Anthropometrical and Motor Ability Variable as Predictors of Performance of Volleyball Players

Dr. Rajeeva H. N.[1]* Mrs. Tishoni Y. N.[2]

[1]Assistant Professor (Physical Education), College of Horticulture, Kolar, Karnataka, India

[2]Physical Education teacher, Gnana Sarovara International School, Mysore

Abstract – A good volleyball player is, skilful, strong, knowledgeable and decisive such attributes may be naturally endowed by training and practice brings them to fore. The present study intended to assess the anthropometrical and motor ability variables that most importantly influence the university volleyball player's performance. The necessary data was collected previous day of the competition, using panel of two expert coaches and a national player. The data was analyzed using step-wise regression. The analysis indicated the Anthropometrical variables viz., Height, Weight, Arm span, Arm length, Hand span, Hand length, and Leg length and the motor ability variables, Hand grip strength, Arm power, Leg power, Speed, Agility, Muscular endurance, and Endurance could be crucial factors.

Keywords: Volleyball, Anthropometrical Variables, Motor Ability, Performance

-------------------------♦----------------------------

INTRODUCTION

Volley ball has become one of the popular sports in the world. This game is also a part of Olympic Sport. The simple rules of game, minimal ground and equipment facilities and the techniques of game itself along with the scope for players to exhibit their exclusive skills makes it a popular game among even the schools and educational institutions. An effective volleyball players needs to possess several physical, mental and kinsiological abilities such as height, balance, strength, neuro muscular coordination, explosive jumping and hand power with proper aiming at goal. Additional abilities like explosive power of arms and legs, and kinesthetic feeling in ball control add to the playing efficacy. These physical activities, most crucial for playing volleyball, are considered anaerobic mainly because of the quick physical actions at which the game is played. In the recent days, a volleyball player is required to possess the longitudinal dimensions like stature, arm span, hand span and length.

The key attraction for audience to this game is its holding excitement until the final minute of the game because of the continuous scoring of points by the teams. Though volleyball is played in indoors, playing it outdoor also exists and the game can be adapted according to the facilities available.

ANTHROPOMETRY AND VOLLEYBALL

Various Anthropometrical, Motor ability, physiological and Psychological variables have been studied for its influence on players' performance. Such studies help coaches in selecting players, providing training to different levels of players. Like for basketball players height can give a definite advantage, players with tall and strong stature have an advantage in Volleyball. These apart, strong anthropometric measures lay a strong foundation for acquiring certain motor abilities also, that help in further improving player's performance. Volleyball is therefore a contact sport where jumping, running, and arm throwing are prominent features of performance.

The present study employed the following Anthropometric measures to evaluate the player's performance:

1. Height

2. Weight

3. Arm span

4. Arm length

5. Hand span

6. Hand length

Dr. H. N. Rajeeva[1]* Mrs. Tishoni Y. N.[2]

7. Leg length

MOTOR ABILITY AND VOLLEYBALL

Training of Volleyball players, aims to improve technical, tactical, Psychological, and physical qualities. During the pre-season, training emphasizes on improvement in physical fitness, whereas during the in-season period, the emphasis is on making tactical and technical improvements while maintaining physical fitness. Indeed, as competition matches require high energy expenditure, the training load is not increased in order to avoid excessive fatigue or the beginning of an overtraining syndrome. Intensity and running periods can alternate at any time according to the demands of the match. In addition, goals or crucial actions are often preceded by accelerations, sprints, bursts, jumps and shots. Consequently, one of the aims of training is to improve the ability to perform maximal and high-intensity exercise.

The following physical fitness variables, which were more associated with playing ability of the Volleyball players, were considered for this study:

1. Hand grip strength
2. Arm power
3. Leg power
4. Speed
5. Agility
6. Muscular endurance
7. Endurance

PERFORMANCE ASSESSMENT

The present study collected the data pertaining to the performance ability university volleyball players by adopting rating method. A panel of expert two coaches and A national volleyball player rate the subject's performance in various factors like skill, technique and application of skill in the game situation, such as passing, blocking, spiking, offensive and defensive ability etc., are assessed on 10 point rating scale, the rating was based on subjective evaluation to predict the performance ability of volleyball players. The overall score for individual players was calculated by averaging the scores by three experts.

METHODOLOGY

To achieve the purpose of the study, the investigator has selected men volleyball players who represented their college in Inter-university volleyball tournament. The subjects identified for present study were sixty (N=60) from different Agriculture, Horticulture, Veterinary and Horti-Agri universities of Karnataka state, who participate in inter-university championship, representing their respective universities. The subjects were aged between 18-28 years .In order to get sufficient number of subjects, the data was collected in consecutive two days during coaching camp, in the year 2014.The data on Anthropometrical and motor abilities of the players and their performance was elicited.

STATISTICAL ANALYSIS

Following statistical method were employed in the present study

a. Regression-stepwise multiple

Table 1: Step-wise regression coefficients of performance against Anthropometric variables

Model		Un-standardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.
1	(Constant)	-4.457	4.774		-0.934	.353
	Hand span	1.381	0.216	0.543	6.404	.000
2	(Constant)	-88.247	17.112		-5.157	.000
	Hand span	1.219	0.1954	0.479	6.237	.000
	Height	0.478	0.095	0.389	5.056	.000
3	(Constant)	-72.498	17.067		-4.248	.000
	Hand span	1.310	0.189	0.515	6.937	.000
	Height	0.565	0.094	0.460	5.994	.000
	Leg length	-0.321	0.100	-0.247	-3.209	.002

The regression coefficients and their significance for each of the three regression models is presented in Table 1. It is clear from the table that addition of each variable to the model had significant influence in the dependent variable, performance, as is evident from the high values of't'. The Beta value for the Hand span at step 1 was found to be .543, at step II it reduced to .479 and at step III it increased to .515. For height, the beta value at second step was .389 which increased to .460 at step III. However, beta value for leg length at step III was found to be -.247. The final model of step-wise multiple regression presented in the table shows that while the hand span and height had positive influence on the player's performance, the leg length exhibited negative influence. The t values obtained for constants and predicted models ranged from .934 to 6.937 and significance levels ranged from .353 to .000 levels.

Dr. H. N. Rajeeva[1]* Mrs. Tishoni Y. N.[2]

Table 2: Step-wise regression coefficients of performance against Motor ability variables

Model		Un-standardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.
1	(Constant)	-8.199	4.392		-1.867	.065
	Leg power	2.642	0.338	0.620	7.818	.000
2	(Constant)	-18.299	4.646		-3.939	.000
	Leg power	2.100	0.334	0.493	6.285	.000
	Arm power	2.851	0.651	0.343	4.3808	.000
3	(Constant)	-1.712	8.362		-0.204	.838
	Leg power	1.986	0.330	0.466	6.017	.000
	Arm power	2.663	0.641	0.321	4.156	.000
	Agility	-1.146	0.485	-0.173	-2.362	.020

The beta value obtained for leg power was .620, in the second step it was reduced to .493 and further reduced to .466 in the final step. The beta value obtained for arm power at steps 2 and 3 were found to be .343 and .321 respectively. Finally, the beta value obtained for the agility was -.173. The t values for constants and predicted models varied from .204 to 6.017 and significance levels varied from .838 to .000 level.

MAIN FINDINGS

1. In Anthropometric variables hand span, height, and leg length were found to be linearly and significantly correlated to performance of volleyball players. However, weight, hand length, arm span and arm length did not correlate significantly to performance of volleyball players.

2. In motor abilities variables arm power, leg power and agility were found to be linearly and significantly correlated to performance of volleyball players. However, hand grip strength, speed, abdominal endurance and endurance did not correlate significantly to performance of volleyball players.

3. Out of the 7 Anthropometric variables only height and hand span best predicted the performance of volleyball players. However, weight, arm length, leg length and arm span failed to predict the performance of volleyball players.

4. Out of the 7 Motor ability variables only arm power, leg power and agility was the best predictor of the performance of volleyball players. However, hand grip strength, speed, Abdominal Endurance and Endurance failed to predict the performance of volleyball players.

CONCLUSION

In nutshell it is very clearly that there are definite predictors for performance from Anthropometric and motor ability variables. The selected study variables hand span, height, leg length, arm power, leg power, agility, reaction time and self-confidence parameters best predicted the volleyball performance. Earlier, selectors were bothered about only endurance and agility at the time of competition and selection. This study has clearly brought the idea that it not only Anthropometric or motor variables contributing to the performance, even Psychological variables do influence the performance of the players. In this backdrop, while selecting the players, the selection panel should focus on Anthropometric and motor variables, which is so far not considered seriously.

Corresponding Author

Dr. H. N. Rajeeva*

Assistant professor (Physical Education), College of Horticulture, Kolar, Karnataka, India

E-Mail – ravirajdaya@gmail.com