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## Comparative analysis of selected physical fitness components among team game players

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### Abstract

The purpose of the present study was to compare the selected physical fitness components among team game players. The age range of the 40 male subjects for the current study was 18 to 25 years. 20 football and 20 handball players were chosen as subjects from the Murshidabad district in West Bengal, India. The variables chosen for this study were agility and speed. The information was gathered by administering the tests for agility (10x4 meter shuttle run) and speed (50-meter dash). Descriptive analysis and an independent t-test with a significance level of 0.05 were used to compare the means of the physical fitness components. According to the findings of this study, there were no significant differences found in speed and agility between football and handball players. Based on the results, it was determined that football and handball players have almost the same fitness capacity for speed and agility.

**Keywords:** Speed, agility, football, handball

### Introduction

"Sports for all" is a slogan that has gained popularity around the world in recent years. It has gained popularity all over the world due to the numerous characteristics that sports have changed including: being more scientific and mass-oriented, well-organized and primarily health-directed, elevating participants' mental and physical fitness, boosting participants' ability to concentrate mentally and bringing honour and social dignity to the successful participants<sup>[1]</sup>. The physical condition is one component or aspect that is crucial to achieving success in sports<sup>[2]</sup>. A normal person's level of physical fitness is just as important as a person who is taking part in a sporting event<sup>[3]</sup>. In general, getting fit involves eating right, exercising, and getting enough sleep; regular exercise prevents or limits increases in body mass index and weight (BMI)<sup>[4]</sup>. Strength, endurance, power, speed, agility, balance, flexibility, and stamina are common components of physical fitness, which play a significant role in enhancing performance in games and sports<sup>[5, 6]</sup>. The significance of physical fitness for athletic performance is so clear that coaches and athletes devote the majority of sports training to promoting physical fitness<sup>[7]</sup>. Sports training is intended to develop this type of news in a way that meets each sport's requirements<sup>[8]</sup>. Developing and maintaining fitness for long-term health and well-being, learning about physical activities, and improving motor skills are all part of physical education<sup>[9]</sup>. Numerous academic researchers in the fields of physical education and sports have demonstrated that regular exercise raises one's level of physical fitness and increases one's capacity to perform a variety of physical tasks in daily life. Physical fitness is made up of many different elements, including strength, endurance, agility, coordination, flexibility, etc.<sup>[10]</sup>. Speed, or the ability to move quickly, is one of the most important bio-motor skills needed in sports from a mechanical perspective; speed is defined as the ratio of space to time<sup>[11]</sup>. Agility abilities that require three stages of information processing- stimulus perception, response choice, and movement execution- are crucial to success in many sports<sup>[12]</sup>. The crucial motor skills needed in every game to enhance performances are speed and agility. The ability of the body to quickly change its direction from one place to another is another aspect of agility and sports refer to a muscle reaction as having a high rate of change in both contraction and relaxation as having speed<sup>[13, 14]</sup>.

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Sports and games require a wide range of skills, including physical, technical, tactical, psychological, etc. for optimal performance, to compete at the highest level on the national and international stage in sports like ball games [15]. The capacity of athletes to handle obstacles is crucial to their performance. Football is changing in a variety of ways, including the technical and physical demands as well as the scientific research that is supporting and offering many recommendations to practitioners on how to optimize player performance and, by extension, team performance [16]. Football and handball are the most globally popular sports in the world. Soccer is one of the most competitive and aggressive games, with 22 players competing for the ball (within match situations) [17]. With 11 players on each team, soccer is played on a grass field that is 100–110 meters long and 64–75 meters wide [18]. Modern football theory is built on the idea that soccer is a ball-dependent sport that demands speed, agility, and quickness [19, 20]. The governing body of handball at the international level is the international handball federation (IHF) and all of the national-level competitions are organized in India by the Handball Federation of India (HFI) administrative and controlling body [15]. Sports requiring a lot of anaerobic work include handball. In the game, actions like pushing and blocking demand a lot of strength and power from the limbs and trunk [21-23]. In handball, players who are heavier and stronger have an advantage because they can throw the ball more powerfully and quickly, which is a requirement of the game [21]. This study compared the speed and agility of two outdoor sports, football and handball. Both of these sports have been shown to require more speed and agility over a longer period. As a result, the current study

compares the speed and agility of team game players.

## Methodology

### Subjects

20 male football and 20 male handball players between the ages of 18 and 25 who participated in the district tournament make up the samples for the current study. Information was gathered at the Makenjee Park Stadium Ground in Raghunathganj, Murshidabad, West Bengal, India.

### Variables and Criterion Measures

Variables and Criterion Measures

Variables	Test items	Unit of measure
Agility	Shuttle run test	Seconds
Speed	50 mtr dash	Seconds

### Analysis of Data

To determine the significant differences in speed and agility between football and handball players, the collected data were analyzed using an independent t-test. At 0.05, the level of significance was set up.

### Findings and Discussions

In this section, the researchers summarized the participant characteristics and computed the variables' mean, standard deviation, and physical fitness components. The speed and agility of football and handball players will be compared in this study.

**Table 1:** The characteristics of the participants (Mean  $\pm$  SD)

Items	Football Players (n=20)	Handball Players (n=20)
Age (yr.)	19.1 $\pm$ 1.33	19 $\pm$ 1.03
Weight (kg)	52.95 $\pm$ 4.02	62.05 $\pm$ 9.78
Height (m)	1.65 $\pm$ 0.6	1.67 $\pm$ 0.07
BMI (kg/m <sup>2</sup> )	19.48 $\pm$ 1.63	22.22 $\pm$ 3.73

Table 1 shows the age of football and handball players were 19.1  $\pm$  1.33 and 19  $\pm$  1.03 years old, according to the data collected. Their weights were 52.95  $\pm$  4.02 kg, and 62.05  $\pm$

9.78 kg. Their heights were 1.65  $\pm$  0.6 m. and 1.67  $\pm$  0.07 m. respectively and their BMI were 19.48  $\pm$  1.63 and 22.22  $\pm$  3.73.

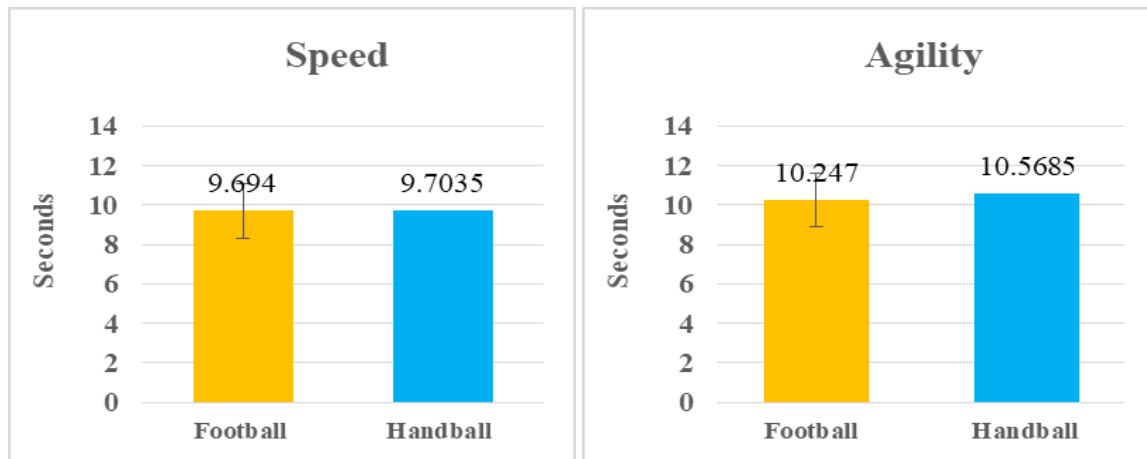
**Table 2:** Unpaired t-test of variables between football players and handball players

Variables	Football Players		Handball Players		Inferential: Unpaired Sample t-test		
	Mean	SD	Mean	SD	t	df	Sig. (2-tailed)
Speed	9.69	1.02	9.70	0.99	0.03	38	0.976
Agility	10.25	0.86	10.57	0.88	1.17	38	0.248

Significance level at 38 df at 0.05 level = 2.024

In speed ability, table 2 shows that the mean of football players is 9.69 and the mean of handball players is 9.70, where the mean of football players is slightly less than the mean of handball players. As a result, the mean difference is 0.01. Before using the t-test the standard deviations for football players and handball players are 1.02 and 0.99 respectively. The calculated value of 't' is 0.03, which is lower than the tabulated 't' of 2.024 at the 0.05 significance level. In

agility ability, table 2 also shows that the mean of football players is 10.25 and the mean of handball players is 10.57, where the mean of football players is less than the mean of handball players. As a result, the mean difference is 0.32. Before using the t-test the standard deviations for football players and handball players are 0.86 and 0.88 respectively. The calculated value of 't' is 1.17, which is lower than the tabulated 't' of 2.024 at the 0.05 significance level.



**Graph 1:** The mean difference in speed and agility between football and handball players

While there are many similarities between handball and football, there are also some differences. Hands are not used by football players at all; however, they are used in handball. According to our study, (i) the mean of speed ability shows footballer's speed ability is better when compared with handball players, and (ii) the mean of agility shows footballer's agility ability is better than handball players. We found some similar studies, according to <sup>[24]</sup> focused on a study of agility between football and handball players of Rabindranath Tagore university of Bhopal, and revealed that football players had better agile than handballers but no significant differences between the group. The agility between football and handball players of government degree college boys Baramulla and found that no significant differences between football and handball players but had more agility than handball players <sup>[25]</sup>. A study of agility between football and handball players of Mewar University of Chittorgarh Rajasthan and concluded that no significant differences between football and handball players <sup>[26]</sup>.

### Conclusions

Based on the data and within the parameters of the study, the following conclusions are made. There was no significant difference found in speed ability between football and handball players taken for the study but football players are having good speed ability than handball players. Also, no significant difference was found in agility between football and handball players but football players are having better agility than handball players.

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