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Relationship of Selected Physical Fitness Components with the Performance of Volleyball Player

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The purpose of the study was to find out the "relationship of speed, agility, muscular strength, Explosive Strength and muscular endurance with the performance of Volleyball Player". 20 Inter Collegiate Volleyball Players from Chhatrapati Sambhaji Nagar who were participating in inter college Volleyball tournament were selected as a subject for the study. Their age ranged between 20 to 25 years. For estimating speed, agility, muscular strength, Explosive Strength, muscular endurance and volleyball performance the following tests were employed For speed (50 meters dash in seconds), agility (4 x 10 meters shuttle Run in second), muscular strength (pull ups in numbers), explosive strength (standing broad jump in meters), muscular endurance (sit ups in numbers/min) and the volleyball performance was graded by a panel of experts on the basis of their skills, techniques and match result. Statistics for analysis, Zero order correlation was used to compute correlation between volleyball performance and selected variables i.e. speed, agility, muscular strength, Explosive Strength and muscular endurance. Result showed that all the physical fitness components (speed, agility, explosive strength, muscular strength and muscular endurance) of an individual correlates maximum with volleyball performance. The coefficient of correlation of speed (r=-0.668), agility(r =-0.81), explosive strength(r =0.52), muscular strength(r =0.65) and muscular endurance(r =0.72) were found to be significant with Volleyball Players performance at 0.05 level of confidence. The finding indicates that speed, agility, explosive strength, muscular strength and muscular endurance were important variables for better performance in Volleyball.

Keywords: Volleyball, Shuttle Run, Correlation, Explosive, Strength

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Introduction

Volleyball is a team sport in which two teams of six players are separated by a net. Each team tries to score points by grounding a ball on the other team's court under organized rules. It has been a part of the official program of the Summer Olympic Games since Tokyo 1964. Beach volleyball was introduced to the programme at the Atlanta 1996 Summer Olympics. The adapted version of volleyball at the Summer Paralympic Games is sitting volleyball.It is an intense team sport characterized by short duration periods (i.e., 3–9 s) at high intensity during gameplay, interspersed with periods of recovery (García-de-Alcaraz et al., 2020) during the pauses between points. Although actions performed by volleyball players may differ in terms of their playing position, common movements include accelerations and decelerations, jumping, ball-spiking, and multidirectional locomotion (Sheppard et al., 2007). Among them, jump performance has been reported as the most essential physical attribute for defensive and offensive actions (Ziv and Lidor, 2010). Indeed, most actions (i.e., spike, block, serve, and setting) are performed while jumping vertically and have been directly related to game success (Sheppard et al., 2007).

Methods

Subjects

20 Inter College male Volleyball Players who were participating in intercollegiate volleyball Tournament in Chhatrapati Sambhaji Nagar City were selected for the purpose of this study. The selected subjects were from the age group of 20-25 years.

Hypotheses On the basis of variable literature and scholars own understanding of the problem it was hypothesized that there would be a significance difference in the relationship of speed, agility, shoulder strength, Explosive Strength and muscular endurance with the performance of Volleyball Player.

Testing Procedures For establishing the relationship of speed, agility, shoulder strength, Explosive Strength and muscular endurance with the performance of Volleyball Player following tests were conducted.

Criterion Measures

Speed was measured by 50 meter dash in seconds, Agility was measured by 4X10 meters shuttle run in seconds, Shoulder strength was measured by maximum number of pull up test, Explosive leg strength was measured by standing broad jump score measured in meters and Abdominal strength was measured by one minutes bent knee sit ups test.

Volleyball performance was recorded on the basis of actual game performance. Every volleyball player was participating in three match seven points each. Three qualified judges were give points /marks out of 10 to each player according to his performance and skills during the match. Some more additional points were awarded according to result of match i.e. 5 points / marks for winning and 2 points / marks for losing the match.

Statistical Analysis

For determining the significant relationship of speed, agility, shoulder strength, Explosive Strength and muscular endurance with the performance of Volleyball Player the Pearson’s Product Moment Correlation was used for the analysis of data.

Results

For testing the relationship between the independent and dependent variables, the level of significance was set at 0.05 level of confidence. The relationship between the independent variables (speed, agility, shoulder strength, Explosive Strength and muscular endurance) and dependent variable (Volleyball performance) have been presented in the table- 1

Enclosed as Annexure 01

Table 1 reveals that all the physical fitness components (speed, agility, explosive strength, shoulder strength and muscular endurance) of an individual correlates maximum with volleyball performance. The coefficient of correlation of speed (r =**-0.668**), agility (r =**-0.81**), explosive strength(r =**0.52**), shoulder strength(r =**0.65**) and muscular endurance (r =**0.72**) were found to be significant with Volleyball Players performance at 0.05 level of confidence.

Discussion

It has been found that there is a significant negative relationship between speed, agility

And volleyball playing ability. Speed is the quickness of movement of a limb, whether this is the legs of a volleyball player or the arm during smashing. Speed is an integral part of volleyball. Agility is the ability to change the direction of the body in an efficient and effective manner. The volleyball player required this type of movement during play. There was a significant relationship between explosive strength and playing ability. Explosive strength is the product of speed and strength. It is the ability of a muscular unit or combination of muscular unit to apply maximum force in minimum time. So during smashing in volleyball the player has to jump as early as possible for effecting smashing. Therefore explosive strength is performance prerequisite for volleyball player. Shoulder strength and muscular endurance both are the part of required for volleyball player and it showed significant positive relationship with volleyball performance. Muscular endurance is the ability of a muscle or group of muscles to perform repetitive contraction over period of time or under condition of fatigue. During game situation one has to perform repetitive contraction of muscles for a longer period of time. Core strength of abdomen in performance prerequisite for a volleyball player therefore the abdomen endurance is required for effective muscular contraction. Shoulder strength is the ability of muscle to overcome resistance or act against resistance and it is required for effecting smashing and long passing.

Discussion of Hypotheses

The hypothesis with respect to selected physical fitness components i.e. speed, agility, explosive strength, shoulder strength and muscular endurance is accepted because significant relationship has been obtained between above mention physical fitness components and volleyball playing ability.

Conclusions

On the basis of the findings of the study, it is concluded that physical fitness components speed, agility, explosive strength, shoulder strength and muscular endurance showed significant relationship with playing ability of volleyball players.

Annexure

Annexure 01

TABLE-1

Coefficient of correlation between physical fitness components and volleyball performance

Independent Variable	Dependent Variable	Correlation of Coefficient
Speed	Playing Ability	-0.668*
Agility	Playing Ability	-0.81*
Explosive Strength	Playing Ability	0.52*
Shoulder Strength	Playing Ability	0.653*
Muscular Endurance	Playing Ability	0.72*

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