A STUDY OF PHYSICAL CHARACTERISTICS OF NATIONAL LEVEL VOLLEYBALL PLAYERS

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Abstract

The objective of the study was to determine the significance of Physical characteristics of National/Inter University Level Volleyball Players.The data pertaining to the physical characteristics(Grip Strength, Explosive Leg Strength, Agility and Flexibility) were collected from the subjects belonging to Rajasthan states. The subjects of this study represented the respective states at various National/Inter University level tournaments. 100 players were selected randomly for this study from the National level tournament.To collect the data, selected physical characteristics measures were taken on each subject individually during practice time. Agility was measured by using 4x10m Shuttle run test, the score was recorded in seconds. Flexibility was measured by using Sit and Reach test, the score was recorded in centimeters. Grip strength was measured by grip dynamometer and the score was recorded in kilograms. Standing Broad Jump Test was used as criteria for measuring leg strength and the score for distance was recorded in centimetersand Performance of the players was measured with the help of three experts during the competitions, the judges were supplied proper scoring sheet for Volleyball playing performance. Total score for judgment in Volleyball playing performance were set 50 marks. The score sheets were collected duly signed by the experts for further calculation of the study. For the data analysis, descriptive statistics and Product Moment Correlation was used. To find out the difference between the values, the level of significance was set at 0.05 levels.

Keywords: *Volleyball,Physical Characteristics,Grip Strength, Explosive Leg Strength, Agility, Flexibility*

INTRODUCTION

The existence of physical activity or any body movement can be traced from the pre-historic period. History begins with the advancement of writing but the period prior

to the invention of writing is termed as per-history. As no written language was developed, practically all we know about this pre-historic culture have been pieced together from various scattered fragments that have been recovered. During those days also, physical fitness was essential the weak could not survive, Muscular strength, endurance, muscular power, speed and reaction time were important physical attributes that ensured survival. Initiation rites usually involve feats of strength and endurance, as well as tests of motor skills and courage. Dancing had a very important place in the pre-historic societies, It was considered as a serious and usually a religious activity.

Physical activity and movements have played numerous roles from fun and enjoyment to attainment of fitness, from maintenance of health to therapeutic care, from education of individual to the emergence of sports as a strong social force. Whatever be the form at every stage of human history, physical activity have been providing exciting outlet for human expression - often creative in nature.

Singh has suggested that most of the coaches agree that the physical characteristic, skills and training of the players are extremely important but they also indicate the good mental preparation for competition, which is necessary component of success. In western countries like Russia, G.D.R., Bulgaria, Czech and Islovakia much stress was given on the mental preparation of their international teams as well as on the psychological conditioning of their sportsman. A coach had the job of helping the athlete to find out his specific talents and factors for their fullest potential. This included developing not only the physical attributes but also his attitudinal motivation and psychological spirits.

The concept of physical fitness, in general athletic terms, means the capability of the individual to meet the varied physical and physiological demands made by a sporting activity, without reducing the person to an excessively fatigued state. Such a state would be one in which he/she can no longer perform the skill of the activity successfully. **(Davis Bob & et.al, 2000)**

This is where the theoretical ideas involved in the discussion on the system that provide the energy necessary for human exercise, become directly related to day to day physical activities. The idea is that we should use our knowledge of the scientific basis of exercise to help and improve performance in our sport and perform in a systematic and predictable way. Unfortunately, nothing a human being does is ever thoroughly predictable and psychological. Cultural and emotional factors tend to upset the true progress of science. However, it must be possible to enhance the aims of physical training by using knowledge of physiology. The aim and objective of training are to improve performance, skill, game ability, motor abilities and physical fitness.

Training methodology and teaching has crossed many milestones as a result of different types of researches in general and their application to the sports development in particular. In the modern scientific age, athletes are being trained by highly sophisticated means for better achievement in their concerned sports. They are being exposed to the exercises and training methods, which have proved beneficial for achieving higher standards. Much progress has been made in the recent years in the acquisition of knowledge about training means and techniques of sports skills. In sport training specialized exercises are being prescribed for the fullest and optimum development for a particular game.

Volleyball occupies a significant place among all other games and sports. In some respects it is unique as a sport. It is an ideal sport and a grand energetic game, giving enjoyment and pleasure, determining fitness and dedication. It requires physical and metal attitudes to be on top geol to tackle all eventualities in the match. In order to achieve optimum performance in game and sports, physical education teachers, coaches and trainees has to understand about all these factors. That contributes to overall performance, these factors one physical fitness, technical and tactical level of sportsman, physiological fitness, physiological make up and finally anthropometrics measurement of the performer and the trainer. Teachers or coaches must train the performer through there aspects of training.

Volleyball, which is an excellent around team sport, has been widely accepted as a highly competitive as well as a recreational game throughout the world. It is now recognized as one of the most breath taking and dramatic sport of the Olympics both from the players and spectators view point.

Performance of an athlete in sports does not depend only upon the physical fitness components but several other factors also contribute to his success, such as, scientific and quality of equipments, clothing, training schedule, competition frequency psychological preparation, and balanced diet. All these factors together prepare the athlete for the competition. Apart from those all, he must develop the motor fitness. Research findings show that high level of technique perfection alone cannot produce success in competitive sports. Most of the games demand a higher level of fitness of the athletes.

PROCEDURE

In this chapter, the selection of subjects, selection of variables, Selection of test, administration of test and statistical technique used for analysis of data have been described.

Selection of Subjects

The subject of the present study was male national level Volleyball players, age ranged between 18 to 25 years. The data pertaining to the physical and psychological characteristics

were collected from the subjects belonging to different states. The subjects of this study represented the respective states at various National or Inter University level tournaments. 100 players were selected randomly for this study from the National or Inter University level tournament.

Before collecting the data the scholar personally requested the coaches and managers of participating teams for their assistance. The objective of the study boosted the moral of different team coaches and willingly asked their team players for their cooperation.

Selection of Variables

The study was undertaken to pinpoint the physical and psychological characteristics only. Therefore, based on literary evidences and scholars own understanding the following characteristics were selected for the purpose of the study;

Physical characteristics:

- **a.** Grip Strength
- **b.** Explosive Leg Strength
- **c.** Agility
- **d.** Flexibility

Criterion Measures

Physical characteristics:

1. Agility was measured by using 4x10m Shuttle run test. The score was recorded in seconds.
2. Flexibility was measured by using Sit and Reach test. The score was recorded in centimeters.
3. Grip strength was measured by grip dynamometer and the score was recorded in kilograms.
4. Standing Broad Jump Test was used as criteria for measuring leg strength and the score for distance was recorded in centimeters.
5. Volleyball playing performance was adjudged with the help of mean score of three judges who were also the expert of the Volleyball game.

Collection of Data

All the selected subjects for the study were informed about the aims and objectives of the present work and requested for their cooperation. The subjects were explained about different variables required for the study with necessary instructions. The required data for different characteristics of each team were collected during the course of two days. The scholar contacted the players personally and their sincere cooperation was solicited. Necessary instructions were given to the players before the administration of each test. The research scholar motivated the team coaches and managers by promising them to send a copy of abstract of the study.

Performance Assessment

1. "Volleyball playing performance was adjudged with the help of mean score of three judges who were expert of the Volleyball game."
2. All the judges were requested to observe the performance of the players during competition and to judge the playing ability of the players. Judges were also requested to attend a formal meeting for deciding the criteria of judgment for avoiding confusion during the subjective scoring based upon their judgment. After deciding the criteria, the judges were supplied proper scoring sheet for Volleyball playing performance. Total score for judgment in Volleyball playing performance were set 50 marks. The score sheets were collected duly signed by the experts for further calculation of the study.

Reliability Of Data

The reliability of data was ensured by establishing the instrument reliability, tester's competency, reliability of the tests and subject's reliability.

Instruments Reliability

The instruments, which were used in the study, were obtained from standard firms, which cater to the needs of various research laboratories in India and abroad and their calibration were accepted as accurate enough for the purpose of this study.

Tester Competency

To ensure that the investigator was well versed in the techniques of conducting the tests, the investigator had a number of practice sessions in the testing procedure under the guidance of the expert. The tester's competency was also evaluated together by reliability of tests.

Statistical Procedure

1. To determine the Physical Characteristics of National Level Volleyball Players, Descriptive statistics was used.

2. To find out the relationship of selected Physical variables of Volleyball performance, Product Moment Method of Correlation was used and the level of significance was set at .05 levels.

ANALYSIS OF DATA AND RESULTS OF THE STUDY

The data pertaining to physical characteristics of the 100 National / Inter University level Volleyball players were gathered for the purpose of the study. The findings of the study are presented with the help of specific table and are described in a simple manner. The data collected were calculated using mean, median, mode and standard deviation. Further the data were analyzed using product moment correlation coefficient and their interpretations are also presented in this chapter.

The level of significance for entire statistical test employed was set at .05 levels.

FINDINGS

To find out Grip Strength of National / Inter University level Volleyball players, descriptive statistics was used and the descriptive analysis is presented in table-1.

TABLE-1

Descriptive statistics in relation to Grip Strength of National / Inter University level Volleyballplayers

Mean	56.63
Median	54
Mode	54
Standard Deviation	5.131
Range	20
Minimum	50
Maximum	70

It is evident from table -1, that observed descriptive statistics in relation to Grip Strength of National / Inter University level Volleyball players, were calculated and different values for Mean, Median, Mode and Standard Deviation score was respectively: 56.63,: 54,: 54 and 5.131. The Range of score was: 20 (with minimum score of 50 and maximum score were 70)

To find out relation between Grip Strength and Volleyball Performance of National / Inter University level Volleyball player, product moment method of correlation was used and the analysis in presented in table-2 .

TABLE-2

Correlation coefficient of relationship between Grip Strength and Volleyball performance of National /Inter University level Volleyball players

Variable	Coefficient of Correlation
Grip strength	0.03287

Insignificant at .05 level at 101 df = .195

It is evident from table-2 that, insignificant relationship was found between grip strength and Volleyball performance, since the calculated coefficient of correlation (0.03287) was found lower than the tabulated value (0.195) at .05 level of significance.

To find outExplosive Leg Strength of national level Volleyball players, descriptive statistics was used and the descriptive analysis is presented in table-3

TABLE-3

Descriptive statistics in relation to Explosive Leg Strength of National / Inter University level Volleyball players

Mean	268.2289
Median	270
Mode	275
Standard Deviation	10.089
Range	59
Minimum	225
Maximum	284

It is evident from table -3, that shows the descriptive statistics in relation to Explosive Leg Strength of National / Inter University level Volleyball players where, the Mean was found to be 268.2289, Median: 270, Mode: 275,Standard Deviation: 10.089 and Range 59 with minimum score of 225 and maximum score was 284.

To find out inter-relationship between Explosive Leg Strength and Volleyball Performance of National / Inter University level Volleyball players, product moment method of correlation was used and analysis is presented in table-4.

TABLE-4

Correlation coefficient of relationship between Explosive Leg Strength and Volleyball performance of National / Inter University level Volleyball players

Variable	Coefficient of Correlation
Explosive Leg strength	0.1321

Significant at .05 level at 101 df = .195

It is evident from table -4 which observed that insignificant relationship was found between theExplosive leg strength and Volleyball performance as the calculated coefficient of correlation (0.1321) was found lower than the tabulated value 0.195 at .05 level of significance.

To find out Agility of National / Inter University level Volleyball players, descriptive statistics was used which is presented in table-5

TABLE-5

Descriptive statistics in relation to Agility of National or Inter University level Volleyball players

Mean	9.0211
Median	9
Mode	8.79
Standard Deviation	0.3342

Range	1.75
Minimum	8.25
Maximum	10

It is evident from table -5 that observed descriptive statistics in relation to Agility of National / Inter University level Volleyball players where, the Mean value found to be 9.0211, Median: 9, Mode: 8.79,Standard Deviation:0.3342 and Range: 1.75 with minimum score 8.25 and maximum 10.

To find out relation between Agility and Volleyball Performance of National or Inter University level Volleyball players, product moment method of correlation was used and analysis is presented in table-6.

TABLE-6

Coefficient Correlation between Agility and Volleyball performance of National / Inter University level Volleyball players

Variable	Coefficient of Correlation
Agility	-0.2410*

*Significant at .05 level at 101 df = .195

It is evident from table -6 that shows significant relationship was found between agility and Volleyball performance, since calculated coefficient of correlation (-0.2410) was found significant as compared with tabulated value 0.195 at .05 level of significance.(In time events, lower the score, better the performance)

To find out Flexibility of National /Inter University level Volleyball players, descriptive statistics was used and the descriptive analysis is presented in table-7

TABLE-7

Descriptive statistics in relation to Flexibility of National / Inter University level Volleyball players

Mean	19.6982
Median	20
Mode	18
Standard Deviation	1.6225
Range	5
Minimum	17
Maximum	22

It is evident from table -7 that observed descriptive statistics in relation to Flexibility of National / Inter University level Volleyball players where the Mean value found to be 19.6982,

Median: 20, Mode: 18,Standard Deviation: 1.6225 and Range 5 with minimum score 17 and maximum score 22.

To find out relationship between Flexibility and Volleyball Performance of National level Volleyball players, Product Moment method of correlation was used and analysis is presented in table-8.

TABLE-8

Correlation coefficient of relationship between Flexibility and Volleyball performance of National/Inter University level Volleyball players

Variable	Coefficient of Correlation
Flexibility	0.1489

Significant at .05 level at 101 df = .195

It is evident from table -8 that shows insignificant relationship between flexibility and Volleyball performance since the calculated coefficient of correlation (0.1489) was found lower than the tabulated value (0.195) at.05 level of significance.

DISCUSSION OF FINDINGS

This study was deliberate attempt on the part of research scholar to know the effectiveness of physical characteristics of sportsmen with his sports performance. This study could be an eye opener to all those, who are in hallucination of physical characteristics as an important factor for sports performance. Physical variables like grip strength, explosive leg strength, agility and flexibility seems to be importance for any sportsmen in order to perform well in sports. All the physical variables which are considered basic for the game of Volleyball were tested with the help of different but standard test items, and agility proved to be significant with sports performance. This physical variable seems to be more in practice at modern Volleyball game. Agility in modern training trends considered as coordinative ability, which are termed according to their nature of work and defined subsequently. In other words agility composed of a different number of coordinative abilities, which are primarily dependent on the motor control and regulation process of central nervous system. According to Singh, these abilities have strong links with the motor skill. This may be one of the strongest possibilities for gaining significant relationship in agility to Volleyball playing performance.

Another possibility of getting positive relationship of agility to sports performance may be the influence of different types of coordinative abilities like differentiation, orientation, coupling, rhythm, balance, adaptation. These all above characteristics of agility might have helped player to perform better.

The result of the study pertaining to the grip strength and leg strength did not proved to be significantly related. Though these characteristics seems to be well within the frame work of Volleball performance, but study did not reveal its importance in results; hence need warranted

studies in this direction. This finding provides new evidence in elucidating the relationship between strength (either grip strength or explosive leg strength) and Volleyball playing performance. The result of this study are partially supported by Newman, M. A.,Tarpenning, K. M., Marino, F. F.,(2004) who conducted a study on isokinetic strength with football players. Baker, D.(2001) has also suggested in his study that strength largely influence power output, however once the strength plateau has been reached the negative effect of high volume training may alter extent of the relationship. The analyses of the results show that, explosive leg strength is much closer to the sports performance than that to grip strength.

The insignificant relationship was found between flexibility and Volleyball performance. This might be attributed to, two different reasons. The first reason might be due to the testing methodology which did not reveal high flexibility or low flexibility group. The high and low flexibility group should have been the actual criteria of testing the performance. Secondly the game has been dominated by high frequency of movement which are dependent on the balance, rhythm and other coordinative abilities. In such condition this physical variable i.e. flexibility might have not given due importance by the players during their practice session, hence did not have significant relationship with Volleyball performance.

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