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Obesity Prevalence Through Diet and Physical Activity in Medical Faculty Students

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ABSTRACT

This study aimed to determine the description of the diet and physical activity in students of the Faculty of Medicine related to obesity. This type of research is descriptive research with the cross-sectional method. The population in this study were all preclinical students of the Faculty of Medicine. The samples in this study were preclinical students from the class of 2015 with a sampling technique, namely the purposive sample technique. Primary data were obtained from questionnaires. Univariate analysis with frequency distribution analysis. The results of the study on students of the Faculty of Medicine from 180 respondents there were 23 people (13%), normal weight 112 people (62%), pre-obesity 33 people (18%), obesity as many as seven people (4%), and obesity II as many as five people (3%). Students who were pre-obese, obese I, and obese II were doing light activities as many as 15 people, 20 people doing moderate activities, and ten people doing strenuous activities. Students who have pre-obesity, obesity I, and obesity II are known as many as 20 people rarely consume fast food, and as many as 25 people often consume fast food.

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Kata kunci:

Aktivitas Fisik
Obesitas
Pola Makan

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ABSTRAK

Tujuan penelitian ini dilakukan untuk mengetahui gambaran pola makan dan aktivitas fisik pada mahasiswa Fakultas Kedokteran yang berhubungan dengan obesitas. Jenis penelitian ini adalah penelitian deskriptif dengan metode cross-sectional. Populasi dalam penelitian ini adalah semua mahasiswa/i prelinik Fakultas Kedokteran. Yang menjadi sampel pada penelitian ini adalah mahasiswa/i prelinik angkatan 2015 dengan teknik sampel yaitu teknik *purposive sample*. Data primer didapatkan dari kuesioner. Analisis univariat dengan analisis distribusi frekuensi. Hasil penelitian pada mahasiswa Fakultas Kedokteran dari 180 responden terdapat yang mengalami berat badan kurang sebanyak 23 orang (13%), berat badan normal sebanyak 112 orang (62%), pra obesitas sebanyak 33 orang (18%), obesitas I sebanyak 7 orang (4%), dan obesitas II sebanyak 5 orang (3%). Mahasiswa yang mengalami pra obes, obesitas I, dan obesitas II didapatkan yang melakukan aktivitas ringan sebanyak 15 orang, aktivitas sedang sebanyak 20 orang, dan yang melakukan aktivitas berat sebanyak 10 orang. Mahasiswa yang mengalami pra obes, obesitas I, dan obesitas II diketahui sebanyak 20 orang jarang mengkonsumsi *fastfood*, dan sebanyak 25 orang sering mengkonsumsi *fast food*.

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INTRODUCTION

In the last ten years, obesity has become a global problem. In 2016, 1.9 billion adults over the age of 18 were overweight. WHO data show that more than 650 million people are obese. Data published on the WHO website shows that in 2016 39% adults over the age of 18 were overweight and 13% were obese. 39 million children under five years of age were overweight or obese in 2020. More than 340 million children and adolescents aged 5-19 years were overweight or obese in 2016 (WHO, 2021). Data from the Director of Prevention and Control of Non-Communicable Diseases, Ministry of Health of the Republic of Indonesia, shows that obesity in Indonesia has also experienced an alarming increase. The results of the 2018 Basic Health Research show that the trend of weight problems in adults has doubled, from 19.1% in 2007 to 35.4% in 2018 (Kemenkes, 2021). Data from the Jakarta Health Office in 2019 showed that 12% of people had a smoking habit, 30% of people consumed less fruit and vegetables, and 36% of people lacked physical activity. Data also found there are 35% of people experiencing obesity problems and 49% of central obesity (CNNIndonesia, 2019). From these data, it can be seen that the problem of obesity should receive attention from all parties involved in handling this disease problem. Because obesity has an increased risk of heart disease, hypertension and diabetes.

To address the problem of obesity, WHO has developed a strategy, namely the "WHO Global Strategy on Diet, Physical Activity and Health." This Strategy teaches all stakeholders to take Global Action. Even the 2030 agenda for Sustainable Development calls for Heads of State and Government to commit to addressing this issue, such as carrying out the "Global action plan for physical 2018-2030: more active people for a healthier world." WHO has also published guidelines on physical activity, sedentary behaviour and sleep in children under the age of five in 2019 (WHO, 2021).

Thus, the study of obesity problems becomes very interesting from the development of the data that has been found. Because the phenomenon of obesity also occurs in students at the Faculty of Medicine at the Universitas Kristen Indonesia (UKI). Even though they are students who are in the field of Health, they experience health problems which are considered worrisome globally. UKI Jakarta medical faculty students are more prone to problems with weight because of irregular eating patterns and lack of physical activity. The results of observations show that the reason for irregular eating patterns and lack of physical activity is because they feel that the lecture schedule is tight so their focus is on learning activities. The cause of their obesity is the consumption of fast food, they consume fast food and soft drinks to create a modern self-image in their community. Moreover, school-age students are a group of people who are relatively vulnerable to advertisements, especially fast food advertisements on television. In addition, students tend to improve their lifestyle by using vehicles rather than walking to nearby places, so physical activity or sports are rarely done.

This condition is an interesting phenomenon to be studied. Moreover, many previous studies have been done related to the problem of obesity. The problem of being overweight has so far been related to the way of nutrition and physical activity. Even in elementary school students, the causes of obesity are high frequency of intake of sweets and thick juices, inadequate level of physical activity and lifestyle (Dinarević et al., 2011; Mead et al., 2017). Even teenagers also experience this obesity problem due to

physical activity, sedentary behaviour, and irregular dietary behaviour (Iannotti & Wang, 2013). In addition, genetic factors, the influence of advertising, psychological factors, socioeconomic status, diet, age, and gender are factors that contribute to changes in energy balance and cause obesity (Kurdanti et al., 2015). Moreover, the COVID-19 pandemic, which has limited all physical activity, has also led to greater overeating and lower physical activity (Robinson et al., 2021). Whereas colleges and universities are potentially important places to promote healthy diets, increase physical activity and encourage healthier eating patterns among students thereby reducing the risk of chronic disease in the future (Majeed, 2015). Thus, school-based preventive intervention programs are at least slightly effective in dealing with obesity for students (Sobol-Goldberg et al., 2013; Rinat Ratner et al., 2013). Therefore, programs to increase physical activity and a healthy lifestyle are important elements in dealing with obesity problems (Grier et al., 2015; Swift et al., 2018; Ayu Afrilia & A, 2018; Fonseca et al., 2018; Downward, 2019).

From the exposure of previous researchers, it is known that the cause of obesity is low physical activity and an unhealthy lifestyle. Thus, this research gap is focused on studying the diet and physical activity of students at the Faculty of Medicine who are obese. The novelty presented is directed at understanding the situation and background of Medical Faculty students who understand the dangers and risks of obesity, but still do not have a regular diet and low physical activity. So, this study presents the context of thinking of Health students who know the risk of obesity but do not do healthy activities. If in previous studies it was only associated with a lifestyle and low physical activity, this study not only found out the diet and physical activity of students had an impact on their overweight but also studied more deeply the main factors that led to diet and physical activity, those who are low. While the reason for doing this research is to increase the understanding of students at the Faculty of Medicine about eating patterns and regular physical activity can still be done even though they have busy lecture activities.

So, the purpose of this study was to determine the prevalence of obesity through diet and physical activity in students of the Faculty of Medicine. This research is expected to be useful and contribute to understanding the mindset of students about the importance of diet and physical activity on health. Especially during the COVID-19 pandemic, which is still not completely gone and limited activity requires everyone to have a healthy diet and physical activity must be carried out continuously and regularly.

METHOD

This study used an analytical observational research design with a cross-sectional design. The research was conducted at the Faculty of Medicine at Universitas Kristen Indonesia, Jakarta from July to December 2020. The research sample was all 180 students at the Faculty of Medicine who were selected using a purposive sampling technique. The sample used is limited by inclusion and exclusion criteria like presented in table 1.

This research has obtained a research permit from the Research Ethics Commission of the Faculty of Medicine, Christian University of Indonesia Number 04B/Etik Penelitian/FKUKI/2020. Data were collected using a questionnaire distributed to students who had signed the

agreement as respondents. Questionnaires were distributed to students measuring physical activity and eating patterns. Physical activity data on students using the International

Physical Activity Questionnaire (IPAQ) and eating pattern data on students using the Food Frequency Questionnaire (FFQ).

Table 1.
Inclusion and Exclusion Criteria for Research Sample

Inclusion Criteria		Exclusion Criteria
1	Students are registered and actively participate in lectures at the 2015 Faculty of Medicine	Students who are not registered and are not actively participating in lectures at the 2015 Faculty of Medicine
2	The student's condition is healthy	chronic diseases
3	Students give consent as research respondents	Students do not give consent as research respondents
4	Students are in the age range of 17-25 years	

The research instrument is a measuring instrument used to measure the observed variables. The instruments used in this study to collect data from respondents are:

- a. Obesity/Overweight was measured using anthropometric measurements based on data obtained from the respondent's body weight and height, then calculated using the formula:

$$BMI = \frac{\text{Weight (kg)}}{\text{Height}^2(\text{m})}$$
- b. Waist circumference was measured midway between the lower border of the ribs and the iliac crest using a horizontal measuring tape at the end of expiration. Subjects were asked not to hold their stomach and were measured using a measuring tape.
- c. Physical activity was measured by the International Physical Activity Questionnaire (IPAQ) method to

measure the extent or severity of a person's activity.
d. Diet is measured by the Food Frequency Questionnaire (FFQ) method, which is a method used to record the type and amount of food consumed during the last 1 month. The data were analyzed using the SPSS version program and statistical tests with the chi-square test because the data scale was ordinal with a significance value of $p < 0.05$.

RESULT AND DISCUSSION

The following table shows the distribution of respondents' characteristics related to obesity and waist circumference data.

Table 2.
Distribution of Respondents

Criteria	Frequency	%
1 Gender	Male	53 29.4%
	Female	127 70.6%
2 BMI (Body Mass Index)	Underweight	5 12.8%
	Normal	112 62.2%
	Pre-obesity	33 18.3%
	Obesity I	7 3.9%
	Obesity II	5 2.8%
3 Waist Size	Normal	148 82.2%
	Obesity	32 17.8%
4 Waist Size (Gender)	Male < 95 cm	36 20%
	Male > 95 cm	17 9.4%
	Female < 85 cm	112 62.2%
	Female > 85 cm	15 8.4%

The results of the analysis of the data that has been analyzed show that students who have pre-obesity as many as 18.3% or 33 students, with the number of obese I as many as 7 students and obesity II as many as 5 students. Meanwhile, students who have a larger waist circumference are dominated by male students. The waist circumference

shows that 18% of students are obese. The data illustrates the relevance of the percentage of students who are obese.

The results of waist circumference analysis from physical activity and diet (breakfast intake) are presented in the following table.

Table 3
Group Body Mass Index kg/m² and Physical Activity

No	Weight	Physical Activity (MET _e)		
		Light Activity (MET _e < 600)	Moderate Activity (MET _e >600)	Strenuous Activity (MET _e >1500)
10				
1	Underweight (<18,5 kg/m ²)	6,7 %	4,4 %	1,7 %
2	Normal (18,5 – 24,9 kg/m ²)	20,6 %	25,6 %	16 %
3	Overweight (>= 25 kg/m ²)	8,3 %	11,1 %	5,6 %

Table 3 describes the body mass index through physical activity of students. The data presented, shows that underweight students do more light activities which can be seen from the percentage of 6.7%. Meanwhile, students who

have normal weight do more moderate activities with a percentage of 25.6% and students who are overweight do more moderate activities with a percentage of 11.1%.

Table 4
Group Body Mass Index kg/m² and Diet (Breakfast Intake)

No	Weight	Diet (Breakfast Intake)	
		Often (> 5x / Week)	Seldom (< 5x / Week)
1	Underweight (<18,5 kg/m ²)	2,6 %	20,6 %
2	Normal (18,5 – 24,9 kg/m ²)	13,9 %	45,6 %
3	Overweight (>= 25 kg/m ²)	3,9 %	8,9 %

Table 4 shows that students who rarely eat breakfast are more than students who eat breakfast frequently. Students who are overweight or overweight, rarely eat breakfast,

which is indicated by a percentage of 8.9% compared to students who often eat breakfast.

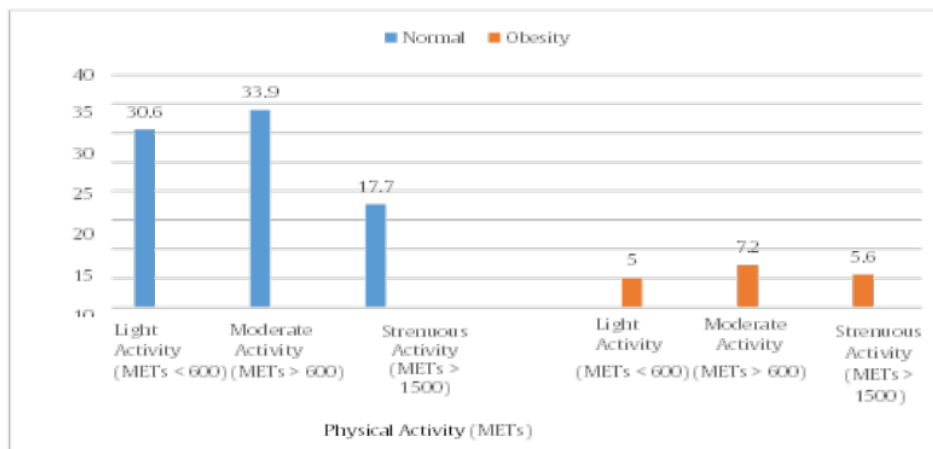
Table 5.
Group Body Mass Index kg/m² and Diet (Type of Food)

No	Weight	Fastfood		Vegetables		Fruits	
		Often (> 2x / Week)	Seldom (< 2x / Week)	Often (> 4x / Week)	Seldom (< 4x / Week)	Often (> 4x / Week)	Seldom (< 4x / Week)
1	Underweight (<18,5 kg/m ²)	8,3 %	4,4 %	8,3 %	4,4 %	8,3 %	4,4 %
2	Normal (18,5 – 24,9 kg/m ²)	33,3 %	26,1 %	50,6 %	11,7 %	44,4 %	17,6 %
3	Overweight (>= 25 kg/m ²)	13,9 %	11,1 %	11,7 %	13,4 %	15,6 %	9,5 %

Table 5 shows the body mass index in terms of eating patterns (consumption of types of food) at various body weights. Students who often consume fast food more than those who rarely. Students who are overweight more often consume fast food with a percentage of 13.9% compared to those who rarely consume fast food. students who have a normal weight more often consume vegetables as much as 50.6%, and at a weight more or less often consume

vegetables as much as 8.3%, while overweight people consume fewer vegetables as much as 13.4%. students who have less weight, are normal and are overweight consume more often than fruit rarely.

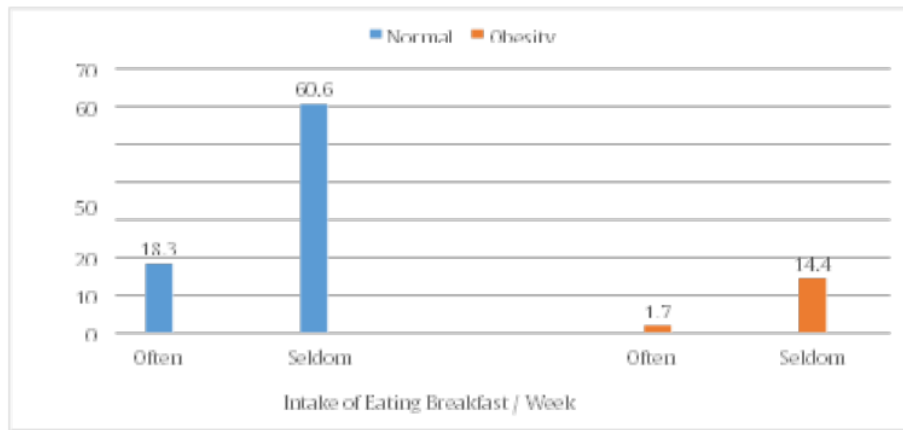
Meanwhile, when viewed from the condition of the waist circumference group, showed varying levels of physical activity and eating patterns.



Picture 1. Physical Activity on Waist Circumference

The results of the univariable analysis for the categorical variables of physical activity as shown in figure 1 can be explained that students who have normal weight do more moderate activity as much as 33.9.6% and obesity do the

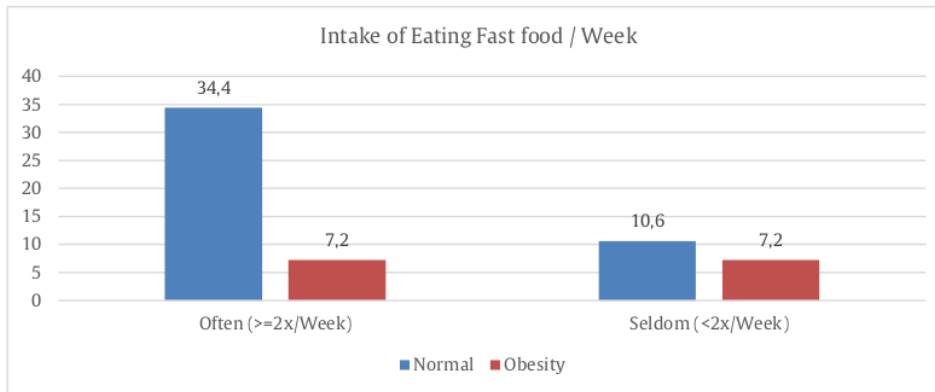
more moderate activity as much as 7.2%. While the waist circumference group on the condition of breakfast intake is shown in the following figure:



Picture 2. Condition of Breakfast Intake on Waist Size

Figure 2 shows that students who rarely eat breakfast are more than those who often eat breakfast. And the obese

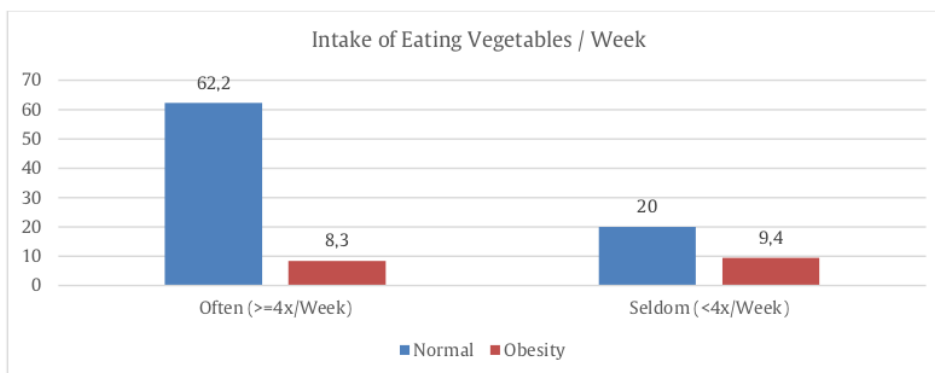
students who rarely eat breakfast with a percentage of 14.4% compared to those who often eat breakfast.



Picture 3. Fast food Intake on Waist Size

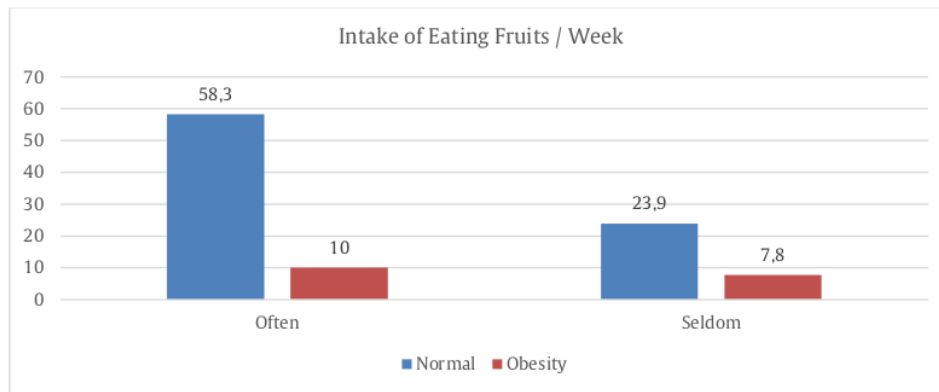
Figure 3 shows that students who often consume fast food are more than those who rarely. And students who are

obese more often consume fast food with a percentage of 10.6% compared to those who rarely consume fast food.



Picture 4. Vegetable Consumption on Waist Size

Figure 4 shows that students with normal weight consume vegetables more often as much as 62.2%, and obese students consume vegetables less frequently as much as 9.4%.



Picture 5. Fruit Consumption on Waist Size

The prevalence of obesity is more common in male students compared to female students. Although the amount of this difference is less. Tapera et al., (2017) found that gender, study faculty, family history of obesity and alcohol were not significantly associated with obesity. The prevalence of obesity is relatively high (36.8%) among university students related to age and level of study. Students practice unhealthy dietary practices. Even other studies show other factors to the problem of obesity. Higher family income, perceived life stress, and university-city unemployment were associated with higher rates of overweight and obesity in men, independent of other individual and city-level covariates (Jiang et al., 2018). Obesity patterns across countries are often gender-oriented (Garawi et al., 2014). In addition, the diversity of background factors such as age, gender, type of settlement, municipality, wealth, marriage, and educational status also affect obesity rates (Chakraborty et al., 2022).

Thus, male students have a greater risk of obesity. The findings show that they have less regular time for carrying out learning activities and physical activities. Meanwhile, judging the body mass index on physical activity that has been carried out by students in the medical faculty, shows that students who are overweight tend to do moderate physical activity. From these findings, it can be understood that students are less interested in strenuous activities. They already feel tired from the hectic lecture activities, so the physical activity they do is only moderate. These findings show similarities to the research of Putra & Rizqi (2018) and Daniati et al., (2020). The results of other studies also show that the relationship between body mass index and physical fitness tests has a relationship where adolescents with normal weight have better fitness test performance. Meanwhile, adolescents who are overweight tend to have low performance on physical fitness tests (Lopes et al., 2019) concluded by Indahsari & Mahali (2019) that physical activity influences body mass index.

Thus, factors such as gender, total physical activity score and leisure time activity, external eating behaviour, emotional eating, restricted eating and perceived stress have important roles in explaining changes in BMI (Aslani et al., 2021). The results of his study showed that students at the

Faculty of Medicine who never did physical activity had a low body mass index, including the obese student group. From the results of the exposure, it can be understood that in certain contexts, physical activity is correlated with body mass index.

In addition to low physical activity factors, student food intake also influences obesity. Urban lifestyle has influenced eating patterns with the concept of time-efficient. Students who experience obsession often consume fast food rather than foods that are sourced from vegetables and fruits. Fast food affects the rate of weight gain among college students. Even middle-aged men and women also show that fast food will cause obesity (Otsuka et al., 2006). Whereas the habit of consuming vegetables and physical activity affects the nutritional status of adolescents. The community, especially adolescent families, need to receive education about the importance of healthy living habits such as the consumption of vegetables and fruit to maintain good nutritional status in adolescents (Sayur et al., 2021).

The results of studies related to body mass index and diet, it has an impact on student bodyweight levels. Of the two factors, eating habits or patterns have a stronger impact on BMI than physical activity. The study of Yousif et al. concluded that the troubling rate of overweight and low physical activity among medical students encouraged the implementation of health programs. Emphasize the importance and benefits of physical activity and eating habits in the medical curriculum (Yousif et al., 2019). In addition, several strategies that can be used to lose excess weight among medical faculty students can be directed at a mindset related to diet, lifestyle or the role of physical activity for health. Lifestyle interventions for weight loss are the cornerstone of obesity therapy (Foster-Schubert et al., 2012).

Weight loss can also be done by implementing a low energy diet with a low fat or low carbohydrate composition accompanied by aerobic exercise (Dewantari & Ambartana, 2017). So, each student must have different motivations related to physical activity and diet that they want to do so that the goal of dealing with excess weight can be achieved (Ajiyawaki et al., 2019). Thus, it can be understood that overweight and obesity are often theorized using the energy

4 balance equation. When energy intake (EI) is greater than energy expended, this creates a positive energy balance and leads to weight gain, conversely when energy expenditure (EE) exceeds EI, it creates a negative energy balance and weight loss (Caudwell et al., 2013).

Overall, these findings provide a clear picture that factors of physical activity and diet have a major influence on the weight gain of students in the Faculty of Medicine. Meanwhile, the diet is influenced by the lifestyle of the urban community which want it to be faster and more practical. In addition, students reasoned that they did not have time to do physical activities because of the tight schedule of lectures. However, the data of students who have normal weight shows a good balance and time management between learning activities and lifestyle. So, from these findings, it is clear that college students who have obesity problems are due to a lack of time management. Thus, this has an impact on the pattern or habits of eating and physical activity.

So, the results of this study have implications for knowledge related to student self-management in managing learning activities with physical activity and eating patterns are interrelated. They can balance their pattern or lifestyle with learning activities if they have an awareness of the importance of life balance so that they have a healthy life. So, lecturers at the Faculty of Health can include a mindset related to this. So that students have an in-depth understanding and knowledge to build a healthy lifestyle. Moreover, they are students in the field of Health, so they have to understand the concept of healthy living.

CONCLUSION AND RECOMMENDATIONS

This study concluded that of 180 participants, 25% were overweight and 18% were obese students were dominated by male students. Factors that cause obesity are students only doing moderate physical activity, students rarely having breakfast, and students prefer fast food to vegetables and fruits. However, the findings show that this condition is caused by the low awareness of the importance of self-management and student time. Because for students who have normal weight, a balance between learning activities and a healthy lifestyle can still be done. So the main factor in causing obesity in medical students is not diet and physical activity, but the level of awareness of the importance of these two factors for their health life

Thus, the results of this study can contribute to knowledge regarding the importance of self-management awareness and time in managing a healthy lifestyle. However, this research is still limited to the analysis of diet and physical activity for medical school students, so this conclusion cannot be generalized to all students in other faculties besides medicine. So, the results of the research can be developed by expanding the participants of students studying in other fields so that the main causes underlying their poor diet and low physical activity can be identified. However, the results of this study have advantages related to understanding the concept of the relationship between time management and students' self-awareness of learning activity habits. So, for students who are overweight at the Faculty of Medicine, it is recommended that they maintain an understanding of time management and awareness regarding the quality of diet and physical activity.

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ETHICAL CONSIDERATIONS

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This research was not funded or sponsored. So this research was done independently.

Conflict of Interest

There are no potential conflicts of interest associated with this article

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