



# DIFFERENCE IN SPEED AND ENDURANCE BETWEEN HANDBALL AND BASKETBALL FEMALE PLAYERS

**Prof. Dr. Chandrashekhar Kadu**

Director of Physical Education & Sports

Shankarlal Khandelwal Arts, Science & Commerce College, Akola

## Abstract

This study aimed to compare the physical fitness components of speed and endurance between basketball and handball players. A total of 100 athletes were recruited, comprising 50 basketball players and 50 handball players. The 50-meter sprint test was conducted to assess speed, while the 12-minute run and walk test measured endurance. Descriptive (mean, SE, and SD) and comparative (t-test) was computed to see the difference in fitness between the groups. Results indicated significant differences between the two groups in both speed and endurance. Handball players demonstrated superior speed, with a significantly lower time in the 50-meter sprint ( $6.11 \pm 0.05$  seconds) compared to basketball players ( $7.00 \pm 0.07$  seconds), as determined by an independent t-test ( $p < 0.05$ ). Similarly, handball players exhibited greater endurance, covering a significantly longer distance in the 12-minute run and walk test ( $2195.00 \pm 33.93$  meters) compared to basketball players ( $1980.00 \pm 40.81$  meters). These findings suggest that handball players possess both superior speed and endurance compared to their basketball counterparts. Such insights into the differing physical fitness profiles of athletes from different sports can inform training programs and selection strategies tailored to optimize performance in each discipline. Further research could delve into the specific training regimens contributing to these differences and explore their implications for athletic development and performance enhancement strategies.

**Key words:** speed, endurance, 50-meter sprint, 12-minute run and walk, handball, basketball

## Introduction

Athletic performance heavily relies on physical fitness, where speed and endurance are essential factors. Basketball and handball are team sports characterized by their dynamic nature and the need for advanced physical conditioning. However, due to their distinct characteristics, participants in both sports may exhibit diverse profiles of physical fitness (Luo et.al., 2022). The attribute of speed holds significant importance in sports such as basketball and handball, wherein swift transitions and abrupt alterations in direction are frequently encountered. Conversely, endurance plays a crucial role in sustaining performance levels during matches, particularly in sports such as basketball and handball, whereby sustained running and high-intensity exertions are inherent. It is imperative for coaches, trainers, and athletes to comprehend these distinctions in order to optimize training procedures and improve performance outcomes (Jaskaran Singh, 2019; Popowczaket.at.al., 2021). The objective of this study is to conduct a comparative analysis of the physical fitness attributes of speed and endurance in basketball and handball athletes, with a specific focus on their performance in standardized benchmark tests measuring speed and endurance. This understanding has the potential to enhance training programs that are customized to address the unique requirements of basketball and handball players, hence maximizing their athletic growth and performance during gameplay.

Physical fitness is a complex spectrum that spans from infancy to old age, influenced by engagement in physical activities. It encompasses a spectrum of activities that are considered optimal in all areas of life, as well as varying levels of physical fitness that might contribute to disease and dysfunction. Efficient and effective functioning encompasses the capacity to derive pleasure from leisure activities, maintain good health, withstand illness, and effectively manage emergency circumstances. Body composition, cardiovascular fitness, flexibility, muscular endurance, and strength are all key components of physical fitness that are associated with health. Proficiency-related elements encompass agility, equilibrium, coordination, strength, responsiveness, and velocity (Kohl and Cook, 2013).

The significance of each component differs across different sports. Physical fitness is not solely limited to a particular sport, but may also be influenced by one's position, encompassing both overall health and physical growth. The primary objective of any physical fitness program is to optimize an individual's health, strength, endurance, and skill in relation to their age, gender, body composition, and physiological characteristics. These objectives can only be achieved via diligent management of physical activity, rest, nutrition, and regular medical check-ups. Regular and rigorous exercise should be initiated gradually and progressively intensified. Common forms of physical activity encompass jogging, cycling, and the utilization of body-building apparatus. The regularity and restfulness of sleep phases hold greater significance than the duration of the sleep itself (Farley et.al., 2020).

### Methodology:

The present study examines the physical fitness of women as a fundamental aspect of team game participants, a topic of significant importance in the ever-evolving sports landscape. The study was designed using a simple random sampling technique. The study involved the collection of samples from a sample of 50 university basketball players and 50 university handball players at Nagpur University. The participants were selected from the age group of 18-21 years. University players had a physical fitness exam, namely assessing their speed (50m run) and endurance (Cooper exam - 12 minutes run/walk).

### Statistical treatment

The data pertaining to this study were obtained from task performed by the selected subjects. Obtained data was then analysed by using Descriptive (Mean  $\pm$ SE), SD, and inferential (independent t-test) statistics with the help of inbuilt statistical program namely SPSS - 18 (Statistical Package for Social Science – 18). The level of significance was set at 0.05.

### Results

**Table 1:** Showing the comparison of 50-meter sprint (speed) and 12-minute run and walk (endurance) between basketball and handball female players

Variable	Basketball		Handball		t-test	
	Mean $\pm$ SE	SD	Mean $\pm$ SE	SD	t -value	p- value
50-meter Sprint	7.00 $\pm$ 0.07	0.46	6.11 $\pm$ 0.05	0.34	2.61	$p < 0.05$
12-Min run and walk	1980.0 $\pm$ 40.81	288.56	2195.0 $\pm$ 33.93	239.95	4.01	$p < 0.05$

### 50-meter sprint

Table 1 depict summary of physical fitness component namely speed and endurance between basketball and handball players. The 50-meter sprint (speed) showed that handball players significantly ( $p < 0.05$ ) demonstrated lower time (6.11  $\pm$  0.05 second) as compare to that of basketball players (7.00  $\pm$  0.07 second). The inferential analysis (independent t –test) revealed statistically ( $p < 0.05$ ) group differences in the sprint between the studied groups.

### 12-minute run and walk

Table 1 depict summary of physical fitness component namely speed and endurance between basketball and handball players. The results of 12-minute run and walk (endurance) indicated inter individual difference within the groups. The 12-minute run and walk (endurance) showed that handball players revealed significantly ( $p < 0.05$ ) higher distance (2195.00  $\pm$  33.93 meter) as compare to that of basketball players (1980.00  $\pm$  40.81 minute). The inferential analysis (independent t –test) revealed statistically ( $p < 0.05$ ) group differences in the

endurance between the studied groups. The handball group showed better performance in 12-minute and walk test.

### Conclusion:

The present study has conducted a scientific investigation into the diverse aspects that impact the power dynamics, with a particular focus on the physical fitness characteristics of women that are relevant to speed and endurance. An individual who has undergone training has a higher level of physical fitness compared to an individual who leads a sedentary and inactive lifestyle. In instances where two individuals, one who has received training and the other who lacks training or possesses a similar physique, engage in an equivalent level of moderate muscular exertion, empirical data suggests that the trained individual exhibits reduced oxygen consumption, lower pulse rate, increased stroke volume, impaired heartbeat, lower blood pressure, elevated red and white blood cell counts, slower respiratory rate, decreased lactic acid production, and a more rapid restoration of blood pressure and heart rate to their baseline levels (Crismas et.al., 2019).

The cardiac muscle exhibits enhanced efficiency, resulting in increased blood circulation with reduced frequency of contractions. Moreover, in physically demanding tasks that cannot be sustained for an extended duration, persons who have received training exhibit enhanced stamina, an increased ability to consume oxygen, and a quicker restoration of heart rate and blood pressure to their usual levels. Training enhances the efficiency of the organism. Due to enhanced cardiac efficiency, there is an increased blood flow to the muscles, leading to a greater supply of fuel and oxygen. Consequently, a greater amount of work is accomplished at a reduced cost. This, in turn, leads to improvements in strength, power, neuromuscular coordination, and endurance. Additionally, coordination and timing of movements are enhanced, resulting in an improved state of physical fitness. Physical fitness is a complex spectrum that spans from infancy to old age, influenced by engagement in physical activities. It encompasses a spectrum of activities that are considered optimal in all areas of life, as well as varying levels of physical fitness that might contribute to disease and dysfunction (Nystoriak and Bhatnagar, 2018).

Therefore, it may be inferred that physical fitness significantly influences the performance of athletes. Engaging in physical activity can counteract certain forms of exhaustion. However, prolonged exercise can have negative effects on young individuals. If they are physically fit, their endurance is high, and the exercise promotes excellent health.

### References: -

1. between handball and basketball male players. *International Journal of Yogic, Human Movement and Sports Sciences* 2019; 4(1): 1173-1175
2. Christmas BCR, Majed L, Kneffel Z. Physical fitness and physical self-concept of male and female young adults in Qatar. *PLoS One*. 2019 Oct 10;14(10):e0223359.
3. Committee on Physical Activity and Physical Education in the School Environment; Food and Nutrition Board; Institute of Medicine; Kohl HW III, Cook HD, editors. *Educating the Student Body: Taking Physical Activity and Physical Education to School*. Washington (DC): National Academies Press (US); 2013 Oct 30. 3, Physical Activity and Physical Education: Relationship to Growth, Development, and Health. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK201497/>
4. Farley JB, Stein J, Keogh JWL, Woods CT, Milne N. The Relationship Between Physical Fitness Qualities and Sport-Specific Technical Skills in Female, Team-Based Ball Players: A Systematic Review. *Sports Med Open*. 2020 Apr 15;6(1):18.
5. Jaskaran Singh (2019) A comparative study of speed and endurance level
6. Luo S, Soh KG, Soh KL, Sun H, Nasiruddin NJM, Du C, Zhai X. Effect of Core Training on Skill Performance Among Athletes: A Systematic Review. *Front Physiol*. 2022 Jun 6;13:915259.
7. Nystoriak MA, Bhatnagar A. Cardiovascular Effects and Benefits of Exercise. *Front Cardiovasc Med*. 2018 Sep 28;5:135.
8. Popowczak M, Cichy I, Rokita A, Domaradzki J. The Relationship Between Reactive Agility and Change of Direction Speed in Professional Female Basketball and Handball Players. *Front Psychol*. 2021 Sep 30;12:708771.