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Explosive strength and anthropometric characteristics of female volleyball players at different levels of achievement

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Abstract

Background and Objective: The objective of the study was to compare the Explosive Strength and Anthropometric Characteristics between selected female Volleyball players.

Method: Total 50 female volleyball players (25 from each selected National and State level Female Volleyball players) were randomly selected (The purposive sampling technique was used to collect the data) with age ranging from 19 to 25 years for the purpose of the study. Explosive Strength and Anthropometric Variables was selected as a dependent variable and selected Game volleyball were considered as independent variable. Explosive Strength and Anthropometric Variables was assessed with the help of Standing Broad Jump for Explosive Strength and Anthropometric Variables was assessed with the help of Gulick Tape and weight machine. t-test statistics were used to compare Explosive Strength and Anthropometric Variables of selected female volleyball players. The level of significance were be set at 5%.

Results: There was significant difference found in Explosive Strength and Anthropometric Variables i.e. (standing height, body weight, hand length and leg length) of national and state level female volleyball players. The obtained 't' ratio was found 10.28, 5.709, 3.767, 12.764 and 8.764 is higher than the table value 1.67 for df 48 which is required for significance at 0.05 levels.

Conclusions: Based on results of the study it was concluded that there all the selected female volleyball players had not similar Explosive Strength and Anthropometric Characteristics.

Keywords: explosive strength and anthropometric variables

Introduction

Volleyball is the game that is played by all ages and both sexes indoor and outdoor. It is highly competitive and requires high level of fitness. Competitive Volleyball is all action game with none of the players acting as involuntary spectators as seen in the others games. The popularity of volleyball has grown in the past two decades and the game continues to build momentum at all competitive levels (Scates and Linn, 2003) [1]. In volleyball, technical and tactical skills, anthropometric characteristics and individual physical performance capacities are most important factors that contribute to the success of a team in competitions (Hakkinen, 1993) [2].

"It is the capacity of an individual to bring into play maximum muscle contraction at the fastest rate of speed" (Barrow and Magee, 1966) [6].

"Explosive power is the ability to release maximum muscular force in the shortest time as in executing a standing broad jump" (Baumgartner and Jackson, 1987) [7].

Anthropometric characteristics for success may not only be different from sport to sport, but also within various playing positions in team sports. The knowledge of anthropometric characteristics also allows the athlete and the coach to make adaptations in his/her training method to attain the optimal physical attributes for best performance.

In fact, the information regarding the anthropometric status of an athlete is essential for two main reasons, firstly, to design an effective training program, and, secondly, to select the event-specific talents in the athletes. Some anthropometric characteristics, e.g. length and breadth measurements, are genetically determined and can hardly be changed with the effects of a training program. Various anthropometric characteristics were found to be closely associated with excellent performance.

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Objective of the study: Explosive strength and anthropometric characteristics of female volleyball players at different levels of achievement.

Methodology

Subjects: Total 50 female volleyball players (25 from each selected National and State level female volleyball players selected from different Stadiums and clubs of Delhi NCR Region) were randomly selected (stratified random sampling) with age ranging from 19 to 25 years for the purpose of the study.

Variable: Dependent Variables:

- 1) Explosive Strength
- 2) Anthropometric Variables
 - A. Standing Height
 - B. Weight
 - C. Hand Length
 - D. Leg Length

Criterion Measures

- 1. Explosive Leg Strength was measured by Standing Broad Jump and the scores recorded in centimeters.
- 2. Standing height was measured using Gulick Tape and the scores recorded in centimeters.
- 3. Weight was measured using Weighing machine and the scores recorded in kgs.
- 4. Arm length was measured using Gulick Tape and the scores recorded in centimeters.
- 5. Leg length was measured using Gulick Tape and the scores recorded in centimeters.

Design of the study: Static group comparison design was used where selected game i.e. Volleyball (National and State level Female Players) were treated as two groups.

Collection of Data: The data were collected as per direction given in the manual of Explosive Strength and Anthropometric Variables from 50 National and State level

Female Volleyball Players on purposive sampling. All the data were collected from the concern National and State level tournaments. Before actual collection of data, the investigator gave a short orientation lecture explaining to the subjects, the purpose of the study.

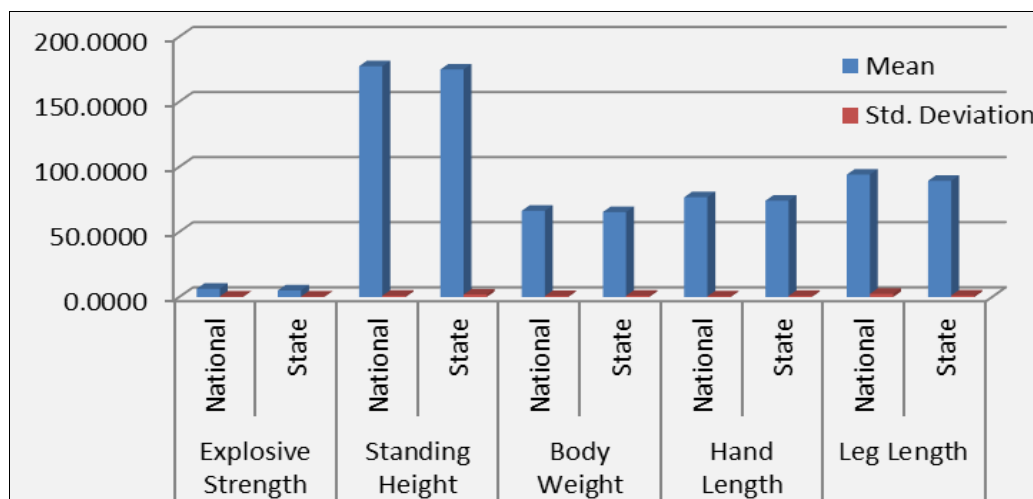
Statistical Analysis: t-test were used to compare Explosive Strength and Anthropometric Variables of selected Volleyball players. The level of significance were be set at 5%.

Table 1: Representation of Mean and Standard Deviation relation to Explosive Strength and Anthropometric Variables of National and State level Female Volleyball Players

Volleyball Players	Mean	Std. Deviation	t-Value	
Explosive Strength	National	6.3332	.41712	10.2758
	State	5.1072	.42647	
Standing Height	National	177.3080	.98605	5.709074
	State	174.8016	1.96117	
Body Weight	National	66.2340	.78230	3.767225
	State	65.2684	1.01511	
Hand Length	National	76.7184	.59321	12.76402
	State	73.9940	.88716	
Leg Length	National	94.0640	2.46027	8.764414
	State	89.2732	1.19032	

Sig at 0.05, table value (48) = 1.67

Table-1 the study showed that the mean values of explosive strength and Anthropometric Variables (Standing Height, Body Weight, Hand Length, Leg Length) between National and State level Female Volleyball Players 6.333 & 5.107, 177.308 & 174.801, 66.234 & 65.268, 76.718 & 73.994 and 94.064 & 89.273 respectively. The obtained 't' ratio was found 10.275, 5.709, 3.767, 12.764 and 8.764 is higher than the table value 1.67 for df 48 which is required for significance at 0.05 levels. It was concluded that there was significant difference occurred in explosive strength and anthropometric variables i.e. standing height, body weight, hand length and leg length of national and state level female volleyball players.



Graph 1: Graphical Representation of Mean and Standard Deviation relation to Explosive Strength and Anthropometric Variables of National and State level Female Volleyball Players

Conclusions: Based on results of the study it was concluded that there all the selected female volleyball players had not similar Explosive Strength and Anthropometric Variables i.e. (Standing Height, Body Weight, Hand Length and Leg Length).

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