ORIGINAL ARTICLE

Physical Activity and Nutritional Status of College Students During Covid-19 Pandemic

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ABSTRACT

Introduction: The Large-Scale Social Restrictions (PSBB) has been carried out in Indonesia in early 2020 as an effort to prevent the global spread of Covid-19. The enforcement of distant learning can cause other problems, such as increased sedentary behaviour and obesity. This study aimed to analyse the physical activity and nutritional status of West Java college students during the Covid-19 pandemic. **Methods:** This study used a cross-sectional study design and conducted 1-2 months after the enforcement of the Large-Scale Social Restrictions in West Java. 330 students from 11 universities volunteered to become respondents of the study by filling out a questionnaire on Google Form. The IPAQ instrument was used to determine the level of physical activity and BMI to find out the nutritional status. Data were analysed by using the multinomial logistic regression. **Results:** The results showed 73.3% students have normal nutritional status and 40.6% performed the vigorous physical activity. Nutritional status did not correlate with physical activity of students ($p=0.555$, $p> 0.5$) but correlate with characteristics and physical activity as a model ($p=0.021$, $p< 0.05$). Study program partially correlate with nutritional status ($p=0.008$, $p<0.05$). **Conclusion:** The study concludes that age, sex, study program, and physical activity had a significant effect on nutritional status, although physical activity did not partially affect them.

Keywords: Covid-19, Exercise, Nutritional status, Students

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INTRODUCTION

The emergence of Covid-19 pandemic, at the end of 2019 in Wuhan China, has a systemic impact on the lives of all mankind (1). The Covid-19 case in Indonesia was confirmed in early January 2020 (2). Initially, Indonesian government did not impose a lockdown or Large-Scale Social Restriction (PSBB) what was done in China (3). However, due to its rapid spread which could lead to a death, the government immediately imposed a large-scale social restriction to prevent the spread of the Covid-19 virus (2). During the large-scale social restriction, 47.4% of students experienced moderate academic stress, while 51.1% of students experienced emotional eating. Thus, academic stress has a significant relationship to emotional eating behaviours in students (4). The Covid-19 pandemic has increased anxiety and depression which have been linked to impaired sleep quality (5), physical activity, and eating behaviour (6).
Physical activity of children and adolescents, during the large-scale social restrictions, required new adaptations as an effort to prevent the spread of Covid-19 (3). This was allegedly disrupting the sleep pattern, eating pattern, and physical activity when students did not attend school normally (7). It also happened in the field of education, which required the closure of school and reinforced remote and online learning to prevent the increasingly massive spread of Covid-19 virus. Distance learning at home does not only increase the higher screen time, it also increases sedentary behaviour (8,9). Lack of physical activity can also trigger excessive stress in children and adolescents, including parents (10). Decreased daily physical activity (11) can lead to weight

gain (12). During school holidays, the availability of food at home is not balanced with the physical activities usually conducted during school days (13). The need for physical activity and balanced nutrition is required to maintain immunity to prevent the Covid-19 virus infection (14).

Social life of sports college students and non-sports college student's backgrounds in Indonesia has quite a contrasting difference (15,16). The fulfilment of the course demands and the role as a student athlete make students have a healthy lifestyle (17). Therefore, the need of physical activity recommended by WHO for non-sports students should to be fulfilled, so that the body will always be in good health (18–20). The fulfilment of physical activity among adolescents, especially sports and non-sports students during the Covid-19 pandemic, is quite worrying. Because it can lead to overweight and obesity (10,12,21). It indicates a need to understand the nutritional status of sports and non-sports students in the Covid-19 Pandemic situation. This study aimed to determine the factors affecting the nutritional status of college students during the Large-Scale Social Restrictions (PSBB) in the midst of Covid-19 Pandemic in early 2020.

MATERIALS AND METHODS

Participants

This study used a cross-sectional study design (22). Participants were recruited from the Universities, Colleges, and Polytechnique in West Java. Respondents were recruited through WhatssApp, email, and messenger. A total of 330 students in West Java Province were taken as subjects using snowball and accidental sampling. The only inclusion criteria was participants were still listed as undergraduate students at the time of the study. Participation was voluntary and the participants were not compensated.

Instrument

Physical activity was measured through International Physical Activity Questionnaire - Short Form (IPAQ-SF) (23) in Google Form (24) that is valid and reliable to be used in many countries (25). IPAQ is categorized into three, 1) vigorous when the intensity of strenuous activity is at least 3 days with 1500 MET-minutes/week or other physical activity combined with walking, moderate or high-intensity activity ≥7 days reaching a minimum of 3000 MET-minutes/week, 2) moderate, if the intensity of heavy activity min. 20 minutes/day for ≥ 3 days, or the intensity of moderate activity or walking min. 30 minutes/day for ≥ 5 days or combination of walking, moderate or high activity for ≥ 5 days reaching a minimum of 600 MET-minutes/week, 3) light when it does not reach the moderate and high categories (23). The nutritional status was reflected in BMI status (26). The weight and height data were calculated to determine BMI status (kg/m2) using the Asia-Pacific standard (27, 28). The classifications of BMI used Asia-Pacific Region standard (Underweight < 18,5 ; Normal 18,5 - 22,9 ; Overweight (at-risk obesity) > 25,0 – 29,9; Obese > 30,0) (20). The body weight and height were filled out by respondents in Google Form. Data were analysed using the multinomial logistic regression.

Analysis

First, descriptive statistics were compiled to describe the participant demographics (eg, age, gender, city, study program, physical activity, and nutritional status). Second, all variables were associated to nutritional status. Third, all data were analyzed using the ordinal logistic regression.

Ethical Clearance

This research was approved by Institute of Research and Community Service, Universitas Pendidikan Indonesia, Bandung, No. 626/UN.40.D/PT/2020.

RESULTS

A total of 330 participants filled out the questionnaire. The majority of participants were teenagers (92.1%), while the rest of them were adults (7.9%). Nutritional Status of 73.3% participants were Normal, 16.4% were underweight, 5.5% were overweight, and 4.8% were obese. Meanwhile, the student physical activity in the high category was 40.6%, in the moderate category was 26.7%, and in the low category was 32.7% (Table I).

Table I: Data description

Variable	Sum	Per-centage	Min	Max
Age, mean+SD (y)	19.75+2.1		17	39
Age Group				
Adult	304	92,1		
Adolescent	26	7,9		
Sex				
Male	105	31,8		
Female	225	68,2		
Study Program				
Sport	129	39,1		
Non-sport	201	60,9		
TB, mean+SD (cm)	160.4+7.8		132	190
BB, mean+SD (kg)	55.12+9.6		35	95
IMT, mean+SD (kg/m2)	21.39+3.17		14.2	34.4
Nutritional Status				
Underweight	54	16.4		
Normal	242	73.3		
Overweight	18	5.5		
Obese	16	4.8		
Physical activity, mean+SD (kcal/week)	2279.4+2841.9		0	25915
Physical activity level				
	108	32.7		
Low	88	26.7		
Moderate	134	40.6		
High				

Table II shows the nutritional status distribution based on age, sex, study program background, and physical activity. The highest proportion of nutritional status in adolescents (57.7%) and adults (75.7%) was in the Normal category. The proportion of overweight and obesity in adulthood was higher (overweight = 15.4%; obese = 11.5%) compared to the adolescent age category (overweight = 4.6%; obese = 4.3%). Related to the gender category, men and women were mostly in the normal category (male = 79%; female = 70.9%). The nutritional status based on study program background was mostly in the normal category (sports = 82.2%; non-sports = 67.7%). However, the difference in nutritional status was quite contrasting in the underweight category (sports = 9.3%; non-sports = 20.9%). In the physical activity group, there were many students who had a low nutritional status who did not meet moderate physical activity (21.3%). However, in the overweight nutritional status category, 7.5% of them did a high physical activity.

Table II: Frequency of data distribution based on nutritional status

Variable	Nutritional Status (n(%))			
	Underweight	Normal	Overweight	Obese
Age				
Adult	50 (16.4)	227 (74.7)	14 (4.6)	13 (4.3)
Adolescent	4 (15.4)	15 (57.7)	4 (15.4)	3 (11.5)
Sex				
Male	13 (12.4)	83 (79)	6 (5.7)	3 (2.9)
Female	41 (18.2)	159 (70.7)	12 (5.3)	13 (5.8)
Study program				
Sport	12 (9.3)	106 (82.2)	9 (7)	2 (1.6)
Non-sport	42 (20.9)	136 (67.7)	9 (4.5)	14 (7)
Physical Activity				
Low	23 (21.3)	76 (70.4)	4 (3.7)	5 (4.6)
Moderate	16 (18.2)	64 (72.7)	4 (4.5)	4 (4.5)
High	15 (11.2)	102 (76.1)	10 (7.5)	7 (5.2)

Furthermore, to find out factors affecting nutritional status, it was necessary to carry out further analysis through multinomial logistic regression because the dependent and independent variable data were in scale, with the dependent variable having more than two categories (polychotomous). The Goodness-of-Fit Model Analysis test showed p = 0.241> 0.05 so that the model was feasible to use. The significance test of the model was conducted through final intercept only with likelihood ratio tests in Table 3 which showed the value of Sig 0. 021, which means that the model had a significant effect on nutritional status (p = 0.021, p <0.05) (Table III). Analysed partially, there is only one variable that is significantly correlated, namely the study program (p=0.008, p<0.05).

Table III: Likelihood Ratio Tests

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	138.505a	.000	0	.
Age	145.622	7.117	3	.068
Sex	138.991	.486	3	.922
Study program	150.442	11.937	3	.008
Physical Activity	143.415	4.910	6	.555

DISCUSSION

The study was conducted in a month (April 2020) on 330 students from 11 universities in West Java and aimed to obtain an overview of nutritional status and physical activity as well as the correlation between them. The results of this study indicate that, at the beginning of the pandemic, students had a good nutritional status. The results also show that the percentage of students with moderate physical activity was quite low. This study is in line with Galo's study showing that, at the beginning of the Covid-19 pandemic, physical activity and anergy expenditure of university students in Australia showed a greater energy intake, approximately 20%, during the pandemic. The study also found that the physical activity of the student was low. Only 30% of the students who achieved a moderate activity level. This indicates that the limitation of this isolation has an influence on health behaviours in a long term (29). During the lockdown period, there were changes in the student appetite and lifestyle. The restrictions imposed during the COVID-19 period have a significant impact on lifestyle, especially reduced physical activity and eating habits (30). The pandemic situation affected the students to be more sedentary (31) and the low physical activity during Covid-19 lockdown perceived weight gain (32,33).

The results show that the model equation combines age, gender, study background, and physical activity of students at the beginning of the pandemic. Age, gender, and physical activity factors do not simultaneously affect the nutritional status of students (34,35). In connection with the Covid-19 pandemic, the learning process was carried out at home using the distance learning method (36). Educational background certainly has an effect on students of sports study program ability to manage their body weight better, especially during the Covid-19 period (37). In addition, a good motor level of sports students (5,38) and demographic areas (39,40) could be one of the factors influencing students to do physical activity, even during the Covid-19 pandemic (41).

Physical activity can prevent the body from the infection of Covid-19 virus (42). Therefore, students from sports and non-sports study program backgrounds have a quite high activity.

The main finding of this study is that nutritional status and physical activity are highly correlated with the background of the study program. Another finding is that the nutritional status of the normal category of sports students is higher than that of non-sports students. The identification of physical activity in sports and non-sports students showed no difference, both of them did physical activity at a moderate-vigorous level. These factors can be caused by various conditions. The normal nutritional status category of sports students was higher than non-sports students. It could be influenced by the motivation to maintain physical condition and to consume nutritious food among students, which still needs to be improved (43,44). Female students with overweight nutritional status have more motivation to lose weight (45), although it is not possible to see how the diet or eating behaviours of each respondent is (46). Healthy life behaviour which includes a healthy diet for a person with a sports education background is relevant with the theory of planned behaviour (45). It is in line with a research on baseball students athletes, they believe that a healthy diet can help their concentration (47). The role of motivation to maintain nutrition and body weight on students can be influenced by the level of understanding of health, nutrition, and physical activity (45). Friends and family affect students in adopting a healthy diet (46). For most students, nutrition is not the main aspect in their priority (44), the insufficient level of nutrition knowledge (47) makes the management of a healthy diet among students not optimal.

The present study has limitations. Using a cross-sectional study, the present study could not investigate other factors related to nutritional status and physical activity in college students. Due to the Covid-19 pandemic condition, the measurements of weight and height were not carried out directly. The weight and height were taken from a self-report. The sample selection used an accidental sampling, not a random sampling, because the instrument used depends on the feedback given by the participants. Further research is expected to examine the influence of the environment related to food availability at home and campus on the student nutritional status and physical activity. The knowledge of the importance of implementing a healthy diet and fulfilling moderate physical activity during the Covid-19 pandemic is important to prevent the body from the Covid-19 virus infection.

CONCLUSION

The study shows that, during the Covid-19 pandemic, physical activity is not related to the nutritional status of students. However, the normal nutritional status of students from sport study program was higher than the students from non-sport study program.

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