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COMPARATIVE STUDY OF ANTHROPOMETRIC CHARACTERISTICS PARAMETERS OF SCHOOL LEVEL FOOTBALL AND VOLLEYBALL MALE PLAYERS

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Abstract

This research paper aims to investigate and compare the anthropometric characteristics of Volleyball and Football players aged 16-18 years. Anthropometric measurements play a vital role in understanding the physical attributes of athletes, which can impact their performance and suitability for specific sports. By comparing the anthropometric profiles of Volleyball and Football players within the same age group, this study aims to provide valuable insights into the unique physical demands of each sport and their influence on player selection and training programs. The study utilized a cross-sectional design, collecting data on height, weight, body composition, and selected body proportions. Statistical analysis and comparison between the two groups were conducted to highlight potential differences. The findings of this study will contribute to a better understanding of the specific physical requirements of Volleyball and Football and assist in optimizing talent identification and athlete development processes.

Keywords: Anthropometric Characteristics, Volleyball players, Football players, Physical attributes, Talent identification, Athletes development.

Introduction

The anthropometric characteristics and body structure of athletes play a crucial role in achieving optimum performance in different sports disciplines. Each sport has its own specific criteria, and athletes need to possess the appropriate physical attributes to excel in their respective disciplines(Masanovic and Vukašević, 2009).

Competitive sports, especially at the professional level, require athletes to function at their peak biomechanical and physiological capacities. Junior athletes participating in top-tier leagues within their age groups are expected to have excellent health, power, and stamina to meet the practical requirements of their sports (Saavedra et al., 2018).

Numerous studies have demonstrated a significant correlation between specific anthropometric features and athletic performance (Malina et al., 2004). Morphological characteristics, in particular, play a vital role in the selection and orientation of athletes in most sports.

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Morphological measurements are essential in determining the suitability of athletes for various sports and even specific roles within a team (Lidor R and Ziv G 2010).

Volleyball is a team sport where two teams of six players compete against each other, separated by a net. The game requires extensive training to complete three sets of competitive play and achieve successful outcomes. In Volleyball, movement patterns differ significantly from those in handball, for example, as the game emphasizes achieving superior results in both attack and defense, with net superiority being a crucial factor in winning (Bilge, 2013).

Volleyball involves a wide range of actions such as spikes, jumps, powerful strikes, blocks, and formations that primarily rely on high levels of strength and power (Singh H and Singh S 2017). These specific requirements have led to the identification of unique physical characteristics necessary for achieving high-level performance in the sport (Keshav K. and Harmandeep S. 2014)

Methodology

In this study, the subjects consisted of boys aged 16-18 years who were selected from four districts of Punjab: Amritsar, Tarn Taran, Gurdaspur, and Pathankot. The sample included 150 Volleyball players and 150 Football players. The researchers used a purposive sampling method to select the participants. Anthropometric measurements were taken from the subjects in order to compare them. The following anthropometric measurements were recorded: 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 was conducted to analyze the data. Descriptive statistics, such as means and standard deviations, were used to summarize the anthropometric characteristics of the subjects. The researchers also performed an independent t-test to observe the differences in anthropometric characteristics between the Volleyball and Football players. The significance level for the statistical analysis was set at 0.05, indicating that results with p-values less than 0.05 were considered statistically significant.

Results

The results of the study comparing the anthropometric characteristics of Volleyball players and Football players aged 16-18 years are presented in Table 1. The analysis revealed significant differences between the two groups for certain variables, while no significant differences were found for other variables.

Table1: Comparisonsofanthropometriccharacteristicsbetween Volleyball playersandFootball players

Variable	Volleyball		Football		p-value
	Mean	SD	Mean	SD	

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Height(cm)	177.56	4.17	175.44	6.54	0.001 *
Sittingheight(cm)	87.46	3.12	86.66	1.15	0.004 *
BodyWeight(Kg)	75.14	6.51	72.89	7.16	0.005 *
Leglength(cm)	90.16	6.27	88.62	6.61	0.04*
Armlength(cm)	74.52	2.79	72.98	3.06	0.001 *
BiacromialDiameter(cm)	37.68	1.78	36.68	2.41	0.001 *
BicondylarHumerusDiameter(cm)	5.97	0.83	5.90	0.85	0.495
AnkleDiameter(cm)	5.70	1.26	6.26	1.35	0.001 *
WristDiameter(cm)	4.98	0.83	5.06	0.79	0.358
BicondylarFemurDiameter(cm)	8.96	0.81	8.97	0.83	0.889
ChestCircumference(cm)	79.04	5.84	79.72	5.64	0.311
UpperArmCircumference(cm)	22.71	2.18	23.48	2.32	0.003 *
CalfCircumference(cm)	29.77	2.53	30.47	2.74	0.023 *
ForearmCircumference(cm)	22.11	3.78	22.60	4.16	0.284
ThighCircumference(cm)	46.45	3.89	46.56	4.30	0.811
Bicepsskinfold(mm)	6.07	1.53	6.82	2.04	0.001 *
Tricepsskinfold(mm)	10.20	2.14	10.77	2.34	0.029 *
Subscapularskinfold(mm)	11.84	2.33	11.93	2.630	0.763
Suprailliacskinfold(mm)	13.30	2.56	13.02	2.46	0.325
Calfskinfold(mm)	9.65	2.30	9.01	2.20	0.015 *

Significant differences were observed between Volleyball players and Football players in the following 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. These findings suggest that Volleyball players and Football players have distinct anthropometric characteristics in terms of these variables.

On the other hand, no significant differences were found between the two groups for the variables of bicondylar humerus diameter, wrist diameter, bicondylar femur diameter, forearm circumference, thigh circumference, subscapular skinfold, and suprailliac skinfold. This implies that these particular anthropometric characteristics do not significantly differ between Volleyball players and Football players in the given age range.

The results indicate that specific anthropometric measurements can differentiate between Volleyball players and Football players, highlighting the sport-specific requirements and physical attributes associated with each sport. These findings contribute to the understanding of the unique physical characteristics necessary for optimal performance in Volleyball and Football.

Discussion

The results of this study indicate clear differences in anthropometric characteristics between male Volleyball and Football players aged 16-18 years. Volleyball players displayed greater height, sitting height, body weight, leg length, and arm length compared to Football players.

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These findings are consistent with the expectations of the study, as Volleyball generally requires taller players compared to Football.

Regarding diameters, it was observed that Volleyball players had a larger biacromial diameter, which refers to the breadth of the shoulders, while Football players had a greater ankle breadth. However, there were no significant differences between the two groups in terms of bicondylar humerus diameter, wrist diameter, and bicondylar femur diameter. These measurements reflect the bone width of the upper arm, wrist, and thigh, respectively. The lack of significant differences suggests that these skeletal dimensions may not be strongly influenced by the choice of sport.

In terms of circumferences, Football players had higher values for upper arm circumference and calf circumference compared to Volleyball players. This could be attributed to the physical demands of Football, which involves more running and leg strength. Additionally, Football players had higher skinfold measurements (biceps, triceps, and calf skinfolds) compared to Volleyball players, indicating higher levels of subcutaneous fat. These differences may be due to variations in training methods and physiological requirements of the two sports.

However, it is worth noting that certain anthropometric characteristics did not show significant differences between the two groups. Measurements such as bicondylar humerus diameter, wrist diameter, bicondylar femur diameter, forearm circumference, thigh circumference, subscapular skinfold, and suprailliac skinfold were similar between Volleyball and Football players. This suggests that these specific variables may not be strongly influenced by the choice of sport and may be more dependent on individual factors.

Conclusion

The findings of this study align with previous research that has also reported significant differences between Volleyball and Football players in terms of anthropometric characteristics (Keshav et al., 2014). These results highlight the importance of considering sport-specific physical attributes and characteristics when selecting and training athletes for different sports. Understanding these differences can aid in talent identification, training program development, and performance optimization in Volleyball and Football.

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