



Impact Participation Activity Sport to Composition Body Teenager

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Abstract

The problem with this research is that it is not yet clear how sports participation affects adolescent body composition, especially in terms of body mass index, body fat percentage, and muscle mass. This study aims to analyze the impact of sports participation on adolescent body composition. The study design used a causal-comparative approach with an ex post facto approach. Respondents were 85 students aged 18–21 years at the Indonesian University of Education, divided into two groups: those who participated in sports activities three times per week and those who only participated once per week for one semester. Body composition measurements were conducted using the Savvy Body Composition Analyzer based on BIA technology to obtain body mass index (BMI) and visceral fat index values. The results of the independent samples t-test showed a significant difference in BMI between the two groups ($p = 0.002$), where the group with a higher exercise frequency had a healthier BMI value. These findings support the importance of regular and structured sports activities to improve better body composition in adolescents, as well as prevent health risks related to obesity and metabolic syndrome.

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INTRODUCTION

Activity sport offer Lots benefit in various aspect life. Sports play role important in development physique children, improve skills like agility and strength, at the same time grow skills social and trust self (Krstin, 2019). For adults, participation in sports and activities recreation own effect term positive length to labor market results work, health and well-being subjective (Lechner, 2009). Although own benefit this, level participation among US adults in general low, with walking, gardening, and shape exercise other become the most common activities (Ham et al., 2009). Sports contribute in a way significant to development personal and integration social, regardless from background behind or someone's status. Sports considered as factor important in development national, which encourages welfare physical and mental outside just entertainment (Selviani et al., 2024). Considering wide-ranging impact this, maintain and strengthen values sport in various aspect life become very important.

Activity sport own impact significant positive to health and quality live in various population. For individuals with hemophilia, sports can increase welfare physical, emotional, and social, which shows that sport must integrated to in management disease in a way overall (Gumilar et al., 2024; von Mackensen, 2007). In adolescents, sports programs recreation reduce component syndrome metabolic, so that increase lipid profile in significant (Faria et al., 2020). Participation term long in activity sport has associated with labor market results positive work, including more income and wages high, and improvement health and well-being subjective in adults (Lechner, 2009). Activities recent exercise routine This found can reduce possibility of stroke and heart attack ischemic transient, with activity lifetime life sustainable and starting sports later day show effect protection (Grau et al., 2009). Findings This highlight importance activity sport in increase health in a way overall and prevent disease chronic in various group age and condition health.

The COVID-19 pandemic has impact significant in style life teenagers, which causes improvement behavior sedentary and change habit eating. Studies have show decline activity physical and improvement time screen among mature young during pandemic (Zheng et al., 2020). Adolescents with condition chronic and friends healthy peers You're welcome report change substantial in style life, including more often cooking and eating in front of television (Mazzolani et

al., 2021). Lifestyle sedentary This cause risk for health physical and mental, with One studies case reported pediatric stroke related with prolonged inactivity (Lam et al., 2021). For overcome problem this, the experts recommend implementation of strategies such as active video games, activity monitors, and monitoring distance Far to activity physique daily (Mittal et al., 2020). Intervention This aim for reduce impact negative from behavior sedentary lifestyle on the mental health of children and adolescents during pandemic.

Composition body in adolescents is field important studies, with implications for health and development. Research show that teenager with scoliosis idiopathic tend own index mass body mass index (BMI) and body fat percentage (BF%) which is higher low compared to with Friend healthy peers (Marinov & Dimitrova, 2021). For evaluate excess weight and obesity in adolescents, BMI in general used but can be misclassified a number of individual (Rodríguez et al., 2004). Circumference waist it seems become predictor syndrome more metabolic good in groups age This (Rodríguez et al., 2004). In adolescents who are overweight overweight and obesity, significant differences in lean and fat mass was observed throughout BMI category (Westphal et al., 2023). Analysis impedance bioelectricity (BIA) is methods used in a way wide For evaluate composition body in children and adolescents, showing reproducibility height and correlation strong with method reference For estimate fat mass and lean mass fat-free, though tend belittle fat mass in both type sex (de Castro et al., 2018).

Recent studies highlight challenge health significant issues faced Indonesian teenagers. Problems mental health affects around one third teenagers, with anxiety become the most common disorders by 3.7% (Wahdi et al., 2023). Adolescents and boys urban more prone to to disturbance behavior (Toharudin et al., 2024). Smoking is problem main, especially among boys, with 14% of teenagers man smoke compared to with 0.2% women (Kusumawardani et al., 2018). Social factors economy play a role, with poorer teenagers have possibility more tall For smoking behavior health reproduction active more general occurs in children men (56.6%) than child women (43.7%), influenced by factors like attitude negative to health reproduction, smoking, and type imagined relationship before Marry (Susanto et al., 2016). Findings This underline the need targeted interventions with consider type gender, age, social status economy, and location geographical for overcome challenge health complexities faced Indonesian teenagers.

Referring to the background behind problem mentioned above, the author feel important for conduct related research impact activity physique to composition body in the environment teenagers. Considering one of the parameters of fitness is How composition body. This study aims to analyze the impact of sports participation on adolescent body composition by examining how regular involvement in structured physical activities influences key indicators such as body mass index, body fat percentage, muscle mass, and overall physical fitness. The novelty of this study lies in its comprehensive analysis of the influence of sports participation on adolescent body composition, considering frequency, intensity, and type of exercise simultaneously and using more specific body composition indicators, such as body fat percentage and muscle mass, based on bio-electrical impedance analysis (BIA). This study also places the study in the context of Indonesian adolescents post-COVID-19 pandemic by comparing adolescents who actively participate in structured sports with those who are less active, thus providing new scientific evidence to inform the development of physical activity programs and adolescent health policies.

The primary objective of this study is to determine the extent to which the frequency, intensity, and type of sports participation contribute to positive changes in body composition among adolescents, as well as to compare differences between adolescents who actively participate in sports and those who are less physically active. Additionally, the study seeks to provide scientific evidence that can be used as a basis for developing effective physical activity programs, informing school-based sports policies, and supporting health promotion strategies aimed at improving adolescent health and preventing obesity.

METHODS

Study This is causal comparative research, namely type non- experimental research aimed at for find connection cause and effect (causal) between two variables or more, with compare two or more different groups based on variables certain. Researchers No do manipulation to variables free, but observe the differences that occur in a way natural. In research This writer intend to for compare composition the bodies of two groups that do activity sport three times a week and once in One week. Therefore That study this also includes to in study ex post facto, where the variable free No manipulated Because has happen previously. Researchers try browse return causes

from something incident or conditions that have been There is moment study done (Darajat & Abduljabar, 2014).

Respondents in study This that is teenager aged 18 – 21 years in the environment of the Indonesian Education University, which consists of 85 people, one group is teenagers who joined in activity lectures sport Where in One Sunday do activity sport as much as three times in a week, and one group is teenagers who joined in activity subject education physical activity that is done once in a while One week. Activities This done during one semester or 6 months implementation.

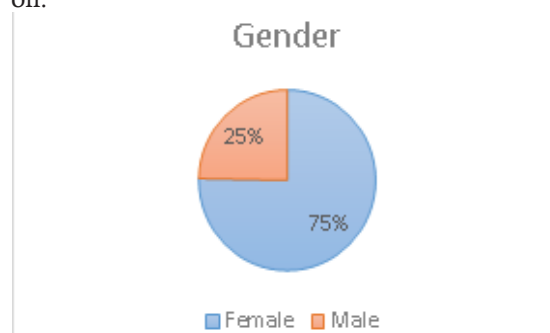


Figure 1. Characteristics of research respondents based on gender

Based on results taking sample obtained as many as 25% men with the number is 21 people and women are 65% with total 64 people.

Composition body measured with using the Savvy Body Composition Analyzer which uses 8 electrodes and BIA technology to measure and analyze various body information in a way accurate. It's connected with application for track change and regulate weight gain effective, but no suitable for group certain like children, women pregnant, or individual with device medical. This manual covers instruction use important, maintenance tips, and troubleshooting suggestions problem for ideal performance. Composition body being analyzed in study This is index mass body and visceral fat index, namely visceral fat index helps determine how much big risk somebody experience problem health consequence accumulation of visceral fat, such as disease heart, diabetes, and problems metabolism other.

RESULTS AND DISCUSSION

The data was analyzed using an independent sample t-test to compare the body mass index (BMI) of the three-times-a-week physical activity group with the once-a-week activity group. The following is an analysis and description of the study.

Table 1. Research Data Description

Physical Activity Group	(N)	Mean BMI	Standard Deviation (SD)
3 times a week	42	22,85	3,12
Once a week	43	19,13	2,98
Total	85		

Based on **Table 1.** Research Data Description: The number of respondents in this study was 85 adolescents who were divided into two groups based on the frequency of physical activity. The group that engaged in physical activity three times a week consisted of 42 respondents with an average body mass index (BMI) of 22.85 and a standard deviation of 3.12, indicating a relatively moderate variation in BMI within the group. Meanwhile, the group that engaged in physical activity once a week consisted of 43 respondents with an average BMI of 19.13 and a standard deviation of 2.98. The difference in the average BMI values between the two groups indicates variations in body composition based on the frequency of physical activity, which was further analyzed using inferential statistical tests.

Based on the data Independent Sampel Test, it was obtained t - value of 3.263 with $\text{sig} = 0.002 < 0.05$ and $t \text{ count} > t \text{ table}$, then can concluded that there is significant difference in the index mass body mass index (BMI) between teenagers who exercise 3 times a week with which only exercise once a week.

The difference in average BMI values between second group of 3.71. That means, young people often exercising own higher BMI value low compared to with rare teenager exercise. Difference This show that exercising will routinely influence body become more healthy and proportional. Research results This support assumption that sports that are done in a way consistent can help guard ideal body weight and prevent risk excess weight and disease chronic other.

Study show that activity consistent physical during adolescence can influence composition body in a way positive. Regular participation in sport run associated with index mass body, circumference waist, and thickness folds more skin low in late adolescence and early adulthood (Belanger et al., 2018). Activity physique with intensity moderate and strong sustainable throughout adolescence associated with improvement lean mass on both type gender, while activity strong associated with decrease fat mass in children man (Ramires et al., 2016). Intervention

activity physique programmed produce improvement or maintenance of composition parameters body and decline level excess weight and obesity compared to with education physical conventional (Farias et al., 2009). Regular physical exercise generally leading to a decline obesity and weight gain mass fat- free, although data on the latter limited, especially for woman (Moreno et al., 1997). Findings this underline importance activity consistent and structured physical during adolescence for increase composition healthy body and reduce risk obesity.

Sports activities offer numerous benefits for body composition and health in adolescents. Participation in competitive sports during adolescence is associated with a healthier body composition, higher bone mineral density, and better physical performance in midlife (Ravi et al., 2020). Soccer training in adolescent boys leads to decreased fat mass, increased fat-free mass, and increased strength over time compared to non-participants (França et al., 2023). Active adolescents, regardless of weight status, exhibit lower fat mass, greater muscle mass, higher physical fitness, and better adherence to a Mediterranean diet compared to sedentary peers (Mateo-Orcajada et al., 2022). Sports activities positively affect various organs and systems, strengthening muscles, building physical endurance, and benefiting physical and mental health in adolescents (Becheva et al., 2023). These findings underscore the importance of regular physical activity and sports participation during adolescence to maintain and improve overall health and body composition.

Activity sport can strengthen muscles, increase Power stand physical, and impactful positive on various organs and systems (Becheva et al., 2023). In addition, participation in sport increase behavior prosocial behavior in children and adolescents, including those who have need education special (Li & Shao, 2022). Intervention based sports have also been show effect big positive on function executives, including memory work, control inhibition, and flexibility cognitive abilities in children and adolescents (Contreras-Osorio et al., 2021). Findings This highlight importance push teenager for involved in activity regular exercise, because contribute to health in a way overall, development social and function cognitive. Choosing proper exercise based on constitution and disposition individual recommended For get optimal benefits (Becheva et al., 2023).

CONCLUSION

Based on the research findings, it can be concluded that sports activity shows a statistically meaningful association ($p = 0.002$) with adolescent body composition, particularly in relation to Body Mass Index (BMI). Teenagers who do sport three times a week during one semester showed a higher average BMI low compared to with a group that only exercising once a week. The average difference was 3.71 points in BMI between second group the influence that activity regular and regular physical activity give benefit in guard ideal and supportive body weight composition more body healthy during adolescence.

Study this also confirms importance implementation of a structured and routine sports program in environment education, both at school and college high. Physical education No should only become eye formal lectures conducted very in a week, but need designed to be able to get used to participant educate exercising with frequency more often. With thus, the benefits health physique like control weight loss, reduction risk obesity, and prevention disease metabolic can achieved in a way more optimal.

Findings study This expected can become base for maker policies in the field education and health for designing promotional strategies more sports effective among teenagers. Required Work The same between schools, universities, government, and society for create supportive environment activity regular physical. This effort expected capable build generation younger healthy, fit, and have quality a better life good in the future.

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