

## COMPARISON OF SELECTED PHYSIOLOGICAL VARIABLES BETWEEN THE BASKETBALL AND VOLLEYBALL PLAYERS

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### Abstract

This study was conducted on different physiological variables among University level Basketball and Volleyball male players. Main aim of the study was the comparison between Basketball and Volleyball players with different physiological variables. The purpose of the study was to compare resting heart rate, blood pressure (systolic and diastolic), maximum oxygen consumption, anaerobic power, positive breath holding and negative breath holding Basketball and Volleyball players. In present study investigator has taken a total of 16 players (08 Basketball and 08 Volleyball). For interpretation of data a comparative analysis of the selected variable, the 't' test was applied. The data of both groups were collected separately for both the variable. Statistic such as mean and standard deviation was computed. The level of significance was set at 0.05. It was found the Basketball and Volleyball players do not have significant difference between the variables: resting heart rate, blood pressure (systolic and diastolic), maximum oxygen consumption, anaerobic power, positive breath holding and negative breath holding.

**Keywords:** Resting Heart Rate, Blood Pressure, Maximum Oxygen Consumption, Anaerobic Power and Breath Holding.

### Introduction

There are many important physiological characteristics required for improved performance in players and officials in team sports (such as basketball, football, handball, hockey, volleyball etc.). Although each of these sports it's on distinctive skills, tactics and movement patterns, they all similar physiological demands such as high aerobic power, high lactate tolerance and increased anaerobic capacity. These physiological capacities allow the team-sports players to repeat sprints often with quite short recovery periods over a prolonged duration. This type of activity commonly reffered to as prolonged high-intensity intermitted exercise.

Amongst the most popular games are basketball, hockey, football, and volleyball. Team games are important in physical education programme because they provide big muscle activity necessary for developing and maintaining a desirable level of physical fitness. Team game is important too for the opportunities they give to the players for demonstrating their ability to contribute to the group effort. Team game such as basketball, hockey, football and volleyball are played on large courts. The activities in these games including under aerobic

conditions for long spells of time, to carry the ball and to chase the opponent at a maximum speed, and to dodge the opponent to retain the ball. These activities contribute to the development of cardio respiratory endurance, speed and agility of the team games players. Physical and Physiological fitness depends on several factors such as heredity hygienic living, nutrition and body activity amongst these factor body activities play on important role. Individual and team games provide a great deal of opportunity to an individual to the body activities. The best contribution to physical fitness results from participation of the individual in different games. Physical and Physiological fitness is a general concept defined in many ways by differing scientists. Here two major categories are considered; general fitness (a state of health and well-being), and specific fitness (a task-oriented definition based on the ability to perform specific aspects of sports or occupations). Physical fitness is generally achieved through correct nutrition, exercise, hygiene, and rest. The game of the Boxing, Wrestling Volleyball and Basketball depend to a large extent on technical skill and tactics. Beside these the endurance, agility, reaction ability, flexibility, speed of movement are the other motor abilities which are important for achieving good performance in Boxing, Wrestling Volleyball and Basketball. As the optimum utilization of all the performance pre-requisites is not possible without a certain minimum of tactical efficiency. Therefore, this sport is placed in the group of game sports. All the sports in this group are classified by a high degree of tactical efficiency needed for good performance. Exercise physiology is concerned with changes in function brought about by participation in physical exercise. Even when there is no clear evidence present that physical changes requires regular exercise there is simple evidence that physical challenges can be meet more successfully if one begins program of physical activity early in life and persists in such activity throughout the years. Successful distance running primarily requires development of aerobic endurance. The deviation of the activity with result in muscle contraction but more the performance in the activity will be limited by the functioning of the heart, blood vessels, blood and lungs. The degree to which circulation and respiration limit once performance depends upon many factors, chief of which is the intensity of the exercise. Distance running is a relatively low intensity activity consisting mostly of rhythmic, non-static mostly contraction and is limited mainly by aerobic capacity. Performance in distance event is influenced by several physiological variables and some of the important variables

are aerobic power, anaerobic power, amount of hemoglobin in the blood, body composition, vital capacity, heart rate, hemoglobin content, body surface area etc. The present study would help in developing prediction equations based on selected physiological variables in assessing the performance of basketball and volleyball players.

**Methodology**

A sample of 16 male players were selected as subjects 08 Basketball and 08 Volleyball players studying in University of Rajasthan Jaipur. The ages of the player were 19 to 25 years. Test Applied:- The data were collected with the help of heart rate, sphygmomanometer, stethoscope, Harvard's step test, sergeant jump, nose clip, stop - watch as standard procedure. Methods of Analysis:- To analysis collected data "t" test was applied to find out the significant difference.

**Findings**

**TABLE-1**  
SIGNIFICANCE OF MEAN DIFFERENCE BETWEEN BASKETBALL AND VOLLEYBALL PLAYERS ON THE RESTING HEART RATE.

| Group      | Sample | Mean  | SD    | "t"  |
|------------|--------|-------|-------|------|
| Basketball | 08     | 71.50 | 02.83 | 0.20 |
| Volleyball | 08     | 69.50 | 08.40 |      |

Significance at 0.05 table value at 0.05 = 2.14  
A perusal of table -1 indicates that a mean and standard deviation values with regard to Basketball on resting heart rate variable were 71.50 and 02.83 whereas in case with Volleyball the same were recorded as 69.50 and 08.40 respectively. These were no significant difference between Basketball and Volleyball players found as the calculated t-value (0.20) was less then tabulation t-value (2.14) at 0.5 level.

**TABLE-2**  
SIGNIFICANCE OF MEAN DIFFERENCE BETWEEN BASKETBALL AND VOLLEYBALL PLAYERS ON THE BLOOD PRESSURE SYSTOLIC.

| Group      | Sample | Mean   | SD    | "t"  |
|------------|--------|--------|-------|------|
| Basketball | 08     | 123.38 | 03.34 | 0.05 |
| Volleyball | 08     | 123.75 | 06.41 |      |

Significance at 0.05 table value at 0.05 = 2.14  
The table -2 indicates that a mean and standard deviation values with regard to Basketball on Blood Pressure Systolic variable were 123.38and 03.34 whereas in case with Volleyball the same were recorded as 123.75and 06.41 respectively. These were no significant difference between Basketball and Volleyball players found as the calculated t-value (0.05) was less then tabulation t-value (2.14) at 0.5 level.

**TABLE-3**  
SIGNIFICANCE OF MEAN DIFFERENCE BETWEEN BASKETBALL AND VOLLEYBALL PLAYERS ON THE BLOOD PRESSURE DIASTOLIC.

| Group      | Sample | Mean  | SD    | "t"  |
|------------|--------|-------|-------|------|
| Basketball | 08     | 73.25 | 03.37 | 0.75 |
| Volleyball | 08     | 84.75 | 10.54 |      |

Significance at 0.05 table value at 0.05 = 2.14

The table -3 indicates that a mean and standard deviation values with regard to Basketball on Blood Pressure diastolic were 73.25 and 03.37 whereas in case with Volleyball the same were recorded as 84.75 and 10.54 respectively. These were no significant difference between Basketball and Volleyball players found as the calculated t-value (0.75) was less then tabulation t-value (2.14) at 0.5 level.

**TABLE-4**  
SIGNIFICANCE OF MEAN DIFFERENCE BETWEEN BASKETBALL AND VOLLEYBALL PLAYERS ON THE MAXIMUM OXYGEN CONSUMPTION VARIABLE

| Group      | Sample | Mean  | SD    | "t"  |
|------------|--------|-------|-------|------|
| Basketball | 08     | 76.75 | 07.89 | 0.27 |
| Volleyball | 08     | 82.13 | 09.75 |      |

Significance at 0.05 table value at 0.05 = 2.14  
The table -4 indicates that a mean and standard deviation values with regard to Basketball on Maximum Oxygen Consumption Variable were 76.75and 07.89 whereas in case with Volleyball the same were recorded as 82.13 and 09.75 respectively. These were no significant difference between Basketball and Volleyball players found as the calculated t-value (0.27) was less then tabulation t-value (2.14) at 0.5 level.

**TABLE-5**  
SIGNIFICANCE OF MEAN DIFFERENCE BETWEEN BASKETBALL AND VOLLEYBALL PLAYERS ON THE ANAEROBIC POWER VARIABLE.

| Group      | Sample | Mean   | SD    | "t"   |
|------------|--------|--------|-------|-------|
| Basketball | 08     | 124.00 | 14.77 | 0.002 |
| Volleyball | 08     | 124.13 | 13.43 |       |

Significance at 0.05 table value at 0.05 = 2.14  
The table -5 indicates that a mean and standard deviation values with regard to Basketball on Anaerobic Power Variable were 124.00 and 14.77 whereas in case with Volleyball the same were recorded as 124.13 and 13.43 respectively. These were no significant difference between Basketball and Volleyball players found as the calculated t-value (0.002) was less then tabulation t-value (2.14) at 0.5 level.

**TABLE-6**  
SIGNIFICANCE OF MEAN DIFFERENCE BETWEEN BASKETBALL AND VOLLEYBALL PLAYERS ON THE POSITIVE BREATH HOLDING

| Group      | Sample | Mean  | SD    | "t"  |
|------------|--------|-------|-------|------|
| Basketball | 08     | 47.13 | 18.09 | 0.03 |
| Volleyball | 08     | 45.53 | 08.01 |      |

\*Significance at 0.05 table value at 0.05=2.14  
The table -6 indicates that a mean and standard deviation values with regard to Basketball on Positive Breath Holding variable were 47.13 and 18.09 whereas in case with Volleyball the same were recorded as 45.53 and 08.01 respectively. These were no significant difference between Basketball and Volleyball players found as the calculated t-value (0.03) was less then tabulation t-value (2.14) at 0.5 level.

TABLE-7

SIGNIFICANCE OF MEAN DIFFERENCE BETWEEN BASKETBALL AND VOLLEYBALL PLAYERS ON THE NEGATIVE BREATH HOLDING

| Group      | Sample | Mean  | SD    | "t"  |
|------------|--------|-------|-------|------|
| Basketball | 08     | 28.21 | 10.38 | 0.31 |
| Volleyball | 08     | 23.39 | 03.93 |      |

\*Significance at 0.05 Table value at 0.05=2.14

The table -7 indicates that a mean and standard deviation values with regard to Basketball on Negative Breath Holding were 28.21 and 10.38 whereas in case with Volleyball the same were recorded as 23.39 and 03.93 respectively. There were no significant difference between Basketball and Volleyball players found as the calculated t-value (0.31) was less than tabulation t-value (2.14) at 0.5 level.

### Conclusion

The researcher had under taken study titled as "resting heart rate, blood pressure (systolic and diastolic), maximum oxygen consumption, anaerobic power, positive breath holding and negative breath holding" Basketball and Volleyball players a comparative study. There was no significant difference noticed. Therefore from the statically analysis the following inferences were derived: No significant differences were observed in the resting heart rate of Basketball and Volleyball players. There were no significant differences noticed on the blood pressure systolic between Basketball and Volleyball players. There were no significant differences were observed in the blood pressure diastolic of Basketball and Volleyball players. There were no significant differences noticed on the maximum oxygen consumption between Basketball and Volleyball players. There were no significant differences

noticed on the anaerobic power between Basketball and Volleyball players. There were no significant differences noticed on the positive breath holding between Basketball and Volleyball players. There were no significant differences noticed on the negative breath holding between Basketball and Volleyball players.

### References

- Jonhson, B.L. and Nelson, J.K., (1982). Practical Measurement for Evaluation in Physical Education, 3<sup>rd</sup> edition, Surjeet Publication, New Delhi.
- Kansal, D.K.(1996). "Test and Measurement in Sports and Physical Education", DVS Publication, New Delhi.
- Singh, H. (1984). Sports Training: General Theory and Methods, NSNIS, Patiala.
- Clarke, H. Harrison and Clarke, David H.(1982). Prentice hall Inc. Englewoods Claffs, New Jersey, Sixth Edition.
- Clarke, H. Harrison.(1979). "Definition of Physical Fitness," Journal of Physical Education and Recreation,50 no.
- Singh, Hardayal.(1995). Science of Sports Training, DVS Publication New Delhi.
- Johnson, Lean and Londire, Ben (1972). "Motor Fitness Testing Manual for the Moderately Mentally Retarded". Reston.va: American Alliance for Health, Physical Education, Recreation and Dance.
- Lamb, David R (1983). Physiology of Exercise Responses and Adaptation. New York; Macmillan Company.

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