

## A STUDY OF SOME SELECTED ANTHROPOMETRIC AND MUSCULAR STRENGTH VARIABLE OF FOOTBALL AND VOLLEYBALL PLAYERS

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### ABSTRACT

*The aims of this study was to investigate some selected anthropometric and muscular strength variable of football and volleyball players. The study was conducted on 60 players (age range 17-25 years) of two different groups i.e., Group 1- having 30 football players and Group 2- having 30 volleyball players. Body Mass Index was measured according to the WHO (Laquatra, 2004). Body weight was checked with digital weighing machine. Muscular strength was accessed with hand grip strength test. Comparison of Mean  $\pm$ SD and t-test was used to identify the significant differences between football and volleyball players in selected anthropometric and muscular strength variables. To find the relationship Karl Pearson's coefficient of correlation was used among age, body weight, and body mass index variables of football and volleyball players. The level of significance was  $p < 0.05$ . A positive significant relationship was observed among age, height, weight, BMI, percentage fat, right hand grip and left-hand grip variables of combined group of football and volleyball players. The results of the present study also demonstrated the effect of age, weight, height, Body Mass Index, and percentage body fat on Football and Volleyball Players.*

**Keywords:** Anthropometry, BMI, fat percentage, football, skinfold, strength.

### 1. INTRODUCTION

Volleyball is an outstanding all-round team sport. It has been broadly recognized as an extremely competitive as well as entertaining game all around the world. It is a team sports of tactics and power and it is played at a faster pace and this calls sharper thinking, high standard of skills and technical application. There are very fast action and accuracy in performance to technique, and tactics, which are the demand of present game. Volleyball game may be characterized as an integrated playing action of six main skills, serve, serve-reception, set, spike, block and dig. Volleyball is game of skill and strategies. One skill is the wall spike ability to smash the ball in the desired direction, with the explosive strength and high speed (Singh, & Singh, 2013).

Volleyball belongs to that sport activities in which anthropometric characteristics of its participants influence the level of sport performance. It was established that volleyball players compared to most other athletes have distinctive anthropo-morphological characteristics (Ercolessi et al., 1999). Anthropometry is the measurement of body size and proportions. The measurements include body weight, height, circumference, skin fold thickness and bony widths and lengths (Mohammad, & Tareq, 2016; Heyward, 2006). Anthropometric measurements are widely used to assess and predict performance in various

sports. Anthropometric measurements and morphological characteristics play an important role in determining the success of a sports person (Mohammad, 2015a,b,c; Wilmore, & Costill, 1999). The anthropometrical characteristics and body composition of athletic populations has been an interest of trainers, exercise scientists and sport medicine professionals for years and many of them assumed the practicing athletes might be expected to exhibit structural and functional characteristics that are specifically favorable for the sport (Ali, & Mohammad, 2012; Hussain, Ahmed, Mohammad, & Ali, 2013; Hussain, Mohammad, & Khan, 2011; Singh, Singh, & Singh, 2010).

Physical fitness plays a very important role in a normal individual as well as in an individual who is there participating in some kind of sports events (Mohammad, 2016). There are different kinds of sports which are performed all over world, some are related to each other but some are entirely different. So, to perform their different kind of sports event physical fitness is an essential component, which should be possessed by a player. Individual has lack of physical fitness due many new inventions and now is totally dependent upon various machines for daily works. Yes, it's true that it saves times but at last these has some sort of adverse effects on physical fitness and wellbeing of an individual. To improve physical fitness of a player training plays a very important role, as the techniques which are given in training to a player improves the player's performance give positive effects to performance in events (Ahsan, & Mohammad, 2018). The ability of sportsmen to bear things plays a vital role in the performance (Kohli, & Singh, 2014).

Thus to work on all these things it was aimed to investigate selected anthropometric and muscular strength variable of football and volleyball players. It was also decided to investigate the relationship of selected anthropometric and physical fitness variables of football and volleyball players.

## **2. METHODS AND MATERIALS**

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

The study was conducted on 60 players (age between 17-25 years). These 60 players were divided in to two different groups i.e., Group-1 comprising 30 football players, and Group-2 comprising 30 volleyball players. Convenience Sampling method was used to recruit samples for this study. A consent form was filled by these players, where they agreed to participate in the study on voluntary basis.

### **2.2 Variables and Tools**

In this study Body weight, height, BMI, and hand grip strength of football and volleyball players were measured with standardized procedure. Body Mass Index was measured according to the WHO (Laquatra, 2004). Body weight was checked with digital weighing machine. Muscular strength was accessed with hand grip strength test.

### **2.3 Statistically Analysis**

Mean  $\pm$ SD and *t*-test was used to identify the significant differences between football and volleyball players in the selected anthropometric and muscular strength variables. To find the relationship Karl Pearson's coefficient of correlation was used among age, body weight, body mass index and skinfold thickness variables of football and volleyball players. The level of significance was set at  $p < 0.05$ .

### 3. RESULTS

**Table 1: Mean± SD of age, height, weight, BMI, % body fat, right and left-hand grip of different groups**

Variable(s)	Group 1 (n=30)	Group 2 (n=30)	t-Value	Sig. (2-tailed)
Age (year)	20.13 ± 1.56	21.20 ± 1.71	2.51	.015
Height (cm)	175.43 ± 7.62	180.50 ± 7.75	2.55	.013
Weight (kg)	59.56 ± 8.52	70.80 ± 11.58	4.27	.000
BMI	19.28 ± 1.80	21.62 ± 2.50	4.14	.000
% Body fat	59.83 ± 12.51	14.22 ± 4.20	3.33	.001
Right hand grip (Kg)	61.24 ± 19.63	76.06 ± 12.61	5.05	.000
Left hand grip (Kg)	58.30 ± 13.95	71.53 ± 12.35	3.88	.000

*\*significant at the 0.05 level*

In the above Table 1 mean, standard deviation and calculated *t* value of each variable are presented. When calculated *t* value is viewed in light of sig. value it was found that significant difference existed in the both the groups i.e. football players and volleyball players on all the selected variable.

**Table 2: Correlation between football and volleyball players on the variables of age, height, weight, BMI, percentage fat, right hand grip and left-hand grip**

Variable(s)	Height	weight	Body mass index	Percentage body fat	Right hand grip	Left hand grip
Age	.131	.174	.136	.166	.315*	.334*
Height		.763*	.377*	.379*	.489*	.294*
Weight			.885*	.732*	.551*	.470*
BMI				.782*	.436*	.451*
Percentage body fat					.324*	.233
Right hand grip						.708*

*\*significant at the 0.05 level*

Table 2 shows a positively significant relationship was observed among age, height, weight, BMI, percentage fat, right hand grip and left-hand grip variables of combined group of football and volleyball players.

### 4. DISCUSSION

From the results of the present study it was observed that volleyball players were found tall than football players. Volleyball players were found heavier than football players when their weights were compared. Therefore, the heights of volleyball players have a direct effect on the performances of volleyball skills. The results of the present study show that Body mass index was found minimum in football players than volleyball players and both groups were observed normal body mass index. The body fat percentage of the football players and volleyball players of different groups were in the acceptable range. In other words, we can say no obesity was observed in them. The maximum body fat percentage was observed in volleyball players and minimum in football players. The mean value of various anthropometric variables body mass index was found minimum in Football Players as compared to volleyball players. Right hand grip strength was found strong than football players. Left hand grip strength was also found stronger in volleyball players than football players. Right hand grip of both groups was observed stronger than left hand grip. The results of two groups have been compared with each other. Further results obtained from anthropometric and hand grip strength variables of two groups were also compared with each

other's. A statistically Significant difference were observed between football and volleyball players in anthropometric and grip strength variables. Karl Pearson's coefficient of correlation was used to find the relationship among the various anthropometric and hand grip strength variables of Volleyball Players in two groups according to their age was positively significant. The finding of this study indicates that, the positively relationship was found among the variables body percentage fat, age, height, weight, and BMI. Percentage lean body mass was found negatively relationship with age, height, weight, and BMI. Left hand grip strength was observed positively relationship with age, height, weight, and BMI. Right hand grip strength was found positively related with age, height, weight, left hand grip strength, fat in kg, and lean body mass in kg and found negatively relationship related with percentage lean body mass.

## 5. CONCLUSION

Within the limits and limitation of the study it can be concluded that volleyball players were found tall and heavier than football players. Body mass index was found minimum in football players than volleyball players and both groups were observed normal body mass index. Whereas, the body fat percentage of the football players and volleyball players were in the acceptable range. In other words, we can say no obesity was observed in them. The maximum body fat percentage was observed in volleyball players and minimum in football players. Thus, volleyball players were observed higher percentage fat as compared to football players. The mean value of body mass index was found minimum in Football Players as compared to volleyball players. Right and left hand grip's strength was found strong in volleyball players when compared with football players.

The positive relationship was found among the variables of body percentage fat, age, height, weight, and BMI. Right hand grip strength was found positively related with age, height, weight, BMI, percentage body fat, and Left hand grip strength. Left hand grip strength was found positively related with age, height, weight, BMI, percentage body fat, right hand grip strength.

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