

Analysis of playing ability and explosive power and muscular endurance among women volleyball players

R. Krishna Veni¹, Prof Y. Kishore²

¹ Research Scholar, University College of Physical Education & Sports Sciences, Acharya Nagarjuna University, Nagarjuna Nagar, Guntur

² Dean, Faculty of Physical Education and Sports Sciences, Acharya Nagarjuna University, Nagarjuna Nagar, Guntur

Received July 18, 2016; Accepted July 30, 2016; Published August 03, 2016

Abstract

The purpose of the study was to find out the analysis of playing ability and explosive power and muscular endurance among women volleyball players. To achieve this purpose of the study, sixty women players were selected as subjects who belonging to various states participated in the South Zone Inter University Volleyball Championship held at Krishna University, Machilipatnam. The selected subjects were aged between 18 to 25 years. The dependent variable for the present investigation was playing ability of women volleyball players. The 12 subjects each selected from University of Calicut, M G University, Hindustan University, University of Madras and Krishna University teams. The independent variable chosen for the present investigation were explosive power and muscular endurance. The data collected from the women volleyball players were statistically treated. Descriptive statistics was computed for volleyball playing ability (dependent variable), teams separately. To examine the association between dependent and independent variables, correlation was applied. Stepwise multiple regressions were worked out to explore the predominance of independent variables of women volleyball players. Further, one way analysis of variance was computed to find out the significance of difference among the female volleyball players of five teams, for dependent variable and each independent variables separately. Whenever the F ratio is significant, to know which of the paired mean differ significantly, Scheffe's test was applied. The level of significance was fixed as 0.01. The findings of the present study indicate that the explosive power and muscular endurance are having positive relationship with their playing ability. The maximum of playing ability of the players are mainly due to their muscular endurance. The players of the different teams differ significantly in their playing ability and the variables of muscular endurance and explosive power.

Keywords: playing ability, volleyball, explosive power, muscular endurance.

1. Introduction

The sports depending upon the aim to be achieved can be classified into various areas; school sports, rehabilitation sports, recreation and fitness sports, industry sports and, performance sports. Each area of sports caters to different section of the society and has differed aims. The sports area, which has gained immense importance in recent times, and has made sports more popular and has contributed much towards the development of organized sports science in the performance sports. The major objective in training is to cause biological adaptation in any to improve performance in a specific task, to enhance physiological improvement effectively and to bring about a change. Specific exercise and overload must be followed, by exercising at a level above normal a variety of training adaptation take place in the body that makes it to function more efficiently. Numerous training procedures are in practice to improve each and every physical and motor fitness. Basic training procedures will serve better when utilized with modification suited to the individual or a group dealt with the best training program is that which increases the desired quality at as higher rate without cause unwanted effects.

Maintaining good health and strength is the key to youth. The Human body does not need food only to maintain it in good health. It needs activity, exercise, relaxation, sleep and above all, a right mental attitude to develop health muscles and strong nerves to able to withstand the ups and downs of modern life. Physical education is generally associated with competitive sports or development of muscles or military drill and talismanic. Since physical education is an integral part of education, it is obvious that physical education and education should both work harmoniously in the total process of education. Physical education should help to develop skills and attitudes which will be conclusive to the wise use of leisure, time and provide opportunities for emotional central, living according to acceptable social standards and self-expression. Sports are not merely fun, games and diversion or entertainment in sports athletes often strive for perfection just as many persons do in religious order. In sports as in religion there are heroes and heroines who provide models to the perfection to be strived for, who are admired for what they did becoming almost like saint such as the religious nature of sports. Sincere ancient times, sports activities in the shape of running, jumping and throwing have been a natural part of man's existence whether it was hunting animals for food or escaping from the wild and dangerous species. Sports in the present world have become extremely competitive. It is not the more participation or practice that brings out victory to an individual. Therefore, sports life is affected by various factors, like physiology, Biomechanics. Sports Training, Sports Medicine, and Sociology and Psychology etcetera. All the coaches, trainers, physical education personal and doctors are doing their best to improve the performance of the players of their country. Athletes/players of all the countries are also trying hard to bring laurels/medals for their countries in International competitions. Proficiency in any sport requires an ideal integration of numerous abilities developed to an ideal degree. However, performance measures of these abilities do vary from activity to activity. The dimensions underlying the human performance into the physical proficiency (fitness) area and the psychomotor area. The factors of strength, power, stamina, flexibility, coordination and balance constituted proficiency whereas reaction-time, speed of movement, arm hand steadiness, visual perception, manual dexterity and rate control were the abilities considered under psychomotor domain. The rate of force development is at the maximum for any type of muscle action is explosive power. In activities requiring high acceleration and output, explosive power training is necessary for maximum development. Some examples of these activities would include soccer, hurdling and football. This type of training is effective in enhancing athletic performance. The general exerciser doesn't usually need to include explosive power training in a regular workout. Cardiovascular and strength training in a slow, steady manner will give adequate results. In contrast, Athletic movements need to be performed at high speeds. The muscles have to be developed and trained outside of the sport in order to do this. The types of exercises used in explosive power training are determined by the type of sport that is being trained for. For example, for a basketball player trying to improve his jump shot would have a training program that would include weighted vertical jumps. Another example would be a gymnast who would like to get more height in her back spring; she would perform jumps and pushups to improve the strength in her arms and legs. Muscular endurance is the ability of a muscle or group of muscles to repeatedly exert force against resistance. Performing multiple repetitions of an exercise is a form of muscular endurance, as is running or swimming. If your muscles have to contract in a similar pattern more than one time you are using muscular endurance. Many factors contribute to muscular endurance, including strength, fiber type, training and diet.

2. Methodology

The purpose of the study was to find out the analysis the playing ability and explosive power and muscular endurance among women volleyball players. To achieve this purpose of the study, sixty women players were selected as subjects who belonging to various states participated in the South Zone Inter University Volleyball Championship held at Krishna University, Machilipatnam. The selected subjects were aged between 18 to 25 years. The dependent variable for the present investigation was playing ability of women volleyball players. The 12 subjects each selected from University of Calicut, M G University, Hindustan University, University of Madras and Krishna University teams. The independent variable chosen for the present investigation were explosive

power and muscular endurance. The data collected from the women volleyball players were statistically treated. Descriptive statistics was computed for volleyball playing ability (dependent variable), teams separately. To examine the association between dependent and independent variables, correlation was applied. Stepwise multiple regressions were worked out to explore the predominance of independent variables of women volleyball players. Further, one way analysis of variance was computed to find out the significance of difference among the female volleyball players of five teams, for dependent variable and each independent variables separately. Whenever the F ratio is significant, to know which of the paired mean differ significantly, Scheffe's test was applied. The level of significance was fixed as 0.01.

3. Results

The mean and standard deviation of dependent and independent variables of all the subjects were presented in table I.

Table I
MEAN AND STANDARD DEVIATION OF DEPENDENT AND INDEPENDENT VARIABLES

S.No	Variable	Mean	S.D.	Mini	Max
Dependent Variable					
1	Volleyball Playing Ability	74.43	10.52	50.00	90.00
Independent Variables					
1	Explosive Power	34.62	7.48	21.00	47.00
2	Muscular Endurance	43.41	10.64	22.00	65.00

The relationship which excised between volleyball playing ability and independent variables given in table II.

Table II
CORRELATION COEFFICIENT BETWEEN PLAYING ABILITY AND INDEPENDENT VARIABLES OF WOMEN VOLLEYBALL PLAYERS

S.No	Independent Variables Vs Playing Ability	Coefficient Correlation	Level of Significance
1	Explosive Power	.954	.01
2	Muscular Endurance	.972	.01

The analysis of variance for the influence of independent variables on playing ability is given in table III.

Table III
CORRELATION COEFFICIENT AMONG INDEPENDENT VARIABLES OF WOMEN VOLLEYBALL PLAYERS

	Sum of Squares	df	Mean Square	F ratio	Level of Significance
Regression	5687.28	2	2843.64	2221.59	.01
Residual	72.96	57	1.28		

It is clear from table III that the obtained F value 2221.59 is significant at .01 level. It reveals that all the independent variables are collectively influencing the playing ability of volleyball players. As the F ratio is significant, multiple regressions is computed. The stepwise multiple regressions between playing ability and independent variables are given in table IV.

Table IV
STEPWISE MULTIPLE REGRESSION BETWEEN PLAYING ABILITY AND INDEPENDENT VARIABLES OF WOMEN VOLLEYBALL PLAYERS

Multiple R	R Square	Adjusted R Square	Standard Error
.87672	.88059	.87936	1.06432

Table IV reveals that among the independent variable half squad jump one. Very much influence the playing ability of women netball players. From R square value it is clear that 99% of playing ability of women volleyball players is mainly due to muscular endurance. The variables in the equation are presented in table V.

Table V
VARIABLES IN THE EQUATION FOR WOMEN VOLLEYBALL PLAYERS

Variables	B	SE B	Beta	T	Level of Significance
Explosive Power	0.0613	0.17	0.035	1.114	.01
Muscular Endurance	0.143	0.062	0.139	2.44	.01
Constant	126.423	7.154		18.14	.01

From the stepwise multiple regression (formal selection procedure) analysis it is clear that the predominance of chosen independent variables of women volleyball players on muscular endurance and explosive power. The mean and standard deviation of volleyball playing ability of women netball players is presented in table VI.

Table –VI
MEAN AND STANDARD DEVIATION ON PLAYING ABILITY OF WOMEN VOLLEYBALL PLAYERS

S.No	State	Mean	SD
1	University of Calicut	86.50	1.67
2	M.G. University	84.40	2.54
3	Hindustan University	73.00	2.58
4	University of Madras	70.30	2.47
5	Krishna University	53.40	2.29

With a view to analysis the difference among different volleyball teams in their dependent and independent variables, one way analysis of variances was computed separately. The analysis on playing ability of women volleyball players of different teams is given in table VII.

Table VII
ANALYSIS ON PLAYING ABILITY OF WOMEN VOLLEYBALL PLAYERS

Source	Sum of Squares	df	Mean Squares	F ratio	Level of Significance
Between	6337.36	4	1584.34	289.11	.01
Within	301.39	55	5.48		

From table VII it is clear that the obtained F value, 289.11 is significant at .01 level as it is higher than the table value 3.69, required for 4, 55 df. It reveals the playing ability of different volleyball teams differ significantly. As the F ratio is significant, to know which of the paired mean differ significantly, Scheffe's test was applied. The result of Scheff's shows that all the teams differ significantly in their volleyball playing ability. The mean and standard deviation on explosive power of women volleyball players is presented in table VIII.

Table –VIII
MEAN AND STANDARD DEVIATION ON EXPLOSIVE POWER OF WOMEN VOLLEYBALL PLAYERS

S.No	State	Mean	SD
1	University of Calicut	44.40	1.54
2	M.G. University	40.58	2.14
3	Hindustan University	34.62	2.57
4	University of Madras	29.24	1.64
5	Krishna University	23.00	2.15

The analysis on explosive power of volleyball players of different teams is given in table IX.

Table IX
ANALYSIS ON EXPLOSIVE POWER OF WOMEN VOLLEYBALL PLAYERS

Source	Sum of Squares	df	Mean Squares	F ratio	Level of Significance
Between	2171.12	4	542.78	126.23	.01
Within	236.49	55	4.3		

From the table IX it is clear that obtained F value, 126.23 is significant at .01 levels. It reveals that the explosive power of different volleyball teams differ significantly. The result of Scheffe's shows all the teams differ significantly in their explosive power. The mean and standard deviation on muscular endurance of women volleyball players is presented in table X.

Table -X
MEAN AND STANDARD DEVIATION ON MUSCULAR ENDURANCE OF WOMEN VOLLEYBALL PLAYERS

S.No	State	Mean	SD
1	University of Calicut	62.40	1.87
2	M.G. University	52.60	2.42
3	Hindustan University	45.10	2.54
4	University of Madras	35.90	2.62
5	Krishna University	25.70	2.53

The analysis on muscular endurance of volleyball players of different teams is given in table XI.

Table XI
ANALYSIS ON MUSCULAR ENDURANCE OF WOMEN VOLLEYBALL PLAYERS

Source	Sum of Squares	df	Mean Squares	F ratio	Level of Significance
Between	7418.96	4	1854.74	255.83	.01
Within	398.75	55	7.25		

From table XI it is clear that obtained F value, 255.83 is significant at .01 level. It reveals that the muscular endurance of different volleyball teams differ significantly. The result of Scheffe's shows that all the teams differ significantly in their muscular endurance.

4. Discussion

The findings of the present study indicate that all the independent variables are having positive relationship with their playing ability. The maximum of playing ability of the players are mainly due to their hand reaction time and muscular endurance. The players of the different teams differ significantly in their playing ability and the variables of hand reaction time, muscular endurance, explosive power, movement speed, agility and muscular strength. The findings of the study is in consonance with Bhupinder Tanwar (2013), Chandrasekaran and others (2012), Meenu (2015), Sadowski Jerzy and others (2015) and Manoj Singh Rana and Yajuvendra Singh Rajpoot (2004). Among the selected five volleyball teams University of Calicut is best while Krishna University is poor in their playing ability.

5. Conclusion

Yogic training and aerobic training reveals significant improvement during mid and post test period on cardio respiratory endurance when compared to the control group. Aerobic training is better than the yogic training on cardio respiratory endurance. Yogic training and aerobic training groups shows that there is gradual reduction on cardio respiratory endurance during training cessation periods.

6. References

- [1]. Bhupinder Tanwar. (2013). Prediction Playing Ability of University Level Handball Players in Relation to their Motor Ability and Kinanthropometric Values. *International Journal of Social Science and Interdisciplinary Research*, 2(1).
- [2]. Chauhan et al., (2003) "Correlation between selected Anthropometric Variables and Middle Distance Running Performance", *General of Sports and Sports SNIPES*, 2(3).
- [3]. Hakkinen K. (1993), "Changes in Physical Fitness Profile in Female Volleyball Players during the Competitive Season. *J Sports Med. Phy. Fitness*, 33(3): 223-32.
- [4]. Manoj Singh Rana and Yajuvendra Singh Rajpoot. (2004). Impact and Role of Selected Coordinative Abilities in Racket Sports. *International Journal of Science and Research*, 4(2), 28-32.
- [5]. Meenu. (2015). Relationship between Motor Abilities and Clear Skill Level of Delhi Badminton Players. *International Journal of Physical Education, Sports and Health*, 2(2), 119-123.
- [6]. S. Chandrasekaran, et. al. (2012). A Study of Selective Motor Fitness Components Empowers on Playing Ability among Low and High Performers of State Level Football Players. *International Multidisciplinary Research Journal*, 2(3), 54-60.
- [7]. Sadowski Jerzy, et. al. (2015). Structure of Coordination Motor Abilities in Male Basketball Players at Different Levels of Competition. *Polish Journal of Sport and Tourism*, 21 (4), 234-239.

Corresponding Author:

R. Krishna Veni,
Research Scholar,
University College of Physical Education & Sports Sciences,
Acharya Nagarjuna University,
Nagarjuna Nagar, Guntur.