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## Comparative study of selected motor abilities and body mass index of basketball and handball players

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### Abstract

Purpose of the study was to evaluate and compare the selected motor fitness components and BMI in Male Basketball and hand ball Players of belonging Amravati district (M.S). Players involved in Physical fitness were selected to Test as subjects for this study. The researcher divided the entire 40 sample into two groups. Basketball (N=20), Hand ball (N=20) groups, which were compared with each other. All the subjects were tested on Explosive Power, flexibility, Agility. In order to find out the significance of differences between male Basketball and handball players independent T-test were computed in the form of t-ratio. The results of the study revealed differences between analysis of data where Hand ball Players were having better mean values in Explosive Power, flexibility than Basketball players whereas in agility and BMI results shows insignificant difference. With the result it could be concluded that at inter-university level Hand ball Players of Amravati district are better in performance than the Basketball male players.

**Keywords:** Basketball, handball, motor components, male players

### Introduction

The physical components of athletes largely determine their performance at all levels. Physical characteristics in turn are determined by genetics, nutritional status and training of the sportspersons. Body composition is a factor that can influence athletic performance and has a bearing upon bio-motor abilities like endurance, strength, speed, agility and flexibility. Body composition is an important component which can improve maximal work capacity by affecting training-based alterations and some physiological parameters (Venkata *et al.* 2004) [17]. Uppal and Chib (2001) [15] in their study while working with volleyball players concluded that explosive strength of the legs and agility were important motor components for predicting performance in the game. To be successful in team games such as volleyball, handball, hockey and basketball, players need to develop strength, endurance, speed, agility, and neuro-muscular skills which can be enhanced by improving body composition variables through a proper conditioning programme. Uppal and Sharma (2002) [16] in their study found out that leg power and agility are the two important motor fitness components for predicting Badminton performance. Investigations undertaken by Shaker (1981), Ellena (1960), Dahl (1973), Atkinson (1977), Lamba (1980) [9], Mishra (1983) [12] and Amusa and Onyewadume (1987) in sports other than cricket have concluded that physical / motor fitness components play an important role in different games and sports and they have a direct relevance to performance. The findings of various other studies have shown that certain anthropometric and body composition characteristics are advantageous to the team game players, including greater height, greater mass (Kovaleski *et al.* 1980) [8], and greater upper body strength (Fry *et al.*, 1991) [6] and lower body fat percent (Fleck *et al.*, 1985) [7]. The female volleyball and basketball players, having large FFM have shown excellent aerobic and anaerobic work capacities (Tsunawake *et al.* 2003) [14]. Manchado *et al.* (2013) [10] reviewed performance factors in women's handball team- physical and physiological aspects and concluded that players that had a higher skill level were taller and had higher fat-free mass; players who were more aerobically resistant were at an advantage in international level women team handball. Regular monitoring of body composition and physical fitness variables are therefore, essential to assess any fluctuations in diet and training schedules.

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Proper evaluation of these parameters gives an insight into their present status and any deficit or alterations can be rectified for better health and performances. Research on body composition and physical fitness parameters of Indian female team game players is limited. Thus, this study was carried out on Indian female university level, team game players to assess the body composition components and their selected physical fitness parameters.

### Review of Related Literature

Singh and Rajan (2015) [4] investigated a comparative Study on Selected Physical and Physiological Fitness Components of Volleyball and Football Players. The main purpose and objective of the present study was to compare the Volleyball and Football players on the selected physical and mental abilities. For purpose of the study fifteen players from the game of volleyball and fifteen from the football has been selected from Allahabad university, who has participated in inter University Competition. All the subjects were regularly practicing and competing in their respective sports competition. The study was confined to physical component Height, Body weight, BMI and Physiological fitness components Speed, Explosive Strength, Cardiovascular endurance. The necessary data was collected with standardized procedure by administering selected tests as suggested by Hardy Singh and W. Cooper. The data were collected and analyzed using the descriptive statistics and t test. The level of significance was set at .05 level. When a two tailed equal group statistical significance mean comparison then t test was employed on both the set of data Volleyball and Football players on selected variables, the result found evident significantly in majority of the variables.

Singh (2014) studied comparative Study of Physical Fitness and Psychological Variables of Softball and Cricket Players. Fitness is that state which characterizes the degree to which the person is able to function. Fitness is an individual matter. It implies the ability of each person to live most effectively with his potential. The study finds then depth perception between cricket players & softball players and difference of arms strength & agility between cricket & softball players. This study provides the guide lines to the coaches, physical education teachers, trainers, players and sports administrators to understand the role of physical fitness components in sports. It was observed that there was insignificant difference between Softball and Cricket players of school level at their respective schools for their Psychological Variable i.e. Depth Perception. There was insignificant difference between Softball and Cricket players of school level at their respective schools for their Physical Fitness Variable i.e. Arm Strength and insignificant differences were observed between Softball and Cricket players of school level at their respective schools for their Physical Fitness Variable i.e. Agility.

Manmeet (2010) [11], conducted "Comparative study of Physical Fitness Components of Rural and Urban Female Students of Punjabi University, Patiala", In the present study, an attempt has been made to compare components namely speed, strength, endurance, agility and flexibility between female students belonging to rural and urban setups. There was carried out on 100 female students, 50 rural and 50 urban of Punjabi University, Patiala. The data was collected by use of measurements of height and weight as well as by

application of tests like jumping, stepping, running, flexibility test, etc. The data was analyzed and compared with the help of statistical procedures in which arithmetic mean, standard deviation (S.D.), standard error of mean (SEN), t-test were employed. Rural female students were found to be superior in strength, endurance, speed and agility. Urban female students on the other hand, were found to be heavier and superior in tasks like flexibility.

### Statement of Problem

Every games and sports are very much unique in nature and according certain level of physical fitness components of the players develop for the utmost performance during competitions. Though both the games of Basketball and Handball looks very alike in nature yet they demand certain fitness components for optimum performance. Therefore the scholar interested to undertake the study stated as "Comparative Study of Flexibility, Agility, Explosive Strength and Body Mass Index of Basketball and Handball Players".

### Purpose of the Study

The Purpose of the study were as

- 1) To determine the difference in flexibility between the Basketball and Handball players.
- 2) To find out the difference in Agility between the Basketball and Handball players.
- 3) To determine the difference in variable of explosive strength between the Basketball and Handball players.
- 4) To compare the body mass index of Basketball and Handball Players.

### Significance of the Study

- 1) The findings of this study would be helpful to the coaches and trainers for the selection of Basketball and Handball Players.
- 2) The result of this study would also be helpful to the coaches or trainer to develop most suitable training program through which the desirable fitness components can be enhanced optimally so as to performance can be improved.

### Materials and Methods

The sources of data were collected from various colleges of Andaman. The level of players who were taken in the study limited to intercollegiate and interuniversity players. The researcher selected 20 male Basketball Players and 20 male Handball Players from Andaman colleges. The subjects were selected by purposive random sampling method. The selected motor fitness variables were chosen for the present study as Flexibility, Agility, Explosive Strength and Body Mass Index. In the administration of the test, various tests were used to measure the variables like Shoulder and Wrist Elevation Test to measure individual's shoulder and wrist flexibility, 4x10 Yard Shuttle Run test to measure agility of the players, Vertical Jump to measure the power of legs and Body Mass Index to measure the height and weight of the players. Mean, standard deviation and comparative statistical technique of independent t-test separately for each selected variable to determine the difference between the groups of Basketball and Handball players. Level of significance was set at 0.05.

## Findings

**Table 1:** Description of mean, standard deviation and mnmnbt-ratio for the data on wrist and shoulder flexibility of basketball and handball players.

Players	Mean	SD	Mean Difference	Standard Error	t-ratio
Basketball	21.700	2.003	1.850	0.797	2.322*
Handball	23.550	2.946			

\* Significant at 0.05 level  
Tab t 0.05(38) = 2.0252

An analysis of table-1 reveals that there is significant difference between the means of Basketball and Handball players in Wrist and Shoulder flexibility, as the calculated t-

ratio of 2.322 is greater than the tabulated t-value of 2.0252 needed to be significant at 0.05 level for the 38 degrees of freedom.

**Table 2:** Description of mean, standard deviation and tratio for the data on vertical jump of basketball and handball players

Players	Mean	SD	Mean Difference	Standard Error	t-ratio
Basketball	38.400	3.926	3.450	1.250	2.761*
Handball	41.850	3.977			

\* Significant at 0.05 level  
Tab t 0.05(38) = 2.0252

An analysis of table-2 show that there is significant difference between the means of Basketball and Handball players in Vertical Jump, as the calculated t-ratio of 2.761 is greater than

the tabulated t-value of 2.0252 needed to be significant at 0.05 level for the 38 degrees of freedom.

**Table 3:** Description of mean, standard deviation and t-ratio for the data on agility of basketball and handball players

Players	Mean	SD	Mean Difference	Standard Error	t-ratio
Basketball	10.999	0.429	0.112	0.186	0.605*
Handball	11.111	0.713			

\* Insignificant at 0.05 level  
Tab t 0.05(38) = 2.0252

An analysis of table-3 reveals that there is insignificant difference between the means of Basketball and Handball players in Agility, as the calculated t-ratio of 0.605 is less

than the tabulated t-value of 2.0252 needed to be significant at 0.05 level and 38 degree of freedom.

**Table 4:** Description of mean, standard deviation and t-ratio for the data on body mass index of basketball and handball players

Players	Mean	SD	Mean Difference	Standard Error	t-ratio
Basketball	23.774	2.099	0.286	0.604	0.473*
Handball	23.488	1.700			

\*Insignificant at 0.05 level  
Tab t 0.05(38) = 2.0252

An analysis of table-4 reveals that there is insignificant difference found between the means of Basketball and Handball players in Body Mass Index, as the calculated t-ratio of 0.473 is less than the tabulated t-value of 2.0252 needed to be significant at 0.05 level and 38 degree of freedom.

### Discussion on findings

The findings of statistical analysis revealed that

1. Significant difference found in Wrist and Shoulder Flexibility ( $t = 2.322$ ) of Basketball and Handball players, which are greater than the tabulated t-value of 2.0252 needed to be significant at 0.05 level and 38 degree of freedom. Wrist and Shoulder Flexibility found greater in Handball than Basketball players because in Handball game the throwing and passing of ball is faster and quick than Basketball.
2. Significant difference found in Vertical Jump ( $t = 2.761$ ) of Basketball and Handball players, which are greater than the tabulated t-value of 2.0252 needed to be significant at 0.05 level and 38 degree of freedom. In Basketball game to put the ball in the basket, player must jump vertically. So, the vertical jump practice of

Basketball players are more than the Handball players, hence the significant difference found.

3. Insignificant difference observed in Agility ( $t = 0.605$ ) of Basketball and Handball players, which are less than the tabulated t-value of 2.0252 needed to be significant at 0.05 level and 38 degree of freedom. In both the games the agility is required to move from one place to another or to pass the ball, hence there is no significant difference found.
4. Insignificant difference observed in Body Mass Index ( $t = 0.473$ ) of Basketball and Handball players, which are less than the tabulated t-value of 2.0252 needed to be significant at 0.05 level and 38 degree of freedom. In both the games the players fitness are approximately same hence the significant not found.

### Recommendations

On the basis of findings and conclusion the researcher made following recommendations.

1. The wrist and shoulder flexibility in handball players are greater than the basketball players.
2. The explosive leg strength in basketball players are

greater than the handball players.

3. Similar study may be conducted by using different levels of players.
4. Similar study may be undertaken by selecting different age, sex and sports activities other than those employed in this study.

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