete, as well as practice, is expected to influence athlete's performance. The study assessed the nutrition knowledge and practice as well as athletes' performance and identified the factors predicting the athletes' performance. Having good nutrition knowledge or practice did not directly determine athletic performance. However, there is the need for nutrition education interventions, to improve athlete's performance by promoting adequate energy intake, lean muscle mass and appropriate weight gain in athletes (**Folasire, Akomolafe, and Sanusi, 2015**).

Current knowledge about this issue is that the impact of nutrition knowledge of athletes on their dietary intake is equivocal. A recent systematic review reported a weak positive correlation between nutrition knowledge and dietary intakes of athletes (**Heaney, et. al., 2011**). Moreover, a significant increase in total energy, carbohydrates, and protein intakes, as well as increased nutrition knowledge was reported in another study (**Valliant, Emplaincourt, & Wenzel, 2012**);).

Balanced diet knowledge of an athlete, as well as practice, is expected to influence athletes performance. A diet is all that we consume in a day. And a balanced diet is a diet that contains an adequate quantity of the nutrients that we require in a day.

A balanced diet includes six main nutrients, i.e. Fats, Protein, Carbohydrates, Fibre, Vitamins, and Minerals. All these nutrients are present in the foods that we eat. Different food items have

different proportions of nutrients present in them. The requirements of the nutrients depend on the age, gender, and health of a person (<https://www.toppr.com>.)

Knowledge and practice of balanced diet play a key role in the maintenance of good health and prevention of diseases. While a well-balanced diet aims at providing the essential nutrients, the role of dietary supplement in complement the diet cannot be undermined. Dietary supplements represent an important source of essential nutrients ( **Alowais and Selim, 2019**).

Good knowledge and practice of balanced diet have been recognized as important factors in improving the player's performance and health status. A balanced diet need of the sportspersons is higher than non-athletes. Balanced diet requirements are based on age, gender, total energy expenditure, type of sport played and environmental conditions (**Bamaniya, Sathe and Sahani, 2019**).

## **2. METHODOLOGY**

### **2.1 Selection of Subject**

The objective of this study to see the knowledge and practice of balanced diet of national level male players N= 80 national level male players of team games and individual games. 40 players from team games and 40 players from individual games. N= 10 players were selected from each game. Researcher had taken total 8 games i.e. Kho-kho, Kabaddi, Basketball, Hockey, Athletics, Tennis and wrestling players. The age of the players was between 18-30 years.

### **2.2 Instrumentation**

Eating habits questionnaire (Dana Farber Cancer Institute website) modify according to Indian food availability and used for Practice of balanced diet. A 37 multiple choice questionnaires regarding the knowledge of a balanced diet. The final questionnaire was further examined by a physical education experts, Physicians specialized in the area of sports medicine and Nutritionist. Reliability and validity was checked with index discrimination and difficulty rating method consisted of 52 ques

The data was collected through online-survey. tionnaires regarding the practice of a balanced diet. The questionnaire was already prepared.

A pilot study was performed among 20 players of Physical education, Devi Ahilya University, Indore (M.P.). The questionnaire consisting of 2 sections was developed, tested and verified at pilot study before the start of the final study

### **2.3 Criterion Measures**

The score was obtained for knowledge of balanced diet questionnaire with each having four options multiple choice questions used and scored (1 or 0). Practice of balanced diet total 52 questionnaires with each having 9 option 1-5 scale was used and scored from: (Never or less than one -1score, 1-3 per month -2 score, 1 per week -3 score, 2-4 per week -4 score, 5-6 per week 5-score, 1- per day 4 score, 2-3 per day 3 score, 4-5 per day 2 score, 6+ per day 1 score).

### **2.4 Statistical Analysis**

The collected data through questionnaires were decoded, tabulated and analyzed statistically. mean and standard deviation were calculated from the scores of knowledge and practice of balanced diet questionnaires.

## **3. RESULTS AND DISCUSSION**

To compare the Knowledge and practice of balanced diet on national level male players of team games and individual games, means and standard deviations were calculate and data pertaining to this has been presented in Table 1 to 4 and depicted in figure 1 to 4.

**TABLE 1**  
**DESCRIPTIVE STATISTICS OF KNOWLEDGE OF BALANCED DIET IN NATIONAL LEVEL TEAM GAME PLAYERS OF DIFFERENT SPORTS AND GAME**

S.NO.	Statistics	Kho-Kho	Kabaddi	Hockey	Basketball
1.	Mean	18.6	12.3	17.4	17.1
2.	SD	7.27	5.43	5.91	5.46

Table 1 shows that knowledge of balanced diet kho-kho mean is 18.6, kabaddi mean is 12.3, Hockey mean is 17.4 and basketball mean is 17.1 It clearly shows that kho-kho, hockey, and basketball players have good knowledge as compared to kabaddi players.

**TABLE 2**  
**DESCRIPTIVE STATISTICS OF KNOWLEDGE OF BALANCED DIET IN NATIONAL LEVEL INDIVIDUAL GAME PLAYERS OF DIFFERENT SPORTS AND GAME**

S.NO.	Statistics	Athletic	Badminton	Tennis	Wrestling
1.	Mean	19.7	12.6	19.3	15.2
2.	SD	3.33	7.12	8.30	6.17

Table 2 shows that knowledge of balanced diet of athletics male players mean was 19.7, badminton mean was 12.6, tennis mean was 19.3 and wrestling mean is 15.1 It clearly shows athletics and tennis, players have good knowledge as compared to badminton and wrestling players.

**TABLE 3**  
**DESCRIPTIVE STATISTICS OF PRACTICE OF BALANCED DIET IN NATIONAL LEVEL TEAM GAME PLAYERS OF DIFFERENT SPORTS AND GAME**

S.NO.	Statistics	Kho-Kho	Kabaddi	Hockey	Basketball
1.	Mean	160.2	159.3	149.0	156.1
2.	SD	22.95	39.64	27.10	26.90

Table 3 shows that practice of balanced diet kho-kho mean was found 160.2, kabaddi mean was 159.3, Hockey mean is 149, and basketball mean is 156.1 It clearly shows that kho-kho, and kabaddi players have good practice as compared to hockey and basketball players which are team games of different players.

**TABLE 4**  
**DESCRIPTIVE STATISTICS OF PRACTICE OF BALANCED DIET IN NATIONAL LEVEL INDIVIDUAL GAME PLAYERS OF DIFFERENT SPORTS AND GAME**

S.NO.	Statistics	Athletic	Badminton	Tennis	Wrestling
1.	Mean	149.7	165.5	136.5	150.8
2.	SD	21.35	23.25	22.68	29.51

Table 4 shows that practice of balanced diet of Athletics mean is 147.7, Badminton mean is 165.5, Tennis mean is 136.5, and wrestling mean is 150.8 which clearly shows that Badminton players have good practice as compared to athletes of Tennis and Wrestling players as far as Individual male athletes are concerned.

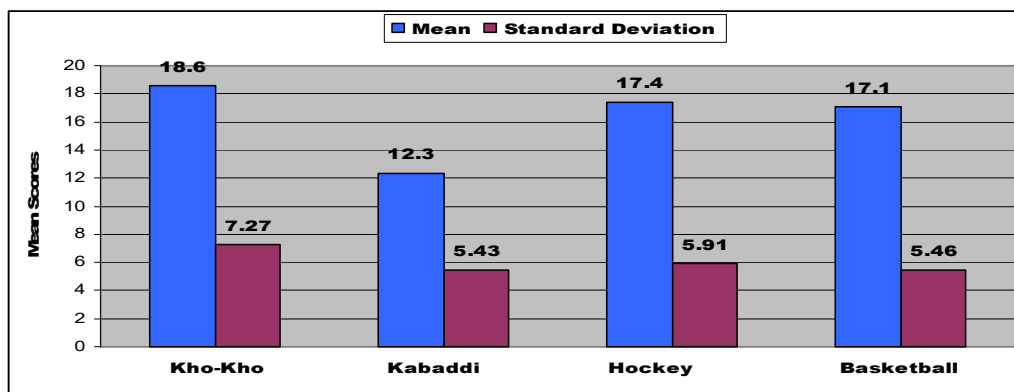


Figure-1: Knowledge of balanced diet National level male team game players.

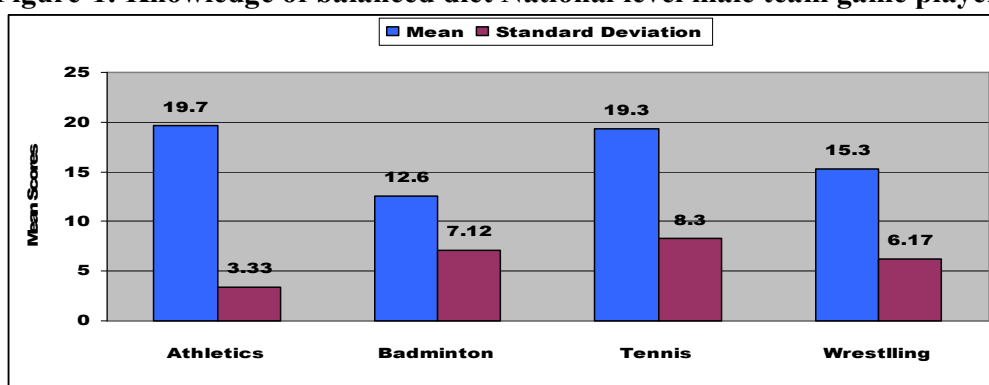


Fig. 2 :Knowledge of balanced diet National level male Individual game players.

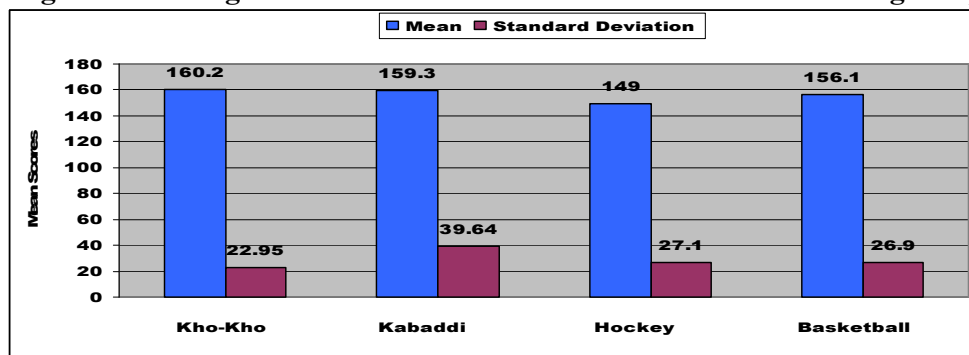


Fig. 3: Practice of balanced diet National level male team game players

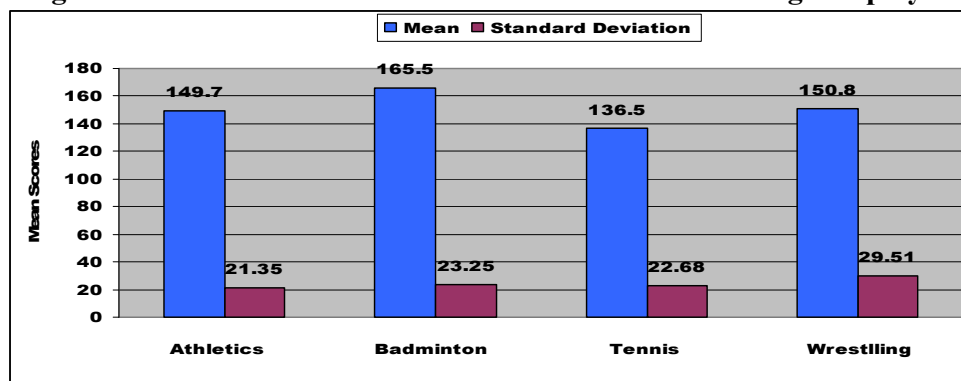


Fig.4: Practice of balanced diet National male individual game players.

#### 4. DISCUSSION

Balanced diet is an important component of any physical fitness program the optimum nutrient intake and good balanced diet knowledge and practice have been recognized as important factors in improving the player's performance and health status of players. The present study was conducted to assess the knowledge, practice, balanced diet on national male athletes of team and Individual players. Badminton playing male athletes were superior as compared to rest of the compared Individual game in practicing balanced diet on the contrary to that they are lacking having knowledge yet they are practicing it thus it shows they need education and streamling. Whereas in Team game ; Kho Kho game playing male athletes found significantly better on the basis of mean score as compared to other team game playing male athletes in practicing balanced diet. Kho Kho playing male athletes were superior as compared to rest of the Team game Male Athletes and they practice it religiously too. Team game Kho Kho male athletes can set example for rest of the athletes to acquire knowledge and practice the same. Individual game playing male athletes. Kabaddi players are good with practicing despite of not having apt knowledge of the same.. Basketball Players lacks necessary knowledge of balanced diet. If we sum up Individual playing male athletes are practicing without knowledge.

#### 5. CONCLUSIONS

1. Kho-kho, hockey, and basketball players were found to have good knowledge of balanced diet than kabaddi players.
2. Kho-kho, and kabaddi players have good practice of balanced diet than hockey and basketball players
3. Athletics and tennis players were found to have good knowledge of balanced diet as compared to badminton and wrestling players.
4. Badminton players have good practice of balanced diet than Tennis and Wrestling players.

#### REFERENCES

- Alowais, Mashaal Abdullah and Selim, Manal Abd El-Hakim (2019)**, knowledge, attitude and practices regarding dietary supplements in Saudi Arabia, *J Family Med Prim Care*, 8(2): 365–372.
- Bamaniya, Basanti, Sathe, Vivek B and Sahani, Ajay Kumar (2019)**, A comparative study of knowledge and practice of balanced diet among players of team game and individual game, *International Journal of Yogic, Human Movement and Sports Sciences*, 4(1-C): 120-124.
- Folasire, Oluyemisi F., Akomolafe, Abiola A. and Sanusi, Rasaki A.(2015)**, Does Nutrition Knowledge and Practice of Athletes Translate to Enhanced Athletic Performance? Cross-Sectional Study Amongst Nigerian Undergraduate Athletes, *Glob J Health Sci*. 7(5): 215–225.
- Hoch, A.Z., Goossen, K., and Kretschmer T. (2008)**, Nutritional requirements of the child and teenage athlete, *Phys Med Rehabil Clin N Am.*, 19(2):373–98.
- Heaney, S., O'Connor, H., Michael, S., Gifford, J., and Naughton, G. (2011)**, Nutrition knowledge in athletes: a systematic review. *Int.l J. Sport Nutr. Exerc. Metab.* 2011;21(3):248–261.
- Khan, Sami Ullah., Khan, Alamgir., Khan, Salahuddin., Khan., Muhammad Khushdil and Khan, Sajid Ullah (2017)**, Perception of Athletes about Diet and Its Role in Maintenance of Sports Performance, *Journal of Nutrition & Food Sciences*, 7: 592.
- Purcell, Laura K. (2013)**, Sport nutrition for young athletes, *Paediatr Child Health*. 18(4): 200–202. doi: 10.1093/pch/18.4.200

**Srivastava, Rekha., Fellows, Anjna., Singh, Divya Rani., Kunwar, Neelma (2017)**, Good nutritional diet for cricket players, International Journal of Home Science, 3(3): 145-147 .

**Steinbaugh, M (1984)**, Nutritional needs of female athletes . Clinical Sports Medicine, 3(3):649-70.

**Supriya V and Sri Ramchandra (2013)**, Knowledge, attitude and dietary practices of track and field athletic, men and women aged 18-22 years, International journal of innovative research and development, 2 (11):Corpus ID: 145244318

**Valliant, M. W., Emplaincourt,H. P., Wenzel, R. K. (2012)**, Nutrition Education by a Registered Dietitian Improves Dietary Intake and Nutrition Knowledge of a NCAA Female Volleyball Team. Nutrients. 4:506–516

<https://www.toppr.com/guides/science/components-of-foods/balanced-diet>





## BOOK REVIEW-ESSENTIALS OF SPORTS PSYCHOLOGY

Review by  
Dr. Ashish Kumar Nigam<sup>1</sup>

- <sup>1.</sup> **Dr. Ashish Kumar Nigam** is an Senior Sports Officer, Jawaharlal Krishi Viswavidhalaya, Jabalpur (M.P.). He has awarded Ph.D. in sports Sciences from Rani Durgawati University, Jabalpur Madhya Pradesh), India

---

### ABSTRACT

I feel this book draws information from various sport science fields neatly together and provides an up-to-date account of assessment options for field sports, fulfilling its aim of providing an interface between the academic and applied aspects of science and coaching. Over a long period of experiences in fruitful career of 35 years in sports Authority of India, he explored the practice of sports psychology through a dynamic progress of sports and physical education in India. This collection of materials on the psychology of sport, written and edited by him apart from giving information about specific issues, will help towards a better understanding of the functions of sport in our society.

## **BOOK REVIEW**

### **1. Description**

The book covers the various psychological attributes which affect the sport performance of the players in different sport events during sport training and sport competition. It will provide psychological support for athletes, coaches, sports scientists, and psychological counsellors etc. in coming future. It provides detailed and clear information about sport field-based methods that can be used to assess and improve both individual and team performance. It can be used to systematically derive measures and interventions that help athletes in dealing with challenging situations. and might provide the advantage that decides victory over defeat.

### **2. Purpose**

The book aims is to provide a contemporary knowledge for selection of appropriate psychological testing procedures for sports across a range of scientific disciplines.

### **3. Features**

The text begins chapter 1 defines and explains the term of psychology in the field of sports and physical education and describes the subfield of psychology, scope and importance of sports psychology in the field of physical education as well as in sports arena.

Chapter 2, provides an overview of the topic of cognitive process in sports and describes the importance of sensation, perception, thinking and imagination, memory and attention in sports and physical activities.

Chapter 3, deals with different aspect of motor learning i.e. meaning, definitions, stages of motor learning, and different stages of motor development in details.

Chapter 4, focuses on meaning and definitions of learning, laws of learning, motor learning curves, concept and theories of motor learning, different aspect of transfer of training and retention of motor skills.

Chapter 5, describes the meaning, definition, nature, types, structure and characteristics of personality; personality characteristics of sportsperson; personality traits of coaches and relationship between personality and sport performance and other aspect of personality in sports.

Chapter 6 describes the meaning, definition, principles, types and factors effecting of sports motivation. Author also indicates the motivation in physical education and sports as well as motivational techniques used to enhance sport performance.

Chapter 7, presents the meaning, definitions, characteristics, essentials, types of emotion arise in the field of sports; role, implication and importance of emotions in sports; influence of emotions on sport performance and emotional arousal during performance.

Chapter 8, addresses about the short term and long term psychological preparation and psychological management of athletes. challenges,

Chapter 9, deals with types and characteristics of audience; effect of audiences on sports performance; co-actors effect in sports and social facilitation.

Chapter 10, discusses the psychological aspect of action in sports. It includes the meaning, characteristics, structure, classification of action regulation; and action theory of action regulation in sports.

Chapter 11, presents the methods of investigation in sport psychology, lists of standard test in sport psychology and importance of investigation methods.

Chapter 12, focuses on the competitive anxiety in sports which includes types of anxiety, stress, arousal, relationship between anxiety and performance and suggestions for coaches.

Chapter 13, describes the heredity and environment in sports and the effect of genes on structure, function and sport performance.

Chapter 14, deals with the meaning, definition, concept, principles of mental health and hygiene. It also include the mental health of good coach, factor effect on ill-mental health and mental health and hygiene in the field of sport activities.

Chapter 15, presents the similarity and dissimilarity among male female athletes in sport.

Chapter 16, discusses the meaning, characteristics, theories, taxonomy of play and difference between play and work.

Chapter 17, deals with the characteristics of various stages of growth and development, difference between growth and development, and physical activities in various stages of growth and development. In the last chapter 18, describes the sociometric technique and sociogram in coaching.

#### **4. Audience**

This book can be considered as an excellent source for sport science students, educators and practitioners.

#### **5. Assessment**

This is a useful reference tool written by subject specialists in relation to sport Psychology. I believe deeply in the educative value for all students in the field of sport and physical education in our developing country and democratic society of India. I also believe that physical education teachers at every level and stage of their career can enrich and strengthen their teaching by learning the different aspect of sport psychology presented in this book. Participating in sports can help the physical education teachers, sport coaches and students for learning the sports skills.

#### **6. Book Citation**

Dr. Rajkumar Sharma, Essentials of Sports Psychology, Self Publisher, 2020, ISBN :978-93-5382-218-7 Self Publisher, 2020, 189 pages, INR 440 (Soft Cover), INR 650 (Hard Cover), ISBN : 978-93-5382-218-7,



## EFFECTIVENESS OF 6 WEEKS FOOTBALL TRAINING ON FLEXIBILITY OF MALE STUDENTS

Amit Kumar Paras<sup>1</sup> & Dr. Alka Nayak<sup>2</sup>

### Affiliations:

- <sup>1</sup>. Research Scholar, Department of Physical Education, Rani Durgavati Vishwavidyalaya, Jabalpur (Madhya Pradesh)
- <sup>2</sup>. Professor, Department of Physical Education, Rani Durgavati Vishwavidyalaya, Jabalpur (Madhya Pradesh)

---

### ABSTRACT

The present study was undertaken to study and compare the effect of 6 weeks football training, on flexibility. 40 students studying in different schools and colleges of Jabalpur (M.P.) were taken as the subjects for this study. The subjects were further assigned into experimental group (N=20) and control group (N=20). Six weeks football training program for flexibility was given to male students of experimental group only. Pre-test and post-test was conducted to measure the flexibility through sit and reach test. The age of the subjects ranged between 15-20 years. To find out the significance of difference between pre and post test means scores of the group, mean, SD and 't' test were computed and significance level was set at .01 level. In overall statistical analysis, it was found that there was significant difference in flexibility component of as physical fitness in experimental group and Control group.

**Keywords:** Male, Students, Training, flexibility, Groups, Tests

---

## 1. INTRODUCTION

Physical health has been evaluated in the history of mankind as an integral component of a human being's daily life. As such, the elderly relied primarily on their own strength, vigor, and stamina for physical survival (Gill, Deol, & Kaur, 2010).

It is generally agreed that physical fitness is an important part of the normal growth and development of a child, a generic definition regarding the precise nature of physical fitness has not been universally accepted. Through research and scholarly inquiry, it is clear that the multi-dimensional characteristics of physical fitness can be divided into two areas: health related physical fitness and skill related physical fitness (Douglas and Alan, 1998). Now a day's people are more aware of physical fitness. Fitness is dynamic quality that allows one to satisfy all needs regarding mental and emotional stability, social consciousness and adoptability, spiritual and moral fibre and organic health consistent with the individual heredity, fitness has become a national concern (Johnson and Nelson, 2013). Basically fitness means being in good physical condition and being able to function at one's best level. Physical fitness is to the human body what fine tuning is to an engine. It enables us to perform up to our potentials (Dutt, 2005)

Flexibility is the range of motion a joint or series of joints can pass across. Inactive individuals reduce versatility, although regular activity may maintain motion capability. The duration of muscles, tendons, and ligaments is increased by stretching exercises. Through continuous usage the ligaments and tendons maintain their elasticity. Versatility is essential to fitness; a lack of flexibility may cause individual health issues. People that are agile appear to have a healthy balance and can have less back pain. Many athletic movements, such as serving a tennis ball or kicking a soccer ball, require a range of motion to produce full energy.

Kumar (2012) compared the physical fitness status of Government and Non-Government school boys of Chandigarh. There were significant differences obtained between government and Non-Government school boys. The finding reveals that Non-Government school boys are superior in their physical fitness than their counterparts.

Ramajayam & Gopinath (2013) concluded that Health related physical fitness variables muscular strength, muscular endurance, cardio respiratory endurance and flexibility are significantly increasing when age advances performance also increased.

## 2. METHODOLOGY

### 2.1 Selection of Subjects

The subjects were selected from different schools and colleges of Jabalpur(M.P.). 40 students aged 15 to 20 years. The subjects were further assigned into two groups experimental and control group consist of 20 subjects in each group. The experimental group underwent 6 weeks training whereas control group was playing their regular game.

### 2.2 Test Used

The sit and reach test from AAPERED health related physical fitness components was selected to measure the flexibility components of physical fitness.

### 2.3 Criterion Measure

A typical measurement of flexibility is the sit and reach test, which precisely tests the stability of the lower back as well as hamstring muscles. Equipment required: sit and reach box. Scoring: The score is recorded to the nearest centimeter or half inch as the distance reached by the hand. The level of the feet was marked as the zero mark.

### 2.4 Collection of Data

Measurements for selected variables was recorded as per the instructions given in literature and manual. All the results were taken in numerical form for further analysis. These numerical scores of each test/measure recorded, represented the data for the present study.

### 2.5 Statistical Analysis

To assess the flexibility of male students significance of the difference between the pre-test and post test scores, of flexibility of male students, ‘t’ test was applied. Statistical The significance level was set at 0.05 level.

## 3. RESULTS

To find out the significance of the difference between the pre-test and post test scores on flexibility of male students in experimental and control groups, ‘mean, SD and t-ratio were computed and data pertaining to this has been presented in Table 1 and 2 and depicted in figure 1.

**TABLE 1**  
**SIGNIFICANCE OF DEFFREENCE BETWEEN PRE-TEST AND POST-TEST MEAN SCORES OF MALE STUDENTS ON FLEXIBILITY OF EXPERIMENTAL GROUP**

Test	N	Mean	SD	MD	$\sigma$ DM	t- ratio
Pre-Test	20	7.23	1.45	0.89	0.22	4.12
Post Test	20	8.12	2.02			

\*Significant at 0.01 level

t.05 (38) = 2.02

Table 1 indicates that the statistically significance of difference was observed between mean scores on Pre-test and post-test of experimental group male students on flexibility component of physical fitness, as the obtained t-value of 4.12 was higher than the required t-05(38)=2.02

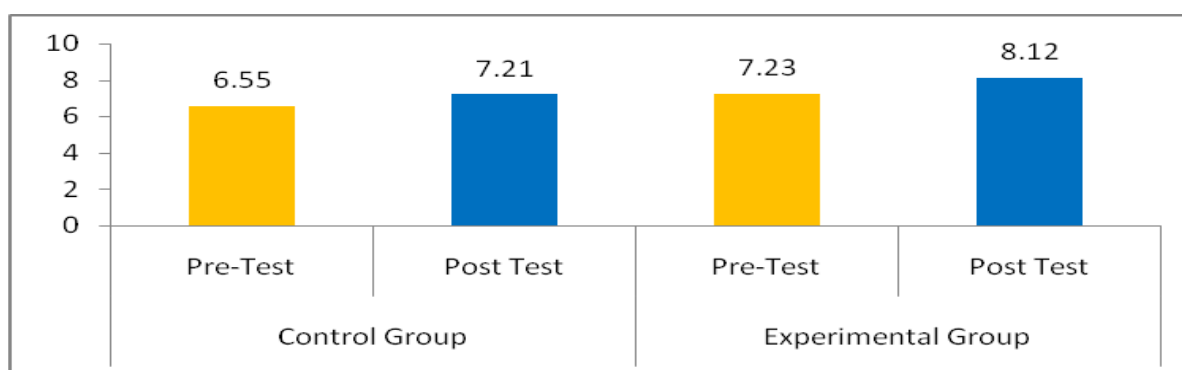
**TABLE 2**  
**SIGNIFICANCE OF DEFFREENCE BETWEEN PRE-TEST AND POST-TEST MEAN SCORES OF MALE STUDENTS ON FLEXIBILITY OF CONTROL GROUP**

Test	N	Mean	SD	MD	$\sigma$ DM	t- ratio
Pre-Test	20	6.55	1.48	0.66	0.22	2.02
Post Test	20	7.21	1.21			

\*Significant at 0.01 level

t.05 (38) = 2.02

Table 2 indicates that the statistically significance of difference was observed between mean scores on Pre-test and post-test of control group male students on flexibility component of physical fitness, as the obtained t-value of 2.02 was similar with the required t-05(38)=2.02



**Figure 1. Mean Scores of Pre-Test and Post-Test Scores on Flexibility of Experimental Group and Control Group Male students**

#### 4. DISCUSSION

Significant differences were observed when flexibility were tested between the groups. The experimental group underwent 8 weeks football training showed improvement in flexibility of players reason being energetic activity produces physical fitness improvements. A lot could be done to improve the health-related fitness levels of players. Results of the present study is in line with the study by **Granacher & Borde (2017)** which concludes that sport-specific training in combination with physical education promotes youth athletes' physical fitness development. **Rutkauskaite, et.al. (2011)** expressed that the health-related physical fitness is positively related to the total amount of physical activity.

#### 5. CONCLUSION

Male students of experimental group as well as control group were found to have significant difference in their Pre-test and post-test mean scores on flexibility component of physical fitness.

#### REFERENCES

- Gill, Manmeet., Deol, Nishan., & Kaur, Ramanjit. (2010)**, Comparative Study of Physical Fitness Components of Rural and Urban Female Students of Punjabi University, Patiala, Anthropologist, 12. 10.1080/09720073.2010.11891126.
- Douglas, H. N. and Alan, L. C. (1994)**, Measurement and Evaluation in Physical Education and Exercise Science, USA: Gorsuch Scarisbrick Publishers.
- Johnson, Bany L. and Nelson, Jack K. (1988)**, Practical Measurement and Evaluation in physical Education, New Delhi: Surjeet publication.
- Dutt, Sunil (2005)**, Health Related physical Fitness of Males aged 8 to 18 years, Journal of exercise science and physiotherapy,1(2), 12-22, (2005)
- Kumar, Sinku (2012)**. Effect of Health-Related Physical Fitness Programmes on the Cardio-Respiratory Function of Sedentary Students. Journal of Exercise Science and Physiotherapy, Vol. 8, No. 2: 1-7.
- Ramajayam, M. and Gopinath, V. (2013)**. Health Related Physical Fitness Among Adolescence School Boys Of Puducherry. Indian Streams Research Journal, Vol. III, Issue. X, DOI : 10.9780/22307850, <http://oldisrj.lbp.world/UploadedData/3306.pdf>
- Granacher, U. & Borde, R. (2017)**, Effects of Sport-Specific Training during the Early Stages of Long-Term Athlete Development on Physical Fitness, Body Composition, Cognitive, and Academic Performances. Frontiers in physiology, 8, 810. <https://doi.org/10.3389/fphys.2017.00810>
- Rutkauskaite, Renata., Emeljanovas, Arunas., Volbekiene, Vida., Sadzeviciene, Eita., Maciuleviciene, Edita., Batutis, Olegas and Gruodyte, Rita (2011)**, Relationship between physical activity and Health-related physical fitness in 16-year-old Boys, Sports Journal, 1(80); 56—62



## A STUDY ON THE PSYCHOSOCIAL IMPACT OF SPORTS INJURIES ON COLLEGE ATHLETES IN KERALA

Devan. C. H

### Affiliations:

1. Post Graduate Student, Department of Sociology, Loyola College, Chennai, Tamilnadu, India. E-mail id: deva8ronaldo@gmail.com Mobile-8907687556

---

### ABSTRACT

Injury is a major threat for every athlete. Youth sports with its increasing competitive features and excessive training methods lead to a situation in which young athletes are highly vulnerable to injuries. In this context, the aftermaths of sports injuries among college athletes who are generally facing variety of adjustment difficulties between their academics and sporting endeavours are studied in a detailed manner. Moreover, the responses of injured college athletes have to be understood from a sociological as well as a psychological perspective. The fundamental purpose of this study is to find out the psychosocial impacts of sports injuries on different college athletes from Kerala which is the first Indian state to integrate sports into the educational curriculum. The researcher from his sample which is consisted of 40 injured college athletes, analyses certain study areas such as the different responses of college athletes towards their injured condition, the level of social support perceived by them during rehabilitation, the role of coaches and colleges during their recovery phase, the effectiveness of current treatment methods and so on. The study concludes that the college athletes perceive their injury experiences differently from one another according to their personal traits and living circumstances, and complete social support and recognition is of paramount importance for the wellbeing of both injured and uninjured athletes. As a matter of fact, it is not only the psychological factors, but the sociological aspects also inextricably connected to sports injuries

**Keywords:** Sports, College, Athletes, Rehabilitation, Social Support, Mental Wellbeing

---



## 1. INTRODUCTION

Sports and physical culture can be considered as the realms of universal interest and attention in all societies. The perceived and objective benefits of participation in sports for children and adolescents are numerous and span multiple domains, including physical, physiological, and social development (**Merkel, 2013**).

Nevertheless, certain uncertain risks are a part of sports culture. In this context, we can study about the impact of sports injuries on young athletes. A sports injury can be defined as any damage to tissues as a direct result of participating in sport and exercise, which causes the frequency and/or intensity of participation to be changed or ceased. For any athlete, injury is a disruptive experience curtailing the mode of athletic expression within a milieu of uncertainty about return to play (**Roy et al, 2015**). To the athlete, injury results in the loss of the opportunity to participate in a high valued activity and is a threat to continued success at sports (**Heil, 1994**).

Moreover, young athletes are highly prone to constant injuries due to the increasing competitiveness and risks associated with youth sports. Adding to this notion, it is said that the possible adverse effects of intensive training upon the physical and psychological development of the young athlete has become of increasing concern to those involved in youth sport (**Baxter-Johns and Helms, 1996**). Across the different sporting contexts, research has revealed that athletes are prepared to take considerable risks with their health to carry on playing while injured or in pain (**Malcolm, 2011**).

In the area of college sports, the athlete functions under a great stress because strong motivation to achieve high grades in sports and academics contributes directly to the adjustment difficulties in family and the college (**Vir, 1989**). Some families sacrifice vacations, savings, and normal family structure to support the athlete's sporting endeavours (**Merkel, 2013**). This could be the reason which makes the life of injured college athletes much worse. As a matter of fact, studies in the psychology of sport injury have failed to a large extent to adopt a social psychological view of the sport injury process and corresponding consequences (**Wiese-bjornstal et al, 1998**). There is indeed an interconnection between the structural functions of society and the activities of games and sports, and this connection is being stressed by many sociologists. Thus, the impacts of sports injuries on young student athletes are to be evaluated not only in a psychological perspective but through a sociological viewpoint as well.

**Frey (1991)** discussed the "culture of risk" in sport that prompts athletes to believe that accepting physical risks is their only legitimate choice. Values of the sports world are such that coaches, teammates, and fans negatively judge the athlete who refuses to play hurt. This external pressure is also prevalent in the media where an athlete's willingness to endure pain and injury is celebrated (**Ewald&Jiobu. 1985; Hughes &Coakley, 1991; Nixon, 1991**).

In their integrated model of psychological response to sports injury and rehabilitation process, **Wiese-Bjornstal et al. (2008)** proposed that personal and situational factors continuously exert their effects on psychological responses and rehabilitation processes. Here, social support can be considered as a situational factor in predicting injured athlete's thought, feelings, and behaviour during the rehabilitation process. Positive social support could serve as a protective factor that helps to reduce distress after an injury and improves motivation during rehabilitation (**Yang et al, 2010**).

Apart from the psychological aspects of an athletic injury, the role of social institutions like family, and college is often crucial as far as an injured student-athlete is concerned. **J.J. Coakley** through his study of sports in society, proposing an idea that interactionist theories can be used to take social action includes questioning identity formation processes that involves the

normalization of pain, injury and substance use in sports (Coakley, 2001). Another example for sociological approaches related to sports injuries is the theory of *Rehabilitation Role* which was articulated by Safilios-Rothschild in 1970. As there are many psychological theories on sports injuries like 'The grief model of injury', 'The affective cycle of injury' 'Cognitive Appraisal Model of Psychological Adjustment from Athletic Injury' etc., there should be some notable sociological approaches as well in order to study the overall impacts of sports injuries on athletes.

The purpose of the present study was to explore the psychosocial impacts of sports injuries on young college athletes in Kerala, and finding out how they perceive their injury experiences different from one another. Here, the role and efficacy of family, coaches, college managements, and medicine in injury rehabilitation and the overall wellbeing of injured athletes, is extensively evaluated by the researcher by using qualitative and quantitative data gathering methods. The study intended to choose 40 injured athletes from different colleges in Kerala through snow-ball sampling method.

## 2. METHODOLOGY

### 2.1 Sample

40 athletes (29 male athletes and 11 female athletes) who have suffered or are suffering from sports injuries in the last 6 months have been chosen through snowball sampling method from different colleges of Kerala. In line with snowball sampling method, respondents are located from 8 colleges in Kerala. The researcher was able to get majority of the respondents from Christ College, Irinjalakkuda where high-performance athletes from almost all the districts of Kerala are pursuing a degree in physical education.

### 2.2 Tools of Data Collection

As a qualitative data gathering method, interview guide is used to gain an in-depth understanding on the psychosocial impacts of sports injuries on college athletes in Kerala. To get quantitative data, two appropriate scales namely 'Multidimensional Scale for Perceived Social Support' (MSPSS) which can be used as a sociological scale, and 'The Warwick-Edinburgh Mental Well-being Scale', a commonly used psychological scale (WEMWBS) are employed in order to find out the levels of perceived social support and mental wellbeing among injured college-level athletes in Kerala. A socio-demographic questionnaire is also used in the study.

#### 2.2.1 Socio-demographic Questionnaire

One of the primary data collection tools used by the researcher was a socio-demographic questionnaire (Printed as well as in digital form) consisting of questions of socio-demographic characteristics of respondents. It includes certain questions regarding the athletic profile of the respondents. The socio-demographic questionnaire is of highly significant for this study since it can give background details of the respondents, which will help the researcher to make a correlational analysis with the responses received through interview guide and research scales.

#### 2.2.2 Multidimensional Scale of Perceived Social Support: (MSPSS)

The researcher used this scale to find out the level of perceived social support among the injured athletes. The multidimensional scale of perceived social support is a measure of how much support a respondent feels they get from family, friends and significant others. The respondent completes 12 questions relating to the extent to which they feel they have support of their family, friends and a special person. Each of these forms a separate subscale relating to perceived support from a significant other, from friends and from family. Each question carries a score ranging from 1 to 7. Any mean total scale score ranging from 1 to 2.9 could be considered low support; a score of 3 to 5 could be considered moderate support; a score from 5.1 to 7 could be considered high support.

### **2.2.3 The Warwick-Edinburgh Mental Well-being Scale**

Here, the researcher used this scale in order to find out the mental well-being among the 40 injured college athletes who have become the respondents of the study. The differences in the perception of the respondents towards their injuries can be evaluated with reference to the given scale. The WEMWBS comprises of 14 items with 5 response categories, from “None of the time” to “All of the time”. The items are all worded positively and cover both feeling and functioning aspects of mental wellbeing. Items are scored on a range from 1 to 5, providing a total score between 14 and 70. According to a study, a WEMWBS score of less than 40 could indicate high risk of major depression. The WEMWES however was not developed to measure mental illness, and should therefore not be used for screening purposes (Taggart et al, 2015).

### **2.2.4 Interview Guide:**

The crucial tool of data collection used by the researcher is an interview guide consisting of 10 open ended questions with related sub-questions, which are highly relevant for the required qualitative data for the study. The interview guide is devised to know the lived experiences of the respondents regarding their injuries. Almost all questions in the interview guide comprise sub questions.

### **2.3 Data Analysis**

The given study uses Mixed-Methods Triangulation to analyse the data, which involves comparing and integrating data collected through some kind of qualitative methods with data collected through some kind of quantitative method (Patton, 2015). This analysis method has been adapted since it is a mixed-method study, so that the researcher can complementarily use both quantitative and qualitative data together in order to answer different research questions.

Statistical analysis of quantitative data has been carried out with the help of Statistical Package for Social Sciences-SPSS (IBM SPSS Statistics 20) and Microsoft Excel-Version 2010. The given statistical tools have been used for storing, analysing and comparing the quantitative data for further crosschecking and evaluation with qualitative data collected by the researcher.

For analysing the qualitative data in the form of interview transcriptions, the researcher used content analysis. Content analysis refers to any qualitative data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meanings (Patton, 2015).

## **3. RESULTS**

### **3.1 Injuries and Rehabilitation**

Qualitative enquiries made by the researcher through in-depth interviews bring out certain important remarks given by the athletes on their rehabilitation process and treatments that they have taken. Physiotherapy can be seen as the mostly followed treatment method by the athletes, which may sometimes combined with orthopaedics and Ayurveda. 26 athletes (65%) were moderately satisfied with their rehabilitation whereas the other 14 athletes (35%) show complete dissatisfaction in the rehabilitation that they received. It was surprising that, only 6 respondents (15%) were provided with a team physio by their respective colleges. As per the opinions given by the athletes, the field of sports medicine has to be improved a lot to help young athletes from constant injuries.

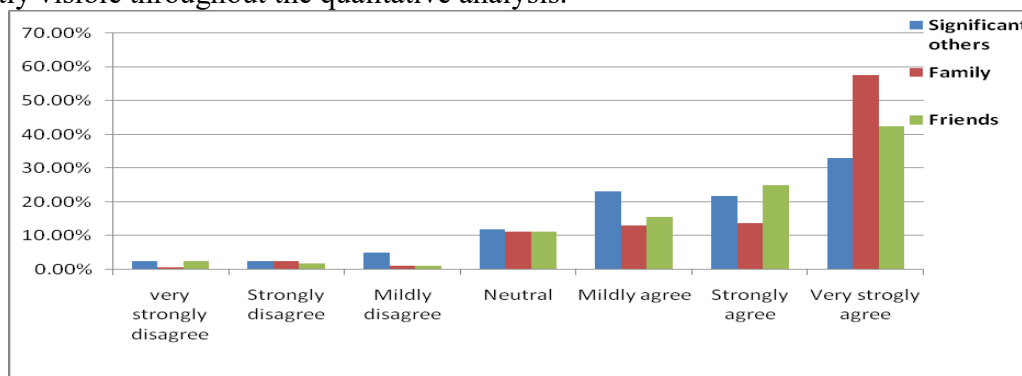
### **3.2 The level of social support and mental wellbeing among the injured college athletes**

Though the respondents generally have support and mental wellbeing as according to the findings of the two scales used in the study (MSPSS and WEMWBS), actually most of them experience number of emotional difficulties (e.g., depression, stress, anxiety), and psychological dilemmas due to injury. In fact, the Multidimensional Scale of Perceived Social Support doesn't

consists of questions which can be asked regarding athlete’s college, coaches, team mates or other people related to their sports career. Thus, this vacuum has been filled by qualitative data gathered through interview guide. One of the predominant opinions given by the respondents was on inadequate support and care provided by the colleges for injured athletes in particular, and athletes in general. ‘Neglect by the college’ is a serious concern reported by most of the respondent athletes, especially during injured condition. Absence of financial aids for injured athletes to meet their treatment expenses, inadequate support and recognition for sports and athletes in the colleges were also reported by the respondents during interviews. As per the data collected through interviews, most of the respondent athletes are facing adjustment difficulties between their academics and sports. As a matter of fact, only 7 (17.5%) out of 40 respondents are of the opinion that they were completely helped by different support systems which helps them in their sports career and further injury occurrences. This figure is clearly different from the general level of social support given to the athletes by their family, friends and significant other (chart 4.6). Here, the role of coach and colleges during an athlete’s injury experience is to be highlighted. Thus, an absolute state of social support is necessary for injured college athletes for coping up with their emotional difficulties and mental traumas, especially during rehabilitation.

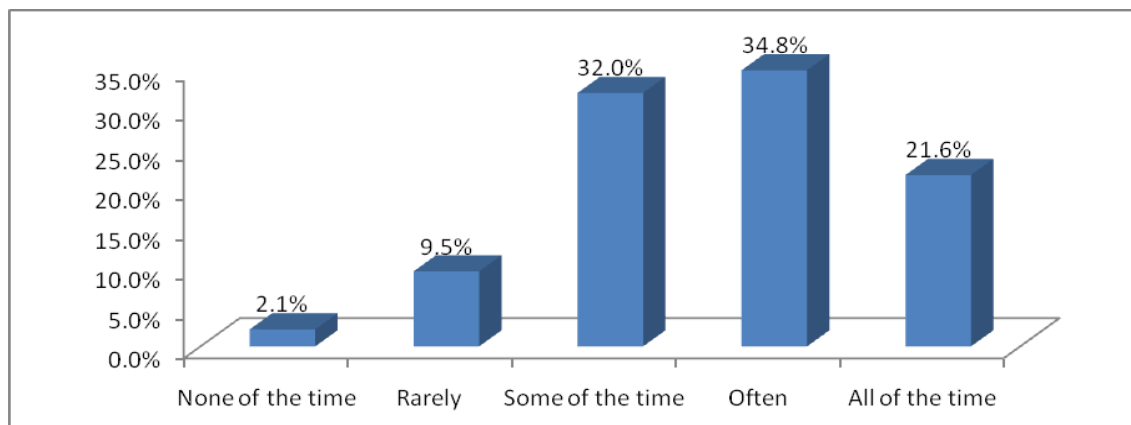
### 3.3 Athletes’ perception and responses towards injuries

Among the 40 college athletes who became the study participants through snowball sampling method, the way they perceive injury experience showed distinctions or differences. Each athlete, according to their personal traits and background features, shows different responses towards injury and further rehabilitation process. The common dilemmas experienced by most of them were depression, anxiety, emotional breakdown, loneliness, stress, and above all anxiety about the future career. At the same time, there were athletes who were of the opinion that injury made them more confident to bounce back to the career with more energy and vitality. The effect of subjectivity among the injured athletes in the way they perceive the injury is evidently visible throughout the qualitative analysis.



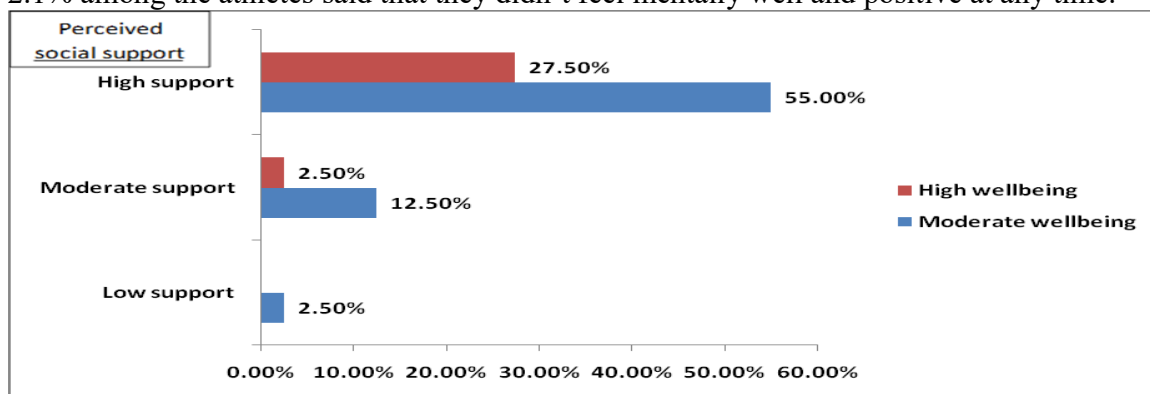
**Chart 1 - Level of Perceived Social Support Among the Participant Athletes**

A great majority of the respondents were provided with high support from their families, friends and significant others, as far as the findings of Multi-Dimensional Scale of Perceived Social Support (MSPSS) is concerned (Chart 4.6). In fact, 57.5% of the athletes were of the opinion that they were very strongly agreeing that family supported them very much. At the same time, 42.5 % of respondents in terms of friends and 33.1% of respondents in terms of significant others, have very strongly agreed that they received high level of support. Only 2.5 % among the participant athletes very strongly disagreed they were getting adequate support from family, friends and significant others, during injury rehabilitation.



**Chart 2 - Distribution of the athletes based on mental wellbeing scale**

By using the Warwick-Edinburgh Mental Well-being Scale (WEMWBS), the level of mental wellbeing among the study participants has been measured as shown in chart 2. Only 2.1% among the athletes said that they didn't feel mentally well and positive at any time.



**Chart 3 – Comparative Analysis of Mental Well-being and Perceived Social Support**

A comparative analysis of the findings given by the two scales used in the study (Multidimensional Scale of Perceived Social Support and Warwick-Edinburgh Mental Wellbeing Scale) has been portrayed in the chart 4.8. It generally shows a pattern that high social support is directly complementary to have high level of mental wellbeing.

#### 4. DISCUSSION

The study conducted among 40 injured college athletes in Kerala finds that it is not only the psychological factors, but the sociological aspect also inextricably connected to sports injuries. Subjectivity obviously plays a great role in the injury experiences of the athletes, according to the major outcomes of this study. Though injured college athletes in Kerala receive high level of support and care from family and friends, emotional difficulties and psychological traumas due to sports injuries are prevalent among them, since most of them are not provided with proper support and timely guidance from the coaches, teammates, college managements and medical professionals. Neglect from the college management during injury rehabilitation is a common experience among many injured athletes. Moreover, the complete recovery state is very low among the injured college athletes in Kerala due to ineffective treatment patterns, and practice of preventive measures is very low among them. The facilities and quality of sports medicine and sports injury rehabilitations are found to be very low in the state. The occurrences of workout overload and overuse injuries among the college athletes are found to be very high in number, and it indicates lack of coach education on sports injuries. As far as the findings of this

study is concerned, sports injury or sports as a general topic are not being given adequate scientific background even in a state like Kerala where a great sports culture has been developed and many outstanding athletic talents reside in compared with most of the other Indian states.

## 5. CONCLUSION

In Kerala, there is a dearth of scientific or systematic knowledge or awareness on sports injuries among the athletes, parents, coaches, and society in general. It is found from the study that injured college athletes are going through great stress and emotional difficulties since injury acts as a great threat to sports career as well as to their academic endeavours. In fact, complete social support and recognition is of extremely important for the wellbeing of both injured and uninjured athletes.

This study has focused exclusively on the psychosocial impacts of sports injuries. Moreover, most of the studies on sports injuries have neglected the role of sociological aspects and merely focused only on the psychological factors. Thus, this study can be considered as an exception and can be used for future researches on this genre.

## REFERENCES

- Roy, J., Mokhtar, A. H., Karim, S. A., & Mohanan, S. A. (2015)**, Cognitive appraisals and lived experiences during injury rehabilitation: A narrative account within personal and situational backdrop,. *Asian Journal of Sports Medicine*, 6(3) :E-24039
- Dharam Vir (1989)**, *Sports and Society: Reading in Sociology of Sport*, Classical publishing company, ISBN, 8170540364
- D. M. Wiese-bjornstal, A. M. Smith, S. M. Shaffer, & M. A. Morrey (1998)**, An integrated model of response to sport injury: Psychological and sociological dynamics, *Journal of Applied Sport Psychology*, 10(1): 46–69.
- Constantina, Safilios- Rothschild (1970)**, *Social Psychology of Disabilit and Rehabilitation*, Book Online, Random House, Incorporated
- Coakley, Jay J. (2001)**, *Sport in Society: Issues & Controversies*, McGraw-Hill.
- 1, Jingzhen., Peek-Asa, Corinne ., Lowe, John B., Heiden, Erin., and Foster, Danny T. (2010)**, Social Support Patterns of Collegiate Athletes Before and After Injury, *J Athl Train*, 45(4): 372–379.
- Ewald, K. & Jiobu, R.M. (1985)**, Explaining positive deviance: Becker's model and the, case of runners and bodybuilders, *Sociology of Sport Journal*, 2 : 144-156.
- Hughes, R.H.. & Coakley, J. (1991 )**. Positive deviance among athletes: The implications of over conformity to the sport ethic, *Sociology of Sport Journal*, 8: 307-325.
- Nixon. H.L. (1991)**. Accepting the risks and pain of sporfs injuries: Understanding the nature of 'consent' to play, Paper presented at the annual meeting of the North American Society for the Sociology of Sport, Milwaukee. WI.
- Frey, J.H. (1991)**, Social risk and the meaning of sport, *Sociology of Sport Journal*, 8: 136 145.
- Merkel, Donna L. (2013)**, Youth sport: positive and negative impact on young athletes, *Open Access J Sports Med.*, 4: 151–160.
- Hell, John (1994)**, Understanding The Psychology of Sport Injury: A Grief Process Model, *Temple Psychiatric Review*, 4.
- Baxter-Jones, A. D. G. and Helms, Peter (1996)**, Effects of Training at a Young Age: A Review of the Training of Young Athletes (TOYA) Study, *Pediatric exercise science* 8(4):310-327.
- Malcolm, Dominic(2011)**, Sport Medicine, Injured Athletes and Norbert Elias's Sociology of Knowledge, *Sociology of Sport Journal*, 28(3):284-302 .

**Patton, Michael Quinn (2015)**, Book Review: Evaluating the Complex: Attribution, Contribution, and Beyond, March 19, 2015, <https://doi.org/10.1177/1098214015569758>

**Taggart, Brenda., Sylva, Kathy., Melhuish+, Edward., Sammons Pam and Siraj, Iram (2015)**, Effective pre-school, primary and secondary education project (EPPSE 3-16+), UCL Institute of Education, University College London, Birkbeck, University of London, & University of Oxford



## EFFECTIVENESS OF SIX WEEKS FOOTBALL TRAINING ON MUSCULAR ENDURANCE OF MALE FOOTBALL PLAYERS OF RAIGARH DISTRICT

Amit Kumar Paras<sup>1</sup> & Dr. Alka Nayak<sup>2</sup>

### Affiliations:

- <sup>3.</sup> Research Scholar, Department of Physical Education, Rani Durgavati Vishwavidyalaya, Jabalpur (Madhya Pradesh)
- <sup>4.</sup> Professor, Department of Physical Education, Rani Durgavati Vishwavidyalaya, Jabalpur (Madhya Pradesh)

---

### ABSTRACT

The aim of the present study was to assess the effect of football training, on muscular endurance of male footballers of Raigarh district of Chattisgarh studying in various institutions. 20 subjects were selected aged between 14-18 years. 't' test was administered to find out the significance of difference in mean scores of both the groups. Analysis of the obtained data revealed significant difference in mean score of experimental group obtained pre test score was 15.73, SD=4.12 and post test mean score 17.18, SD=3.59, 't'=2.58 which is greater than the tabulated 't'. It may be concluded that 6 weeks of football training is effective in improvement of muscular endurance of athletes.



## 1. INTRODUCTION

Performance in many sports, some occupations, and some special tests of work selection depends on the capacity to apply strength at the highest possible speed (power) and to perform repeated submaximal muscular actions (**Baker, 2001**). Muscular endurance is a muscle's capacity, or a group of muscles, to exert force over an long time span. Endurance postpones the start of exhaustion to prepare for long hours of exercise. Sporting events involve muscle stamina, since several occasions without exhaustion punching, hitting, and attacking techniques must be practiced. You execute actions of physical toughness while you sweep leaves, shovel snow, or do sit-ups. The stronger the muscle capacity, the more fatigue-free you can proceed with the tasks.

Muscular endurance is the ability of a muscle or a group of muscles to sustain repeated contractions against a resistance for an extended period of time. Muscular endurance is one of the components of muscular fitness, along with muscular strength and power (**Kim, 2015**).

**Barranco-Ruiz et. al. (2020)** analyzed the effect of two exercise interventions on health-related physical fitness in sedentary employed females. The study concluded interventions based on Zumba fitness<sup>®</sup> or Zumba fitness<sup>®</sup> combined with an extra muscle-strengthening workout based on bodyweight training exercises are effective strategies to improve the health-related physical fitness in sedentary women employees.

**Peitz, et.al. (2018)** aimed at examining comparative intervention studies that assessed the effects of age, sex, maturation, and resistance or plyometric training on measures of physical fitness while holding other variables constant. The study came up with conclusion that different types of resistance training are effective in improving measures of muscle endurance in untrained children and adolescents. Effects of plyometric training in untrained youth primarily follow the principle of training specificity.

**Jen, et al. (2011)** revealed that the results indicate that college students who routinely engage in exercise tend to have physical fitness including flexibility superior to those who do not exercise on a regular basis.

**Syed, et.al.(2015)** intended to find out the extent to which the effectiveness of the circuit training intervention program included in PE subject can increase muscular endurance among year 5 pupils in a primary school. Result of their research determined that the circuit training for 8 weeks is able to enhance muscular endurance among primary school pupils.

## 2. METHODOLOGY

### 2.1 Selection of Subjects

The 20 students aged 14 to 18 years studying in different institution of Raigarh (CG) were selected as the subject of the present study.

### 2.2 Criterion Measures

The push-up fitness test (also called the press-up test) measures upper body strength and endurance. floor mat and stopwatch are required to measure the score. Traditional push-up started with the hands and toes reaching the surface, body and legs in a straight line, feet slightly apart, the arms apart from each other at shoulder level, bent and at a right angle. Number of correctly finished push-ups were recorded as the score of the subjects.

### 2.3 Collection of Data

Measurements for selected variables was recorded as per the instructions given in literature and manual. All the results were taken in numerical form for further analysis. These numerical scores of each test/measure recorded, represented the data for the present study.

### 2.4 Statistical Analysis

Mean, Standard Deviation and ‘t’ test was applied to analyze the obtained data. significance level was set at 0.05.

### 3. RESULTS

To investigate the effect of six week football training on muscular endurance of male football players, mean, SD and t-ratio were computed and data pertaining to this has been presented in Table 1 and depicted in figure 1.

TABLE 1

**SIGNIFICANCE OF DEFFREENCE BETWEEN PRE-TEST AND POST-TEST MEAN SCORES ON MUSCULAR ENDURANCE OF MALE FOOTBALL PLAYERS**

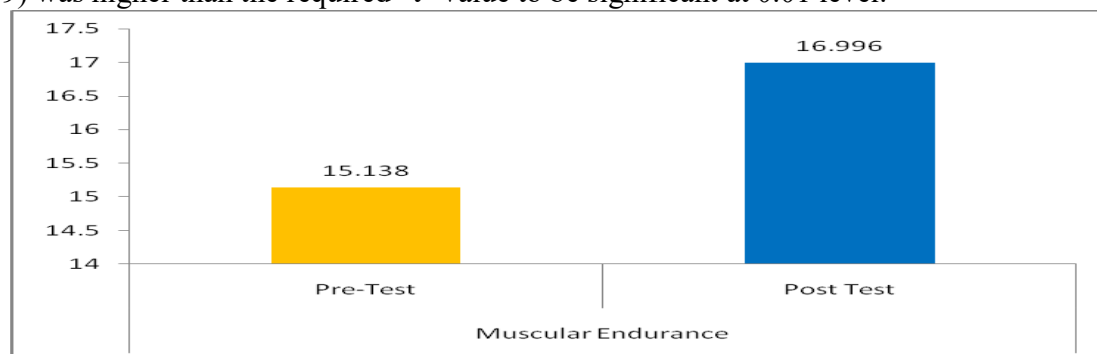
Test	N	Mean	SD	MD	$\sigma$ DM	t- ratio
Pre-Test	20	15.138	3.521	1.858		3.19
Post Test	20	16.996	4.398			

Significant at .05 level

$t_{.05(38)}=2.02$

Table 1 indicates that the statistically significance of difference was observed between mean Pre-test and post-test scores on muscular endurance component of physical fitness of male football players, as the obtained t-value of 3.19 was higher than the required  $t_{-05(38)}=2.02$

The test of significance of difference between mean scores Pre-test (15.138) and post-test (16.996) on muscular endurance indicated a significant difference as the obtained “t” value of (3.19) was higher than the required “t” value to be significant at 0.01 level.



**Figure 1. Mean Scores on Pre-Test And Post-Test of Muscular Endurance of Male Football Players**

### 4. DISCUSSION

Since there was a significant differences in mean scores it may be interpreted that the experimental group which underwent football training for 6 weeks showed improvement in muscle endurance students. Pushups are beneficial for building upper body strength. Pushups are a fast and effective exercise for building strength. They can be done from virtually anywhere and don't require any equipment. Results of the present study is supported by a study where **Belachew & Mengistu (2018)** concluded that the twelve weeks of physical fitness training program significantly improved physical fitness variables of male football players. Also **Campillo (2018)** found that one PJT session per week combined with regular soccer-specific training appears to be sufficient to induce physical fitness improvements in amateur female soccer players.

## 5. CONCLUSION

Statistical analysis of the data revealed significant difference in scores of muscle endurance components of health-related physical fitness. It may be concluded that 6 weeks of regular football training is effective in improvement of muscle endurance.

## REFERENCES

- Baker, D. (2001)**, Acute and long-term power responses to power training: Observations on the training of an elite power athlete, *Strength Cond J.*, 23(1): 47-56.
- Barranco-Ruiz, Y., & Villa-González, E. (2020)**. Health-Related Physical Fitness Benefits in Sedentary Women Employees after an Exercise Intervention with Zumba Fitness, *International journal of environmental research and public health*, 17(8):2632.
- Belachew, Birtukan and Mengistu, Sisay (2018)**, Effects of Physical Fitness Exercises on Muscular Strength and Endurance Performance of Male Football Players of Tabor Secondary School, *Journal Of Humanities And Social Science (IOSR-JHSS)*, 23(2)- 10: 60-68.
- Jee, Byung-Jun C. (2015)**, Effects of exercise therapy on muscular strength in firefighters with back pain of physical therapy science, 27(3): 581–583.
- Jen, S., Cheng, M. C., Yang, Ping, H. T., Wan, L. C., & Yi, Y. H. (2011)**, Leisure, lifestyle, and health-related physical fitness for college students, 39, 3.
- Peitz, M., Behringer, M., & Granacher, U. (2018)**, A systematic review on the effects of resistance and plyometric training on physical fitness in youth- What do comparative studies tell us?, *PloS one*, 13(10): E-0205525.
- Syed A. S. K., Arumugam, M. A.P K., Ranjbar, Z., MegatDaud, M. A. K. and Samad, R. S. A. (2015)**, The effectiveness of circuit training in enhancing muscle endurance among standard five boys in a primary school, *International Journal of Physical Education, Sports and Health*, 2(1): 11-16
- Ramirez-Campillo, R., García-Pinillos, F., García-Ramos, A., Yanci, J., Gentil, P., Chaabene, H., & Granacher, U. (2018)**, Effects of Different Plyometric Training Frequencies on Components of Physical Fitness in Amateur Female Soccer Players, *Frontiers in physiology*, 9 : 934.



**A STUDY ON HEALTH RELATED PHYSICAL FITNESS STATUS OF  
MALE PHYSICAL EDUCATION STUDENTS OF DIFFERENT  
AGE GROUPS**

**Biswanath Garai<sup>1</sup>**

**Affiliation:**

<sup>1.</sup> Research scholar Department of Physical Education, Visva-Bharati University, Santiniketan-731235, West Bengal, Email: biswanathgarai2011@gmail.com, Mobile-7001156186

---

**ABSTRACT**

The purpose of the study was to study the Health-related physical fitness of male student of physical education of different age groups. The samples of the study, considering random sampling method were taken from the students of Department of Physical Education, Visva-Bharati. Thirty male students (n = 30), age ranged from 18 to 24 yrs., Located at Department of Physical Education, Visva-Barati Santiniketan (West Bengal) were considered as sample. Following health-related physical fitness components were selected as parameters for the study. These parameters were Cardio-respiratory Endurance, Muscular Strength-endurance, Flexibility and Body mass index. In the level of Height and Weight of the age group of 18 yrs., 20 yrs, 22 yrs and 24 yrs of physical education students was mostly different. Results of study revealed that the cardio-respiratory endurance, muscular strength-endurance and flexibility were found better in high age group male physical education students than their counter parts. The BMI was found better in low age group male physical education students than their counter parts

**Keywords:** Physical fitness, Health related fitness, Male, Physical Education students.

---

## 1. INTRODUCTION

Physical fitness to health for all individuals has been well documented. Physical fitness is a required element for all the activities in our society. Health related physical fitness of an individual is mainly dependent on lifestyle related factors such as daily physical activity levels. It was believed that the low physical fitness level of an individual is associated with higher mortality rate (Hunt, 1961).

Physical fitness is also considered as the degree of ability to execute a physical task under various ambient conditions. The maintenance and promotion of health is achieved through different combination of physical, mental, and social well-being, together sometimes referred to as the "health triangle" (Short and Winnick, 1988). Further that health is not just a state, but also "a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities.

Recently, concept of "Health Related Physical Fitness" (HRPF) has been evolved with the consideration that along with achieving fitness level, one must improve health. United States of America found the importance of HRPF not only for common people, but also for the adolescent students. The Physical Education students renders scientific training and coaching to the adolescent students of its sports college for preparing them to become a good sportsman with an assumption that the students might have also developed a good status of health-related physical fitness. To assess the status of HRPF of the students of Physical Education institutes, the present investigation seems to be justified (Meqni, A. 1966).

Physical fitness to health for all individuals has been well documented. Physical fitness is a required element for all the activities in our society. Significance of the study is to find out the health related physical fitness status of the male Physical Education students studying in Physical Education institution. To compare health fitness levels of different age groups of Physical Education subjects.

Many researchers have been conducted studies on Health-related physical fitness which refers to cardio-respiratory fitness, muscular strength, speed-agility and body composition components of boys and girls in different age groups. Goon Daniel Ter1, 2006; Verma et al., 2002; Bakshi, 2001; Dawson et al., 2001; Singh and Singh, 2012; Toriola & Monyeki, 2012; Kamil et al., 2012; Anil, et. al., 2009; Ramajayam & Gopinath, 2013; Bazyar and Shabani, 2014 etc. investigated and compared the health-related fitness in male and female children of schools in different age groups.

The purpose of the study was to study the Health-related physical fitness of male student of physical education of different age groups.

## 2. METHODOLOGY

### 2.1 Subjects

The samples of the study, considering random sampling method were taken from the students of Department of Physical Education, Visva-Bharati. Thirty male students (n = 30), age ranged from 18 to 24 yrs, located at Department of Physical Education, Visva-Bharati Santiniketan (West Bengal) were considered as sample.

### 2.2 Criterion Measure & Tool Used

On the basis of literature review and considering feasibility criteria, following health-related physical fitness components were selected as parameters for the study. Those parameters were Cardio-respiratory Endurance, Muscular Strength-endurance, Flexibility and Body mass index (Butt, 1992). The tools used and criterion measures adopted to this study have been presented below:

S. No.	Variables	Tool	Criterion Measures
1.	Cardiovascular endurance	600 yard Run and Walk	Measured to the 1/10th of a second.
2.	Muscular strength-endurance	Bent-knee Sit-ups	Numbers in one minute
3.	Flexibility (Hip & Back)	Sit and reach test	Measured to the nearest quarter of centimeter
4.	Body composition (BMI)	Wt .in kg / Ht. in mts	BMI Index obtained from height & weight.

### 2.3 Experimental Design

A static group compression design was employed in the study and the health-related parameters chosen were cardio-respiratory endurance, abdominal strength endurance, hip & back flexibility and body mass index. Data were collected under identical condition for four groups and recorded.

### 2.4 Statistical Analysis

The data were processed calculating mean and standard deviation of performances on Sit & reach, 600m run. & Sit-ups and BMI.

## 3. RESULTS

To find out the mean scores of health related physical fitness of male physical education students of different age groups, mean and standard deviation were calculated and data pertaining to the health-related physical fitness components, viz., Cardio-respiratory endurance, muscular strength- endurance flexibility and body mass index of four different age groups of subjects have been presented in Table 1 to 4.

**TABLE 1**  
**MEAN AND STANDARD DEVIATIONS OF CARDIO-RESPIRATORY ENDURANCE OF MALE PHYSICAL EDUCATION STUDENTS IN DIFFERENT AGE GROUPS**

Statistics	Age Groups			
	18 to 19+ yrs.	20 to 21+ yrs.	22 to 23 + yrs.	24 to 25+yrs.
Mean (M)	2.01	1.41	1.69	1.35
Standard Deviation (SD)	0.30	0.05	0.37	0.05

Table 1 revealed that performance mean score of cardio-respiratory endurance was found better in age group of 24 to 25+ yrs followed by 20 to 21+ yrs., 22 to 23 + yrs., and 18 to 19+ yrs., as the obtained mean scores of cardio-respiratory endurance were 1.35, 1.41, 1.69 and 2.01 respectively.

**TABLE 2**  
**MEAN AND STANDARD DEVIATIONS OF MUSCULAR STRENGTH ENDURANCE OF MALE PHYSICAL EDUCATION STUDENTS IN DIFFERENT AGE GROUPS**

Statistics	Age Groups			
	18 to 19+ yrs.	20 to 21+ yrs.	22 to 23 + yrs.	24 to 25+yrs.
Mean (M)	43.40	46.71	53.80	51.25
Standard Deviation (SD)	5.85	8.36	11.93	7.42

Table 2 revealed that performance mean score of muscular strength-endurance was found better in age group of 22 to 23 + yrs followed by 24 to 25 yrs , 20 to 21+ yrs., and 18 to 19+ yrs., as the obtained mean scores of muscular strength-endurance were 53.80, 51.25, 46.71 and 43.40 respectively.

**TABLE 3**  
**MEAN AND STANDARD DEVIATIONS OF FLEXIBILITY OF MALE PHYSICAL EDUCATION STUDENTS IN DIFFERENT AGE GROUPS**

Age Groups				
Statistics	18 to 19+ yrs.	20 to 21+ yrs.	22 to 23 + yrs.	24 to 25+yrs.
Mean (M)	27.60	28.71	27.90	27.37
Standard Deviation (SD)	1.67	2.92	3.81	3.11

Table 3 revealed that performance mean score of flexibility was found better in age group of 24 to 25+ yrs followed by 18 to 19+ yrs, 22 to 23 + yrs and 20 to 21+ yrs.,, as the obtained mean scores of flexibility were 27.60 , 28.71 , 27.90 and 27.37 respectively.

**TABLE 4**  
**MEAN AND STANDARD DEVIATIONS OF BODY MASS INDEX OF MALE PHYSICAL EDUCATION STUDENTS IN DIFFERENT AGE GROUPS**

Age Groups				
Statistics	18 to 19+ yrs.	20 to 21+ yrs.	22 to 23 + yrs.	24 to 25+yrs.
Mean (M)	17.68	19.47	21.17	22.53
Standard Deviation (SD)	1.17	1.79	2.12	2.61

Table 4 revealed that performance mean score of BMI was found higher in age group of 24 to 25+ yrs followed by 22 to 23 + yrs., 20 to 21+ yrs. and 18 to 19+ yrs., as the obtained mean scores BMI were 22.53, 21.17, 19.47 and 17.68 respectively.

#### 4. DISCUSSION

Health related physical fitness level of the students is different according to different age groups (18 yrs, 20 yrs, 22 yrs, and 24 yrs). The cardio-respiratory endurance, muscular strength-endurance and flexibility factors of Health related physical fitness were found better in high age groups male Physical Education Students and Body Mass Index was better in low age group Physical Education male Students. The results of study indicated that the male Physical Education Students had a sound level of Health related physical fitness.

#### 5. CONCLUSIONS

1. The cardio-respiratory endurance, muscular strength-endurance and flexibility were found better in high age group male physical education students than their counter parts..
2. The BMI was found better in low age group male physical education students than their counter parts

#### REFERENCES

- Hunt, J.M. (1961)**, Effect of selected activities upon physical fitness and motor ability of fitness second and third grade. International journal published in March 1961. U.K.
- Mohd. Siddique Butt (1992)**. A comparative study of motor ability and physical fitness of tenth class pupils studying schools having adequate and inadequate facilities in Kashmi division. Unpublished masters thesis, Jiwaji University, Gwalior.
- Short, F. X. and Winnick, J.P. (1988)** "Adolscent physical fitness, a comparative study" Case Report, Journal of Visual impairment and blindness, 82 (6): 217
- Meqni, A. (1966)** "Comparison of performance in AAHPER Youth fitness Test between University of Philippines freshman student and American and Japanese Boys." Completed research in Health, Physical Education and Recreation, p. 78.

- Anil, R., Deol, N. S. and Gill, M. (2009).** "Assessment of body mass index and health related fitness among school children". Journal of Physical Education & Sport . 1 (25- 4): 39-44.
- Bazyar, Fazel and Shabani, Ramin.(2014).** "Differences in health-related physical fitness status among elementary school girls in Croatia". Annals of Applied Sport Science. 2 :4 :23-32
- Dawson, K., Hamlin, M., Ross, J. and Dsuffy, D. (2011).** "Trends in the health related physical fitness of 10-14 year old of New Zealand children". Journal of Physical Education New Zealand .34 ( 1): 26-39.
- Goon D. T. (2008).** "Evaluation of Physical Fitness and Body Composition of Nigerian children". African Journal of Physical Health Education Recreation and Dance. 14 : 130-142.
- Bakshi, B.K. (2001).** "Assessment of Health-Related Physical Fitness of School Students Belonging to Jammu Province" Unpublished Doctoral Thesis, Punjab University, Chandigarh.
- Kamil, A. A., Saidon, B. A., Kok, L. Y., and Bahaman, B. A. S. (2012).** "Factors Affecting Levels of Health-Related Physical Fitness in Secondary School Students in Selangor". Malaysia Journal of Basic & Applied Sciences. 8 :202-216.
- Ramajayam M. and Gopinath V. (2013).** "Health Related Physical Fitness among Adolescence School Boys of Puducherry". Indian Streams Research Journal 3 (10) : 1-7.
- Singh, D. and Singh, K. (2012).** "Assessment of health related physical fitness among boys of Kandi area". International Journal of Current Research. 4(10): 213-217.
- Toriola, O. M. and Monyeki, M. A. (2012).** "Health-related fitness, body composition and physical activity status among adolescent learners: The PAHL study". African Journal for Physical, Health Education, Recreation and Dance 18 :(4-1) : 795-811.
- Verma. S.K., Nischint. and Kumar. Ashok.(2002).** "Age changes in some health related components of fitness among Jat Sikh females of Punjab". Indian Journal of Sport Science and Physical Education. 11: (1 & 2) :39-52.



### **GUIDELINES FOR AUTHOR**

The Indian Journal of Physical Education, Sports and Applied Sciences is a quarterly journal publishes scientific research and review articles on sports and sports science disciplines and other such subjects having inter-disciplinary perspective with specific application to sports.

Manuscripts are accepted for publication with the understanding that they have not been published, simultaneously submitted, or already accepted for publication, elsewhere.

Manuscripts deemed suitable are acknowledged and critically reviewed by a qualified, independent, expert evaluator, through a secret evaluation system. The evaluator's comments may be communicated to the principal author along with the comments of the Editor.

All the manuscripts are to be submitted by the principal author to the Editor-in-Chief/Editor, Indian Journal of Physical Education, Sports and Applied Sciences by e-mail as well as on mailing address along with a letter of intent for publication. This covering letter should also contain the following certificate:

"It is certified that this article is my/ our own original research work which has not been published, simultaneously submitted, or already accepted for publication, elsewhere.

"I have the consent of the co-authors for this submission and I/we transfer the ownership of the copyright to the publisher, in the event of publication of this article."

The covering letter should contain a complete mailing address of the principal author. The Editor-in-Chief/Editor may acknowledge the receipt of the same, as well as, handle all future correspondence.

#### **Manuscript Preparation**

All parts of the manuscript should be typewritten, double-spaced, with margins of at least 3 cm on all sides. Number manuscript pages consecutively throughout the paper. Each manuscript should include title page, the second title page and text, and may contain up to 20 pages. Authors should also supply a shortened version of the title suitable for the running head, not exceeding 50 characters with spaces. Each article should be summarized in an abstract. Abstracts should be accompanied by three to five keywords that will facilitate indexing and data retrieval purposes.

The title page should contain the title of the study and the names, qualifications, employment status, the employing institution and the place and state, of all the authors. The title being brief, should not contain the words like 'A Study Of or 'A Probe into' etc.

The second title, the page following the title page should contain the title of the study, abstract and key words. The numbering of pages should begin here. The third page should contain the text including introduction, methodology, results, discussion, conclusion, and references. All these heads are to be typed on the left hand in upper lower type, in case there are no subheads like purpose of the study, review of literature, hypotheses, and limitations of the study and its implications. When there are sub-heads, the heads are to be typed in all capitals and the sub-heads in upper-lower type letters. Abbreviations must be spelt.

#### **Abstract**

The abstract should be self-explanatory, of about 150 words; suitable for use by the abstracting journals, without rewording and should state what was aimed, what was done,

what was found and what was concluded. For the review article, the abstract should be a concise summary.

### **Keywords**

Following the abstract, the author should list not more than six key words that do not appear in the title, that represent the content of the manuscript.

### **Introduction.**

This describes the present state of knowledge of the subject or the review of the literature, the concise statement of the problem, the aim of the research, and the development of the research hypotheses. It should include the practical and applied questions around which the study was developed.

### **Methodology**

This section should include a complete description of subjects, materials, equipments, procedures and experimental techniques. It should also include the description of the statistical methods used to analyze the data. The methods and the statistical procedures published in detail before hand should be cited. Units of measurement, symbols and abbreviations must conform to the international standards. Metrics system is preferred.

### **Results**

This section should include a concise presentation of the data. Figures, tables and photographs may be used to show the results of the study. Tables and figures should not be used for the presentation of the same data. The subjects must not be identified by name or any other recognizable label.

### **Discussion**

The discussion part should contain the interpretation of the results with possible comparisons with other relevant studies. The discussion must be rigorous and correspond to the data and the hypothesis. New-hypothesis, if any, may be stated. Recommendations, if any, question of practical application, consistent with the limitations of the study, may be included.

### **Conclusion**

This should briefly state the conclusions drawn from the study. Conclusions should not be drawn without any supporting data.

### **References**

All sources, cited in the text, must be also cited in the reference list. The reference list includes circulated material, i.e., books, journal, proceedings, films, etc.

### **Tables**

Each table should be typed on separate sheets, numbered consecutively in Roman numerals at the top centre, and given collectively after the references. Each table should have a brief but meaningful title which should start next to the Table Number after colon. Explanatory matter and non-standard abbreviations should be given in the footnote, and not below the title. Tables should be referred in the text.

### **Illustrations**

All figures and illustrations should be either artwork in black ink on Art Card or 5" x 7" glossy prints. The photographs should be glossy black and white having good contrast. The letters used in the illustrations and photographs should be of sufficient size to withstand reduction to single column size. Figures should be numbered in Arabic numerals. Captions of photos and illustrations and the legends should be typed on a

separate sheet. All illustrations must be identified on the back by gently writing in ink or pencil, indicating illustration number and the author.

Art work should be done professionally, Art work carried out by the publishers, out of necessity, would be charged to the authors.

The authors must send a CD containing the material meant for publication, to facilitate printing.

---

#### **CHECK LIST OF THE DOCUMENTS TO BE SUBMITTED BY THE INVESTIGATOR**

- 1. Individual Subscription form**
- 2. Hard copy of the original Manuscript**
- 3. Soft copy of the original Manuscript**
- 4. Copyright Transfer Statement**
- 5. Subscription Fees in the form of Demand Draft of Nationalized Bank.**
- 6. Manuscript of the research paper will be typed in M. S. Word 2003**
- 7. Follow the other instructions as given in Guidelines for the author.**

**INDIAN JOURNAL OF PHYSICAL EDUCATION , SPORTS AND APPLIED SCIENCES**

ISSN: 2229-550X (P) 2455-0175 (O)  
**COPYRIGHT TRANSFER STATEMENT**

Manuscript Title : .....

Name 1 ..... Address .....

Mailing Address: .....

Telephone: .....Email ..... Institutional Affiliations .....

Name 2 : ....., Address .....

Mailing Address: .....

Telephone: ..... Email .....

Institutional Affiliations .....

Name 3 : ....., Address .....

Mailing Address: .....

Telephone: ..... Email .....

Institutional Affiliations .....

Corresponding Author - Name .....email .....

Each author warrants that his submission to the work is original and that he or she has full power to enter into this agreement. Neither this work nor a similar work has been published elsewhere in any language nor shall be submitted for publication elsewhere while under consideration by IJPESAS Each author also accepts that the IJPESAS will not be held legally responsible for any claims of compensation.

Authors wishing to include figures or text passages that have already been published elsewhere are required to obtain permission from the copyright holder(s) and to include evidence that such permission has been granted when submitting their papers. Any material received without such evidence will be assumed to originate from the authors.

We are in agreement with the statements and we accept scientific and legal responsibility of the article

Name1 .....Date .....Signature.....

Name2 .....Date .....Signature.....

Name3 .....Date .....Signature.....