

## Evaluation of VO2 Max across Basketball, Football and Volleyball Players

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### Abstract

For the study, forty-five players from the Banaras Hindu University team competed in inter-university basketball, football, and volleyball tournaments. Each group contains fifteen subjects, including basketball (N=15), football (N=15), and volleyball (N=15).

Their age ranged from 20 to 25 years. To determine the significant difference in maximum oxygen consumption among basketball, football, and volleyball players, the analysis of variance F-ratio was used at the 0.05 level of significance. For further investigation, the post-hoc test (LSD test) was used.

Basketball and football players had no significant differences in terms of VO2 max. Volleyball players had a lower VO2 max than basketball and football players.

**Keywords-** VO2 Max, Basketball, Football & Volleyball.

### INTRODUCTION

**Larsen, et al (2001)** Determined Cardiovascular efficiency shows an individual's ability to perform and sustain submaximal physical tasks over a longer length of time. **Armstrong, N. (2019)** Identified that to assist scientists, physical educators, and coaches in measuring cardio-vascular efficiency, tests of physical work capacity and VO2 max have been created for use in laboratory and field settings.

**Myers et al, (2009)** Examined Some of these are only acceptable for contemporary, fully equipped exercise physiology laboratories and typically involve the use of a bicycle ergometer and a treadmill. These methods are known as direct ways of testing aerobic power because they entail collecting expired air while exercising on a treadmill or a bicycle ergometer. The collected gas is then examined, and the individual's VO2 max is estimated.

**Gamble, P. (2013)** Evaluated The degree to which cardio-vascular fitness contributes to a specific game or sport is determined by the type and range of motions involved. Sports training places a strong emphasis on the physical fitness components that are most important to the sport. **Yamamoto, L. M. et al (2008)** Shows Cardiovascular and muscular endurance is essential for long-distance running training, whereas sprinting emphasizes strength and speed development.

The same is true for training for sports such as football, basketball, volleyball, and swimming. Physical fitness is a complex concept that combines muscular strength, muscular endurance, and cardio-respiratory endurance, the latter being the most significant.

**METHODOLOGY**

Forty-five players were recruited from Banaras Hindu University teams to compete in inter-university basketball, football, and volleyball. Each group contained fifteen subjects, including basketball (N=15), football (N=15), and volleyball (N=15). Their age ranged from 20 to 25 years. Total Body Weight and VO2 max were chosen as the criteria metrics. The total body weight was measured using a weighing machine and reported in kilograms.

The VO2 max was assessed using a step bench test, and the heart rate was recorded. VO2 max was calculated using Astrand and Astrand Nomogram and recorded in litres **Sindhu, S. (2021)**. To determine the significant difference in maximum oxygen consumption among basketball, football, and volleyball players, the analysis of variance F-ratio was used at the 0.05 level of significance. For further investigation, the post hoc test (LSD) is used.

**FINDINGS**

The following table presents the findings on VO2 max of basketball, football, and volleyball players who were submitted to analysis of variance and mean difference methods.

**Table-1**  
**Comparison of VO2 max among basketball football and volleyball players**

Source of Variance	df	SS	MSS	F-ratio
Between group	2	569.96	284.98	11.03*
Within group	42	1085.54	25.85	

\* Significant of 0.05 level

Tab. F = df 0.05 (2,42) = 2.40

The data in Table-1 show a significant difference in VO2 max for basketball, football, and volleyball players. As the F-ratio was found to be significant, the data was further investigated using a post hoc test. The results are shown in Table 2.

**Table-2**  
**Paired mean difference of VO2 max basketball football and volleyball players**

Mean			Mean Difference	CD at 5% level
Basketball	Football	Volleyball		
65.60	63.19		3.41	3.73
65.60		57.14	8.44*	3.73
	63.19	57.14	6.05*	3.73

\* Significant at 0.05 level

Table 2 shows that Basketball players (65.60) were judged to be negligible when compared to Football players (63.19), as the observed mean difference (3.41) was smaller than the CD value of 3.73.

The above data also shows that basketball players (65.60) were significantly different from volleyball players (57.14), as the observed mean difference (8.44) was greater than the CD value (3.73).

The above data also shows that football players (63.19) were significantly different from volleyball players (57.14), as the observed mean difference (6.05) was greater than the CD value (3.73).

## DISCUSSION OF FINDINGS

Table-2 data reveal that there is no difference in VO<sub>2</sub> max between basketball and football players. This could be because the subject's load in their separate daily regular training regimen has remained constant due to the nature of their game **Smith, H. K. (2020)**. Both games required a great level of endurance.

Table-2 shows that volleyball players had a lower VO<sub>2</sub> max than basketball and football players **Serin et al. (2021)**. The reason could be that they participated in such training, which focuses on strength endurance and explosive strength. Volleyball is predominantly an anaerobic activity, hence VO<sub>2</sub> max is not a crucial trait. Furthermore, the length of movement is extremely short.

## CONCLUSIONS

The study's findings may lead to the following conclusions:

- 1) There is no discernible difference in VO<sub>2</sub> max between basketball and football players.
- 2). Basketball players had the greatest VO<sub>2</sub> max when compared to football and volleyball players.
- 3). Volleyball players exhibited considerably lower VO<sub>2</sub> max compared to basketball and volleyball players.

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