

COMPARATIVE STUDY OF SELECTED PHYSICAL FITNESS VARIABLES BETWEEN SPRINTERS AND FOOTBALL STRIKERS OF MANIPUR

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Abstract

The purpose of the study was to compare the physical fitness (i.e. speed, agility, and explosive strength) between sprinters and football strikers of Manipur. 20 state level male athletes i.e. 10 sprinters and 10 football strikers were selected, age ranging from 20-25. The physical fitness test of the players was conducted on the selected variables of speed (50 meters dash), agility (shuttle run) and explosive strength (standing broad jump). The data collected from the athletes were analysed using independent t-test and level of significance was set at 0.05. The result of the study indicates that significant difference was found in speed, agility and explosive strength among sprinters and football strikers of Manipur.

Keywords: Physical fitness, speed, agility, explosive strength, sprinters, and football strikers.

INTRODUCTION

In the realm of sports science, understanding the distinct physical fitness attributes of athletes across different disciplines is crucial for optimizing performance and tailoring training regimens. Sprinters and football strikers, while both engaged in high-intensity activities, exhibit unique physical demands and skill sets inherent to their respective sports.

Sprinters are the athletes which are specialize in short-distance races, requiring exceptional speed, explosive power, and anaerobic capacity to achieve peak performance over brief durations. Their training focuses on enhancing fast-twitch muscle fibres, reaction time and maximal force output.

Football strikers, on the other hand, operate in a dynamic and multifaceted environment. Their role necessitates not only bursts of speed and power to evade defenders and capitalize on scoring opportunities but also agility, endurance, and strategic acumen to navigate the continuous play and varied scenarios of a football match.

Speed refers to the ability to move rapidly from one point to another in the shortest time possible. It is a critical component in sports like sprinting, football, and basketball. It is influenced by factors such as reaction time, stride length, and stride frequency.

Agility is the ability to change direction quickly and efficiently while maintaining control and balance. It is essential in sports that require quick movements, dodging opponents, or sudden direction shifts, such as football, basketball, and tennis.

Explosive strength, also known as power, is the ability to exert a maximum amount of force in a short period. It combines both strength and speed and is crucial for activities like jumping, sprinting, and weightlifting. Examples include a sprinter's start, a high jumper's leap, or a footballer's powerful kick.

The comparison of physical fitness between athletes from different sports provides insight into the specific attributes that contribute to their performance. Sprinters and football strikers are both required to demonstrate high levels of physical fitness, but the demands of their respective sports differ significantly. This study aimed to compare selected physical fitness variables, including speed, agility, and explosive strength, between sprinters and football strikers in the state of Manipur, India.

OBJECTIVE OF THE STUDY

The objective of the study was to compare the difference of physical fitness i.e. speed, agility and explosive strength between Sprinters and Football Strikers of Manipur.

METHODOLOGY

Participants:

The study was comprised of 20 male athletes from the state of Manipur, aged between 20-25 years. The participants were divided into two groups: 10 Sprinters and 10 Football Strikers. All participants had competed at state level competition.

Tests Conducted:

1. **Speed (50m Dash):** Measured in seconds to assess sprinting speed.
2. **Agility (Shuttle Run):** Time taken to complete a 4x10 meter shuttle run.
3. **Explosive Strength (Standing Board Jump):** Distance jumped from a standing start.

CRITERION MEASURE

Variables	Test	Criterion Measurement
Speed test	50m dash	In seconds
Agility	Shuttle Run	In seconds
Explosive strength	Standing broad jump	In centimetre

Statistical Analysis:

Independent t-test was applied to determine significant differences between the two groups, with a level of significance set at 0.05.

Results and Findings

The speed, agility and explosive strength between sprinters and football striker were calculated by using descriptive statistics and independent t-test. The level of significance was set at 0.05 levels. To find the significance of mean score difference for speed between Sprinters and Football Players was presented in the table 1.

Table -1: Significance Difference of Mean Score for speed between Sprinters and Football Strikers of Manipur.

Experimental Groups	N	Mean	SD	df	t-value
Sprinters	10	6.25	0.15	18	12.05*
Football Strikers	10	7.41	0.26		

Table value of 't' at 0.05 level of significance at 18 df = 2.10

In the above table no.1 revealed that the Mean, and Standard Deviation value regarding speed of Sprinters were 6.25 and 0.15 whereas in the case of Football Strikers were 7.41 and 0.26 respectively. So, it indicates that there was significant difference found between Sprinters and Football Strikers as the calculated t-value 12.05* was greater than tabulated t-value 2.10 with 18 df at 0.05 level of significance.

A graphical representation of mean values of speed between Sprinters and Football strikers has been presented in figure 1.

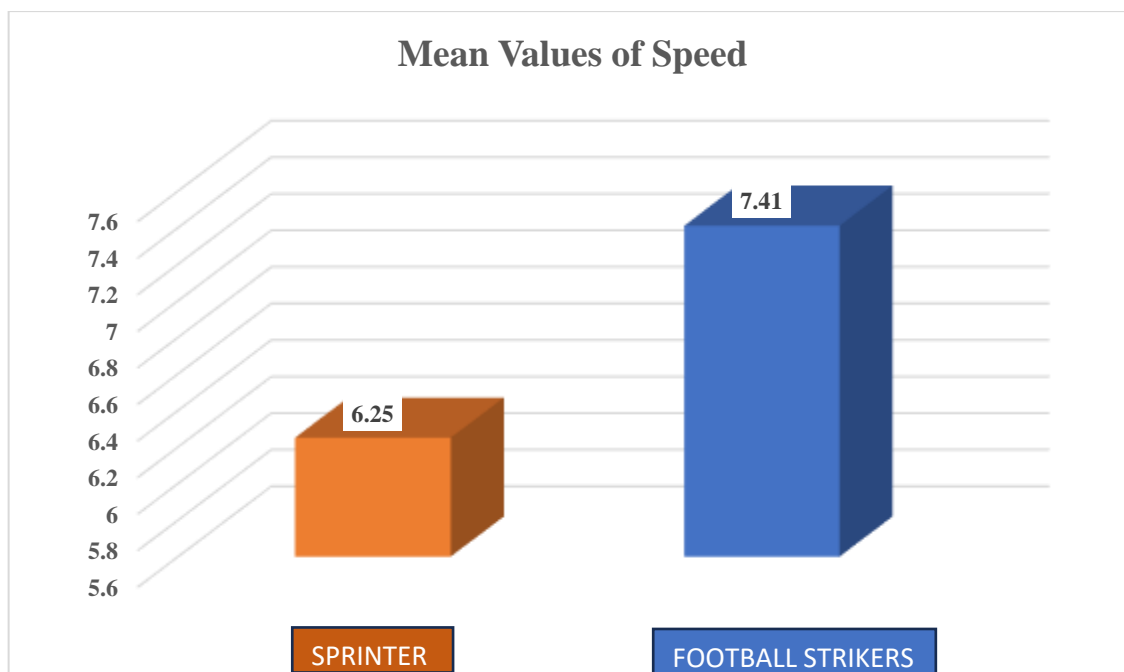


Figure1: Mean values of speed between sprinters and football strikers.

To find the significance of mean score difference for agility between Sprinters and Football Players has been presented in the table 2.

Table-2: Significance Difference of Mean Score of agility between Sprinters and Football Strikers of Manipur.

Experimental Groups	N	Mean	SD	df	t-value
Sprinters	10	11.66	0.1713	18	15.91*
Football Strikers	10	10.4	0.1826		

Table value of 't' at 0.05 level of significance at 18 df = 2.10

In the above table-2 revealed that the Mean and Standard Deviation value regarding Agility of Sprinters were 11.66 and 0.1713 whereas in the case of Football Strikers were 10.4 and 0.1826 respectively. So, it indicates that significant difference had been found between Sprinters and Football Strikers as the calculated t-value 15.91* was greater than tabulated t-value 2.10 at 0.05 level of significant.

A graphical representation of mean values of agility between Sprinters and Football strikers has been presented in figure 2.

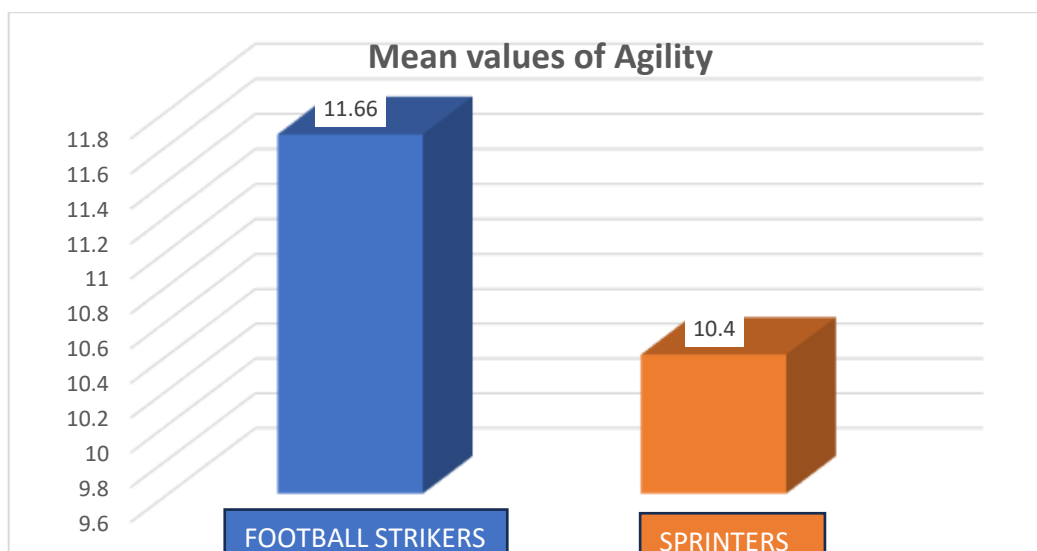


Figure 2: Mean values of agility between sprinters and football strikers.

To find the significance of mean score difference for explosive strength between Sprinters and Football Players has been presented in the table 3.

Table-3: Significance Difference of Mean Score of Explosive Strength between Sprinters and Football Strikers of Manipur.

Experimental Groups	N	Mean	SD	Df	t-value
Sprinters	10	237.5	7.91	18	5.09*
Football Strikers	10	220	2.45		

Table value of 't' at 0.05 level of significance at 18 df = 2.10

In the above table no.3 revealed that the Mean and Standard Deviation value regarding Explosive Strength of Sprinters were 237.5 and 7.91 whereas in the case of Football Strikers were 220 and 2.45 respectively. So, it indicates that there was significant difference had been found between Sprinters and Football Strikers as the calculated t-value 5.09* was greater than tabulated t- value 2.10 at 0.05 level of significant.

A graphical representation of mean values of explosive strength between Sprinters and Football strikers has been presented in figure 3.

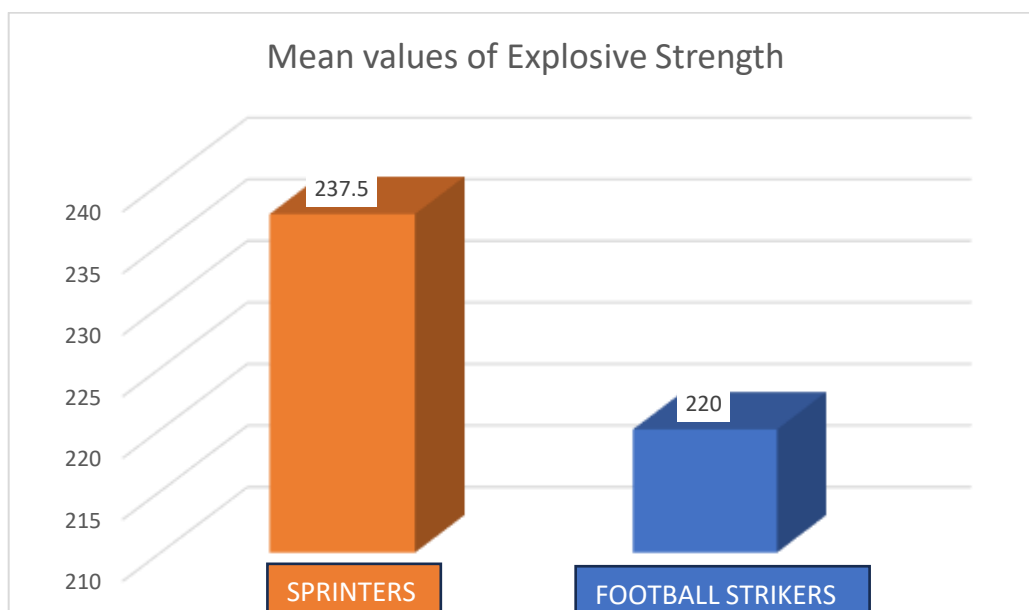


Figure 3: Mean values of explosive strength between sprinters and football strikers.

DISCUSSION

The findings of this study provide significant insights into the comparative physical fitness attributes of sprinters and football strikers of Manipur. The result indicates that there is a statistically significant difference in speed, agility, and explosive strength between the two groups of athletes.

1. **Speed:** The results shows that sprinters had significantly faster times in the 50-meter dash as compared to football strikers. This outcome is expected, as sprinting requires maximal acceleration and top-end speed, which are the primary focus of training for sprinters. Football strikers, while also requiring bursts of speed, must balance their sprinting ability with endurance and ball control, Football strikers might have relatively lower speed performance as compared to sprinters.
2. **Agility:** The agility test results revealed that football strikers performed better than sprinters. This can be attributed to the nature of football, which requires rapid changes in direction, quick foot movements, and dynamic body control to navigate defenders and execute plays effectively. In contrast, sprinters primarily train for straight-line speed and do not emphasize on agility as much in their training routines.
3. **Explosive Strength:** The standing broad jump results demonstrated that sprinters had significantly higher explosive strength than football strikers. This is consistent with the demands of sprinting, which rely on powerful lower-body muscle contractions to generate

force and propel the athlete forward. Football strikers also require explosive strength, particularly for shooting and jumping, but their training involves a broader range of skills, including endurance and coordination, which may result in slightly lower scores in this parameter.

These findings align with existing literature suggesting that athletes develop sport-specific physical attributes based on their training and performance requirements. Sprinters excel in speed and explosive power due to their focus on anaerobic performance, while football strikers exhibit superior agility due to the demands of their sport.

CONCLUSION

The study may be concluded that there was a significant difference in physical fitness variables speed, agility, and explosive strength between sprinters and football strikers of Manipur. Sprinters demonstrate superior speed and explosive strength, while football strikers exhibit higher agility. These findings emphasize the importance of sport-specific training in developing the necessary physical attributes for optimal performance in each discipline.

Coaches and trainers can use these insights to design targeted training programs that enhance the strengths of each group while addressing the areas of potential improvement. For instance, sprinters could be benefited from agility drills to enhance movement adaptability, while football strikers might be more incorporate to explosive strength training to improve their power output. Future studies could also be expanded on these findings by exploring additional physical fitness variables and considering larger sample sizes for more comprehensive analysis.

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