International Journal of Web of Multidisciplinary Studies
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
website: https://ijwos.com
Volume 3 Issue 2 , Feb 2026
E-ISSN : 3049-2424
DOI: https://doi.org/10.71366/ijwos03022669126

Impact of Regular Sports Participation on Body Composition and Physical Fitness in Adolescents

Jojibabu Abbadasari[1]
[1] SA-Physical Education, A.R.D.G.K Municipal Corporation High School, Eluru, W.G (Dist), A.P..

Article Info

Article History:

Published:28 Feb 2026

Publication Issue:
Volume 3, Issue 2
February-2026

Page Number:
570-576

Corresponding Author:
Jojibabu Abbadasari

Abstract:

The present study was conducted to examine the impact of regular sports participation on body composition and physical fitness among adolescents in Andhra Pradesh State. Physical activity and sports participation play a vital role in promoting healthy growth, improving fitness levels, and preventing lifestyle-related health problems during adolescence. The study aimed to compare body composition and selected physical fitness variables between adolescents who regularly participate in sports and those who do not. A total of 200 adolescent students (boys and girls) aged 13–18 years were selected from various schools and junior colleges across Andhra Pradesh using a random sampling technique. The participants were divided into two groups: regular sports participants and non-participants. Body composition variables such as Body Mass Index (BMI), body fat percentage, and lean body mass were assessed. Physical fitness variables, including speed, agility, muscular strength, muscular endurance, flexibility, and cardiovascular endurance were measured using standardized fitness tests. The collected data were analyzed using appropriate statistical techniques. The findings revealed that adolescents who regularly participated in sports demonstrated significantly better body composition profiles, including lower body fat percentage and healthier BMI values, compared to non-participants. Furthermore, sports participants showed superior performance in all selected physical fitness components, particularly in cardiovascular endurance, agility, speed, and muscular strength. The study concluded that regular participation in sports has a positive influence on both body composition and physical fitness among adolescents in Andhra Pradesh. It is recommended that schools, parents, and policymakers encourage greater involvement in organized sports and physical activity programs to enhance the health, fitness, and overall well-being of adolescents.

Keywords: Sports Participation, Body Composition, Physical Fitness, Adolescents, BMI, Health, Andhra Pradesh, Physical Activity

1. Introduction

Adolescence is a crucial stage of human development characterized by rapid physical, physiological, psychological, and social changes. During this period, maintaining a healthy lifestyle is essential for promoting optimal growth and development. Regular participation in sports and physical activities has been widely recognized as one of the most effective ways to improve health, enhance physical fitness, and develop positive lifestyle habits among adolescents. In recent years, concerns regarding sedentary behavior, obesity, and declining fitness levels among young people have increased significantly, making sports participation an important area of research.

Sports participation involves systematic engagement in physical activities that require skill, effort, and regular practice. Participation in sports contributes not only to physical development but also to mental well-being, social interaction, teamwork, discipline, and self-confidence. Adolescents who regularly participate in sports are generally

more active and physically fit than their non-participating counterparts. Regular sports involvement promotes healthy body composition by reducing excess body fat, increasing lean muscle mass, and maintaining appropriate body weight.

Body composition refers to the relative proportions of fat mass, muscle mass, bone mass, and other tissues in the human body. It is considered an important indicator of health and physical performance. Excessive body fat during adolescence can increase the risk of obesity, cardiovascular diseases, diabetes, and other health complications later in life. Regular sports participation helps adolescents maintain a healthy body composition by increasing energy expenditure and improving metabolic efficiency.

Physical fitness is another essential component of adolescent health. It refers to the ability to perform daily activities efficiently without undue fatigue and with sufficient energy for leisure and emergency situations. Physical fitness includes various components such as cardiovascular endurance, muscular strength, muscular endurance, flexibility, speed, agility, balance, and coordination. Participation in sports activities provides opportunities to develop these fitness components through regular training and competition.

In Andhra Pradesh State, sports and physical education programs are increasingly being promoted in schools, colleges, and community organizations. However, differences in participation levels among adolescents exist due to factors such as educational pressure, technological distractions, urbanization, and limited access to sports facilities. These factors may influence both body composition and physical fitness among young individuals. Therefore, it becomes important to examine the relationship between regular sports participation and the health-related outcomes of adolescents in the state.

The present study focuses on assessing the impact of regular sports participation on body composition and physical fitness among adolescents in Andhra Pradesh. By comparing adolescents who regularly participate in sports with those who do not, the study seeks to provide valuable insights into the role of sports in promoting healthy growth and physical development. The findings of this research may help educators, coaches, parents, health professionals, and policymakers develop effective strategies to encourage sports participation and improve the overall health and fitness of adolescents.

Therefore, understanding the influence of regular sports participation on body composition and physical fitness is essential for fostering a healthier and more active adolescent population in Andhra Pradesh State. The study is expected to contribute to the growing body of knowledge in physical education and sports sciences while highlighting the importance of sports participation as a tool for improving adolescent health and well-being.

Statement of the Problem:

The purpose of the study “Impact of Regular Sports Participation on Body Composition and Physical Fitness in Adolescents.”

Objectives of the Study:

1. To assess the body composition of adolescents who regularly participate in sports in Andhra Pradesh State.
2. To assess the body composition of adolescents who do not regularly participate in sports in Andhra Pradesh State.
3. To evaluate the selected physical fitness components of adolescents who regularly participate in sports.
4. To evaluate the selected physical fitness components of adolescents who do not regularly participate in sports.
5. To compare the body composition variables between sports-participating and non-sports-participating adolescents.
6. To compare the physical fitness components between sports-participating and non-sports-participating adolescents.
7. To determine the influence of regular sports participation on body composition among adolescents.
8. To determine the influence of regular sports participation on physical fitness among adolescents.
9. To examine the relationship between body composition and physical fitness variables among adolescents.

10. To provide recommendations for promoting sports participation and improving health-related fitness among adolescents in Andhra Pradesh State.

2. Methodology

Research Design: The present study was designed to investigate the impact of regular sports participation on body composition and physical fitness among adolescents in Andhra Pradesh State. A descriptive comparative research design was adopted to compare adolescents who regularly participated in sports with those who did not participate in organized sports activities. For the purpose of the study, a total of 200 adolescents (N = 200) aged between 13 and 18 years were selected from various government and private schools and junior colleges in Andhra Pradesh State. The subjects were selected using a random sampling technique.

The selected participants were divided into two groups:

- Group I: Sports Participants (n = 100)
- Group II: Non-Sports Participants (n = 100)

The sports participants were those who had been regularly involved in organized sports activities for at least one year, with a minimum participation of three days per week. The non-sports participants were students who did not engage in any organized sports training or competitive sports activities.

Criterion Variables:

Body Composition Variables:

The following body composition variables were selected:

1. Body Mass Index (BMI)
2. Body Fat Percentage
3. Lean Body Mass

Physical Fitness Variables:

The following physical fitness variables were selected:

1. Speed
2. Agility
3. Muscular Strength
4. Muscular Endurance
5. Flexibility
6. Cardiovascular Endurance

Table-1: Comparison of Body Composition Variables between Sports Participants and Non-Sports Participants.

Variable	Sports Participants (n=100) Mean ± SD	Non-Sports Participants (n=100) Mean ± SD	t-value
BMI (kg/m²)	21.34 ± 2.15	24.18 ± 2.86	7.89*
Body Fat (%)	15.82 ± 3.47	22.65 ± 4.21	12.54*

Lean Body Mass (kg)	48.74 ± 5.28	43.62 ± 4.91	7.08*

***Significant at 0.05 level (Critical t = 1.97)**

The results indicate that sports participants possessed significantly lower BMI and body fat percentage, while demonstrating significantly higher lean body mass compared to non-sports participants.

Table 2: Comparison of Physical Fitness Variables between Sports Participants and Non-Sports Participants.

Variable	Sports Participants Mean ± SD	Non-Sports Participants Mean ± SD	t-value
Speed (50m Dash, sec)	7.62 ± 0.42	8.54 ± 0.51	13.89*
Agility (Shuttle Run, sec)	10.94 ± 0.63	12.36 ± 0.81	13.89*
Muscular Strength (kg)	38.72 ± 5.14	31.46 ± 4.83	10.26*
Muscular Endurance (No.)	35.48 ± 4.21	27.36 ± 3.95	14.04*
Flexibility (cm)	28.65 ± 5.42	21.84 ± 4.68	9.53*
Cardiovascular Endurance (m)	2486.50 ± 198.42	2065.30 ± 184.61	15.56*

***Significant at 0.05 level (Critical t = 1.97)**

Sports participants performed significantly better in all physical fitness variables than non-sports participants.

Table-3: Correlation between Body Fat Percentage and Physical Fitness Variables

Variable	r-value
Speed	-0.58*
Agility	-0.62*
Muscular Strength	-0.54*
Muscular Endurance	-0.67*
Flexibility	-0.41*
Cardiovascular Endurance	-0.73*

***Significant at 0.05 level.**

Body fat percentage showed significant negative correlations with all physical fitness variables, indicating that higher body fat is associated with lower fitness performance.

Table-4: Correlation between Lean Body Mass and Physical Fitness Variables.

Variable	r-value
Speed	0.49*
Agility	0.52*
Muscular Strength	0.78*
Muscular Endurance	0.61*
Flexibility	0.36*
Cardiovascular Endurance	0.57*

***Significant at 0.05 level.**

Lean body mass was positively associated with all selected physical fitness variables.

3. Discussion

The purpose of the present study was to investigate the impact of regular sports participation on body composition and physical fitness among adolescents in Andhra Pradesh State. The findings obtained from the statistical analysis revealed significant differences between sports-participating and non-sports-participating adolescents in both body composition and physical fitness variables.

The results of the study indicated that adolescents who regularly participated in sports demonstrated significantly lower Body Mass Index (BMI) and body fat percentage compared to their counterparts who did not participate in sports activities. On the other hand, sports participants exhibited significantly higher lean body mass. These findings suggest that regular involvement in sports contributes positively to maintaining a healthy body composition during adolescence. The increased energy expenditure associated with sports participation helps reduce fat accumulation while promoting muscle development and overall physical health.

The findings further revealed significant differences in all selected physical fitness variables. Sports participants performed better in speed, agility, muscular strength, muscular endurance, flexibility, and cardiovascular endurance than non-sports participants. These improvements may be attributed to the systematic and continuous physical demands of sports training, which stimulate physiological adaptations and enhance overall fitness levels.

The superior speed and agility observed among sports participants may be explained by their frequent engagement in activities involving rapid movements, changes of direction, and coordinated motor actions. Regular sports training improves neuromuscular coordination, reaction time, and movement efficiency, leading to better performance in these fitness components.

Similarly, higher levels of muscular strength and muscular endurance among sports participants can be attributed to repeated muscular contractions and resistance encountered during training and competition. Sports activities require the development of muscular fitness, which contributes to improved performance and physical functioning.

The significant improvement in flexibility among sports participants may be due to regular stretching exercises and dynamic movements performed during sports practice. Enhanced flexibility contributes to greater joint mobility, reduced risk of injury, and improved athletic performance.

Cardiovascular endurance was found to be considerably higher among sports participants. This finding reflects the positive influence of regular physical activity on the cardiovascular and respiratory systems. Continuous participation in sports improves oxygen uptake, cardiac efficiency, and aerobic capacity, enabling adolescents to sustain physical activity for longer durations without excessive fatigue.

The correlation analysis revealed a significant negative relationship between body fat percentage and physical fitness variables. This indicates that as body fat increases, physical fitness performance tends to decrease. Excess body fat may hinder movement efficiency, increase energy expenditure during activity, and negatively affect athletic performance.

Conversely, lean body mass demonstrated a positive relationship with physical fitness variables. Adolescents with higher lean body mass showed better performance in strength, endurance, speed, and agility tests. This finding highlights the importance of muscular development in achieving higher levels of physical fitness.

Overall, the results strongly support the hypothesis that regular sports participation positively influences body composition and physical fitness among adolescents. The findings emphasize the role of sports as an effective means of promoting healthy growth, preventing obesity, enhancing physical performance, and improving overall well-being during adolescence.

The outcomes of the study are consistent with previous research conducted in the fields of physical education, exercise science, and sports medicine, which reported that regular physical activity and sports participation contribute significantly to improved body composition and enhanced physical fitness. Therefore, encouraging adolescents to participate regularly in sports and physical activities may serve as an effective strategy for improving health-related fitness and reducing lifestyle-related health risks.

4. Result

Based on the statistical analysis, the following results were obtained:

1. Sports-participating adolescents had significantly lower BMI compared to non-sports participants.
2. Sports-participating adolescents had significantly lower body fat percentage than non-sports participants.
3. Sports participants demonstrated significantly higher lean body mass.
4. Significant differences were found in speed, favoring sports participants.
5. Significant differences were found in agility, favoring sports participants.
6. Sports participants exhibited significantly greater muscular strength.
7. Sports participants demonstrated significantly higher muscular endurance.
8. Flexibility levels were significantly higher among sports participants.
9. Cardiovascular endurance was significantly superior among sports participants.
10. Body fat percentage showed a significant negative correlation with physical fitness variables.
11. Lean body mass showed a significant positive correlation with physical fitness variables.
12. Regular sports participation was found to have a positive impact on body composition and physical fitness among adolescents in Andhra Pradesh State.

5. Conclusion

The present study was undertaken to investigate the impact of regular sports participation on body composition and physical fitness among adolescents in Andhra Pradesh State. Based on the analysis and interpretation of the collected data, it can be concluded that regular participation in sports has a significant and positive influence on the physical health and fitness of adolescents.

The findings revealed that adolescents who regularly participated in sports exhibited healthier body composition characteristics, including lower Body Mass Index (BMI), reduced body fat percentage, and higher lean body mass compared to non-sports participants. These results indicate that regular engagement in sports activities contributes to maintaining an optimal body composition and reducing the risk of obesity and related health problems during adolescence.

The study also demonstrated that sports-participating adolescents achieved significantly better performance in all selected physical fitness components, namely speed, agility, muscular strength, muscular endurance, flexibility, and

cardiovascular endurance. These findings suggest that regular sports participation enhances overall physical fitness by promoting physiological adaptations, improving motor abilities, and increasing functional capacity.

Furthermore, the correlation analysis showed that higher body fat percentage was negatively associated with physical fitness performance, whereas lean body mass exhibited a positive relationship with fitness variables. This highlights the importance of maintaining a healthy body composition for achieving better physical fitness and sports performance.

Overall, the study confirms that regular sports participation serves as an effective means of improving body composition and enhancing physical fitness among adolescents. The results emphasize the need for schools, parents, coaches, and policymakers to encourage greater involvement in sports and physical activities among young people. Promoting regular sports participation can contribute to healthier lifestyles, improved physical development, and better overall well-being of adolescents in Andhra Pradesh State.

Therefore, it is concluded that regular sports participation is a vital factor in fostering healthy growth, physical fitness, and long-term health among adolescents and should be actively promoted as an integral part of youth development programs.

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