Analysis of Agility Among Women Volleyball Players

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ABSTRACT

The research paper aims to inquire the relationship between agility and women's Volleyball playing ability. The purposive sampling technique was used to select the subjects. The subjects were 72 women of under nineteen age group, from Northern regions of India, who participated in SGFI National Volleyball Championship held at Jhansi (Uttar Pradesh). They were team members from different States/Units/UT i.e. Haryana, Himachal Pradesh, Punjab, Delhi, IPSC (Indian Public School Conference) and Chandigarh. Data was collected during pre-national coaching camps and during SGFI Volleyball National Championship. Prior to the administration of tests, a meeting of the subjects was held in the presence of the coaches, trainers, managers and other tournament organizers during coaching camps and for the period of National Volleyball Championship. Agility of players were measured through Semo Agility Test, Burpee Test and Quadrant Jump. Volleyball playing ability was observed in the light of the five point rating scale by a panel of three qualified judges (all were diploma in coaching holders from national Institute of sports) who had sufficient experience in the game of Volleyball. Analysis of data revealed that Semo Agility Test and Quadrant Jump is statistically significant to women Volleyball playing ability, at.01 level of significance. The results further show that Burpee Test is non-significant to Volleyball playing ability. The present paper has its sports/ training implications for Volleyball coaches, researchers, Volleyball trainers and professional clubs, working for the development of Volleyball.

Keys words: *Analysis, Agility, Women Volleyball Players*

INTRODUCTION

Athletes and sports have been a part of the world culture for many centuries. They have been trained to compete in sporting events that prepares them for rigorous training. The training that the athletes of yesteryear underwent evidently was sufficient for the athletes of that time period, but contemporary athletes have an advantage because of new techniques available. The contemporary athletes have more efficient, more effective training techniques because of modern day science. In the highly modern, scientific, techno-friendly society, sports and games have assumed multi-dimensional implications and are better understood today than ever before. Sports and games have acquired immense popularity in view of the scientific organization and have become a worldwide phenomenon. Competition in sports and specialized physical

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education consists of various kinds of training and different activities which create team unity necessary for reaching ultimate training goals and tasks. Faster, higher, stronger, as said by Pierre de Coubertin, the founder of the modern Olympic Games and since 1896, whenever Olympiad has convened that motto has been realized. Indeed, the quest for greater achievement has become the goal of every sport. These recent changes in conditioning methods are based on, and have been motivated by, an abundance of scientific research. The research has produced valid & precise information about the relative effectiveness of different training methods. As a result, we currently know much more than ever before about how to develop strength, endurance, power, agility, speed & other athletic skills.

Craiq (2008) commented that "one of the major responsibilities of coaches at all level of competitions is to teach the skills they need in order to perform at their best on a consistent basis" (p. 9). Science is acceptable in each and every sport and Volleyball is not an exception. Due to a growing change in the competitive philosophy of sports, a rapport has developed among sports scientists, team physicians, athletics trainers, coaches and athletes to discover modern scientific techniques in terms of selection of athletes best suited to the activity and to devise new tactics and training methods. The modern age has been specially marked by the progress in all areas of human endeavors. This observation is appropriate in the world of games and sports as well. Scientific investigation of the performance of sportsmen is playing a vital role in evaluating this progress.

It is pertinent to say that physical training lays the groundwork for the whole training programme. Without good physical attributes, it would be impossible for Volleyball players to develop their individual skills completely, no matter how refined they are. This is especially true at the present time when competition has become more rigorous than ever and a team has often to play a series of grueling matches at short intervals in a major tournament. When the two sides are on par technically, it is always the physically stronger that wins.

Chander and Mukherjee (2012) stated that Volleyball is a sport that not only requires a number of individual skills and technical abilities in each player, but also requires that the players have a high degree of development in a number of physical and physiological parameters in order to be successful.

According to Taye & Wondirad (2017) "Volleyball performance depends on well-developed physical qualities, which are agility, acceleration, strength, and vertical jumping, and superior anticipation and decision making skills" (p.131). Volleyball is one of the thriving, aggressive and

recreational sports in the in modern world of sports. The elements of game involved high-speed, thrilling and explosive actions. Sahin (2014) stated that "Volleyball performance depends on well developed physical qualities, which are agility, acceleration, strength, and vertical jumping, and superior anticipation and decision-making skills... agility in Volleyball is very important to produce high force and rapid stretch shortening cycle movements and high-speed whole body movements" (pp. 303, 307). After formal introduction of Volleyball in 1964 Summer Olympics, the game has developed by leaps and bounds. Presently, it is considered a transnational sport. There is hardly any corner on earth where people of all ages and both sexes have not been attracted by and to this game. Its spectacular smashes, deadly blocks & lovely floor defenses make this game different from others. Volleyball is the combination of masterful skills and aesthetic body movements.

Bompa and Carrera (2005) said that Volleyball players must be able to react quickly and explosively off the ground to spike, block, or dive. Maximum strength, power and specific endurance are required for carrying a player through the long competitive phase with power and confidence.

Horicka, Hianik, and Simonek (2014) revealed that, "agility is not simply one of speed abilities. Besides simple reaction speed, acceleration, deceleration accompanied by the change of direction of movement it comprises also perceptual components determined by complex reaction to unexpected, changeable stimuli occurring during a sport game" (p. 49).

Darren, Gabbett and Nassis (2015) argued that agility is an important attribute of team game players. There is a growing interest in the factors that influence agility performance as well as appropriate testing protocols and training strategies to assess and improve this quality.

Horicka et al (2014) concluded that the dominance of perception in the character of movement action in game situations in sport games and its importance in the development of agility in the sport preparation...the relationship between speed factor and involve decision-making or reactive component and could be better described as change of direction speed tests.

Simonek, Horicka, and Hianik (2016) remarked that, "when developing agility it is inevitable to transfer from performing exercises with the change of direction planned in advance realized in static conditions onto the practice of open skills, in which reaction to the changing conditions of the match is combined with anticipation of the resulting optimum solution of the given situation" (p. 68).

Speed and agility in team sports represent complex psychomotor skills (Verchoshansky, 1996). Koestanto,

Setijino, and Mintarto (2017) revealed that circuit training and circuit ladder drills improve the speed and agility. Gortsila, Theos, Nesic, and Maridaki (2013) find out from their study that "training on sand surface could be a useful and effective tool for improving agility and passing skills in prepubescent female Volleyball players" (p. 1). Sekulic, Spasic, Mirkov, Cavar and Sattler (2013) reported that balance measures were significantly related to the agility performance for men but not for women.

After discussing all sides of agility, contemporary science, women Volleyball and necessities of modern Volleyball, the researcher has reached on the following research problem and therefore the problem has been stated as "Analysis of Agility among Women Volleyball Players".

Agility defined

Along with ability of changing the direction of movement, agility also constituted the capability to anticipate the movement of the opponent, read and react to specific game situations (Gamble, 2013).

The bodily trait of changing the direction rapidly and perfectly is termed as agility. It is closely associated with anticipation and decision making. Bloomfield et al. (1994) advocated that the difficulty in defining agility stems from the multiple individual skills involved in performing a task that is seen as an agile movement. A comprehensive definition of agility would recognize the technical skills, cognitive processes, and physical demands involved in agility performance. Some of the accepted definitions are as follows:

i. Sheppard and Young (2006) define agility as a rapid whole body movement with change of velocity or direction in response to a stimulus.
ii. Young et al (2002) identified agility as comprising two key sub components, speed in changing direction and cognitive factors.
iii. Bompa and Carrera (2005) remarked that agility is product of a complex combination of speed, coordination, flexibility and power.
iv. Altug, Altug, & Altug (1987) defined it as a fast change of direction of movement.
v. Sporis, Jukic, Milanovic, and Vucetic (2010) said that agility is the ability to maintain and control correct body positions while quickly changing direction through a series of movements.

Objective of the study

i. To find out the inter-relationship among three agility tests namely: semo agility test, burpee test and quadrant jump test among women Volleyball players.
ii. To find out the best test of agility associated with women's Volleyball playing ability.

Significance of the study

i. The investigation may help all those who are involved in coaching Volleyball.
ii. The finding on agility might help the Volleyball players to evaluate themselves so as to motivate themselves to give better performance.
iii. The study could motivate other Volleyball lovers to take similar studies so that Volleyball could become a more scientific game in India.
iv. The study would make addition to the already existing knowledge of physical education and sports.
v. The study might motivate other scientists to take similar study in other sports disciplines.

METHODOLOGY

The purposive sampling technique was used to select the subjects. The subjects were 72 girls of under nineteen age group from Northern regions of India, who participated in SGFI National Volleyball Championship held at Jhansi (Uttar Pradesh). Venue for championship was Shree Laxmi Vyayam Mandir, Inter College, Jhansi (UP) and subjects were team members from different States/Units/UT i.e. Haryana, Himachal Pradesh, Punjab, Delhi, IPSC (Indian Public School Conference) and Chandigarh. All subjects were in good health as verified by the concerned authority and it was also ensured that all the selected subjects were medically fit for going through the testing programme as well.

Prior to the administration of tests, a meeting of the subjects was held in the presence of the coaches, trainers, managers and other tournament organizers during coaching camps and for the period of National Championship. The requirements of the testing procedure was explained to them in detail, so that there was no vagueness in their minds regarding the efforts required of them and the hard work they had to bear in addition to their regular involvement in the competition. All the students and others officials were willing to cooperate in the testing procedure explained to them in the curiosity of scientific exploration and enhancing their own performance. No special technique was used to motivate the subjects to put in their best efforts.

Selection of Variables

The testing of agility was through the performance in the game of Volleyball were selected with greater care on the basis of personal experience of the researcher, long discussion with the coaches, and critical analysis of related literature, with joint consideration of the feasibility of the tests, availability of the equipments and acceptability of the subjects. As whole the purpose of three agility tests was to find out the best test variable for players Volleyball playing ability. After having taken the above criteria into consideration, Semo Agility Test, Burpee Test and Quadrant Jump were selected to test the agility. The Criterion-measure chosen for this study was "overall Volleyball playing ability."

Reliability of Data

The reliability of data was done by establishing the instruments reliability, test competency and reliability of tests and subjects' reliability.

Instrument Reliability

The stopwatch, which caters to the needs of various research laboratories in India and abroad, the reliability of the instruments was ensured and calibrated by their manufacturers. All the instruments used in this study to measure the performance of the subject on different variables were considered reliable and precise. Their reliability was further ensured by their repeated use on the same subject by the same tester under similar condition.

Tester competency and reliability of tests

To ensure that the investigator were well-versed with the techniques of conducting the tests, the investigator had number of practice sessions in testing procedures under the expert, Dr. S. Mukherjee, Professor, LNUPE, Gwalior. The tester competency was evaluated together with the reliability of the tests. To determine the reliability of tests, the scholar recorded the performances of ten subjects selected at random on the selected variables, twice under identical conditions. A Pearson's Product Moment Co-efficient of Correlation was computed between the two measures of each variable and these reliability coefficients have been depicted in Table no. 1.

Table-1: Reliability coefficient of test – retest score of test variables

Sr. No.	Test Variables	Reliability
1.	Semo Agility Test	.88
2.	Burpee test	.91
3.	Quadrant Jump	.85

It is signified that the correlation coefficient with reliability of test and the retest scores were found high.

Tools used for research

Agility

- Semo Agility Test (Berry L. Johnson & Jack K. Nelson) 1982 to measure the agility of subjects in running and changing direction forward, backward and sideward.
- Burpee Test or Squat Thrust Test (Berry L. Johnson & Jack K. Nelson) 1982 to measure the rapidity by which body position can be changed.
- Quadrant Jump (Berry L. Johnson & Jack K. Nelson) 1982 to measure the agility of subjects in changing body position rapidly by jumping.

Volleyball playing ability

Volleyball playing ability was observed during the SGFI Volleyball Championship, in the light of the five point rating scale, by a panel of three qualified judges (all were diploma in

coaching holders from national Institute of sports) who had sufficient experience in the game of Volleyball. Volleyball Playing Ability Scale was based upon following criteria:

Table-2 : Volleyball Playing Ability Scale

Sr. No.	Guiding Instructions	Score Points
1.	Excellent in all aspect of the game	5
2.	Very good in all aspect of the game	4
3.	Good in all aspect of the game	3
4.	Above average in all aspect of the game	2
5.	Average in all aspect of the game	1

Above mention scale (Table 2) was applied keeping in view the following points: i) Skill proficiency, ii) Anticipation and quick reaction. iii) Tactics and strategies Interactions, iv) Knowledge of rules and games, v) Ability to change tactics when new situation demands, vi) Ability to analyze opponent's move and respond accordingly, vii) Overall rational of the game.

Administration of Tests and Collection of Data

The necessary data was collected by administering the tests for the selected agility variables. All the tests were administrated ten days before and during the SGFI National Volleyball Championship. This period was considered to be the best time for the collection of data mainly because the players had entered the competition period after having acquired optimum fitness and skill proficiency. The impact of their training and conditioning had reached the peak level. They were in a position to respond to the load of tests without undue fatigue. The subjects were given a chance to practice the prescribed test so that they may become familiar with the tests and know exactly what was required to be done. We had ensured uniform testing conditions; the subjects were tested only during morning and evening sessions.

The collection of data was completed during pre national coaching camps at Uchha Pind Sanghol (Punjab), Kandaghat (Himachal Pradesh), Sports Complex Sector- 46, (Chandigarh) Dhakah Sports Complex (Delhi), Kaithal (Haryana), Motilal Nehru School of Sports, Rai, Sonipat, Haryana (IPSC) and during SGFI National, that was organized by Directorate of Education, Uttar Pradesh by Uttar Pradesh Education Department at Jhansi. The Venue for championship was Shree Laxmi Vyayam Mandir Inter College, Jhansi (UP).

RESULTS & DISCUSSION

Analysis of data was done with use of Pearson's product moment co-efficient of correlation to find out the

relationship of overall Volleyball playing ability of players with each of the motor fitness test variables.

Descriptive Analysis of Agility among Women Volleyball Players

Descriptive analysis of agility variables of girl Volleyball players i.e. mean, standard deviation, standard error of mean and coefficient of variation percentage have been presented in following Table:

Table 3 show that Semo Agility Test had 13.758 mean, 1.073 standard deviation, .126 standard error of mean and 7.801 percent coefficient of variation. Further, the Table reveales that Burpee Test had 20.07 mean, 2.34 standard deviation, .276 standard error of mean and 11.659 percent coefficient of variation. Quadrant Jump had 23.44 mean, 3.166 standard deviation, .373 standard error of mean and 13.506 percent coefficient of variation.

Table-3 : Descriptive analysis of agility among women Volleyball Players

Sr. No.	Name of Test	Unit	Minimum	Maximum	Mean	SD*	SEM**	CV %***
1	**Semo Agility Test**	Second	11.1	16.5	13.758	1.0733	.1265	7.8%
2	**Burpee Test**	Number	16	25	20.07	2.340	.276	11.659%
3	**Quadrant Jump**	Number	16	31	23.44	3.166	.373	13.506%

N=72, * standard deviation, **standard error of mean, ***coefficient of variation percentage

Table-4 : Descriptive Statistics of Volleyball Playing Ability among women players

Name of Test	N	Range	Minimum	Maximum	Mean Static	Mean Std. Error	Std. Deviation
Volleyball Playing Ability	72	4.00	1.00	5.00	3.1852	.12646	1.07306

Table 4 reveals that Volleyball playing ability among women Volleyball players have 4.00 range 3.1852 static mean, 1.07306 standard deviation and .12646 standard error of mean.

Table-5 : Inter-correlation matrix of agility among women Volleyball players

	Semo Agility Test	Burpee Test	Quadrant Jump Test
Semo Agility Test	1	-.203	-.550**
Burpee Test	-.203	1	.283*
Quadrant Jump Test	-.550**	.283*	1

N=72, ** Correlation is significant at the 0.01 level, *Correlation is significant at the 0.05 level Degree of freedom = 70

Table 5 depicts the inter-relationship between Semo Agility test, Burpee Test and quadrant jump test of northern Indian women Volleyball players in terms of Pearson Product moment correlation coefficients. Outcomes illustrates the negative relationship between Semo Agility Test and Quadrant Jump Test was (r = -.550**) and it was significant at level of .01 level, but relationship between semo agility test, and Burpee Test was (r = -.203) that is statistically insignificant. The Burpee Test and quadrant jump test co-relation (r=.283*) was found significant, at the level of .05.

Table-6: Relationship between agility and women Volleyball playing ability

Agility	Correlation coefficients	Level of significance
Semo Agility Test	-.537(**)	< .01
Burpee test	.066 NS	< .01
Quadrant Jump	.307(**)	< .01

N=72,** Correlation is significant at the 0.01 level, * Correlation is Non Significant at .01 level, Degree of freedom = 70

Table 6 illustrates the co-relation of women Volleyball playing ability and Semo Agility Test (r = -.537), Quadrant Jump (r =.307), were found significant at the level of .01 because calculated value is greater than the Table value .302 (at 1% level of significance) and Burpee Test were found non-significant to Volleyball playing ability.

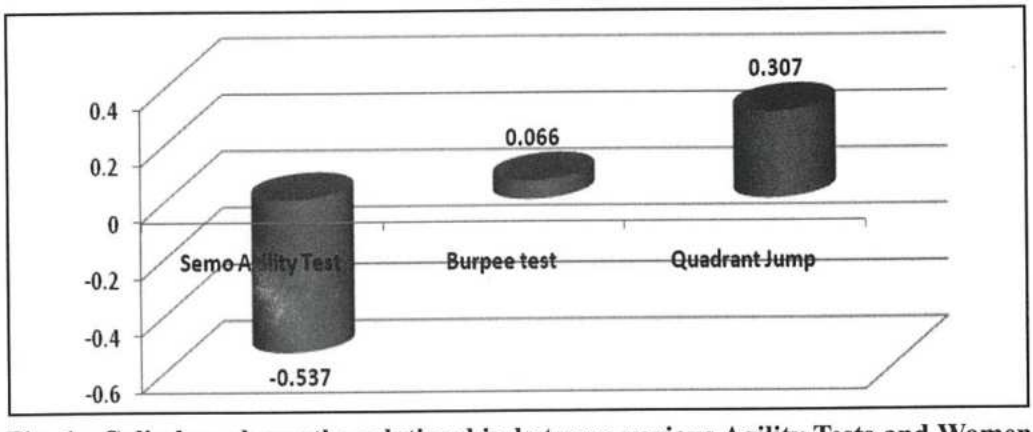

Fig.-1: Cylinders shows the relationship between various Agility Tests and Women Volleyball playing ability

It is pertinent to mention here that the probable cause of significant relationship between women's Volleyball playing ability is the similarity of movements' pattern in game of Volleyball and Semo Agility Test and Quadrant Jumps. The pattern of movements in Burpee Test and

Volleyball are not alike that's why this test could not statistically clear the level of significance.

CONCLUSION

i. Semo Agility Test and Quadrant Jump were found statistically significant to Volleyball playing ability.
ii. Burpee Test was found non-significant to Volleyball playing ability.
iii. Semo Agility Test was found as best suitable for judging Volleyball playing ability.

PRACTICAL APPLICATIONS

The present paper has its sports/ training implications for Volleyball coaches, researchers, Volleyball trainers and professional clubs working for the development of women's Volleyball in India.

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