



The effect on self-efficacy on the level of physical activity in adolescents of the Driyorejo Health Center Area, Gresik Regency

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ABSTRACT

Obesity has become a complex issue that can affect all age groups, including adolescents. One of the primary causes of obesity is a lack of physical activity. Low levels of physical activity among adolescents are influenced by various factors, including individual factors such as sex and age. Additionally, low self-efficacy in engaging in physical activity plays a significant role. This study aims to analyse the impact of self-efficacy on the level of physical activity among students. This study employed a quantitative approach with an observational research type. The research was conducted utilising a cross-sectional design. The study was carried out in four high schools within the Driyorejo Community Health Centre area, involving a total of 335 students. The sampling method employed was proportionate stratified random sampling. The research took place from March to April 2024. The data analysis was performed using SPSS version 25 with ordinal logistic regression analysis. The results of the multiple ordinal regression analysis for physical activity suggested that sex ($p=0.000$) and self-efficacy ($p=0.000$) had p -values less than 0.05, indicating a significant effect of both sex and self-efficacy on the level of physical activity among students in the Driyorejo Community Health Centre area. Therefore, efforts that can be undertaken include optimising the role of the School Health Unit (UKS) to provide opportunities for adolescents to share experiences within peer groups, thereby enhancing their motivation to engage in physical activity.

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1. Introduction

One of the goals of Sustainable Development Goals (SDGs) are to ensure good health and improve the well-being of all individuals of various ages with the goal of reducing deaths from non-communicable diseases. One of the non-communicable diseases remaining as a national health problem is obesity. It is the accumulation of fat in adipocytes when calories enter the body and comes from the food consumption exceeding the body's metabolic needs (Telisa et al., 2020). Obesity in children and adolescents is a health problem all over the world (Lee & Yoon, 2018). The Centers for Disease Control and Prevention (CDC) explains that obesity is a pressing health problem in the United States (US) and occupies a great risk in serious health conditions (CDC, 2019). In addition, China and India are the two countries with the highest number of obesity cases in children and adolescents until 2030, with a

projection of around 27.5 million children (World Obesity Federation, 2019). In the recent years, Singapore also reported prevalence of obesity in child and this has become one of the core issues on the agenda of policymakers (Singapore Ministry of Health, 2020).

Indonesia ranks second after Singapore with the largest total number of adolescents experiencing obesity at 12.2% (Liberali et al., 2019). The Basic Health Research report released a report that obese and overweight adolescents aged 13-15 years in Indonesia was 20%, while those of aged 16-18 years was 13.6%. The prevalence of adolescent obesity in Indonesia had increased when compared to 2013, where the obesity rate in adolescents aged 13-15 years increased by 0.4% while in adolescents aged 16-18 years increased by 2.2% (Ministry of Health RI, 2018). This figure would have doubled by 2030 as in other countries if there is no prioritized attention and intervention for the cases (Agustina et al., 2021).

Driyorejo Health Center is one of the areas with tremendous obesity cases in children and adolescents and the numbers steeply increase each year. From the screening results of 4,079 adolescents in the Driyorejo Health Center, obesity in high school students escalate every year, from 85 cases to 306 cases. Thus, it is necessary to prevent obesity from an early age to reduce obesity problems in children and adolescents, specifically in the Driyorejo Health Center area. Theoretically, this study is grounded in Bandura's Social Cognitive Theory (SCT), which posits self-efficacy as the focal determinant of human agency. While external psychosocial factors such as social support (from peers and family) and school environment provide the necessary resources and opportunities, they are often insufficient to drive behavioral change on their own. Self-efficacy acts as the central cognitive mediator; it determines whether adolescents will utilize the available social support and persist in physical activity when facing barriers (Bandura A, 1997). Recent studies affirm this hierarchy, demonstrating that self-efficacy frequently mediates the relationship between social support and physical exercise behavior (Zhang et al., 2022). Consequently, aiming to increase physical activity levels requires a primary focus on the internal belief system of the adolescents, making self-efficacy a critical variable to investigate compared to purely environmental factors.

Self-efficacy has an important correlation in physical activities during adolescence (Bandura A, 1997). This is corroborated by research that self-confidence simultaneously has a significant impact on adolescent physical activity as much as 33% (Hadyansah, 2021). Other research shows that *self-efficacy* are some of the most reliable factors for physical activity and there is a strong link between adolescent physical activity and self-efficacy during exercise (Hamilton et al., 2017). It is one of the predictors in increasing physical activity (Zhang et al., 2022). In contrast, less physical activity occurs due to low *self-efficacy* in adolescents (Kooijmans et al., 2020). It also refers to a person's beliefs and judgments on their ability to successfully engage in certain behaviors. People with high level of *self-efficacy* tend to have higher goals and devote more effort to achieving their goals.

Initiatives to reduce the number of people with obesity in Indonesia have been completed around 21.8% until 2024 and those were included as the targets in the 2020-2024 National Medium-Term Development Plan (RPJMN) under the Presidential Regulation No. 8 of 2020 (Ministry of Health RI, 2020). These initiatives have been implemented through various policies encouraging obesity control programs, one of which is regarding Healthy Living Community Movement (GERMAS). Physical activity is part of the initiatives to live a healthy life that can prevent obesity. WHO recommends that children should complete 60-minute physical activity every day. Regular physical activities are useful for the psychological and physiological aspects of children. According to the aforementioned reasons, this research focuses on preventing obesity by observing at the influence of *adolescent self-efficacy* in performing physical activity.

2. Methods

This study uses a quantitative research approach with an observational research model where the researcher merely conducts observations without intervention to the respondents to obtain the data that would be analyzed. This study also uses *cross sectional* model, particularly through the observation of subjects of research only once at a time or a certain period. This study was conducted with a total sample of 335 students in 4 schools in the Driyorejo Health Center area, Gresik Regency, covering SMAN 1 Driyorejo Gresik, SMKN 1 Driyorejo Gresik, SMA Raden Fatah Driyorejo Gresik and SMK Ma'arif NU

Driyorejo, Gresik. This research has conducted *Ethical Clearance* at the Faculty of Public Health, Universitas Airlangga with number 72/EA/KEPK/2024. The size of the research sample is determined based on a *simple random sampling formula*. The next stage is to determine the total sample of each school by using the proportional number of students in a *proportionate stratified random sampling* method, or the selected respondents of each school will be calculated by the ratio of students in each selected school and the total number of students at high schools in the Driyorejo Health Center area who Selected is multiplied by the minimum number of samples as follows:

Table 1.
The size of the Sample of High School Students Per Strata in the Driyorejo Health Center Area

No	High School	Population	Sample
1	SMAN 1 Driyorejo Gresik	685	88
2	SMKN 1 Driyorejo Gresik	845	109
3	SMA Raden Fatah Driyorejo Gresik	128	16
4	SMK Maarif NU Driyorejo Gresik	950	122
	Total	2.608	335

The variables in this study were grouped into 2: the dependent variable derived from physical activity in students and independent variable from age, sex and self-efficacy of students in carrying out physical activities. The measuring questionnaire of self-efficacy used to assess the answers in the questionnaire was a likert scale test, with the scoring details as follows; high if $X > M + 1 SD$, moderate if $M - 1 SD \leq X \leq M + 1 SD$ and low if $X < M - 1 SD$. The writers used the *Global Physical Activity Questionnaire (GPAQ)* developed by WHO to monitor physical activity (WHO, 2021). This questionnaire has been translated into Indonesian with the following measurement scale:

Table 2.
GPAQ Questionnaire Measurement Categories

Category	MET's (minutes/week)
High	>3000
Medium	$\geq 600 - 3000$
Low	<600

(Istiqamah et al., 2021)

The data was analyzed by utilizing *univariable* analysis to explain each variable in the study and to display the data of respondent criteria, *self-efficacy*, and physical activity level. The raw statistics were then scrutinized through SPSS version 25 while the researchers used ordinal logistic regression analysis to determine the influence among variables.

3. Results and Discussion

Respondent Characteristics Analysis

Table 3.
Student Characteristics Analysis

Characteristics	Total (n)	Percentage (%)
Sex		
Male	157	46,9
Female	178	53,1
Total	335	100.0
Age		
<17 years old	248	74,0
≥ 17 years old	87	26,0
Total	360	100.00

Based on the results obtained in Table 3, the dominant sex of students was women at 53.1% or 178 students, while male respondents was 46.9% or equaled to 157 students. Based on the results obtained in Table 5.1, the age of students was mainly less than 17 years old, which was 74% or approximately 248 students, while students older than 17 years were merely 18.8% or 87 students.

Distribution of Self-Efficacy

Table 4.
Distribution of Student Self-Efficacy

Self-Efficacy	Total (n)	Percentage (%)
High	140	41,8
Medium	79	23,6
Low	116	34,6
Total	335	100,0

Based on Table 4. students' confidence in performing physical activity in the high category was 41.8%, equaled to 140 students. Students with low confidence in physical activity were 34.6%, or approximately 116 students. Meanwhile, students with moderate self-confidence were only 23.6% or 79 students.

Distribution of Physical Activity

Table 5.
Distribution of Student Physical Activity Level

Physical Activity Level	Total (n)	Percentage (%)
High (>3000 MET)	137	40,9
Medium ($\geq 600 - 3000$ MET)	95	28,4
Low (<600 MET)	103	30,7
Total	335	100,0

Based on the results of the research, the majority of students, 40.9% or 137 students, demonstrate a high level of physical activity, students with a low level of physical activity category of 30.7% or 103 students and students with a moderate level of physical activity of 28.4% or 95 students. Most students have been physically active in accordance with the WHO recommendation that children and adolescents aged 5-17 years should complete at least an average of 60 minutes per day with strenuous intensity to strengthen muscles and bones at least 3 days a week.

The Effect of Sex, Age and Self-Efficacy on Physical Activity Level

Table 6.
The Effect of Age and Self-Efficacy on Physical Activity

Variable	Low	Medium	High	P-Value
	n (%)	n (%)	n (%)	
Sex				
Girls	71 (39,9)	56 (31,5)	51 (28,7)	0.000
Boys	32 (20,4)	39 (24,8)	86 (54,8)	
Age				
< 17 years old	81 (32,7)	74 (29,8)	9 (5,2)	0.142
≥ 17 years old	22 (25,3)	21 (24,1)	4 (2,1)	
Self-Efficacy				
High	6 (4,3)	26 (47,8)	108 (77,1)	0.000
Medium	25 (31,6)	38 (48,1)	16 (20,3)	
Low	72 (62,1)	31 (26,7)	13 (11,2)	

The analysis of the sex influence on the level of physical activity resulted in a *p-value*, where $(0.000) < 0.05$, then H_0 was rejected. In other words, there is a significant impact between the sex on the level of physical activity of students in the Driyorejo Health Center area. The analysis of the effect between age on the level of physical activity obtained a *p-value* $(0.142) > 0.05$, then H_0 was accepted. The age does not affect the level of physical activity in the Driyorejo Health Center area. The analysis of the effect of *self-efficacy* on the level of physical activity obtained a *p-value* $(0.000) < 0.05$, then H_0 was rejected. In contrast with previous variable, there was a compelling impact of *self-efficacy* on the level of physical activity of students in the Driyorejo Health Center area.

Discussion

Influence of Sex on Physical Activity Level

Sex could distinguish students' physical activity level as depicted by the results of the study in the Driyorejo Health Center area, Gresik Regency. This is in line with the former research of (Kurnianingsih, Batiari and Oktaviani, 2022), which there was an influence of the sexes on physical activity. Female adolescents had 5.2 times higher odds of conducting low physical activity compared to their male counterparts. As proven in the research by Ballesteros, Piccardi dan Goh, (2022), there is a substantial difference between the levels of physical activity for male and female students, including the higher frequency of male students' physical activity. Male students exercise four or more times a week compared to female ones. The latter subjects do not commonly perform physical activity due to an encouragement to spend more time studying and perform household activities rather than the physical activity (Baharudin et al., 2014). In addition, male students often participate in physical activities, including outdoor sports compared to females (Carayanni et al., 2021). The majority of male students in this study performed physical activity in the high category with a MET of $>3,000$, as also evidenced by previous studies. Some activities within a high category are lifting heavy weights and undertaking sports-such as gym, futsal, badminton-with an intensity 3-4 times a week. This is relevant because women had more restricted opportunities for sports, hence the physical activity carried out by men is higher than that of women (Al-Hazzaa et al., 2011).

The Effect of Age on Physical Activity Level

Age considerably has an impact towards the level of physical activity of students. Despite the evaluation, the results in Table 5. depicted that age did not have a substantial effect on the level of students' physical activity in the Driyorejo Health Center area, Gresik Regency. The results are in contrast to the former research conducted by Li et al., (2020), arguing that age is significantly correlated with physical activity in adolescents. This occurs because older respondents (17 years old) have an active percentage of physical activity levels for 7 days compared to younger people (10 years). Physical activity levels decrease as the person becomes older due to lifestyle (Rosselli et al., 2020). Older adolescents were found to be less active compared to younger adolescents; older children or adolescents assumed it as a barrier, whereas younger adolescents are considered facilitators (D. Hu et al., 2021). The findings of some studies differ from the results of this study due to no significant effect between age on physical activity levels. Corroborated by research conducted by Kurnianingsih et al., (2022), age does not significantly affect physical activity in adolescents because the respondents were in the same age group, or the adolescent; where in general, the adolescent age group performs higher physical activity compared to the adult age group. Research by Apriliani & Sofiani (2020) also confirmed that there was no meaningful relationship between ages and physical activity in adolescents. The relevance of comparing these contradictory results lies in highlighting the specific characteristics of the study population. Previous studies often analyzed a broad age spectrum (e.g., 10 to 18 years), capturing the drastic behavioral changes from childhood to adolescence. In contrast, this study focused on a homogenous group of high school students (grades X and XI), predominantly aged 16–17 years. The lack of significant difference in this study suggests that the decline in physical activity reported in broader studies may have already plateaued by the time students reach senior high school. Consequently, this finding offers a crucial insight for policymakers: within the high school environment, age is not a distinguishing factor for physical inactivity. Therefore, health interventions aimed at increasing physical

activity in high schools do not need to be segmented by age or grade level, but should instead focus on other significant determinants such as gender and self-efficacy.

The Effect of Self-Efficacy on Physical Activity Level

The *simple ordinal regression* test demonstrates that *self-efficacy* has a significant effect on the level of physical activity of students in the Driyorejo Health Center area, Gresik Regency. These results are in accordance with research conducted by Hu *et al.*, (2016), that *self-efficacy* has a strong relationship with physical activity in adolescents. Other research proved that *self-efficacy* affects physical activity in adolescents (Alrimali, 2023). Other studies using the *cross-sectional method* validated that there is a significant relationship between *self-efficacy* with physical activity in high school teenagers (Zhao *et al.*, 2019).

Self-efficacy determines which activities a person will accomplish, the amount of effort they spend in those activities, the extent to which they survive in the face of difficulties and the cognitive and emotional evaluations caused by success and failure (Bandura A, 1997). It refers to an individual's assessment of himself or herself whether he or she is able to complete an activity and has the confidence and certainty to complete it (Trudeau *et al.*, 2004). *Self-efficacy* is one of the predictors in increasing physical activity (Hamilton *et al.*, 2017). Other studies show that *self-efficacy* It is defined as a person's confidence in self-regulation and the ability to do physical activities in the face of various difficulties. *Self-efficacy* is highly important in the initial process of a person's participation in physical activity. The higher it is, the higher the level of physical activity (Motl *et al.*, 2007).

4. Conclusion

Based on research conducted at SMAN 1 Driyorejo, SMKN 1 Driyorejo, SMA Raden Fatah, and SMK Ma'arif NU Driyorejo, it can be concluded that male students have a higher level of physical activity compared to females, while age does not affect the level of physical activity. In addition, students with higher self-efficacy demonstrate a higher level of physical activity in the Driyorejo Health Center area, Gresik Regency. Thus, it is necessary to optimize the role of the School Health Unit (UKS) to provide space for adolescents to share experiences and increase their motivation. However, to validate these findings beyond associations, future research should employ longitudinal designs to rigorously test the causal relationship between self-efficacy and physical activity over time.

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