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The Association Between Physical Activity with the Nutritional Status of Student in Faculty of Medicine Tarumanagara University in 2019-2020

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ABSTRACT
Physical activity as one of the factors that contribute to energy expenditure is related to nutritional status which is described as the energy balance of nutritional intake with the body's energy needs. This study aims to study the relationship between physical activity and nutritional status of students of the Faculty of Medicine, Tarumanagara University Class of 2019-2020. The design of this research was descriptive analytic with a cross-sectional approach. Physical activity data was collected using the GPAQ (Global Physical Activity Questionnaire) questionnaire and nutritional status data was collected using anthropometric measurements (WHO Asia Pacific Body Mass Index). The results showed that from 136 students, there were 73 (53.7%) students who had low physical activity, 48 (35.3%) students had moderate physical activity, and 15 (11.0%)) students had high physical activity. Based on the nutritional status,there were 65 (47.8%) students with normal nutritional status, 30 (22.1%) students with nutritional status at risk of obesity, 26 (19.1%) students with obese nutritional status I, and 15 (11 .0%) students with obese nutritional status II. The results of the analysis test between physical activity and nutritional status using the Chi-Square Test obtained p-value = 0.092 and prevalence risk was 1.325. The conclusion of the research is that there was no statistically significant relationship between physical activity and nutritional status of students at the Faculty of Medicine, Tarumanagara University Class of 2019-2020. Respondents who do low physical activity had a 1.325 times higher risk of having a nutritional status of obesity and obesity risk than respondents who engage in moderate and high physical activity.

Keywords: *Physical activity, Nutritional status, Faculty of medicine students*

1. INTRODUCTION

Nutritional status is a health status that shows the balance of a person's energy needs and intake. This status is indicated by the ratio of height and weight. Overweight is a major risk factor for noncommunicable disease. [1, 2]. Based on WHO data in 2016 more than 1.9 billion adults were categorized as overweight and 650 million of them were obese. [3]

The prevalence of the proportion of adults with obesity (age >18 years) increased from 15.4% (2013) to 22% (2018). [4,5,6]. DKI Jakarta is the province with the highest prevalence of obese adults (age > 18 years) in 2018 and ranked second in 2013. There was an increase in prevalence from 19.4% (2013) to 29% (2018). Increased prevalence of the proportion of less physical activity in the population aged 10 years, from 26.1% (2013) to 33.5% (2018) and DKI Jakarta is the province with the highest prevalence in terms of the proportion of lack of physical activity in the population aged 10 years in 2018 with a prevalence of 47.8% . [5,6]

A person's nutritional status is influenced by various factors, one of which is physical activity. Physical activity is protective against obesity and overweight. Adequate physical activity can improve the quality of life and control nutritional status by maintaining a balance of

energy expenditure. [7,8] Poor physical activity is caused by busy daily activities, indulgent technology to rarely move, as well as increased facilities and facilities that support the formation of a sedentary lifestyle and 23% of people aged over 18 years does not do adequate physical activity. [8, 9]

Based on study on secondary data on third and fourth year medical student conducted at a university in Indonesia in 2018, it was found that 60% of Faculty of Medicine students did not have an adequate level of physical activity. This situation can be caused by a tight schedule of lectures and study, the increased use of electronic devices in spare time such as mobile phones, computers, and television also reduces the number of physical activity so that the formation of a sedentary lifestyle among students.[10]

In light of this information, researchers are interested in knowing patterns of physical activity in regards to nutritional status. This study aims to determine the relationship between physical activity and nutritional status of students of the Faculty of Medicine, Tarumanagara University Class of 2019-2020.

2. METHOD

The study sample consisted 136 students year 2019-2020 at the Faculty of Medicine, Tarumanagara University and used observational with a cross-sectional design. Sample selection was done by using consecutive non random sampling technique which was taking all subjects encountered in the population according to inclusion and exclusion criteria that at least met the minimum number of study subjects. The inclusion criteria in this study were subjects enrolled as Students of the Faculty of Medicine, Tarumanagara University. Age 18 – 25 years in good health, fulfilled GPAQ questionnaire and willing to become a respondent by signing a written informed consent. The data collected online in February–June 2021 (Google Forms). A questionnaire method used to collect data. The questionnaire to Measurement of physical activity using the Global Physical Activity Questionnaire (GPAQ). Physical activity assessment was conducted using GPAQ consisting of 16 questions about physical activities (P1-P16) which were separated into 3 areas : working activities (high intensity: P1-P3, moderate intensity: P4-P6), walking activities (P7-P9), and recreation exercises (high intensity: P10-P12, moderate intensity: P13-P15), in addition to sitting(P16). This questionnaire was used to assess the physical activities performed based on the total combination of metabolic equivalent (MET) minutes within 1 week

METS for light physical activity is 1.5, moderate physical activity is 4 METS and 8 METS for heavy physical activity. To assess the physical activity score is calculated by multiplying the minutes spent in each activity by the number of days of activity. Physical activity scores were classified into low (<600 METSMin/Week) and normal (≥600 Mets Min/Week). [16] Nutritional status was calculated by the body mass index (BMI) of the respondents. BMI is calculated based on body weight in (kg) divided by height squared (m2). BMI was divided into 2 groups according to Asia-Pacific: normal weight (BMI 18.5–22.9 kg/m2), abnormal weight divided: risk of obesity and obesity (23 kg/m2).

Data analysis was researched using computer software. Percentage, frequency, number (n), mean, standard deviation (SD), and percentage value (%) were provided as descriptive statistics. level. Chi-square test is used to analyze the relationship between physical activity and nutritional status. The significance level was accepted as p-value < 0.05.

3. RESULT

A total of 136 people completed the questionnaire. The gender of the participants was 92 females (67.6%) and 44 males (32.4%). The mean age of respondents was 18.8 ± 0.9 years. The distribution in 2019 is 66 (48.5%) respondents, and the respondents in 2020 are was 70 (51.5%) respondents. Based on the intensity of physical activities, 73 persons (80.9%) performed light activities, 48 person(35,5%) moderate activities and 15 out of 136 respondents (11%) performed high activities. Respondents with METS 600 were 73 (53.7%) and 63 (46.3%) respondents had 600 METs. There were 71 (52.2%) respondents with body mass index (BMI) at risk of obesity and obesity and 65 (47.8%) respondents with a normal body mass index (BMI). Research related to the characteristics of respondents can be seen in Table 1.

The association between the physical activity and nutritional status was presented in Table 2. Chi Square test shows that there is no significant relationship between physical activity with nutritional status (p-value = 0.092) and the prevalence risk was 1.325, which means that respondents who did physical activity with METs <600 had 1.325 times (PR = 1.325) higher risk of having abnormal nutritional status than respondents who did physical activity with METs 600.

Table 1. General Characteristics of The Respondents

Variabel	N(%)	Mean ± SD
Gender		
Male	44 (32.4)	
Female	92 (67)	
Age		18,81±0.907
Class of 2019	66 (48.5)	
Class of 2020	70 (51.5)	
Physical activity intensity		
Light	73 (53.7)	
Moderate	48 (35.3)	
High	15 (11)	
Physical activity in METs		
<600 METs	73 (53.7)	
≥600 METs	63 (46.3)	
Nutritional Status		
Risk of obesity and Obesity	71 (52.2)	
Normal	65 (47.8)	

Table 2. The association between the physical activity and nutritional status

Parameter	Nutritional Status		Total	*P-Value*	PR
Physical activity	Normal	risk of obesity and obesity			
≥600 METs	30	43	73		
<600 METs	35	28	63	0,09	1.325
Total	65	71	136		

4. DISCUSSION

Based on research on students of the Faculty of Medicine, Tarumanagara University in 2019-2020 of 136 respondents, 53.7% had a low physical activity. The findings of this study are much higher than the research by Habut et al. in 2015 with 107 research respondents, 38.3% of respondents had low physical activity. This difference can be caused by differences in the measuring instruments used the study used the International Physical Activity Questionnaire (IPAQ) to measure the respondents' physical activity. The condition of low physical activity in respondents can be influenced by data collection carried out during the COVID-19 pandemic so that students' daily physical activities are limited. [10]

The results showed that 71 (52.2%) respondents with body mass index (BMI) were at risk of obesity and obese. These findings are much higher than the research conducted by Setyani in 2019 with a number of respondents as many as 170 students. It was found that 70 (41.2%) respondents had a BMI at risk of obesity and obese. This difference is influenced by differences in the age characteristics of the respondents. [11]

The results of data analysis there is no significant relationship between physical activity and nutritional status with p-value = 0.092. The findings of this study are similar to the research of Syaputri Hutasuhut in 2011 with 89 respondents and Fabianus 2018 research with 180 respondents, there is no significant relationship between physical activity and nutritional status, with p-values of 0.710 and 0.095. [12,13]

The research by Bruna Gonçalves C. da Silva et al in Brazil with 3,206 respondents aged 23-30 years found a relationship between high physical activity and low body mass index (BMI). This difference can be caused by a larger number of respondents, differences in race, and different methods of assessing physical activity and nutritional status, namely self-report. [14]

The same results from the research conducted by Borja del Pozo-Cruz et al in New Zealand with the results of 1812, respondents aged 5-24 years found that there was a relationship between high physical activity and low body mass index (BMI). This difference is caused by the larger number of respondents, racial differences, and different measuring instruments using the Actigraph accelerometer. [15]

Due to the collection of weight and height data obtained from subjective measurements of respondents, the results of the study are not significant. Researchers did not conduct a direct examination of weight and height. Researchers did not do a diet recall and asked about eating habits. In this study there are limitations in data collection because researchers can only retrieve data through filling out google forms so that researchers cannot explain questions to respondents directly.

The results showed that 73 (53.7%) respondents had MET <600 and 63 (46.3%) respondents had MET 600. There were 71 (52.2%) respondents with a body mass index (BMI) at risk for obesity and obesity, while 65 (47.8%) respondents had a normal body mass index (BMI). There was no significant relationship (p-value = 0.092) between physical activity and nutritional status, but respondents who did physical activity with METs < 600 had an 1.325 times (PR = 1,325) higher risk of having obesity nutritional status and obesity risk than respondents who perform physical activity with METs 600.

It is recommended for further research to add respondents who are on a diet or fasting in the exclusion criteria. Using objective physical activity measurement methods such as questionnaires and physiological indicators to obtain more accurate data.

AUTHORS' CONTRIBUTIONS

Yemima Graciela created the proposal, collected data about physical activity, body weight, height and characteristic responden. Yemima Graciela and Susy Olivia Lontoh analyzed data and created the article

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