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THE CORRELATION BETWEEN PHYSICAL ACTIVITY AND BODY MASS INDEX (BMI) FOR ADOLESCENT STUDENT

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ABSTRACT

Obesity is a disease that occurs due to the accumulation of excess fat tissue in the body and it is bad for health. This study aims to determine the frequency of physical activity, BMI category and the relation between physical activities with the level of BMI. The respondents are 99 adolescents aged 15-19 years old. They were selected using random sampling techniques. Physical activity was measured using the PAQ-A instrument and BMI levels were assessed by height, weight, gender, and age range. Data were analyzed using Pearson correlation test. The calculation results showed no relationship between physical activity with BMI (r = 0.112; p = 0.271> 0.05). Most students have the light category of physical activity and normal BMI levels.

KEYWORDS: *Physical Activity, Body Mass Index, Adolescent Student*

INTRODUCTION

Obesity is an important issue that is developing at this time. Obesity in children will decline their physical activity and creativity. Overweight makes children become lazy, as a result, it decreases the level of cognitive capacity of the children(1). Lazy behavior in children and adolescents can also be influenced by a lack of knowledge about how to perform ideal physical activity besides the motivation of doing the exercise. They hold a common paradigm that doing physical activity creates feel pain and fatigue. Obesity also has a negative impact on the growth of a young individual, especially in psychosocial development(2,3), low self-esteem, and other social disorder behaviors(4). Obesity is a classic problem in school and community settings, but it is important to note because obesity has a significant impact on health, quality of life, and life expectancy(5,6). These impacts contribute as one of the main factors trigger the emergence of several non-communicable diseases, including hypertension, stroke, and diabetes mellitus(7,8). In addition, the psychological impact was assessed to occur diversely in each individual who experienced the incident(9).

In general, the prevalence of overweight children and adolescents shows a dramatic increase. Surveys in Taiwan and Hong Kong, show that one out of four children has obesity problems (10). In Indonesia, according to data from Basic Health Research (11), there is the prevalence of cases of overweight and obesity in adolescents aged 16-18 years as much as 7.3%. The province with the highest prevalence of cases was experienced in Jakarta at 4.2% and the lowest in West Sulawesi by 0.6%. The trend of nutritional status (BMI) of adolescents aged 16-18 years with the prevalence of overweight or obese cases increased from 1.4% in 2007 to 7.3% in 2013, the more nutrition has been identified since the age of under-fives with the prevalence of 11 , 9%.

The effect of such prevalence can be attributed to habitual patterns or lifestyles of less-active people(12). The large obesity prevalence rate is associated with a decrease in the use of time for physical activity in addition to increased consumption of energy-dense foods(13,14). There are only 9.0% of the population of Indonesia among the age of above 15 years who are included in the category enough activity, most people also do physical activity, but most do not meet the requirements as physical activity enough, the presentation of the inhabitants less physical activity reached 84.9% and even 9.1% of them were included to the category of sedentary(15).

Regarding body composition in terms of weight control and physical health, physical activity is a basic means of relating to the development, health, and well-being of a person. Lack of physical activity contributes to the cause of illness or death related to the risk of non-communicable diseases in the long run. This study aims to figure out the frequency of physical activity, BMI categories and the relationship between physical activity and BMI levels in adolescent students.

METHOD

Participant

Participant in this research was the students of the vocational high school in grade 11. The number of respondents involved as many as 99 students. Characteristics of participants included were participants in the group of adolescents with a range of age 15-19 years old, following the activities in school, has the characteristics of adolescents in general, and have spare time.

Physical Activity Measurement

Physical activity was measured using a questionnaire adapted from the international journal The Physical Activity Questionnaire for Older Children (PAQ-C) and Adolescents (PAQ-A) with some modifications as it was adjusted to the conditions and habits of physical activity in Indonesia(16,17). This physical activity questionnaire is an instrument performed by remembering the activities performed on the previous seven days. Questionnaires in the PAQ-A questionnaire included scaled response questions, which formed a question that used a scale to measure and find out a summary of the general physical activity of the respondents as the response to the questions provided in the questionnaire. In this questionnaire, the response scale statements were reflected in the eight questions and one question to identify students who had unusual activity in the previous week, but this was not used in the score measurement section of summary activity. Furthermore, the activity was categorized to be very light, light, medium, heavy, and very heavy. The purpose of using this questionnaire was to measure the level of variables that may be considered most important by the respondents who can later be made material improvements of the most important parts.

Body Mass Index

Body mass index (BMI) is defined as a result of anthropometric test or human body measurements. The data include both height and weight measurements. Body height measured with stature meter with 0.1 cm accuracy and weight measurement using digital scales with 0.1 kg accuracy. BMI measurements were obtained from body weight in kilograms divided by squared height in square meters (kg/m^2). The interpretation of BMI depends on the age and sex of the child, as boys and girls have different body compositions. The BMI value for obesity in adolescents follows the WHO criteria for Asian people(18) based on the BMI table of adolescent girls and men aged 10-19 years with very thin, thin, normal, obese, and very obese categories.

Data Analysis Procedures

Data processing and analysis were done by using SPSS program version 21.00 for windows. Data processing consists of frequency of respondent and Pearson correlation test.

RESULTS AND DISCUSSIONS

The results of the percentage of characteristics based on physical activity and BMI value are discussed in the following table.

Table 1: Frequency of Respondents by Physical Activity

Physical Activity Category	Frequency	Percentage
Very light	2	2 %
Light	85	86 %
Medium	11	11 %
Heavy	1	1 %
Very Heavy	0	0 %
Total	99	100 %

Table 2: Frequency of Respondents by Body Mass Index

Body Mass Index	Respondents	Percentage
Very thin	0	0 %
Thin	6	6 %
Normal	76	77 %
Obese	11	11 %
Very Obese	6	6 %
Total	99	100 %

Based on the research conducted by the researchers, Table 1 shows that the categories of activity of the respondents are very light as much as 2%, light 86%, medium 11%, heavy 1%, and none included in the category of very heavy activity. The BMI value describes in table 2. It can be obtained that the respondents categorized in the category of thin as much as 6%, normal 77%, obese 11 %, and very obese as much as 6%.

Table 3: Correlation between Physical Activity and Body Mass Index

		Physical Activity	Body Mass Index
Physical Activity	Pearson Correlation	1	.112
	Sig. (2-tailed)		.271
	N	99	99
Body Mass Index	Pearson Correlation	.112	1
	Sig. (2-tailed)	.271	
	N	99	99

From the correlation test results, it was obtained correlation coefficient r value = 0.112. Then the test of significance on the variable of physical activity with body composition represented by body mass index (BMI) got probability number p = 0,271>0.05. It showed that there was no significant correlation between physical activity and BMI in vocational high school.

Based on the physical activity data from this research, the respondents were categorized as a good physical activity that was only 11% and weight only 1% only, while 2% of the respondents have very light category or included an the activity sedentary and 86% of respondents had mild activity which also included in explanation of lack of activity (inactivity). This phenomenon needs attention, because many other factors -besides BMI, which only gives an effect of 1.2% only to physical activity of students -that affect the lack of physical activity.

Factors affecting the lack of activity should also be researched to the same respondent. However, Vilhjalmsson and Thorlindsson(19)explained that there are many factors related to the lack of activity in adolescents such as gender, physiological characteristics, sports subject in school, watching TV, season and weather, environmental security, the influence of parents, and peer influence. Our study failed to show a positive relationship between a lack of activity and obesity.This may due to the small number of obese in our study. Although there was no significant association between physical activity and BMI, but many studies show that lack of activity can lead to overweight and obesity(20–22).

Regarding the description of BMIrespondents in this study, it was known that the prevalence of overweight or obesity with the prevalence of underweight had an equation of 6%. Nevertheless, added with the number of fat categories ranging from 11%, high BMI values require more attention. In addition, the BMI in the normal category of 77% does not mean it does not require monitoring and regardless of the threat of disease, respondents in this category also require monitoring on other factors that may affect the occurrence of health problems.

CONCLUSIONS

Our study concludes that many students belonged to the light category of physical activity. For future study, researchers recommend to look for factors of lack of physical activity in students and factors that affect BMI. Furthermore, it can also be studied about the relationship of physical activity with the measurement of body composition as a whole by looking for correlation through measurement of waist circumference, lipid fat, and other anthropometric measurements.

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REFERENCES

1. *Rostania M, Syam A, Najamuddin U. Nutrition Education Effect to Knowledge and Sedentary Lifestyles Change to Overweight Childhood. Makasar; 2013.*
2. *Agrawal P, Gupta K, Mishra V, Agrawal S. The Psychosocial Factors Related to Obesity : A Study Among Overweight,Obese, and Morbidly Obese Women in India. Women Health. 2015;55(6):623–45.*
3. *Rosengren A, Teo K, Rangarajan S, Kabali C, Khumalo I, Kutty VR, et al. Psychosocial factors and obesity in 17 high-, middle- and low-income countries : the Prospective Urban Rural Epidemiologic study. Int J Obes. 2015;39(8):1217–23.*
4. *Djalalinia S, Qorbani M, Peykari N, Kelishadi R. Health impacts of obesity. Pak J Med. 2015;31(1):239–42.*
5. *Busutil R, Espallardo O, Torres A, Martínez-galdeano L, Zozaya N. The impact of obesity on health-related quality of life in Spain. Heal Qual Life Outcomes. 2017;15(197):1–11.*
6. *Jia H, Lubetkin EI. The impact of obesity on health-related quality-of-life in the general adult US population. J Public Health (Bangkok). 2005;27(2):156–64.*
7. *Mayige M, Kagaruki G, Ramaiya K, Swai A. Non communicable diseases in Tanzania : a call for urgent action. Tanzan J Health Res. 2012;14(2):1–12.*

8. *Gupta R, Xavier D. Hypertension : The most important non communicable disease risk factor in India. Indian Heart J [Internet]. 2018;4–11. Available from: http://dx.doi.org/10.1016/j.ihj.2018.02.003*
9. *Young-hyman D, Tanofsky-kraff M, Yanovski SZ, Keil M, Cohen L, Peyrot M, et al. Psychological Status and Weight-Related Distress in Overweight or At-Risk-for-Overweight Children. Obes (Silver Spring). 2007;14(12):2249–58.*
10. *Gill T. Young people with diabetes and obesity in Asia : a growing epidemic. Diabetes Voices. 2007;52(May):20–2.*
11. *BPDANP Kesehatan. Riset Kesehatan Dasar [Internet]. Kementerian Kesehatan RI. 2013 [cited 2018 Mar 19]. p. 1–306. Available from: www.depkes.go.id/resources/download/general/Hasil Riskesdas 2013.pdf*
12. *Kobel S, Kettner S, Kesztyu D, Erkelenz N, Drenowatz C, Steinacker JM. Correlates of habitual physical activity and organized sports in German primary school children. Public Health. 2015;129(3):5–11.*
13. *Biro FM, Wien M. Childhood obesity and adult morbidities 1 – 4. Am J Clin Nutr. 2010;91(5):1499–505.*
14. *Chan RSM, Woo J. Prevention of Overweight and Obesity : How Effective is the Current Public Health Approach. Int J Environ Res Public Health. 2010;7(3):765–83.*
15. *Notoatmodjo S. Ilmu perilaku kesehatan. Jakarta: Rineka Cipta; 2010.*
16. *Kowalski KC, Crocker PRE, Faulkner RA. Validation of the Physycal Activity Questionnaire for Older Chlidren. Pediatr Exerc Sci. 1997;9(2):174–86.*
17. *Sunduss Baqir Dawood & Izz Al-deen Fakhr Al-deen Baha' Al-dee, Impact of Maternal Body Mass Index on Obstetric Outcome in Women Attending Labor in Al-Basra Hospitals, International Journal of General Medicine and Pharmacy (IJGMP), Volume 3, Issue 5, August-September 2014, pp. 69-80*
18. *Kowalski KC, Crocker PRE, Donen RM. The Physical Activity Questionnaire for Older Children (PAQ-C) and Adolescents (PAQ-A) Manual. Canada: College of Kinesiology University of Saskatchewan; 2004. 1-37 p.*
19. *Kurniasih D, Soekirman, Thaha A., Hardinsyah, Hadi H, Jus'at I, et al. Buku sehat dan bugar berkat gizi seimbang. Jakarta: Nakita dan Yayasan Institut Danone; 2010.*
20. *Vilhjalmsson R, Thorlindsson T. Factors Related to Physical Activity : A Study of Adolescents. Soc Sci Med. 1998;47(5):665–75.*
21. *Yombom Bam & Usha Malagi, Nutritional Status Based on Body Mass Index of Adult Apatanis: A Tribal Population of Lower Subansiri District, Arunachal Pradesh, India, IMPACT: International Journal of Research in Applied, Natural and Social Sciences (IMPACT: IJRANSS), Volume 4, Issue 11, November 2016, pp. 31-36*
22. *Mahfouz AA, Abdelmoneim I, Khan MY, Daffalla AA, Diab MM, Al-Gelban KS, et al. Obesity and Related Behaviors among Adolescent School Boys in Abha City, Southwestern Saudi Arabia. J Trop Pediatr. 2007;54(2):120–4.*
23. *Metabolism E. Relationship between physical activity related energy expenditure and body composition : a gender difference. Int J Obes. 1997;21:184–8.*

24. *Collins AE, Pakiz B, Rock CL. Factors associated with obesity in Indonesian adolescents. Int J Pediatr Obes. 2008;3(1):58–64.*