Integrated Journal for Research in Arts and Humanities
ISSN (Online): 2583-1712
Volume-4 Issue-5 || September 2024 || PP. 130-135 https://doi.org/10.55544/ijrah.4.5.20

Comparative Study of Speed and Agility Across Different Playing Positions

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www.ijrah.com || Vol. 4 No. 5 (2024): September Issue

Date of Submission: 03-09-2024	**Date of Acceptance:** 16-09-2024	**Date of Publication:** 30-09-2024

ABSTRACT

The purpose of the present study is to find out the correlation between Physical variables and different playing positions in football. The objective of this study is to examine and compare the speed and agility of district-level football players across different playing positions: defenders, midfielders, and forwards. Speed and agility are critical physical attributes that contribute significantly to a football player's performance, and understanding their variation across positions can provide valuable insights into position-specific training and talent identification. A sample of 90 players from Bhopal district-level teams was selected for the study, and their speed and agility were assessed through standardized tests such as the 50-meter sprint test for speed and the Shuttle Run Agility Test for agility.

The results reveal significant differences in both speed and agility between playing positions. Forwards demonstrated the highest average speed, which is essential for offensive runs and goal-scoring opportunities, while midfielders exhibited superior agility, reflecting their need to navigate tight spaces and switch directions frequently during the game. Defenders displayed moderate levels of both attributes, balancing the need for speed in counterattacks and agility in defensive maneuvers.

The findings suggest that position-specific physical training could enhance the performance of football players, and coaches should consider these differences when developing conditioning programs. This comparative analysis highlights the importance of tailoring speed and agility training to the specific positional requirements, which could lead to better overall team performance.

Keywords- Speed, Agility, Defenders, mid-field & forward Football players, etc.

I. INTRODUCTION

Games and sports have been integral components of human culture and society for centuries, playing a significant role in the physical, mental, and social development of individuals and communities. From ancient civilizations that used games as a means of religious expression and social bonding to the modern era where sports are a global phenomenon, these activities have evolved to reflect societal values, technological advancements, and the human spirit's quest for excellence and enjoyment. This introduction explores the broad spectrum of games and sports, with a particular emphasis on football, a sport that has captured the hearts of millions around the world.

Physical variables play a critical role in determining the athletic performance of individuals across various sports disciplines. These variables, which include speed, strength, endurance, agility, flexibility, and power, are essential components of physical fitness that athletes must develop to excel in their respective sports. The study of these physical variables has become

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a core aspect of sports science, helping coaches and athletes optimize training programs, improve performance, and reduce injury risks. By understanding the influence of physical variables on sports performance, sports scientists can tailor training regimens to the specific demands of different sports and playing positions.

Speed is one of the most important physical attributes in many sports, directly influencing performance in activities that require quick movement and reaction times. Speed is defined as the ability to move the body or its parts as rapidly as possible, and it is particularly important in sprinting, football, basketball, and tennis (Miller, 2019). Speed is often measured in short-distance sprints, such as the 50-meter or 100-meter dash, and is crucial for athletes competing in track and field events, as well as sports requiring rapid direction changes, like soccer or hockey.

Agility, the ability to change direction quickly and efficiently, is a critical physical variable in many sports, especially those that involve sudden stops and starts, such as basketball, soccer, and tennis. Agility combines speed, strength, and coordination to allow athletes to navigate the playing field or court more effectively (Roberts & White, 2021). Training for agility often involves drills that mimic the quick direction changes required in sports, such as cone drills, ladder drills, and shuttle runs.

Agility is particularly important in sports where reaction time and quick changes in direction can determine the outcome of a play. For example, a soccer player must be able to quickly change direction to evade a defender, while a basketball player needs agility to outmaneuver opponents and drive to the basket (Simpson, 2020). Agility training not only improves an athlete's ability to change direction but also enhances balance and coordination, which are essential for maintaining control during fast-paced movements.

1.1 Objectives of the Study

The research objectives of this study are as follows:

1. To examine the relationship between speed & Agility and the playing performance of district-level football players.
2. To assess the relationship between selected physical variables and the playing performance of district-level football players.
3. To investigate the differences in physical variables among football players excelling as defenders, midfielders, and forwards.

II. METHODOLOGY

2.1 Selection of the subjects

For the study 90 subjects of district football players were selected based on purposive sampling technique for the present study, and the age level of the players was 18 to 25 years old.

2.2 Variables

1. -Speed
2. Agility

2.3 Criterion measures

1- Speed was measured by a 50m dace test.
2- Agility was measured by the Shuttle run test.

III. STATISTICAL ANALYSIS

The results of the study based on the data analysis conducted in the experimental research. The study aimed to analyse the selected physical and performance variables among football players across different playing positions. For testing the hypothesis the level of significance was set at 0.05 levels.

3.1 Findings

Table 1.1: Descriptive Statistics of physical variables of Mid-Field football players

S. No.	N	Physical variable	Min.	Max.	Mean	Standard deviation
1	30	Speed	6.4000	9.0000	7.206667	0.7515195
2	30	Agility	9.5000	12.7000	10.720	0.8125736

As depicted in Table 1.1 and Figure 1.1, the descriptive statistics of physical variables for midfield football players are presented.

The data reveals the following descriptive scores for the physical variables of midfield football players:

- **Speed**: Mean = 7.20, S.D. = 0.75
- **Agility**: Mean = 10.72, S.D. = 0.812

These values provide insight into the physical capabilities of midfield football players in terms of speed and agility.

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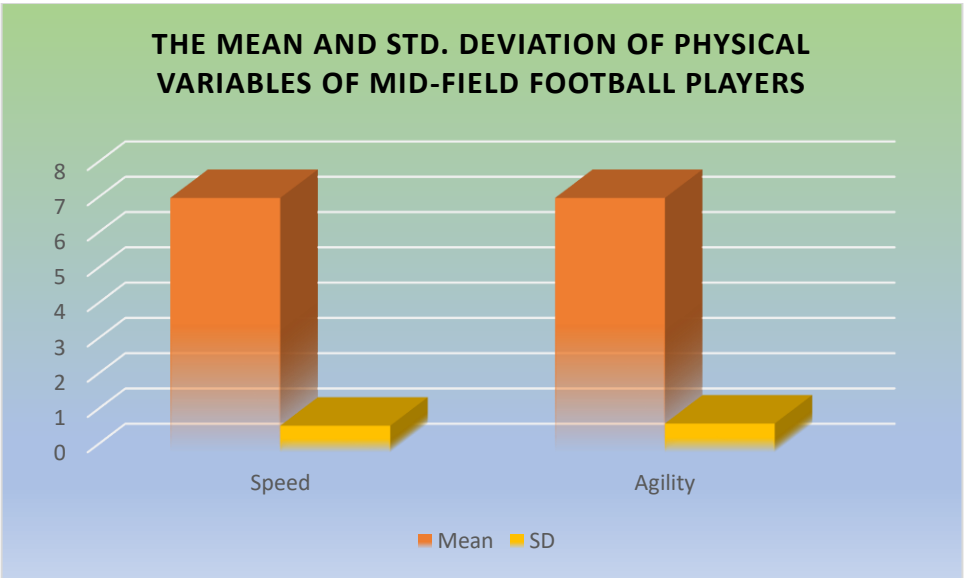

Figure 1.1: The Mean and Std. deviation of physical variables of Mid-Field football players

Table 1.2: Descriptive statistics of Physical Variables of Defender Football Players

S. No.	N	Physical variable	Min.	Max.	Mean	Standard deviation
1	30	Speed	7.1000	9.0000	7.47	0.41659
2	30	Agility	9.1000	12.6000	10.83	0.7676440

As depicted in Table 1.2 and Figure 1.2, the descriptive statistics for the physical variables of defender football players are presented.

The data reveals the following descriptive scores for the physical variables of defender football players:

- **Speed**: Mean = 7.47, S.D. = 0.41
- **Agility**: Mean = 10.83, S.D. = 0.767

These statistics provide insight into the defenders' physical attributes, highlighting their speed and agility.

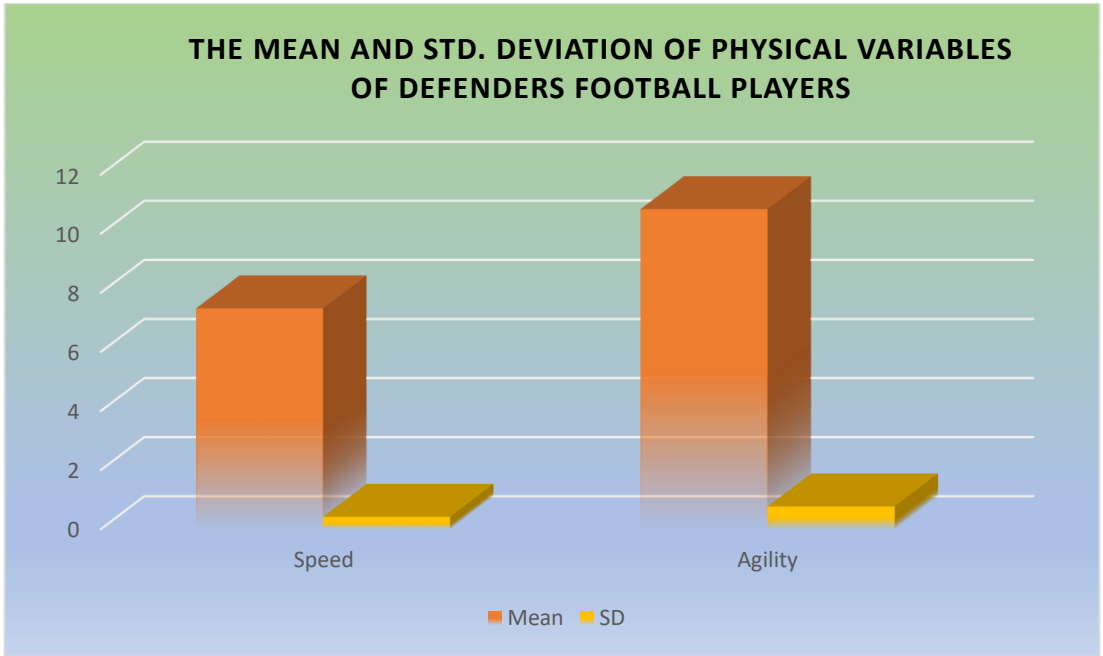

Figure 1.2: The Mean and Std. deviation of physical variables of defender football players

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Table 1.3: Descriptive Statistics of Physical Variables of Forward Football Players

S. No.	N	Physical variable	Min.	Max.	Mean	Standard deviation
1	30	Speed	6.5000	9.5000	8.065714	0.7206790
4	30	Agility	9.5000	12.3000	10.63714 3	0.6575738

As depicted in Table 1.3 and Figure 1.3, the descriptive statistics for the physical variables of forward football players are presented.

The data reveals the following descriptive scores for the physical variables of forward football players:

- **Speed**: Mean = 8.06, S.D. = 0.72
- **Agility**: Mean = 10.63, S.D. = 0.657

These statistics provide an overview of the physical characteristics of forward football players, emphasizing their speed and agility.

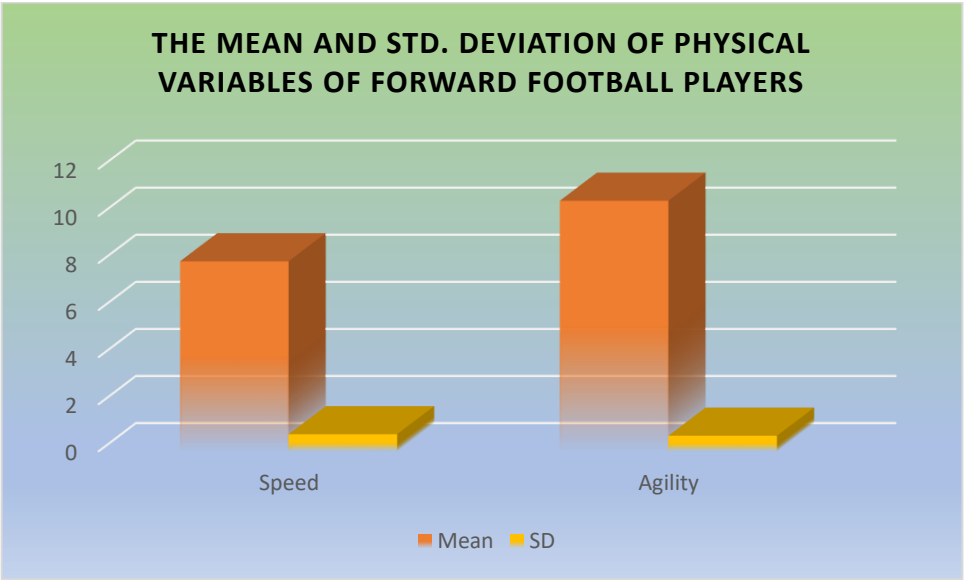

Figure 1.3: The Mean and Std. deviation of physical variables of forward football players

Table 1.4: Statistics for correlations of physical variables and playing ability of Mid-Field football players

S. No.	Physical variables	Statistical Analysis	Playing Ability
1	Speed	Pearson correlation	0.047
		Sig. (2-tailed)	0.804
		N	30
2	30	Pearson correlation	0.020
		Sig. (2-tailed)	0.916
		N	30

The analysis of the correlation between the physical variables and the playing ability of midfield football players, as shown in Table 1.4, indicates several significant findings.

Thus, it was concluded that there is an **insignificant correlation** between these variables—However, there was no significant correlation observed in variables such as speed and agility as the obtained 'r' values were lower than the required tabulated 'r' at the 0.05 confidence level.

Table 1.5: Statistics for correlations of physical variables and playing ability of defender football players

S. No.	Physical variables	Statistical Analysis	Playing Ability
1	**Speed**	Pearson Correlation	0.038
		Sig. (2-tailed)	0.828

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		N	30
4	**Agility**	Pearson Correlation	0.044
		Sig. (2-tailed)	0.804
		N	30

The analysis of the correlation between physical variables and the playing ability of defender football players, as shown in Table 1.5, presents several noteworthy insights.

Conversely, no significant correlation was found with physical variables, such as **speed** and **agility** as their obtained 'r' values were lower than the threshold required for statistical significance at the 0.05 confidence level. This implies that these specific variables may not contribute as significantly to the playing ability of defenders as the others

Table 1.6: Statistics for correlations of physical variables and playing ability of forward football players

S. No.	Physical variables	Statistical Analysis	Playing Ability
1	**Speed**	Pearson Correlation	0.467**
		Sig. (2-tailed)	0.005
		N	30
4	**Agility**	Pearson Correlation	0.410*
		Sig. (2-tailed)	0.014
		N	30

The analysis of the correlation between physical variables and the playing ability of forward football players, as depicted in Table 1.6, provides several key findings.

The **Pearson Coefficient of Correlation** values for:

- **Speed** (r = 0.467),
- **Agility** (r = 0.410), and

were all greater than the tabulated "r" value at the 0.05 confidence level.

This indicates a **significant positive correlation** between these variables—speed and agilityand the playing ability of forward football players. These findings highlight that forwards who exhibit greater speed, strength, agility, and leg power tend to perform better on the field.

IV. DISCUSSION/CONCLUSION

The study concluded that in Physical Variables and Playing Ability of Midfielders, no significant correlations were found for speed, shoulder strength, or agility, as the obtained 'r' values were lower than the tabulated value at the 0.05 confidence level.

In Physical Variables and Playing Ability of Defenders, speed, and agility did not significantly correlate with playing ability.

However Physical Variables and Playing Ability of Forwards, the analysis for forwards revealed significant correlations between playing ability and speed (r = 0.467) and agility (r = 0.410.

Football, being a highly competitive sport, requires the development of physical, physiological, and psychological attributes, along with great stamina and mastery of the game's skills. To achieve excellence in football, several key components play a prominent role in determining physical performance. This study aims to provide evidence supporting the belief held by coaches, athletes, and sports professionals that physical fitness is essential for success in football performance.

The collected data has been thoroughly analyzed using statistical techniques such as mean and standard deviation to create prediction equations for assessing players' game performance. The researcher also identified significant differences in the selected variables among the players.

RECOMMENDATIONS

Based on the findings and conclusions of this study, several recommendations are made to improve the development and performance of district-level football players:

1. Greater emphasis should be placed on the preparation and training of district-level football players to help them reach higher levels of success in sports.
2. Future studies could explore similar research across a broader range of sports disciplines to better understand the relationship between physical and anthropometric variables and performance.
3. The results of this study can serve as a valuable tool for district-level football players to self-evaluate and identify areas for improvement.

Similar studies could be conducted at various levels of achievement, providing insights into how players at different competitive levels can benefit from tailored physical.

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