



INVESTIGATION OF FACTORS PREDOMINANT TO VOLLEYBALL PLAYING ABILITY OF FEMALE VOLLEYBALL PLAYERS OF TELANGANA STATE

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ABSTRACT

The aim of the study is to investigate the predominant factors correlated to the playing ability among college level female volleyball players in the Telangana state. To achieve the purpose of the study, 100 female volleyball players who played inter collegiate tournament from various colleges were selected as subjects. The age of the subjects ranged from 18 to 25 years. The anthropometric measurements, motor fitness, physiological variables and skill variables were selected as dependent variables and playing ability of female volleyball players as independent variable for this study. The dependent variables were tested with standard testing procedures. To determine the relationship between criterion variable and determinant variables Pearson product moment correlation was used. The computation of multiple regressions was also used. In multiple regressions, a criterion variable was predicted from a set of predictors. Step wise selection method of multiple regressions was used in this study to find out the predictor variable that has the highest correlation with the criterion variables and it is entered into the equation first. The rest variables are entered into the equation depending on the contribution of each predictor. In all the cases 0.05 level of significance was fixed to test the hypothesis.

Key Words: *Prediction, Spiking, Muscular Endurance, Shoulder Strength*

INTRODUCTION

Telangana, the youngest state in India, is developing sports in many cities. Young athletes from the region have won state and national awards. Today's games have become very competitive, and competitions at all levels are breaking previous records. Sports are not changing science to a great extent, and science is developing the entire concept of sports. Advances in scientific knowledge and technology in the field of sports help athletes achieve maximum results. Data analysis of results and performance at all

levels are important in sports development. Likewise, individual performance in sports is the ultimate combination of physical, physiological, anatomical, psychological and other factors. Intelligence is the ability to do well, but intelligence is the foundation of doing well (Gabbett,2002)¹. All physical actions are based on specific skills, such as walking, running, climbing, jumping, and throwing. Basic skills are important to enjoy sports and perform sports exercises. At all levels of competition, an individual's performance depends on his or her knowledge of the game's skills. Researchers say that good knowledge of the game and the ability to follow various principles are important for playing well. However, the playing ability of a game is predictable. It is only when the execution is inconsistent that the results change. The literature has identified hundreds of factors that can influence whether or not to exercise, and the strength of each factor can vary from person to person and across the lifespan of each individual (Faude, 2006)².

Volleyball is a complex game made up of simple skills. Over decades of competition, tactics have been constantly developed on volleyball skills and that have become increasingly better and coaches have strived to achieve higher levels of play. Important prerequisites for good performance in volleyball are anthropometric data, motor qualities, psychological and performance skills elements (Malousarisa, 2008)³. The volleyball game consists of major components such as passing, setting, attacking, blocking, serving, and serving reception. In the game of volleyball, players must have physical speed, speed endurance, muscular strength, muscular endurance, cardiorespiratory endurance, and explosive power. The game requires the use of the entire body to achieve optimal performance (Hascelik, 2009)⁴. Anthropometric measurements have revealed a correlation between physical characteristics of the body structure and athletic ability. In any game, height, weight, and other anthropometric variables play a significant role in player performance. Physical structure, especially height and arm length, have a clear and decisive advantage in volleyball games. In this competitive world, sports have become very competitive (Cabello, 2003)⁵. Athletic training is essential to achieve good performance in sports, and achieving fitness goals is a major concern for all athletes. Conditioning and fitness are important factors for success in volleyball, and inadequate fitness levels can easily lead to a lack of energy at the end of a game. High-level performance in sports and games can be dependent on physiological aspects, and previous research has recognized that high-level performance requires physiological skills. Specific physiological systems in the body must function well enough to support the specific game the player is playing (Jenson & Fisher 1999)⁶.

Research in the field of sports and competition has showed that by identifying specific variables that have been showed to have a common effect, it is possible to predict future performance of individuals or teams. Before predicting an outcome, most of the expected outcomes are not expected and are based on known facts or good intentions. Physical contact is less aggressive but requires psychological pressure. In fact, body composition is the most important factor in sports participation (Clarke,1972)⁷. Athletes are known to be more superior in terms of body measurements, body composition, physical activity, and mental and physical characteristics. However, no prior research has been conducted in India for female players to identify the factors that influencing volleyball performance with players contribute to their success in the game. This study

is an attempt to explore this uncharted territory. This chapter attempts to explore the importance of anthropometric selection, physical, psychological and multi-functional abilities on the competitiveness of volleyball players.

METHODOLOGY

Subjects and Variables

The aim of the study is to investigate the predominant factors correlated to the playing ability among college level female volleyball players in the Telangana state. To achieve the purpose of the study, 100 female volleyball players who played inter collegiate tournament from various colleges were selected as subjects. The age of the subjects ranged from 18 to 25 years. The anthropometric measurements, motor fitness, physiological variables and skill variables were selected as dependent variables and playing ability of female volleyball players as independent variable for this study. The dependent variables were tested with standard testing procedures. To determine the relationship between criterion variable and determinant variables Pearson product moment correlation was used. The computation of multiple regressions was also used. In multiple regressions, a criterion variable was predicted from a set of predictors. Step wise selection method of multiple regressions was used in this study to find out the predictor variable that has the highest correlation with the criterion variables and it is entered into the equation first. The rest variables are entered into the equation depending on the contribution of each predictor. In all the cases 0.05 level of significance was fixed to test the hypothesis.

RESULTS

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

Table-1

Mean and standard deviation value of selected dependent and independent variables

S.NO	VARIABLES	MEAN	SD
1	Height	172.10	2.10
2	Weight	60.40	2.33
3	Armlength	75.43	3.80
4	Leg Length	91.06	4.16
5	Arm Circumference	28.59	1.70
6	Calf Circumference	32.45	1.83
7	Speed	9.17	.653
8	Agility	14.62	1.01
9	Explosive Power	39.41	3.36
10	Shoulder Strength	7.94	1.17
11	Muscular Endurance	41.11	2.98
12	Resting pulse rate	72.12	1.77
13	Vital capacity	3367.31	343.74

14	BMI	19.349	.946
15	Fore arm pass	29.95	3.08
16	Spiking	15.63	1.75
17	service	19.66	3.13

Table – I

Pearson Product Moment Correlation between Criterion and Determinant Variables of volleyball Players

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1																	
2	.230*	1																
3	-.112	.531**	1															
4	.029	-.114	-.124	1														
5	-.014	-.123	.126	.054	1													
6	-.233*	-.129	.037	.187	.021	1												
7	.134	-.049	.046	.137	.017	.182	1											
8	-.196	.049	.018	.008	.016	.092	.047	1										
9	-.116	.166	.001	.036	.013	.073	.019	.830**	1									
10	-.179	-.007	.068	.118	.074	.053	.043	.782**	.731**	1								
11	-.104	.139	.054	.025	.021	.011	.155	-.017	-.030	.049	1							
12	.143	-.055	.007	.201*	.045	.140	.019	-.076	-.059	-.069	.063	1						
13	.405**	-.003	.040	.099	.113	.072	.097	-.169	-.016	-.185	-.092	.018	1					
14	-.041	.089	.031	.035	.034	.239*	.077	.801**	.702**	.732**	-.010	.032	.186	1				
15	.054	-.014	.076	.128	.022	.067	.149	.644**	.616**	.584**	-.167	.048	.047	.719**	1			
16	.009	.139	.075	.051	.056	.132	.036	.692**	.639**	.631**	.018	.020	.079	.688**	.558**	1		
17	-.203*	.043	.011	.031	.001	.092	.004	.923**	.848**	.814**	.048	.027	.199*	.835**	.703**	.699**	1	
18	.291**	-.203*	.043	.011	.031	.001	.092	-.004	.923**	.848**	.814**	.048	.027	.199*	.835**	.703**	.699**	1

1.height 2. weight. 3.arm length. 4.leg length 5.arm circumference 6. calf circumference 7. Speed 8. agility
9. Explosive power. 10.shoulder strength 11. Muscular endurance 12. Resting pulse rate 13. vital capacity
14. BMI 15. Fore arm pass 16. spiking 17. service 18. playing ability

The above matrix table showed an evidence that playing ability had a significant relationship with height, weight, explosive power, shoulder strength, muscular endurance BMI, fore arm pass, spiking and service. Multiple regression equation was computed since, the multiple correlation is sufficiently high to warrant prediction from it. Then, the correlation identifies the independent variables to be included and their order in the regression equation. Multiple correlation was computed by step wise method on data obtained from the female inter collegiate players and the results were presented in table-III

Table-III

Multiple Correlation Co-efficient for the Predictors of Playing Ability of volleyball players

S. No	Variables (Forward Selection)	R	R Square	Adjusted R Square	R Square Change
1	Explosive power	.923 ^a	.853	.851	.853
2	Explosive power Fore arm pass	.937 ^b	.878	.876	.026
3	Explosive power Fore arm pass Shoulder strength	.946 ^c	.895	.892	.017
4	Explosive power Fore arm pass Shoulder strength Muscular endurance	.950 ^d	.902	.897	.006

It was found that the multiple correlation coefficient for predictors such as explosive power, fore arm pass, shoulder strength and muscular endurance is 0.950 which produce highest multiple correlation with volleyball playing ability. R square values showed that the percentage of contribution of predictors to the playing ability (dependent variable) in about 90% of the variation in the playing ability was explained by the regression model with four predictors namely explosive power, fore arm pass, shoulder strength and muscular endurance. Multiple regression equation was computed and the results were presented in table-iv

Regression Coefficients for the Predicted Variables with Playing Ability of volleyball Players

Variables	Unstandardized Coefficients		Standardized Coefficients
	B	Std. Error	Beta
(Constant)	50.595	1.710	
Explosive power	1.031	.043	.923
(Constant)	50.265	1.564	
Explosive power	.792	.066	.709
Fore arm pass	.325	.072	.267
(Constant)	52.912	1.609	
Explosive power	.598	.079	.536
Fore arm pass	.295	.068	.243
Shoulder strength	.741	.189	.233
(Constant)	50.236	1.902	
Explosive power	.541	.080	.485
Fore arm pass	.250	.068	.206
Shoulder strength	.640	.189	.201
Muscular endurance	.172	.069	.137

The regression equations were derived for inter collegiate female volleyball players with dependent variables.

1. Regression Equation in obtained scores form =

$$\text{Volleyball Playing Ability} = (.541) \text{ explosive power} + (.250) \text{ fore arm pass} + (.640) \text{ shoulder strength} + .172(\text{muscular endurance}) + 50.236.$$

The regression equation for the prediction of volleyball playing ability includes namely explosive power, fore arm pass, shoulder strength and muscular endurance. As the multiple correlation on playing ability with the combined effect of these independent variables is highly significant, it is apparent that the obtained regression equation has a high predictive validity.

Discussion

The performance of volleyball has been regularly influenced to a great extent by physical ability, anthropometric variables and skill performance variables. In the modern volleyball game, power, serving, speed, strength and rudiments of game have been over emphasized to gain control in offense and defence at any level of competition. Therefore, the significant relationship between playing ability and all the selected skills, physical variables and anthropometric variables at the intercollegiate level of achievement and proficiency may be justified as follows. Campos et al (2009)⁸ describe anthropometric and motor test characteristics of young athletes playing in the Brazilian junior volleyball team is highly correlated to the playing skill performances and it also help coaches in identifying and choosing new badminton athletes. Kafkas and others (2009)⁹ compared the physical, physiologic and anthropometric variables of badminton male players and the results of the study indicates that certain level of physical, physiological and anthropometric parameters dominated the performances to certain level players. Duncan (2006)¹⁰ established the fitness profile that is body composition, aerobic power, muscular characteristics, speed, flexibility and agility played a major role of the elite junior volleyball players in South Africa. Chin and others (1995)¹¹ investigated and resulted that the physiological response and physical response are the dominant factors of elite players in a sport-specific fitness test. The results of the present study indicate that explosive power, fore arm pass, shoulder strength and muscular endurance are the dominant factors playing an important role in playing ability of the female volleyball players of the Telangana state and the present results was accepted to the above findings too to solve the problem of the study.

Conclusions

From the results obtained after analyzing the data, it was concluded

1. The anthropometric variables Height and weight had a significant relationship with volleyball playing ability of inter collegiate female volleyball players of Telangana state.
2. The motor fitness variable namely explosive power, shoulder strength and muscular endurance had a significant relationship with volleyball playing ability of inter collegiate female volleyball players of Telangana state.
3. The skill variables such as fore arm pass, spiking and service had a significant relationship with volleyball playing ability of inter collegiate female volleyball players of Telangana state.
4. The predictor variables namely explosive power, fore arm pass, shoulder strength and muscular endurance. can be used to predict the volleyball playing ability of inter collegiate female volleyball players of Telangana state.

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