



A Comparative Study of Cardiovascular Fitness between Football Players and Non-Football Players”

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Abstract: The present study was conducted to compare **cardiovascular-related fitness** between football players and non-football players of Swami Ramanand Teerth Marathwada University, Nanded. A total of **40 male subjects** were selected and divided into two groups: football players (n = 20) and non-football players (n = 20). Speed was assessed using the **12-meter run test**, while cardiovascular fitness was interpreted through performance outcomes associated with repeated high-intensity effort.

The results revealed that football players demonstrated superior performance in the 12-meter run, with a higher mean score (M = **2167.50**, SD = **124.78**) compared to non-football players (M = **1995.78**, SD = **119.67**). The obtained **t-ratio (33.56)** indicated a statistically significant difference between the two groups. These findings suggest that regular football training leads to better speed and enhanced cardiovascular efficiency due to continuous involvement in sprinting, acceleration, and recovery-based activities.

In conclusion, the study confirms that football players possess significantly better **speed and cardiovascular fitness** than non-football players. The observed differences highlight the positive impact of systematic football training on physical fitness and emphasize the importance of regular sports participation for improving cardiovascular health and performance among university students.

Keywords: Football players, Non-football players, Speed, 12-meter run, Cardiovascular fitness

I. INTRODUCTION

Physical fitness is a fundamental component of sports performance, particularly in dynamic team games such as football, where players are required to demonstrate high levels of speed, power, endurance, and cardiovascular efficiency (Singh 2022; Bansode, & Singh, 2022a; Singh, (2022d)). Among the various components of fitness, **cardiovascular fitness, speed, and athletic power** play a decisive role in determining an individual’s ability to perform repeated high-intensity activities over prolonged periods. Football demands continuous movement, intermittent sprinting, rapid acceleration, and quick recovery, which collectively place significant stress on the cardiovascular and musculoskeletal systems (Singh 2022; Bansode, & Singh, 2022a; Bansode, & Singh, 2022b; Singh & Bansode, (2022c); Singh, (2022d).

Previous research has consistently highlighted that regular participation in structured sports training leads to significant physiological and morphological adaptations, including improved aerobic capacity, enhanced muscular power, and better speed performance. In this context, comparative studies between football players and non-football players provide valuable insights into the impact of systematic training on physical fitness variables. Singh S.K. has emphasized that structured physical activity and sports participation positively influence stress regulation, physical efficiency, and overall health outcomes among young adults (Singh, 2020a; Singh, 2020b). These findings support the notion that regular engagement in sports such as football contributes not only to physical fitness but also to holistic well-being.

Therefore, the present study was undertaken to compare selected **morphological characteristics, cardiovascular Fitness (12-meter run)**, between football players and non-football players. The study aims to establish whether regular football training results in significant differences in these fitness parameters.

II. METHODOLOGY

Selection of Subjects

The study was conducted on a total of **40 male subjects**, aged between 18 and 25 years, selected for this study. The subjects were divided into two equal groups:



- **Football Players (n = 20):** Students who had been regularly participating in football training and competitions.
- **Non-Football Players (n = 20):** Students who did not participate in any organized sports or regular training programs.

Administration of Tests

All tests were administered under standardized conditions. Prior to testing, the subjects were given proper instructions and a standardized warm-up to ensure safety and optimal performance. Each subject was tested individually, and adequate rest was provided between trials to avoid fatigue.

Statistical Analysis

The collected data were analyzed using descriptive statistics, including **mean and standard deviation**, to determine group performance. To examine the significance of differences between football players and non-football players, the **independent 't' test** was applied. The level of significance was set at **0.05**. The results were interpreted to determine whether participation in football training had a significant effect on the selected fitness variables.

III. ASSESSMENT OF CARDIOVASCULAR FITNESS TESTS

12 minute Run

Cardiovascular fitness was assessed using the **12-minute run test**, in which participants were instructed to run continuously for 12 minutes on a marked track. Distance markers were placed at regular intervals to accurately measure the total distance covered. Participants were encouraged to give their best effort, and walking was permitted when necessary. The total distance completed in 12 minutes was recorded as the performance score. **Body Mass Index (BMI)** was calculated using the **Quetelet equation** (weight in kilograms divided by height in meters squared).

IV. RESULTS

Comprised and indentified of cardiovascular fitness of **Football and non Football Players**

- . The data have been systematically analyzed in the form of Mean Scores, Standard Deviations and t-ratios.

Table 1 shows the criterion measure of variables of Football and non Football Players

Morphological Characteristics of Football and non Football Players					
S.No.	Parameters	Football Players		Non-Football Players	
1	Age	22.46	4.50	23.40	4.44
2	Height	67.89	11.67	69.89	12.30
3	Weight	170.20	23.78	168.20	23.97

The morphological characteristics of football and non-football players were analyzed using selected parameters such as age, body weight, and height. The results reveal only minor variations between the two groups.

With regard to **age**, football players had a mean age of **22.46 years**, whereas non-football players recorded a slightly higher mean age of **23.40 years**. The small difference indicates that both groups were almost comparable in terms of age, minimizing the influence of age on other physical variables.

In terms of **body weight**, football players showed a mean weight of **67.89 kg**, while non-football players had a higher mean weight of **69.89 kg**. This difference suggests that non-football players tend to have slightly greater body mass, possibly due to lower physical activity levels and the absence of regular sport-specific training.

Regarding **height**, football players recorded a mean height of **170.20 cm**, which was marginally higher than that of non-football players (**168.20 cm**). This indicates that football players may possess a slight anthropometric advantage, as greater height can be beneficial for performance aspects such as heading, reach, and physical contests during play.

Overall, the findings suggest that while football and non-football players are similar in age, football players tend to be slightly taller and lighter, reflecting adaptations associated with regular training and competitive sports participation.

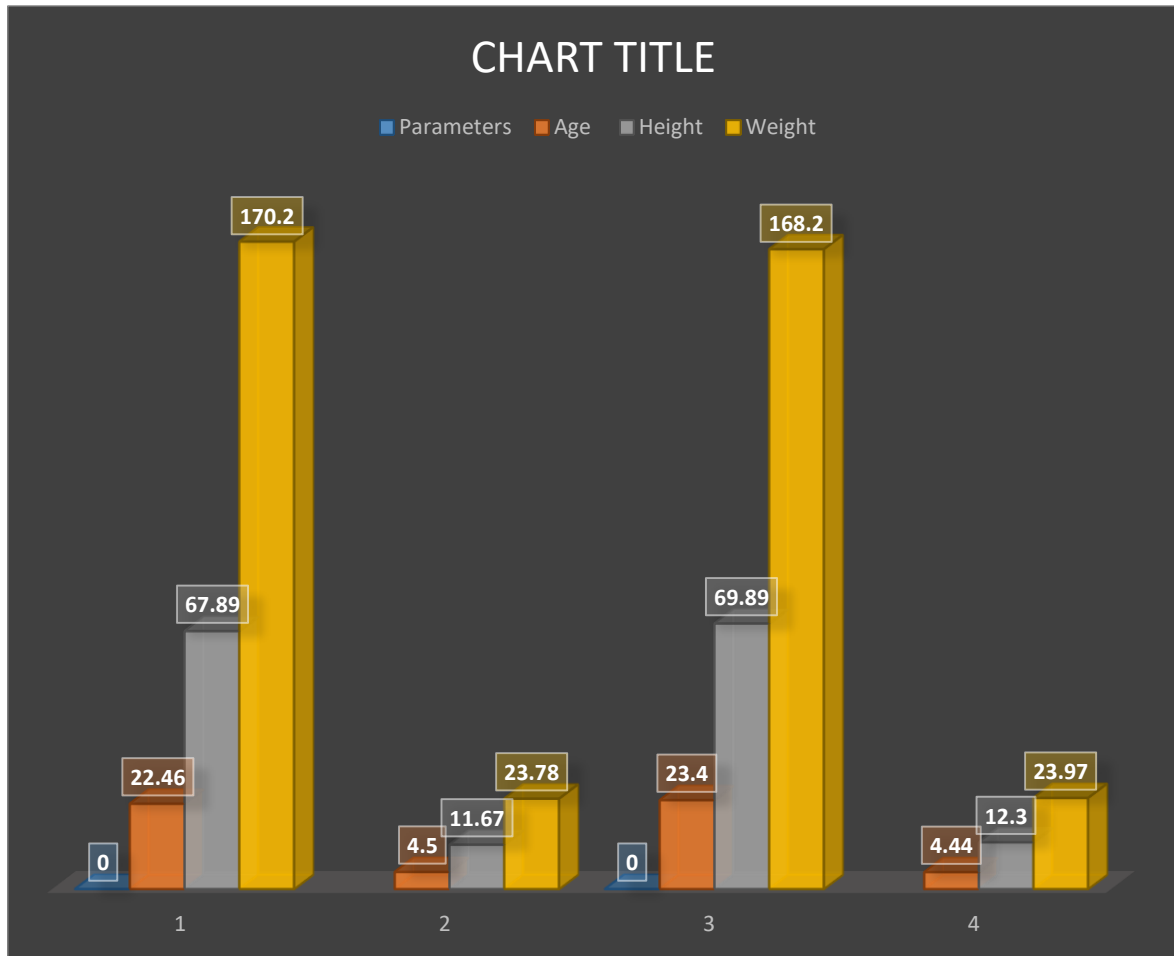


Figure-1 Morphological Characteristics of **Football and non Football Players**

Table -2

Statistical Comparison of Body Mass Index between football and non-Football Players

Variable	Players	Number	Mean	S.D.	T-ratio
Body Mass Index	Football	20	17.78	3.56	5.79*
	Non-Football	20	18.30	3.56	

*** Significant**

The table presents the morphological characteristics of football players and non-football players with reference to age, weight, and height. The results show that both groups are nearly similar in age, indicating that age-related factors did not significantly influence the comparison. The mean age of football players was **22.46 years**, while that of non-football players was **23.40 years**, showing only a marginal difference between the two groups.

With respect to **body weight**, football players recorded a mean weight of **67.89 kg**, whereas non-football players showed a comparatively higher mean weight of **69.89 kg**. This slight increase in body weight among non-football players may be attributed to lower levels of regular physical activity and the absence of structured sports training.

In terms of **height**, football players had a mean height of **170.20 cm**, which was marginally higher than the mean height of non-football players (**168.20 cm**). This difference suggests that football players may possess more favorable anthropometric characteristics, as height can contribute positively to performance elements such as speed, balance, reach, and aerial ability in football.



Overall, the findings indicate that football players are generally **slightly taller and lighter** than non-football players, reflecting the influence of systematic training and continuous engagement in football activities on morphological development.

Comparison of Body Mass Index between football and non-Football Players

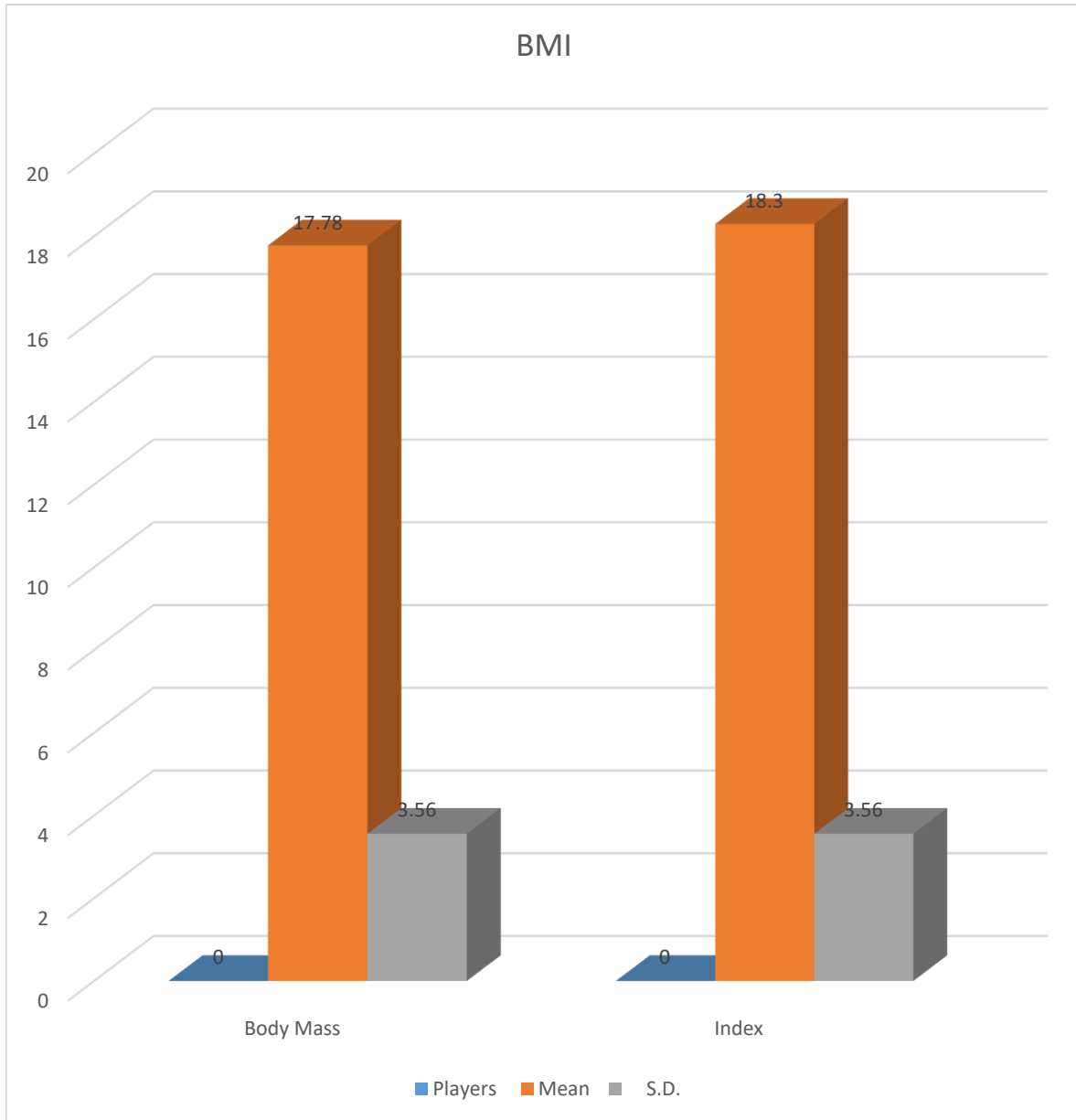


Table- 3

Statistical Evaluation of Cardiovascular Fitness through 12 meter run& walk test among football players and non-football players

Variable	Players	Number	Mean (Mts.)	S.D.	T-ratio
12 Meter Run	Football	20	2167.50	124.78	33.56*
	Non-Football	20	1995.78	119.67	



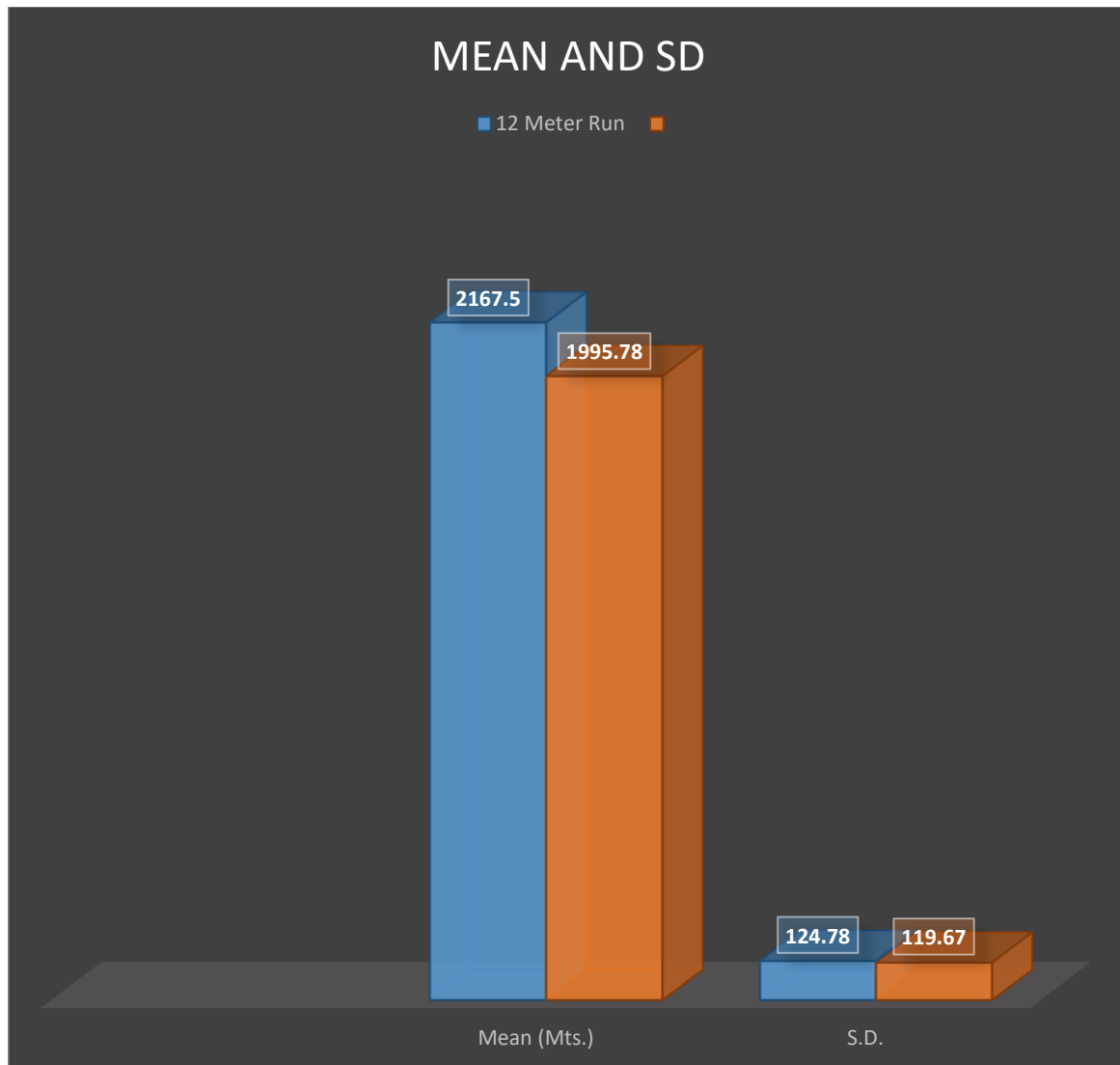
The table shows the comparative performance of football players and non-football players in the 12-meter run test, which is an indicator of speed and explosive acceleration. The football players ($n = 20$) achieved a higher mean score (2167.50 meters, $SD = 124.78$) compared to the non-football players ($n = 20$), who recorded a mean score of 1995.78 meters with a standard deviation of 119.67.

The obtained t-ratio of 33.56, marked with an asterisk (*), indicates that the difference between the two groups is statistically significant at the selected level of significance. This clearly demonstrates the superior performance of football players in short-distance running ability.

The significantly better performance of football players may be attributed to regular training involving sprinting, rapid acceleration, and frequent changes of direction, all of which are essential components of football performance. In contrast, non-football players lack such sport-specific conditioning, resulting in comparatively lower scores.

Overall, the findings confirm that football players possess significantly greater speed and acceleration ability than non-football players, highlighting the positive impact of systematic football training on short-distance running performance.

Figure-3 Cardiovascular Fitness through 12 meter run& walk test among football players and non-football players





V. DISCUSSION OF FINDINGS

Cardiovascular fitness refers to the ability of the heart, lungs, and circulatory system to supply oxygen efficiently to working muscles during sustained physical activity. It is a crucial component of overall physical fitness and plays a vital role in enhancing endurance, work capacity, and recovery.

Individuals who regularly participate in sports such as football generally exhibit superior cardiovascular fitness due to continuous involvement in aerobic and anaerobic activities, including running, sprinting, and intermittent high-intensity efforts (Singh, 2024; Singh, 2024a). These activities lead to physiological adaptations such as increased cardiac output, improved oxygen uptake, and enhanced efficiency of the respiratory system (Bansode Singh, 2022f; Bansode & Singh, 2022g). As a result, trained athletes are able to perform physical tasks for longer durations with less fatigue.

In contrast, non-football players or less physically active individuals often demonstrate lower levels of cardiovascular fitness due to limited exposure to sustained or high-intensity exercise. Overall, improved cardiovascular fitness contributes not only to better sports performance but also to long-term health benefits, including reduced risk of cardiovascular diseases and improved quality of life.

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