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## The role of physical education in combating childhood obesity: A comparative study of football players and non-players in Rohtak District

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### Abstract

This study examines the impact of physical education on childhood obesity by comparing body composition and fitness levels of 20 football players from various schools in Rohtak district with 20 non-players. The research investigates whether regular participation in sports like football significantly affects obesity metrics and improves physical fitness among children. The findings indicate that football players show lower BMI and body fat percentage along with better physical fitness compared to non-players, highlighting the importance of physical education in combating childhood obesity.

**Keywords:** Physical education, childhood obesity, football, non-players, physical fitness, Rohtak District

### 1. Introduction

Childhood obesity is a growing concern globally, with significant implications for both current and future health. In India, childhood obesity rates have been increasing, contributing to a rise in associated health risks such as type 2 diabetes and cardiovascular diseases. Physical education (PE) has long been advocated as a critical component in the prevention and management of obesity in children. However, the effectiveness of PE, particularly through structured sports like football, in combating obesity among school-aged children in specific regions like Rohtak district, remains underexplored.

This study aims to investigate the role of physical education in combating childhood obesity by comparing the body composition and physical fitness of football players and non-players in Rohtak district. The research seeks to answer whether participation in football as a form of physical education can lead to significant reductions in obesity-related metrics and improvements in physical fitness.

### 2. Literature Review

The relationship between physical activity and childhood obesity has been well-documented. According to the World Health Organization (2020) [3], regular physical activity, including sports, is essential in maintaining a healthy weight and preventing obesity. Structured sports, such as football, require continuous movement and exertion, which are effective in burning calories and building muscle. Studies have shown that children who participate in regular physical activity are less likely to be obese and more likely to have better cardiovascular and muscular fitness (Janssen & LeBlanc, 2010) [1].

However, the impact of physical activity on obesity can vary based on the type of activity, its intensity, and the individual's overall lifestyle. While some studies suggest that sports participation leads to significant reductions in obesity metrics, others indicate that the benefits may be more pronounced in improving overall fitness rather than solely reducing body fat (Sahoo *et al.*, 2015) [2]. This study seeks to contribute to this body of knowledge by focusing on the effects of football as part of physical education on childhood obesity in Rohtak district.

### 3. Methodology

#### 3.1 Participants

The study involved 40 participants aged 10-12 years from different schools in the Rohtak district. The participants were divided into two groups: 20 football players who regularly

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participated in football as part of their school's PE program, and 20 non-players who did not engage in any structured sports activities. The football players were selected from schools with active football programs, while the non-players were randomly selected from the same schools to ensure similar backgrounds.

### 3.2 Study design

This experimental study used a cross-sectional design to compare body composition and physical fitness between the two groups. Body composition was assessed by measuring height, weight, and body fat percentage, which were then used to calculate the Body Mass Index (BMI). Physical fitness was evaluated using the 20-meter shuttle run test (to measure cardiovascular endurance), the sit-up test (to assess core strength), and the standing broad jump (to measure lower body strength).

### 3.3 Data collection

Data were collected over two weeks. Height and weight were measured using a stadiometer and a digital scale, respectively.

Body fat percentage was determined using a skinfold caliper, following standardized protocols. The physical fitness tests were conducted on a school playground under similar weather and time conditions to minimize variability. Each participant completed the fitness tests on the same day to ensure consistency in the data.

### 3.4 Data analysis

Descriptive statistics were used to summarize the data, including means and standard deviations for BMI, body fat percentage, and fitness test scores. An independent t-test was conducted to compare the means between the football players and non-players, with a significance level set at  $p < 0.05$ .

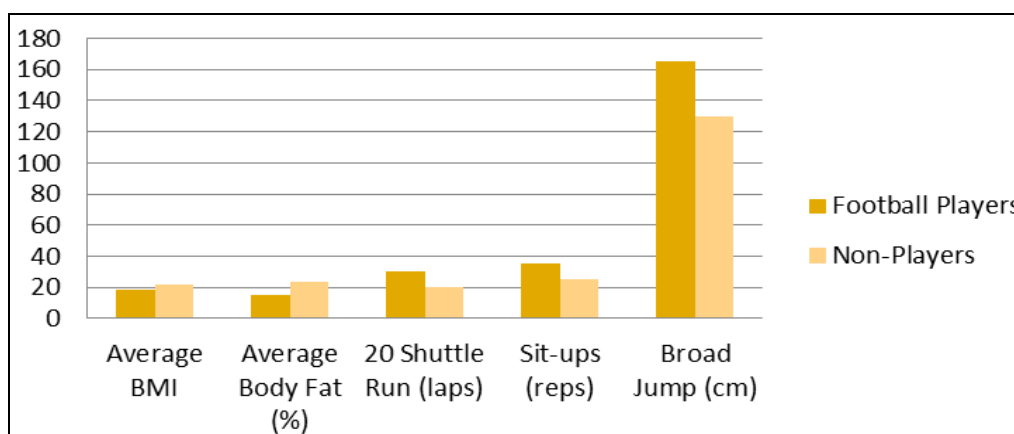
## 4. Results

### 4.1 Descriptive statistics

The results revealed that football players had a lower average BMI (18.4) compared to non-players (22.1). Similarly, the average body fat percentage was lower in football players (15.2%) compared to non-players (23.4%).

**Table 1:** Comparison of body composition and fitness levels

Group	Average BMI	Average body fat (%)	20 Shuttle run (laps)	Sit-ups (reps)	Broad jump (cm)
Football players	18.4	15.2%	30	35	165
Non-players	22.1	23.4%	20	25	130



**Graph 1:** Comparison of body composition and fitness levels

### 4.2 Physical fitness

The physical fitness tests showed that football players outperformed non-players in all categories. Football players completed more laps in the 20-meter shuttle run, performed more sit-ups, and jumped farther in the broad jump test.

### 4.3 Statistical analysis

The independent t-test results indicated that the differences in BMI, body fat percentage, and physical fitness scores between football players and non-players were statistically significant ( $p < 0.05$ ). This suggests that regular participation in football contributes to lower obesity-related metrics and better physical fitness.

## 5. Discussion

The findings of this study support the hypothesis that participation in structured physical activities, such as football, plays a significant role in combating childhood obesity. The football players in this study exhibited lower BMI and body fat percentages, as well as superior physical fitness levels, compared to their non-playing peers. These results are consistent with previous research, which has shown that

regular physical activity is crucial in preventing and managing childhood obesity (Janssen & LeBlanc, 2010) [1].

The significant differences observed between the two groups highlight the importance of physical education in schools. Football, as a team sport, not only provides an enjoyable and engaging way for children to be active but also fosters physical fitness, which is critical in maintaining a healthy weight. The results also underscore the need for schools to prioritize PE programs that encourage participation in sports and other physical activities.

## 6. Conclusion

This study demonstrates that regular participation in football, as part of a school's physical education program, has a positive impact on reducing childhood obesity. The findings suggest that structured physical activities should be an integral part of the school curriculum to help combat the rising rates of childhood obesity. Schools in the Rohtak district, and elsewhere, should consider promoting sports like football to enhance the physical health and well-being of their students.

## 7. Recommendations

### Given the results of this study, it is recommended that:

- Schools should increase the frequency and variety of PE classes, with an emphasis on team sports like football.
- Further research should investigate the long-term impact of different types of sports on childhood obesity and fitness levels.
- Policymakers should develop initiatives that encourage regular physical activity among children, both in and out of school.

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