E-ISSN: 2395-1702 P-ISSN: 2395-0382 Volume 01- Issue 05-, PP-05-04

Research Paper

RELATIONSHIP AMONG HEIGHT EXPLOSIVE POWER AND SHOULDER STRENGTH ON SPIKING ACCURACY

Dr.S.Veeramani Assistant professor Department Of Physical Education, Annamalai University, Chidambaram. Email: <u>sivesh24@gmail.com</u>. Mobile no: 9842047031

Abstract

The purpose of the study is to find out the relationship among height, explosive power and shoulder strength on spiking ability of the university level players. To achieve the purpose of the studyfifteen male volleyball players from Annamalai University were selected to take part in the study. The following criterion variables spiking ability and independent variables (standing height, explosive power and shoulder strength were considered in the study. The selected variables were assessed by using standard testing procedures. The selected variables like height were measured by using stadiometer, explosive power by sergeant jump and shoulder strength by medicine ball throw. The spiking accuracy was measured by the trials spiked by the attackers in the special court markings in the spiking zones. In order to study the relationship between the criterion and determinant variables and the inter relationship between determinant variables were computed, using the method of Pearson's product moment correlation. The level of significance was accepted at p < 0.05.

Key Words: Height, Explosive Power, Shoulder Strength, Spiking Accuracy

1. Introduction

The skill of spiking in volleyball is a very valuable weapon for any team. Most teams gain a majority of their points on successful spikes. The spike takes very little time to travel from the attackers hand to the floor therefore there is little time for defensive team to relocate its players on the court in strategic position before the ball is contacted on the spike. The relationship between morphological variables and sports performance is the object of study of anthropometry and is an important element to be analyzed. Studies have pointed out the importance of physical characteristics for different sports such as volleyball (Duncan et al, 2006;)^[1], rugby (Gabbett, 2002)^[2], and (Neto César. $2005)^{[3]}$ basketball е Successful sporting performance at elite levels of competition often depends heavily on the explosive leg power of the athletes involved.In many individual sports such as track and field events, gymnastics and diving the ability to use high levels of strength as quickly and as explosively as possible is essential to perform at elite levels.During the game, muscle strength is required, because each player performs such dynamic movements as kicks, headers, tackling, and sprinting. So, power,

Asian Journal of Applied Research (AJAR)

endurance and muscle strength are needed to compete in the game (Cabri et al., 1988; Bangsbo, 1994)^{[4,5].} The relation between muscle strength and performance in the field is a subject of controversy in many research fields dealing with muscle power. Data has been produced for many elite individual and team sport athletes for physical and physiological characteristics. including standing vertical jump scores, related to specific sports performance (Black. & Roundy, 1994; Coutts, 1976; Latin, et al., 1994; Sawula, 1991) ^[6, 7,8,9]. Greater the general quality of speed, strength, power, endurance, flexibility and agility the more quickly will be the specific skill he learned and once learned the better will be the performance(Belay, 1987)^[10].

2. Subjects and Variables

The purpose of the study is to find out the relationship among height, explosive power and shoulder strength on spiking ability of the university level players. To achieve the purpose of the study, fifteen male volleyball players from Annamalai University were selected to take part in the study. The following criterion variables spiking ability and independent variables (standing height, explosive power and shoulder strength were considered in the study.

3. Methodology

The selected variables were assessed by using standard testing procedures. The selected variables like height were measured by using stadiometer, explosive power by sergeant jump and shoulder strength by medicine ball throw. The spiking accuracy was measured by the below following procedures.

3.1Explosive Power Test

The performer dips his finger in chalk powder and stands sidewise against the wall, keeping the arm raised completely above the head keeping the fingers straight. Then he jumps as high as possible and touches the wall. The reading shall be noted by keeping eyes as level with the chalk mark on the graduated marking. Standing testers score is subtracted from the jumping reach.

3.2Shoulder Strength Test (Overhead forward medicine ball throw)

To evaluate the explosive strength of the shoulder, 2kg Medicine ball and measuring tape was used. The subject stands behind the starting line (Parallel stance with feet comfortably a part), holding 2kg medicine ball with both hands and he then performs a medicine ball overhead forward throw to cover maximum distance. Out of three trials the average of the best two distances were recorded in meters.

3.3Spikes for Accuracy Test

A standard volleyball court was utilized for the purpose of assessing the accuracy of the spike. One half of the court is marked with specific zones as illustrated in the diagram, each subject will be given two sets of three attempts each for cross court attack and straight zone attack respectively. The subjects toss the ball to a setter who positions himself at the extreme line and sets the ball in accordance to the liking of the concern attackers. The subjects were asked to spike the ball cross court during the first three trials and spike straight during the next three trials. Points will be recorded in accordance to the zone in which the ball lands and also on the specific attack zones (cross court zones and straight zones). The scoring is the sum of the scores which the target values of total 6 trials.

Figure-1 Court markings for spike for accuracy test



4. Statistical Technique

In order to study the relationship between the criterion and determinant variables and the inter relationship between determinant variables were computed, using the method of Pearson's product moment correlation. The level of significance was accepted at p < 0.05.

5. Analysis of the Data

The mean and standard deviation values among the criterion and the selected independent variables were presented in table-I

ShoulderStrength andspiking accuracyamong volleyball Players						
Variables	Μ	S. D	Ν			
Height	181.06	7.03	15			
Explosive power	66.33	10.16	15			
Shoulder strength	13.95	1.63	15			
Spiking accuracy	83.05	5.99	15			

Table-1Mean, Standard Deviation of Height Explosive PowerhoulderStrength andspiking accuracyamong volleyball Players

The correlation coefficient values on height, explosive power and strength endurance on playing ability of badminton players were presented in table-II

Table-IICorrelation Coefficient Values on Height Explosive PowerShoulder Strength and spiking accuracy among volleyball Player

Variables	Spiking	Height	Explosive power	Shoulder strength
Spiking				
Height	.831**			
Explosive power	.920**	.717**		
Shoulder strength	.771**	.572*	.627*	

Significant at .05 levels is .641

6. Results

The correlation coefficient of spiking accuracy with height, explosive power and shoulder strength was significant at 0.05 levels, since the obtained value of.831, .920 and .771 respectively was greater than the required value of 0.641 for 13 degrees of freedom. The results of the study indicate that the selected variables were highly correlated with spiking accuracy.

7. Discussion

Volleyball, as one of the most amazing sports, includes fast movements, jumping's, landings and sudden shifts which need high power and strength for optimized almeida&Soarres, performance (De 2003)^{[11].} Physical structures of volleyball players are mainly assessed through measuring anthropometric parameters such as standing height, Body mass index and some other physical factors related to performance skills like jumping ability, agility, strength and endurance (Bayois et al., 2006; Gualdi-Rosso&Zaccogni, 2001; Ibrahim, 2010; Palao et al., 2008; Zhang, 2010) ^[12,13,14,15,16]. Volleyball is introduced as power sport in which optimized а performance of players are mainly related to the amount of jumping (Ciccarone et al., 2007; Malousarisa et al., 2008; Stamm et al., 2003; Strangelli et al., 2008; Voigt & Vetter, 2003; Xing et al., 2006) [17, 18, 19, 20,21,22] Lower extremity power and vertical jumping are of the significant indexes of volleyball players to be successful (Stec&Smulsky, 2007) [21]. Better performance of spike and

Block as well as jumping service are dependent to the amount of height which players can reach (Ciccarone et al., 2007)^{[17].} Studies show that there is significant correlation between vertical jump ability with success rate of spike and block in volleyball games (Xing et al., 2006) ^[20].Volleyball players' excellent performances are widely associated with efficiency of jumping or lower extremity explosive power which finally introduce vertical jump as one of the most important characteristics of physical fitness in volleyball players (Zhang, 2010) ^{[16].} Like other power sport, muscle power seems to be a vital component for volleyball players (Hertogh& Hue, 2002)^{[23].} Anthropometric properties as well as appropriate physical fitness are important prerequisites for outstanding performance of sports skills and play a distinguished role in sports' successful achievements (Stamm et al., 2003) ^{[19].} Volleyball, as one of the most amazing sports, includes fast movements, jumping's, landings and sudden shifts which need high power and strength for optimized performance demand high number of jumps for players to perform spikes and blocks and the relationship between morphological variables and sports performance is an important element, most teams gain a majority of their points on successful spikes. Therefore there was a big impact on height, explosive power and shoulder strength in relation to spiking.

8. Conclusion

From the results obtained after analyzing the data, it was concluded that height, shoulder strength, explosive power have a significant

relationship with spikingaccuracy among volleyball players.

9. References

- 1.Duncan Mj, Woodfield L, Al-Nakeeb Y. Anthropometric and physiological characteristics of junior elite volleyball players. *Br j sports med. 2006*; 40(7):640-651.
- 2.Gabbett T, Georgieff B. Physiological and anthropometric characteristics of Australian junior national, state, and novice volleyball players. *Journal of Strength & Conditioning Research. 2007*; 21:902-908.
- 3.Neto, A. P.; César, M. C. Avaliação da composição corporal de atletas de basquetebol do sexomasculinoparticipantes da liganacional 2003. *RevistaBrasileira de Cineantropometria e DesempenhoHumanov.* 7, p. 35-44, 2005.
- 4.Cabri, J., De Proft, E., Dufour, W. &Clarys, J. (1988). The relation between muscular strength and kick performance. In: *Science and Football*. Eds: Reilly, T., Lees, A., Davids, K. And Murphy, W. London: E & FN Spon. 186-193.
- 5.Bangsbo, J. (1994).*Physical conditioning training in soccer*: a scientific approach. Copenhagen, Denmark: University of Copenhagen7, p. 35-44, 2005
- 6.Black, W. & Roundy, E. 1994. Comparisons of size, strength, speed and power in NCAA Division 1 Football players. *Journal of strength and conditioning research*Vol.8(2) pp.80-85.
- 7.Coutts,K.D. 1976. Leg power and Canadian female volleyball players. *The Research Quarterly Vol.47(3) pp. 332-333*
- 8.Latin, R.W. et al 1994. Physical and performance characteristics of NCAA Division 1 male basketball players. *Journal of Strength and Conditioning Research*. Vol. 8(4) pp. 214-218
- 9.Sawula, L. 1991. Tests used by volleyball coaches for determining physical fitness. *International Volleytech*. Vol. 2 1991 pp 18-24.

10. Belay James A (1987) Illustrated Guide to Developing Athletic Strength, Power and Agility, (New York: Parking Publishing Company), P.16

2015

- 11.De Almeida Ta, Soares Ea. Nutritional and anthropometric profile of adolescent volleyball athletes. *RevistaBrasileira de MedicinadoEsporte*. 2003; 9:198-203.
- 12. BayiosIa, BergelesNk, Apostolidis Ng, Noutsos Ks, Koskolou Md. Anthropometric, body composition and somatotype differences of Greek elite female basketball, volleyball and handball players. *J Sports Med & Physical Fitness*. 2006;
- 13. Gualdi-Russo E, Zaccagni L. Somatotype, role and performance in elite volleyball players. *Journal of Sports Medicine and Physical Fitness*. 2001; 41:252-262.
- 14. Ibrahim Ma. Anthropometric measurements as a significant for choosing Juniors both in Volleyball and Handball Sports. *World J Sports Sci. 2010*; 3(4):227-289.
- 15. PalaoJm, Gutierrez D, FrideresJa. Height, weight, body mass index and age in beach volleyball players in relation to level and position. *J Sport Med & Physical Fitness*. 2008; 48(4):466-471.
- 16. Zhang Y. An investigation on the anthropometry profile and its relationship with physical performance of elite Chinese women volleyball players, mscthesis, *Southern Cross University, Lismore*, NSW; 2010.
- 17. Ciccarone G, CroisierJl, Fontani G, Martelli G, Albert A, Zhang L, et al. Comparison between player specialization, anthropometric characteristics and jumping ability in top-level volleyball players. J Sport Med & Physical Fitness. 2007; 61(1):29-43.
- 18. MalousarisGg, BergelesNk, Barzouka Kg, Bayios La, NassisGp, Koskoloub Md. Somatotype, size and body composition of competitive female volleyball players. *Journal of Science and Medicine in Sport*. 2008; 11:337-344.

Asian Journal of Applied Research (AJAR)

- 19. StangelliLc, Dourado Ac, Onken P, Mancan S, Da Costa Sc. Adaptations on jump capacity in Brazilain volleyball players prior to the under-19 World Championship. *Journal of Strength & Conditioning Research. 2008*; 22:741-749.
 - 20. Stamm R, Veldre G, Stamm M, Thomson M, Kaarma H, Loko J, et al. Dependence of young female volleyballers' performance on their body build, physical abilities, and psychophysiological properties. *J Sports Med & Physical Fitness. 2003*; 43:291-299.
- 21. Voigt Hf, Vetter K. The value of strength-diagnostic for the structure of jump training in volleyball. *European Journal of Sport Science. 2003*; 3:1
- 22. Xing Hl, Qi N, Sun M. Analysis on development ofbodyphysiqueand spike height of Chinese elite mlae volleyball playersin league match in recent ten years. *Journal of China Sport Sci& Tech.* 2006; 42:47-49.
- 23. Hertogh C, Hue O. Jump evaluation of elite volleyball players using two methods: jump power equations and force platform. *Journal of Sports Medicine and Physical Fitness*. 2002; 42:300-303.