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JEPHS
Journal of Exercise Physiology and Health Sciences

Original Article

Open Access

The Relationship Between Physical Activity and the Incidence of Obesity in Elementary School Children

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Citation: Daulay, D.A.A., Prasetyabudi, D. The Relationship Between Physical Activity and the Incidence of Obesity in Elementary School Children. Journal of Exercise Physiology and Health Sciences. 2025, 1(2):22-25.

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Abstract: A person who is obese may be at risk for a number of health problems due to the abnormal or excessive buildup of fat in their body. Physical exercise is one of the risk factors that can result in obesity. Obesity risk can arise from physical inactivity. It is advised that kids and teens (ages 5 to 12) engage in moderately intense physical activity for at least 60 minutes each day. The purpose of this study is to ascertain how physical activity and the prevalence of obesity in elementary schools serving grades 4-6 are related. This study, which is a case-control observational analytical investigation, involved up to 158 participants, of whom 79 were obese and 79 were normal weight. With a odds ratio of 0.318 and p value of 0.001, the statistical test findings demonstrated a significant correlation between physical activity and the occurrence of obesity among Elementary School students. The study's findings led to the conclusion that physical activity and the prevalence of obesity were significantly correlated.

Keywords: Weight Loss; Overweight; Student

1. Introduction

Cardiovascular Obesity is a medical condition characterized by excessive accumulation of body fat, which can lead to a variety of health problems (1). Obesity in children can be caused by a variety of factors, including unhealthy diet, lack of physical activity (2), and genetic factors (3). Children who eat high-calorie foods and rarely move are more prone to excessive fat accumulation, which can negatively impact their health (4). The health impact of obesity on children is very serious and can continue into adulthood (5). Children who are obese are at high risk of developing chronic diseases such as type 2 diabetes, hypertension, and heart disease (6). In addition, obesity can also cause psychological problems, such as low self-esteem and difficulty getting along with peers (7). Physical signs of obesity in children include the appearance of a fatter body than children their age and the presence of fat folds in certain areas such as the thighs and abdomen (8).

Prevention of obesity in children is very important and can be done through lifestyle changes (9). Parents have a key role in forming healthy eating habits and encouraging physical activity (10). Managing a balanced diet, limiting the consumption of sugary foods, and inviting children to exercise regularly are effective steps to maintain an ideal weight (11). With the right approach, obesity in children can be prevented, so that they can grow up healthy and active.

The early signs of obesity in children can be recognized through several striking physical and behavioral traits (12). First, obese children usually look

fatter compared to their peers (13). They may have fatter thighs and abdomen as well as folds in the area (14). In addition, changes in the skin, such as darker or blackish neck areas, can also be an indication of obesity (15). Second, obese children often show breathing problems, such as shortness of breath when exercising or sleep apnea. This can interfere with their sleep quality and daily activities. In addition to physical signs, obese children also tend to experience psychological problems, such as lack of confidence and difficulty in socializing with peers. Third, other symptoms that can be noticed include a rounded face, chubby cheeks, and the presence of a double chin. Children with obesity may also feel tired quickly and always feel hungry. If parents notice some of these signs, it is important to conduct further examinations with medical personnel to assess the child's overall health status.

The Body Mass Index is used to determine if a person is overweight or obese. The Body Mass Index (BMI), in addition to physical observations, is a crucial tool for determining a child's weight status. The formula for calculating a child's BMI under the age of five is weight divided by height squared (kg/m^2). The youngster can be classified as obese if the findings indicate a figure above +3 on the WHO curve. As a result, it's critical that parents routinely measure their children's height and weight and compare the results to relevant growth norms. The causes of childhood obesity are complex and include genetic, psychological, and other variables, as well as an imbalance between energy intake and expenditure. A number of behavioral factors, including diet, increased fast food intake, and a lack of physical activity, contribute to childhood obesity. Examining the relationship between physical activity levels and the prevalence of obesity among primary school pupils is the goal of this study.

2. Materials and methods

Because this study included both an obese and a normal-weight sample of primary school pupils in the city of Surabaya, it was carried out utilizing an observational analytical method in case control. The purpose of the data collection, which uses questionnaires given to primary school students, is to determine the connection between physical activity and the prevalence of obesity among Surabaya's elementary school pupils. Data analysis is done with SPSS software. The Chi square test was used for both univariate and bivariate analysis of the data. SPSS with chi-square was used for the statistical analysis. If the chi square rule is not met, determined from an expected value of less than 5 as much as 20%, the Fisher Exact test is used. The value is considered to have a relationship if it is $p<0.05$, with a confidence degree of 95%.

3. Results

Tabel 1. The Association Between Obesity Incidence and Physical Activity

Variable	**Obesity Status**				***Total***	**p**	**OR**
	Normal Weight		**Obesity**				
Activity Type	**n**	**%**	**n**	**%**			
Light	30	36.59	52	63.41	82		
Medium-Heavy	49	64.47	27	35.53	76	0.001	0.318
Total	79	50.00	79	50.00	158		

[a]Chi Square Fisher Exact *Significant p-value

The data was separated into two categories of obesity status, namely normal weight and obesity, as well as the type of physical activity that the

respondents engaged in. Of the 158 respondents, 79 (50%) were normal weight and the remaining 79 (50%) were obese. In the physical activity category, two types of activities were analyzed: light activity and moderate-vigorous activity. Light Activity: Of the 82 respondents who engaged in light physical activity, 30 (36.59%) were normal weight and 52 (63.41%) were obese. This indicates that the percentage of obesity is higher among those who engage in light activities.

Moderate-Severe Activity: In this group, out of a total of 76 respondents involved in moderate-heavy activities, as many as 49 respondents (64.47%) had a normal weight, while 27 respondents (35.53%) were obese. The proportion of normal body weight was higher among those who did moderate-vigorous activity compared to those who did light activity. Moderate-Severe Activity: In this group, out of a total of 76 respondents involved in moderate-heavy activities, as many as 49 respondents (64.47%) had a normal weight, while 27 respondents (35.53%) were obese. The proportion of normal body weight was higher among those who did moderate-vigorous activity compared to those who did light activity. From this data, it can be concluded that there is a significant relationship between the level of physical activity and the status of obesity in the respondents. More intensive (moderate-strenuous) physical activity tends to be associated with a higher proportion of normal weight and a lower incidence of obesity. It emphasizes the importance of increasing physical activity levels to prevent obesity.

4. Discussion

Low levels of physical activity at school, a lack of extracurricular activities that cut down on children's activities, and a lack of interest in playing outside after school because kids would rather watch television or play games, which makes light activities more common than moderate or heavy ones, are some of the factors contributing to obesity in Surabaya's elementary school students. Furthermore, primary school kids today spend more time at home playing with electronics and watching TV than they do outside, thus the activities they engage in are also light (51.9%) and moderate (35.44%). The Connection Between Obesity Incidence and Physical Activity (16). In addition to aiding in weight loss, physical activity provides numerous other health benefits, including improving bone mineral density, mental clarity, and cardiovascular fitness (17). Physical activity and health have a curvilinear dose-response connection, which implies that people who increase their level of activity from inactivity to moderate activity will, on average, have the biggest health advantages.

5. Conclusions

According to this study, the prevalence of obesity among elementary school pupils is significantly correlated with physical activity. According to the findings, children who engage in little to no physical exercise are more likely to become obese than those who engage in moderate physical activity. In this regard, schools are a crucial setting for putting programs in place that can promote physical activity and so assist stop the onset of obesity.

Conflicts of Interest: The authors declare no conflict of interest.

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