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## Comparisons of anthropometric characteristics between the volleyball and football players of age 16-18 years

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### Abstract

The purpose of this study was to find the differences of anthropometric characteristics between the male Volleyball and Football players. The subjects were male Volleyball and Football players of age 16-18 years. They were tested for their anthropometric measurements in order to make comparisons. It was found that significant differences were found between both groups with regard to the variables: Height, Sitting height, Weight, Leg length, Arm length, Biacromial Diameter, Ankle Diameter, Upper Arm Circumference, Calf Circumference, Biceps skinfold, Triceps skinfold and Calf skinfold. However, no significant differences were found between the both groups for the variables: Bicondylar Humerus Diameter, Wrist Diameter, Bicondylar Femur Diameter, Forearm Circumference, Thigh Circumference, Subscapular skinfold and Suprailiac skinfold. It can be concluded that Volley ballers had greater lengths whereas Footballers had greater diameters and skinfold scores.

**Keywords:** Anthropometric, volleyball, football, skinfold

### Introduction

Different sporting competitions need different styles of body to reach optimum performance (Masanovic and Vukašević, 2009) <sup>[1]</sup>. Because each sport has its own unique criteria, each athlete should have clear anthropometric characteristics and body structure statistics for his or her own athletic discipline. Both competitive activities performed at a professional level enable the body to function at an optimum biomechanical and physiological capacity (Saavedra *et al.*, 2018) <sup>[2]</sup>. Logically, a junior competitor playing in the toughest leagues of his age group is supposed to have the highest health, power and stamina to fulfil the practical criteria of the sport of question. Many research have shown that particular anthropometric features are substantially correlated with performance in sport (Malina *et al.*, 2004) <sup>[3]</sup>. Morphological characteristics are of special significance for orientation and selection of most sports disciplines, as morphological measurements hold one of the most significant roles in the equation of the specification of virtually any sport and even of each unique role in the squad. Volleyball is a playing game in which two teams of six players are divided by a net. It takes a high degree of training in order to complete three sets of competitive play and achieve results. In this game, movement trends vary greatly from those in handball, since the game needs the most successful results in attack and defense such that net superiority becomes the most crucial element in victory (Bilge, 2013) <sup>[6]</sup>. This game also contains a wide variety of spikes, leaps, power strikes, barriers, and configurations that are primarily focused on a high degree of strength and power. The various criteria of these tasks have contributed to the need for unique physical characteristics for the high-level embodiment of game elements.

### Methods

The subjects of this study were the boys of 16-18 years age selected from the four districts of Punjab viz. Amritsar, Tarn Taran, Gurdaspur and Pathankot. The subjects were 150 Volleyball players and 150 Football players. The purposive sampling method was used to select the

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Sample. They were tested for their anthropometric measurements in order to make comparisons. The anthropometric measurements were: Height (cm), Sitting height (cm), Weight (Kg), Leg length (cm), Arm length (cm), Biacromial Diameter (cm), Bicondylar Humerus Diameter (cm), Ankle Diameter (cm), Wrist Diameter (cm), Bicondylar Femur Diameter (cm), Chest Circumference (cm), Upper Arm Circumference (cm), Calf Circumference (cm), Forearm Circumference (cm), Thigh Circumference (cm), Biceps skinfold (mm), Triceps skinfold (mm), Subscapular skinfold (mm), Suprailliac skinfold (mm) and Calf skinfold (mm).

### Statistical analysis

Descriptive statistics were described as means and standard deviation. The differences of anthropometric characteristics between Volleyball and Football players were observed using

the Independent t-test. The significance level was set at 0.05 level.

### Results

Table 1 shows the differences of anthropometric characteristics of Volleyball players and Football players of age 16-18 years. It is evident from the results that significant differences were found between both groups with regard to the variables: Height, Sitting height, Weight, Leg length, Arm length, Biacromial Diameter, Ankle Diameter, Upper Arm Circumference, Calf Circumference, Biceps skinfold, Triceps skinfold and Calf skinfold. However, no significant differences were found between the both groups for the variables: Bicondylar Humerus Diameter, Wrist Diameter, Bicondylar Femur Diameter, Forearm Circumference, Thigh Circumference, Subscapular skinfold and Suprailliac skinfold.

**Table 1:** Comparisons of anthropometric characteristics between volleyballers and footballers

Variable	Volleyball		Football		p-value
	Mean	SD	Mean	SD	
Height (cm)	177.56	4.17	175.44	6.54	0.001*
Sitting height (cm)	87.46	3.12	86.66	1.15	0.004*
Body Weight (Kg)	75.14	6.51	72.89	7.16	0.005*
Leg length (cm)	90.16	6.27	88.62	6.61	0.04*
Arm length (cm)	74.52	2.79	72.98	3.06	0.001*
Biacromial Diameter (cm)	37.68	1.78	36.68	2.41	0.001*
Bicondylar Humerus Diameter (cm)	5.97	0.83	5.90	0.85	0.495
Ankle Diameter (cm)	5.70	1.26	6.26	1.35	0.001*
Wrist Diameter (cm)	4.98	0.83	5.06	0.79	0.358
Bicondylar Femur Diameter (cm)	8.96	0.81	8.97	0.83	0.889
Chest Circumference (cm)	79.04	5.84	79.72	5.64	0.311
Upper Arm Circumference (cm)	22.71	2.18	23.48	2.32	0.003*
Calf Circumference (cm)	29.77	2.53	30.47	2.74	0.023*
Forearm Circumference (cm)	22.11	3.78	22.60	4.16	0.284
Thigh Circumference (cm)	46.45	3.89	46.56	4.30	0.811
Biceps skinfold (mm)	6.07	1.53	6.82	2.04	0.001*
Triceps skinfold (mm)	10.20	2.14	10.77	2.34	0.029*
Subscapular skinfold (mm)	11.84	2.33	11.93	2.630	0.763
Suprailliac skinfold (mm)	13.30	2.56	13.02	2.46	0.325
Calf skinfold (mm)	9.65	2.30	9.01	2.20	0.015*

### Discussion

The aim of the study was to find the differences of anthropometric characteristics between the male Volleyball and Football players of age 16-18 years. This study found that Volleyball players had more height, sitting height, body weight, leg length and arm length than the Football players. Volleyball is game that demand more heighted players as compared to Footballers, hence these results were expected. With regard to diameters, it was found that Volley ballers had more biacromial diameter than their counterparts whereas Footballers has more ankle breadth. However, bicondylar humerus diameter, wrist diameter, bicondylar femur diameter were not significantly varying between the two groups. For circumferences, upper arm circumference and calf circumference were higher in Footballers than Volleyballers. Similar results were found for skinfolds as the Footballers showed higher scores for biceps skinfold, triceps skinfold and calf skinfolds. On the contrary, both groups showed equal characteristics with respect to bicondylar humerus diameter, wrist diameter, bicondylar femur diameter, forearm circumference, thigh circumference, subscapular skinfold and suprailliac skinfold. An earlier study also found significant differences between Volleyball and Football players (Keshav *et al.*, 2014).

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