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

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Abstract

The knowledge of anthropometric characteristics allows the athlete and the coach to make adaptations in his/her training method to attain the optimal physical attributes for best performance. A total 50 female volleyball players (25 from each selected National and State level Female Volleyball players) were purposively selected, with age ranging from 19 to 25 years. Explosive Strength and Anthropometric Variables were selected as the variables for the study. Explosive Strength and Anthropometric Variables were assessed with the help of Standing Broad Jump and Gulick Tape and weight machine respectively. The collected data was analyzed by computing descriptive statistics and t-test. There was a 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 tabulated value 1.67 for df 48. 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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Objectives and Hypothesis

Following objectives were framed for the study:

- To assess the Explosive strength of State and National level female volleyball players.
- To assess the Anthropometric characteristics of Female State and National level volleyball players.
- To compare the selected variables among the State and National level female volleyball players.

Based on the objectives following hypothesis was framed for the study:

- There would be no significant difference in the selected variables among the State and National level female volleyball players.

Procedure and Methodology

Subjects

A total 50 female volleyball players (25 from each selected National and State level Female Volleyball players) were purposively selected, with age ranging from 19 to 25 years. Explosive Strength and Anthropometric Variables were

selected as the variables for the study. Explosive Strength and Anthropometric Variables were assessed with the help of Standing Broad Jump and Gulick Tape and weight machine respectively. The collected data was analyzed by computing descriptive statistics and t-test.

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.

Results and Discussions

The collected data was analyzed and results pertaining to it are explained in the following tables:

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	6.33	0.41	10.27
	State	5.10	0.42	
Standing Height	National	177.30	0.98	5.70
	State	174.80	1.96	
Body Weight	National	66.23	0.78	3.76
	State	65.26	1.01	
Hand Length	National	76.71	0.59	12.76
	State	73.99	0.88	
Leg Length	National	94.06	2.46	8.76
	State	89.27	1.19	

Sig at 0.05, table value (48) = 1.67

Table No. 1 shows the mean values of explosive strength and Anthropometric Variables (Standing Height, Body Weight, Hand Length and Leg Length) between National and State level Female Volleyball Players, which were found to be 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 tabulated 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.

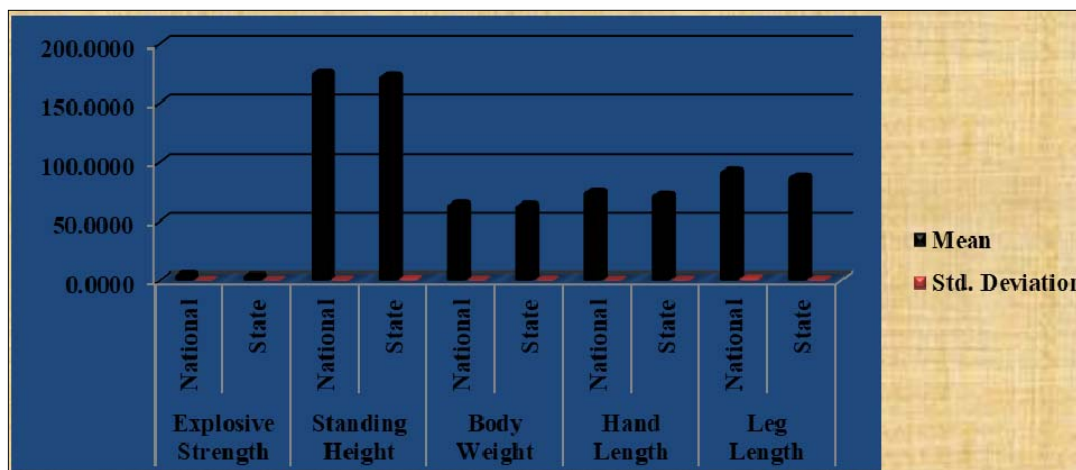


Fig 1: Graphical representation of mean and standard deviation relation to explosive strength and anthropometric variables of national and state level female volleyball players

Discussion and Conclusions

Based on results of the study it was concluded that 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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