

**COMPARATIVE STUDY OF AEROBIC AND ANAEROBIC CAPACITY  
BETWEEN BASKETBALL AND HANDBALL PLAYERS**

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**ABSTRACT**

*The purpose of the study was to compare the aerobic and anaerobic capacity between Basketball and Handball players. 15 male Basketball players and 15 male Handball players of C.S.J.M. University, Kanpur, were selected as the subject for the study. Age was ranging from 20-25 years. To determine the aerobic capacity, 12 minutes Run- walk test was conducted and recorded the distance covered in meters. To determine the anaerobic capacity Sargent jump- Lewis Nomo gram was employed and anaerobic power was expressed in Kg.-m /sec. To compare the aerobic and anaerobic capacity between Basketball and Handball players 't' test was used at 0.05 level of significance. It was concluded that no significant difference exists between the mean of Basketball and Handball players in relation to Anaerobic and Aerobic capacity.*

**INTRODUCTION**

The profession in the field of sports and physical education have changed dramatically in the yester years till today. Sports and different fitness programmes have been broadened from various angles throughout the human habitats along with the dynamic change of life. Organisms carry different capacity level; depend on their anatomical, anthropometrical, physiological and different training loads and systems. Physical capacity has been synonymously used with organic capacity and motor capacity. Like motor capacity, the physical capacity is also out of vogue. This is a more of general term referring to one's capacity to perform physical activities and has

no specific identity or scientific and uniform definition. Sports are a privileged of expression of democratic way of life, to others, popular object of demonstration for totalitarian government systems. Many seen in it a way of understanding among peoples. Some regard it as a means of recreation and health improvement, others condemn it as a kind of hard forced labour and as a destroyer of health. Some find that the only pleasure to be derived from sports resides in self activated harmonious rhythmic movement and others are those for who the victor, the top performance and the record are the only things that count. Sports are physical activities of a recreational character where the individual effort of the participant determines the result. Sports is now universally accepted or a place in physical activities in which men and women 'disport' themselves either in relaxation or competition. Competing with one self with is own previous records on competing with others, individually are in groups, is most often the essential feature of sports. With increasing popularity of sports the levels of participation in any sport have themselves crystallized in to distinct categories such as, recreational sports, competitive sports and high competition sports. The objectives of recreational sports are health and recreation. High competition sports call for supreme human effort that body is capable of or rained to perform. In such sports the heart beat is raised to the level of 180 strokes per minute. The opportunity for business to profit from sports, application of science and technology and the growing consciousness among nations have intensified the spirit of sports competition. The time when sports were nothing more than an enjoyable competition in the sense of recreation for individuals is irrevocably past. The phenomenon of sports today has assumed an important field of human endeavor. Sports have thus experienced an enormous extension for qualitatively, as well as, quantitatively with many positive but also negative aspects. Achieving success and bringing laurels for their respective countries in the International competitions have become the motivation as well as anxiety of top class sportsmen. Sports championships and competitive sports can note the expression of supreme psycho-physical efforts. Top sportsman works to the highest limit to endurance of human constitution an any slightest. Top level sports refers to the stereotype competitive activities in which most of the participants follow almost some type of techniques and tactics, but still it results in winning and losing. Then the question arise as to what factor may be the level of physical capacity to mobilize energy resource at a critical phase of sports performance or in extended time to beat an opponent or a previous record. Aerobic

capacity is the ability to mobilize energy for continuous performance of specific movement for prolonged time i.e. capacity for prolonged physiological functioning under continuous supply of required oxygen under conditions of required oxygen completely available the glucose molecule is completely broken down to CO<sub>2</sub> and H<sub>2</sub>O, and energy is made available as needed. Anaerobic capacity is the ability to mobilize energy during activities of intense nature i.e. executing intensive work with explosive action in short duration of time, such as kicking the football faster and for explosive take- off in jumps, maximum rate for about two to three minutes under water swimming etc. Caur et al. (1970) conducted this study was to compare the maximum anaerobic and maximum aerobic muscular power of young football player with corresponding non-athletic subjects. He found that the average maximum anaerobic muscular power in football players was significantly higher than non players on the contrary the maximal aerobic power does not differ significantly between two groups. Sheer (1975) studied a group of thirty untrained college males aged 10 to 20 years, who volunteered for test on 100, 200, 400 and 800 yards run, as well as on 1, 2 and 3 miles run. This study was conducted to predict maximal aerobic power and anaerobic work capacity various running performance and no practice session were give for the track running. In addition the subjects were tested for maximum aerobic capacity (max O<sub>2</sub>) intake on a treadmill and anaerobic work capacity (as measured by method of margaria). It was conducted that distance beyond half mill are significantly related to the aerobic work capacity and distance up to including quarter mile and significantly related to anaerobic work capacity.

### **METHODOLOGY**

The purpose of the study was to compare of the Aerobic and Anaerobic Capacity between Basketball and Handball Players. Their age ranged from 20-25 years. To achieve these purpose 15 male Basketball players and 15 male Handball players of C.S.J.M. University, Kanpur, was selected as the subject for this study. Their minimum status of participation was inter-collegiate level. To determine the aerobic capacity, 12 minutes Run- walk test was conducted and recorded the distance covered in meters. To determine the anaerobic capacity Sargent jump- Lewis Nomo gram was employed and anaerobic power was expressed in Kg.-m /sec. To compare Aerobic and Anaerobic capacity between Basketball and Handball players the 't' test was used at 0.05 level of significance.

he findings pertaining Basketball group and Handball groups mean and standard deviations were computed and data pertaining to that have been presented in table -1.

**Table-1**

**Mean and Standard Deviation of anaerobic capacity and Aerobic capacity Between Basketball and Handball group of C.S.J.M. University, Kanpur**

<b>Variables</b>	<b>Groups</b>	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>Anaerobic capacity</b> <b>Kgm/sec</b>	Basketball	15	93.93	17.18
	Handball	15	100.20	14.65
<b>Aerobic capacity</b> <b>ml/kg/min</b>	Basketball	15	41.50	9.11
	Handball	15	41.66	7.99

Fourth and Fifth column of table -1 reveals the mean and standard deviation of **Anaerobic capacity** Basketball (93.93 ±17.18), Handball (100.20±14.65) **Aerobic capacity ml/kg/min** (Basketball 41.50 ±9.11, Handball 41.66 ±7.99) respectively.

To observe the difference between Basketball and Handball group the ‘t’ test was adopted and data pertaining to these have been presented in Table – 2 and 3.

**TABLE -2**

**Significant Difference of Mean on anaerobic capacity between University Basketball and Handball Players**

<b>Variable</b>	<b>Group Mean</b>		<b>Mean Diff.</b>	<b>σ Dm</b>	<b>‘t’</b>
	<b>Basketball Players</b>	<b>Handball Players</b>			
<b>Anaerobic</b>	93.93	100.20	6.27	5.83	-1.075

<b>Capacity</b>					
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\*Significant at .05 level of confidence

$t_{.05} (28) = 2.048$

Since calculated “t” is less than tabulated “t” at 0.05 level of significance, we may accept Ho. Thus it may concluded that anaerobic capacity of both, Basketball and Handball players are same.

**TABLE -4**  
**Significant Difference of Mean on Aerobic capacity between University**  
**Basketball and Handball Players**

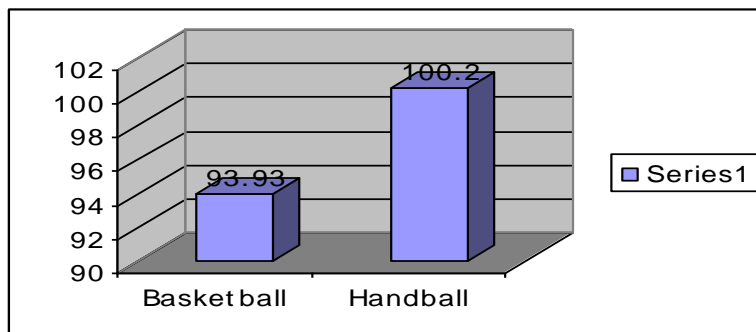
Variable	Group Mean		Mean Diff.	$\sigma$ Dm	‘t’
	Basketball	Handball			
<b>Aerobic Capacity</b>	41.50	41.66	0.16	3.13	-.050

\*Significant at .05 level of confidence

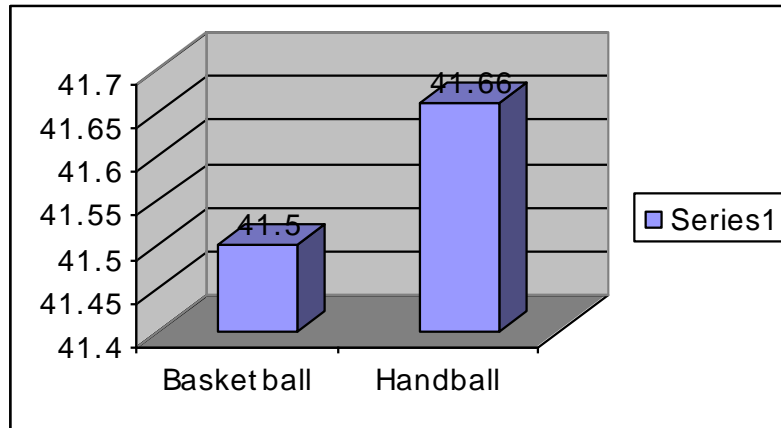
$t_{.05} (28) = 2.048$

Since calculated “t” is less than tabulated “t” at 0.05 level of significance, we may accept Ho. Thus it may concluded that Aerobic capacity of both, Basketball and Handball players are same.

*Figure-1: Graphical representation of anaerobic capacity between Basketball and Handball players*



*Figure-2: Graphical representation of Aerobic capacity between Basketball and Handball players*



### **DISCUSSION OF FINDINGS**

No significant difference exists between the Basketball and Handball players in relation to Anaerobic and Aerobic capacity. This insignificant difference can be attributed to the fact that nature of the game (Basketball and Handball) demands more or less equal amount of effort. The pace of the game is more or less similar. Thus, there was no significant difference in relation to Anaerobic and Aerobic capacity between Basketball and Handball players. Moreover, the Basketball and Handball players both were from the same institution and followed the same routine. Thus they must have got adapted to the same nature of training provided in the institution. As a result there were no significant differences in relation to Aerobic and Anaerobic capacity.

### **CONCLUSIONS**

In the light of the findings, it was concluded that no significant difference exists between the mean of Basketball and Handball players in relation to Anaerobic and Aerobic capacity.

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