



## Anthropometric measurements of football and volleyball players: A comparative study

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### Abstract

The purpose of the study was to compare the Anthropometric characteristics of Volleyball and football players. 60 male players were randomly selected from SBBS University Khiala, Jal. All of them were the players from Department of Physical Education of SBBS University. The age of subjects was 18 to 25 years. They were divided in two categories i.e. 30 football players and 30 volleyball players who were representative of SBBS University for interuniversity competition in their respective games. The scholar explained the propose and procedure of the study to the selected subjects. The scholar checked the 10 body measurements with the different tools. T-test was used to compare the groups at 0.05 level of significance and found that there was no significance difference in both groups.

**Keywords:** anthropometry, body composition, lean body mass, percentage body fat

### Introduction

In the beginning of the 21<sup>st</sup> century, multiple theories about science and other disciplines were found. The contemporary scientific world saw an array of discoveries and inventions. The theories are being challenged every day paving way to the new theories either challenging the earlier ones or supporting them and making them more advanced.

The use of word "anthropometry" has been gaining more popularity in the recent years. Anthropometry is a science which deals with measurements of body and those body parts which are related to kinetics and kinematics. The word kin anthropometry is an acronym of three Greek words "Kinein" means to move, "Anthrop" means man and "Metering" means to measure.

Ross *et al.* (1978) [2] defined kin anthropometry as the application of body measurements to the study of human size, shape, proportion, composition, maturation and gross functions so as to help to understand human movement in relation to growth, exercise, performance and nutrition.

International Society for the advancement of Kin anthropometry (IASK) defined kin anthropometry as, "Scientific specialization dealing with the measurement of humans in a variety of morphological perspective, its application to movement and those factors which influence movement including components of body build, body measurements, proportions, composition, shape, maturation, motor abilities and cardio- respiratory capacities, physical activity, including recreational activity as well as highly specialized sports performance."

The human physique differs in many ways and variation in physical characteristics is an interesting aspect. This variety of human physique plays an important role to attain better performance in particular sports. Every game requires a specific type of body whereas unsuitable body types in relation to the sports may build great stumbling block in the

progress of the sports performance. Recognizing the importance of the different physique in the ancient times Hippocrates, a great Greek Philosopher of the 5<sup>th</sup> century B.C. was the first expert who introduced a method of body classification in which the individuals were divided into two body types as 'habits phthisis's' who had thin and lean body with long extremities and 'habits apoplectics' who had short, thick and massive bodies

Apart from the considerations of body size, the constitutional make up of body composition components are also important. The division of the body weight into various components can well be conceived by considering the major parts of the body, i.e. fat mass, muscle mass and bone mass (Singh & Malhotra, 1989) [3]

Body composition of athletes is an important tool to evaluate the health of the athlete, to monitor the effects of a training program and to determine optimal competitive body weight and other components of body composition (Prior *et al.*, 2001) [5]. Knowing and understanding the effect of training and competition on body composition can help athletes control weight and alter body composition safely.

The physical education teachers, trainers and coaches have understood the importance of various factors such as training, skill, personality, motivation in the sports performance but most important of them all is morphology, Somatotyping, body composition and kin anthropometric characteristics because these factors are definite predictions of the degree of efficiency and level of success of sportsperson. The sports performance of athletes is greatly influenced by such factors as age, height and weight and body structure. It is also observed that persons of the same age group vary in body size and shape, the individuals of the same height differ greatly in body weight, the persons may weigh the same, but the relative proportion of muscle, fat, and bone will be varied (Johnson and Nelson 1982)

## Objectives

1. To know the differences of anthropometric characteristics between Inter University level football and volleyball players.
2. To find out the differences of body composition between inter University level football and volleyball players.

## Hypotheses

1. There will be significant differences of anthropometric characteristics between Inter University level football and volleyball players.
2. There will be significant differences of body composition between inter University level football and volleyball players.

## Delimitations of the Study

1. The study will delimit only to male player who have participated in Inter University football and volleyball championships for the year 2017-2018.
2. The study will also delimit to SBBS University only.
3. The study will delimit to the football and volleyball players' age ranged between 18 to 25 years.
4. The study will delimit to 10 anthropometric characteristics of 60 male football and volleyball players.

## Significance of the study

1. The findings of the study may provide criteria for selecting best talent that exist for football and volleyball players.
2. A comparative analysis of the physique of football and volleyball players will be helpful in the evaluation and prediction of their performance in their respective games.

## Definitions of terms

- **Anthropometry:** Branch of science concerned with comparative measurements of the human body, its parts, and its proportions and composition.
- **Body Composition:** is used to describe the percentages of fat, bone and muscle in human bodies.
- **Lean Body Mass:** The total body weight minus the fat mass. Lean body mass consists of water, bones, collagen, and muscle.
- **Percentage Body fat:** This describes the percentage of total weight that is composed of fat. Body fat percentage is that percentage of body mass that is not made up of bone, muscle, connective tissue and fluids; that is, everything else. This is referred to as 'fat-free mass'.

## Review of Related Literature

Thorland *et al.* (1981)<sup>[8]</sup> examined 145 male and 133 female adolescent participants in National Meet Competition in the sports of track and field, gymnastics, diving and wrestling. The objective of the study was to determine body composition and Somatotype in Junior Olympic Competition to evaluate the structural characteristics concomitant to high proficiency in various athletic activities. The most frequent differences within either the male or female Junior Olympic samples involved the performers in throwing events (shot put, discus and javelin), who were taller, heavier, fatter and unique

Somatotype when compared to all or most other competitors. Difference in body composition characteristics were also noted when junior Olympians were compared with other adolescent athletes or non-athletes.

Thomas *et al.* (1983)<sup>[9]</sup> in their study Twenty-four collegiate distance runners and twenty power athletes (sprinters and jumpers) of various success levels were tested on a number of physiological and psychological parameters. Subjects were male volunteers, ages 17-22 years, from the University of Kansas Varsity track and field team. All subjects had been training for several years. The multiple regression analysis indicated that the combination of physiological and psychological variables could explain a large percentage over 80% of the variation in jumping performance. The percent fat, body weight were the strongest predictors of power event performance. The weight of the jumpers was  $73.16 \pm 6.45$  and the percentage of fat was  $4.6 \pm 2.0$ .

## Sampling Procedure

In this study, only those football and volleyball players used as subjects who participated in Inter University football and volleyball competition from session 2017-18. In this study the age of the players were 18 to 25 years. The players divided into two groups i.e. football players group and Volleyball players group.

## Data Collection

All the anthropometric measurements of all subjects measured in the morning hours with empty bowl in University ground no.1. The measurements recorded in centimeters scale up to the nearest millimeters. Posture of the subject checked every time so that a correct measurement can be taken by the scholar. Following measurement was measured by the scholar.

## Gross Body Measurements

1. Weight (kg)
2. Height (cm)

## Length of Body Parts (cm)

1. Sitting Height
2. Arm Length
3. Leg Length

## Circumferences of Body Parts (cm)

1. Chest Circumference
2. Abdominal Circumference
3. Upper Arm Circumference
4. Forearm Circumference
5. Thigh Circumference

## Statistical Procedure

Significant difference in anthropometric measurements in volleyball and football players was determined through 't' test. t-Test was used to compare the groups at 0.05 levels of significance.

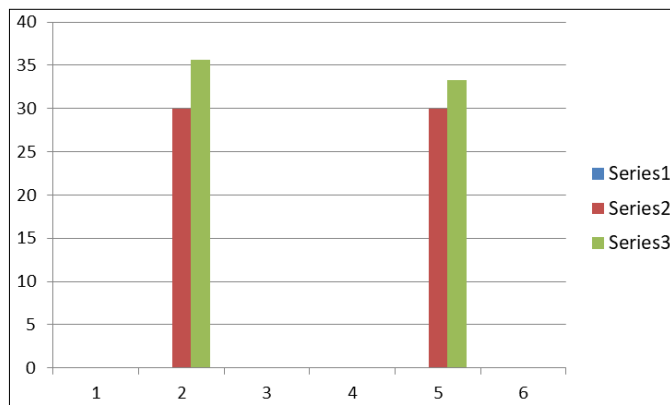
## Results and Discussion

The finding of the various parameters is discussed as under:-

**Table 1:** Table showing the no significance of difference in Anthropometric measurements between Volleyball and Football players.

Sr. No.	N	Mean	SD	Calculated t value
Volleyball Players	30	35.61	7.81	1.24*
Football Players	30	33.26	6.76	

The anthropometric measurement mean score (35.61) of Volleyball players which is higher than mean score (33.26) of football players. Their Standard Deviation is (7.81) and (6.76) respectively. However, the t ratio is 1.24 which is less than table value (1.672) significant at 0.05 levels. It means that there is no significant difference in anthropometric measurements between Volleyball and Football players of SBBS University. The difference of anthropometric measurements represented in table 1 and its comparison is depicted graphically in fig 1.



**Fig 1:** showing the no significance difference in anthropometric measurements of Volleyball and Football players.

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