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Determination Of Obesity Incidence In Students Of The Faculty Of Medicine And Health Sciences, University Of Jambi

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ABSTRACT

Obesity, a condition of excessive body weight, is a major nutritional issue and a known risk factor for degenerative diseases. Based on the 2023 Indonesian Health Survey, the prevalence of obesity among adults over 18 years old reached 23.4%. A preliminary survey of 10 students at the Faculty of Medicine and Health Sciences, University of Jambi, found 3 students to be obese. This study aims to analyze the factors associated with obesity among students at the faculty. This quantitative study used an analytical design with a cross-sectional approach and involved 136 respondents selected through proportionate stratified random sampling. Data collection utilized instruments such as the Stunkard Figure Rating Scale, PSQI, IPAQ-SF, PSS, and FFQ, along with direct measurements of body weight and height. The study found that 21% of the students were obese. There were significant associations between obesity and sex (p=0.017), parental body shape (p=0.025), sleep quality (p=0.005), and physical activity (p=0.005). However, no significant association was found with stress (p=0.361), consumption of high-risk foods (p=0.277), or fruit and vegetable intake (p=0.070). Sleep quality was identified as the most dominant factor (Adj PR 12.788). Sex was a protective factor, while parental body shape, poor sleep quality, and low physical activity were risk factors for obesity.

Keywords: Obesity, College Students, Parental Stature, Stress, Sleep Quality, Consumption Patterns

INTRODUCTION

Nutritional problems are problems that must be resolved properly. Nutritional problems are usually influenced by nutritional status, which makes nutritional status a reference and an important element in determining an individual's health condition. The reference for nutritional status can be known through an assessment of several parameters which can then be compared and used as a reference. So from these parameters, an individual can be said to have good nutritional status if the nutritional intake in food is right for the body's needs, while a lack of nutritional intake in food can result in malnutrition and excessive nutritional intake can cause excess nutrition.

One of the problems of excess nutrition is obesity, where obesity is both a disease and a risk factor. Obesity is characterized by excessive fat accumulation and an imbalance between calories in and out. A person can be diagnosed as overweight and obese if measured based on

the Body Mass Index (BMI). According to the Indonesian Ministry of Health (2022), obesity can cause various serious Non-Communicable Diseases (NCDs) so that it can trigger several other complications, such as CHD, hypertension, cancer, diabetes, and other metabolic and non-metabolic diseases.

According to the Indonesian Ministry of Health (2022), obesity is a significant risk factor contributing to deaths from non-communicable diseases such as heart disease, with at least 5.87% of deaths caused by heart disease linked to obesity, and 1.84% of deaths caused by diabetes and kidney disease also associated with obesity. In 2019, Indonesia ranked fourth among Southeast Asian countries with the highest obesity rate, reaching 6.9%, and a mortality rate of 80.48 per 100,000 population.

The World Health Organization (WHO) (2024) has classified obesity as a global epidemic. In 2022, approximately 43% or 2.5 billion adults aged over 18 were classified as overweight, while 16% or 890 million adults aged over 18 were classified as obese. Based on the 2023 Indonesian Health Survey, the prevalence of obesity among adults over the age of 18 in Indonesia was 23.4%, showing an increase compared to the 2018 Basic Health Research (RISKESDAS), which recorded a rate of 21.8%. In Jambi Province, the 2023 prevalence of overweight among adults over 18 was 15.4%, and obesity was 14.6%. This reflects a change from the 2018 data, which reported 13.3% for overweight and 17.6% for obesity. Although there has been a decrease in obesity, the rise in overweight cases is concerning, as being overweight also increases the risk of obesity.

Obesity cases have increasingly shifted toward younger age groups, particularly among individuals aged 18 to 29 years. This trend is especially evident among young adults pursuing higher education. According to the 2023 Indonesian Health Survey, the prevalence of obesity among individuals aged 19 was 8.5%, while those aged 20–24 had a prevalence of 13.4%. This marks an increase from the 2018 Basic Health Research (RISKESDAS) data, which recorded a prevalence of 12.1% for the 20–24 age group. Although there was a slight decrease of 0.4% for 19-year-olds from the previous 8.9%, this age group still requires attention as part of the young adult population at risk.

According to John Gordon’s Epidemiologic Triangle theory, university students can serve as the host in the context of nutritional problems. Students in high-demand academic programs—such as those in medical, pharmacy, and other health-related faculties—often face intense workloads and academic pressure. The difference in academic systems, such as the block

system in medical and nursing programs and the credit system in public health, pharmacy, and psychology programs, contributes to varied learning characteristics and stress levels. The academic environment itself can serve as an environmental factor that contributes to stress and, ultimately, to obesity. Additionally agents such as poor nutrition, lack of physical activity, unhealthy eating habits, and high stress levels contribute to unhealthy lifestyles and increased risk of overweight and obesity among students.

Physical activity is believed to be an influence on the incidence of obesity because it affects the burning of energy or fat in the body.11 From a study conducted by Sitorus (2020) on medical students regarding the relationship between physical activity and the nutritional status of obesity and non-obesity, it was found that there was a relationship between physical activity and nutritional status in students.

Unhealthy eating behavior can cause someone to not regulate the food that enters the body so that it affects consumption patterns. Consumption patterns of risky foods such as high-calorie and fat foods, sweet foods and drinks have a high chance of causing obesity. As research conducted by Arifani (2021) shows that risky foods such as sweet foods, sweet drinks, soft drinks and instant foods are significantly related to obesity in those over 18 years of age.

As for the lack of fiber intake such as consumption of fruits and vegetables is a risk factor for obesity in young adults. According to data from the Indonesian Health Survey (2023), it shows that the proportion of lack of fruit and vegetable consumption in those over 19 years of age is more than 90% who do not consume fruits and vegetables5. This also shows that lack of vegetable/fruit intake is related to the incidence of obesity in a study conducted by Awaliya (2020) among students.

Stress in students university students can have an impact on obesity. Students experiencing high levels of stress often suffer negative effects on their health and academic performance, which can influence their eating behavior and lead to the consumption of obesogenic foods. A study by Adilah (2023) on medical students supports this, indicating a significant relationship between stress and obesity.

Sleep quality can also affect an individual's concentration, trigger fatigue, and reduce physical activity. Poor sleep quality may negatively impact the body’s metabolism, making it less efficient. Adilah’s (2023) study on health students found a significant association between poor sleep quality and the occurrence of obesity, suggesting that sleep plays a critical role in obesity among students.

Genetic factors or parental stature cause differences in metabolism in some people such as inherited and biological genes from parents, as well as gender due to differences in hormones and lifestyle between women and men, usually men expend more energy than women. Research conducted by Lubis (2020) on students said that gender and hereditary factors are significantly related to the incidence of obesity.

Based on previous research, researchers found that research on obesity in students within the faculty is still rare, and variables such as parental stature, stress, and consumption of risky foods are also rarely found. This can be a research gap in this study. Based on the researcher's observations of students at the Faculty of Medicine and Health Sciences, University of Jambi, the researcher found that out of 10 students, 3 people were obese. Therefore, researchers conducted research on the determinants of obesity in students at the Faculty of Medicine and Health Sciences, University of Jambi.

LITERATURE REVIEW

Obesity is a global health problem that is now starting to shift its vulnerable population target, from the older age group to the younger adult group, especially students. According to the Indonesian Health Survey (2023), the proportion of obesity in the 19-24 age group showed a significant increase, namely 13.4% in the 20-24 age group, up from 12.1% in the 2018 RISKESDAS data. Although the proportion of obesity at the age of 19 has decreased slightly, this remains a concern, considering that college is a crucial phase in shaping a person's lifestyle.

According to the Epidemiological Triangle Model developed by John Gordon, the occurrence of diseases or health conditions such as obesity can be influenced by three main components, namely the host (vulnerable individual), agent (causal factor), and environment (influencing environment). In the context of medical and health students, the host is an individual with a high academic burden who often experiences stress and fatigue. Agents in the form of an unbalanced diet, lack of physical activity, and consumption of high-calorie foods are further exacerbated by an academic environment that is full of pressure and does not support a healthy lifestyle.

Various studies have shown that academic stress is closely correlated with unhealthy eating patterns. Students who experience stress tend to consume high-calorie foods or “obesogenic foods” as a form of psychological escape (comfort eating). Adilah's study (2023) showed a significant relationship between high stress levels and the incidence of obesity in medical

students. In addition to stress, sleep quality is also an influential factor. Poor sleep can disrupt the body's metabolism, reduce concentration, and inhibit physical activity. In his research, Adilah also concluded that poor sleep quality is associated with an increased incidence of obesity in health students.

A sedentary lifestyle or minimal physical activity is also a major factor contributing to the increase in body mass index (BMI) in students. Many students spend hours in front of a computer screen or electronic devices for study or entertainment activities, which directly reduces the daily calorie burn rate. From a health behavior perspective, the Health Belief Model (HBM) theory is also relevant to explain students' tendencies in choosing healthy or unhealthy lifestyles. Perceptions of susceptibility to obesity, perceptions of the benefits of physical activity, and perceptions of barriers to dietary changes can all influence an individual's decision to maintain ideal body weight.

METHODS

This type of research is quantitative with an analytical design that applies a cross-sectional approach. The research was conducted at the Faculty of Medicine and Health Sciences, University of Jambi from December 2024 to February 2025. The study population consisted of students of the Faculty of Medicine and Public Health, University of Jambi, class of 2022-2024, undergraduate level, totaling 1920 people. The sample selection was carried out using the Lemeshow formula, so that a sample of 136 respondents was obtained which would be taken using the proportionate stratified random sampling method. The instruments used were the Stunkard Figure Rating Scale, Pittsburgh Sleep Quality Index (PSQI), International Physical Activity Questionnaire-Short Form (IPAQ-SF), Perceived Stress Scale (PSS), Food Frequency Questionnaire (FFQ), and height and weight measurements. This research has received approval from the Ethics Commission of the Faculty of Medicine and Health Sciences, University of Jambi (1115/UN21.8/PT.01.04/2025). Data analysis was carried out using univariate analysis to see the distribution and frequency, bivariate analysis using the Chi Square test to analyze the relationship, and multivariate analysis with multiple logistic regression to determine the most dominant factors influencing obesity.

RESULTS

Univariate Analysis

Based on the results of this study, the results obtained based on the characteristics of the respondents can be seen in the table below :

Table 1 General description of respondent characteristics

Variable	Frequency (n=136)	Percentage (100%)
Age		
17	3	2,2 %
18	33	24,3 %
19	48	35.3 %
20	45	33.1 %
21	7	5.1 %
Gender		
Woman	108	79,4 %
Man	28	20,6 %
Study program		
Medical	26	19,1 %
Nursing	25	18,4 %
Psychology	20	14,7 %
Public Health Science	50	36,8 %
Pharmacy	15	11,0 %
Force		
2022	43	31,6 %
2023	43	31,6 %
2024	50	36,8 %
Residence Status		
No Cost/With Family	45	33,1 %
Cost/Alone/With Friends	91	66,9 %

Source: Processed Primary Data (2025)

Based on table 1, it is found that the distribution of respondents is mostly 19 years old, 48 people (35.3%), the results of the distribution of respondents are mostly female, 108 people (79.4%), the results of the distribution of respondents are mostly students majoring in Public Health Sciences, 50 people (36.8%), the results of the distribution of respondents are mostly the class of 2024, 50 people (36.8%), the results of the distribution of respondents are mostly students who live in boarding houses, live alone, and/or with friends as many as 91 people (66.9%).

Based on the results of this research, general description results were also obtained based on the following variables:

Table 1 Overview Based on Research Variables

Variable	Frequency (n=136)	Percentage (100%)
Nutritional Status		
Obese	28	20,59 %
Not Obesitas	108	79,41 %

Gender		
Female	108	79,4 %
Male	28	20,6 %
Parental Body Type		
Present	98	72,1 %
Not Present	38	27,9 %
Sleep Quality		
Poor Sleep Quality	103	75,7 %
Good Sleep Quality	33	24,3 %
Physical Activity		
Low	54	39,7 %
Moderate/High	82	60,3 %
Stress Level		
Severe Stress	8	5,9 %
Mild/Moderate Stress	128	94,1 %
Risky Food Consumption Pattern		
Excessive	70	51,5 %
Adequate	66	48,5 %
Fruit and Vegetable Intake		
Inadequate	69	50,7 %
Adequate	67	49,3 %

Source: Processed Primary Data (2025)

Based on table 2, the proportion of obesity incidence is 21%. The results of the distribution of respondents were mostly female as many as 108 people (79.4%), the results of the distribution of respondents mostly had obese parents as many as 98 people (72.1%), the results of the distribution of respondents mostly had poor sleep quality as many as 103 people (75.7%), the results of the distribution of respondents mostly had moderate/high physical activity as many as 82 people (60.3%), the results of the distribution of respondents mostly experienced moderate/light stress as many as 128 people. (94.1%), the results of the distribution of respondents mostly had risky food consumption patterns in the more category, 70 people (51.5%), the results of the distribution of respondents mostly had fruit and vegetable consumption patterns in the less category, 69 people (50.7%).

Bivariate Analysis

The results of the analysis in this research can be seen from the bivariate analysis which connects the independent variable with the dependent variable. Bivariate results can be seen below :

Table 3 Bivariate Analysis Results

Variabble	Kejadian Obesitas	Total	PR	(95% CI)

	Of		No					
	N	%	N	%	N	%			*P-Value*
Gender									
Female	17	15,7	93	84,3	108	100	0,401	(0,212-0,756)	0,013
Male	11	39,3	17	60,7	28	100			
Parental Stature									
There is	26	26,5	72	73,5	98	100	5,041	(1,257-20,210)	0,012
There isn't any	2	5,3	36	94,7	38	100			
Sleep Quality									
Bad	26	25,2	77	74,8	103	100	4,165	(1,044-16,618)	0,034
Good	2	6,1	31	93,9	33	100			
Physical Activity									
Low	19	35,2	35	64,8	54	100	3,206	(1,568-6,552)	0,001
Medium/High	9	11,0	73	89,0	82	100			
Stress									
Heavy	3	37,5	5	62,5	8	100	1,920	(0,734-5,021)	0,361
Medium/Ligh	25	19,5	103	80,5	128	100			
Risky Food Consumption Patterns									
More	20	28,6	50	71,4	70	100	2,357	(1,116-4,979)	0,031
Enough	8	12,1	58	87,9	66	100			
Fruit and Vegetable Consumption Patterns									
Not Enough	10	14,5	59	85,5	69	100	0,539	(0,269-1,082)	0,116
Enough	18	26,9	49	73,1	67	100			

Source: Processed Primary Data (2025)

Based on table 3, the results of bivariate analysis show that the variables that have a relationship with the incidence of obesity are gender, parental stature, sleep quality, physical activity and risky food consumption patterns with *p-value* < 0.05. Meanwhile, variables that have no relationship with the incidence of obesity are stress and fruit and vegetable consumption patterns *p-value* > 0.05. However, a multivariate analysis is needed to determine any changes in the analysis, *confounding*, and the dominant factor in the incidence of obesity. Therefore, the final model obtained from the multivariate analysis is as follows :

Table 2 Final Multivariate Analysis Model

Variabble	B	*Adj* PR	95% CI	*P-Value*	*P-Value* Model (Omnibus)	*Overall Percentage*
Gender	-1,420	0,242	(0,075-0,779)	0,017	0,000	79,4
Parental Stature	1,922	6,832	(1,279-36,500)	0,025		
Sleep Quality	2,548	12,788	(2,117-77,232)	0,005		
Physical Activity	1,512	4,535	(1,592-12,923)	0,005		

Fruit and Vegetable Consumption Pattern	-1,041	0,353	(0,115-1,088)	0,070	
Risky Food Consumption Patterns	0,653	1,920	(0,592-6,224)	0,277	
Nagelkerke R Square					0,398

Source: Processed Primary Data, 2025

From the results of the multivariate analysis shown in table 4, it was found that variables related to the incidence of obesity include gender and *p-value* (0.017) and *Adj* PR (0.242), parents' stature with *p-value* (0.025) and *Adj* PR (6.832), sleep quality with *p-value* (0.005) and *Adj* PR (12.788), as well as physical activity with *p-value* (0.005) and *Adj* PR (4.535). In addition, variables that are not related to the incidence of obesity include fruit and vegetable consumption patterns *p-value* (0.070) and *Adj* PR (0.353), as well as risky food consumption patterns with *p-value* (0.277) and *Adj* PR (1,920). The stress variable is not included in the model, so it is not related to the incidence of obesity *p-value* (0.361) and PR (1.920). The most dominant variable related to obesity is sleep quality, which shows that students with poor sleep quality have a 12.7 times higher risk of obesity than those with good sleep quality.

DISCUSSION

Sex Relations With the incidence of obesity

The results of this analysis showed that 15.7% of female students were obese and 84.3% were not obese, while 39.3% of male students were obese and 60.7% were not obese. However, in this study it was found that the female gender variable played a role as a protective factor (preventing) obesity.

This research is in line with research conducted at Malahayati University in 2020 which found that there was a relationship between gender and the incidence of obesity. This is because gender affects a person's body metabolism, so it is said that naturally women have more body fat reserves than men, this is because women's metabolism is slower than men's metabolism..

Other research also found similar things, such as research conducted on teenagers in Indonesia in 2020 which found that gender was related to the incidence of obesity and female gender played a role as a protective factor. This research also states that obesity in women is due to hormonal factors, hormones not only affect the menstrual cycle process but can also increase the development of fat in the body.

This research is also in line with research conducted in Bangkan Hamlet in 2021 which stated that gender was significantly related to the incidence of obesity. This research states that the influence of this relationship is caused by the presence of physical activity factors, which states that physical activity in women is lower than physical activity in men, so that the percentage of body fat in women is higher than in men.

Based on the results of this study, it was also found that the percentage of women who were obese was greater than the percentage of men who were obese. Based on theory, gender is a risk factor for obesity, which says that women are more at risk of obesity than men. However, in this study it is said that female gender plays a role as a protective factor. According to the researcher's assumption, this is because the majority of respondents are female, so the distribution of students who are obese among women is less than the distribution of students who are obese among men, so this really influences the events that occur. Meanwhile, there are other factors that may not have been studied, so the factors that influence obesity are not just gender.

Relationship between Parental Stature With the incidence of obesity

The results of this analysis showed that students who had obese parents and were obese were 26.5%, while those who were not obese were 73.5%, whereas students who did not have obese parents and were obese were 5.3%, while those who were not obese were 94.7%. In this study, it was found that having obese parents acts as a risk factor for obesity.

This research is in line with research conducted at Malahayati University in 2020 which found that there is a relationship between hereditary factors or the genetic history of parents and the incidence of obesity. This can happen because humans generally have genes that determine the increase in fatty acids in the body which are still needed for reserves, so this can cause weight gain. Genetic factors usually have a 25% to 75% influence on the incidence of obesity. However, there are other influencing factors such as parenting and environmental factors.

Research conducted in Bangkan Hamlet in 2021 found a relationship between genetics or family history and obesity. This is because if the family environment causes changes in lifestyle, eating patterns and exercise habits, so that if the family, especially parents, are obese, then their children have the opportunity to also become obese.

As in research conducted at the Faculty of Public Health, Uniska MAB Banjarmasin in 2022, it also stated that genetics is significantly related to the incidence of obesity. Overweight or obesity can be passed down from families from previous generations to the next.

Other similar research comes from research conducted at the Segiri Community Health Center Vocational School in 2021 which found that genetics and obesity have a significant relationship. Genetic factors can influence body fat accumulation, meaning individuals with a hereditary background of obesity tend to have more fat than others.

Based on the results of this study, the stature of obese parents can describe the body shape of obese parents, therefore the stature of parents is related to the incidence of obesity, which is supported by previous research. This is because the majority of students who are obese have obese parents who are assisted by instruments that can describe the parent's body shape.

Relationship between sleep quality and the incidence of obesity

The results of this analysis showed that students who had poor sleep quality were obese by 25.2% and those who were not obese by 74.8%, while students who had good sleep quality were obese by 6.1% and those who were not obese by 93.9%. In this study, it was found that having poor sleep quality acts as a risk factor for obesity.

This research is in line with research conducted at the Faculty of Medicine, Muhammadiyah University, Surakarta in 2023 regarding sleep quality on obesity. This research found that sleep quality has a significant effect on the incidence of obesity. This research states that the quality of sleep can cause disruption of the leptin hormone so that individuals will experience uncontrollable hunger, so that if a person's sleep quantity and quality is not good or not appropriate it will affect the balance of various hormones which ultimately results in obesity.

Research conducted at the Faculty of Public Health, Muhammadiyah University of Aceh in 2024 found that there was a relationship between sleep quality and nutritional status. This is because it is related to a decrease in sleep quality at night which makes the body unable to carry out optimal metabolic processes. The process involves growth hormone *(Growth Hormone)* and the hormone cortisol which affects glucose regulation, this hormone can increase during sleep, so if the quality is poor it will disrupt this hormone.

Similar research was also conducted on teenagers in Jatiwaringin in 2023 which found that the relationship between sleep quality and nutrition was more significant. Sleep duration, which is included in the sleep quality category, can influence hunger and appetite, which can affect

ghrelin levels and decrease leptin levels. The hormone ghrelin acts as a hormone that increases hunger and appetite, while the hormone leptin acts as a hormone that inhibits appetite. This situation results in the accumulation of fat in adipose tissue, causing excess weight.

Based on the results of this study, sleep quality is related to the incidence of obesity and acts as a dominant factor. According to the researchers' assumptions, this is because students are busy due to assignments and high academic demands so that respondents who experience lack of sleep found that the average sleep time was 6 hours per day, while the recommended sleep time was around 7-9 hours per day.

Relationship between physical activity and the incidence of obesity

The results of this analysis showed that students who had low physical activity and were obese were 35.2% and those who were not obese were 64.8%, while students who had moderate/high physical activity but were obese were 11.0% and those who were not obese were 89.0%. In this study, it was found that having low physical activity acts as a risk factor for obesity.

This research is in line with research conducted on students in Semarang City in 2022 which found that physical activity had a significant relationship. The research also states that students who lack physical activity are three times more likely to have abnormal nutritional status, this is because students are busy doing lectures, playing on cellphones, and sitting in front of a computer or laptop for too long, so they forget about physical activity.

There is research that says the same thing, namely research conducted at the Pangolombian Community Health Center in 2020, namely that physical activity is a variable that is related to the incidence of obesity. This is because in the body there is a metabolic process that is useful for burning body fat when doing physical activity.

Research conducted in the Marina Permai Community Health Center Work Area, Palangka Raya City in 2023 also found that physical activity was significantly related to the incidence of obesity. This research shows that physical activity is closely related to quality of life. Low levels of physical activity can increase the risk of obesity and various other chronic diseases. To obtain health benefits, it is recommended that you do physical activity for at least 30 minutes every day or 150 minutes per week regularly.

According to researchers' assumptions, this is due to busy lecture and academic schedules which mean students do not have time for sports. This causes an increase in cases of obesity in society, because the lack of awareness of their body's health causes many comorbidities to

emerge. Therefore, it is important for public awareness, especially students, to carry out regular physical activity in order to lose weight and prevent obesity.

The Relationship between Stress and Obesity

The results of this analysis showed that 37.5% of students experienced severe stress and were obese and 62.5% of students who did not experienced obesity, while 19.5% of students who did not experience moderate/light stress but were obese and 80.5% did not experience obesity.

This research is in line with research conducted on students in Semarang City in 2022 which found that stress had no relationship with the incidence of obesity. This is due to differences in student characteristics in dealing with stress. Stress in students can be caused by differences in the ability to adapt and deal with stress *(coping stress)*, so that the differences that are stress factors are not related to obesity.

The research that found something similar, namely that there was no relationship between stress and nutritional status, was research conducted on teenagers in Jatiwaringin in 2023. Stress can trigger a person's eating behavior, which is called *eating dissorder*, this eating behavior can cause a person to have no appetite or become an appetite. Stress can affect appetite through various hormones, such as *noradrenaline* and hormones *corticotropin-releasing* (CRH), which functions to suppress appetite. On the other hand, hormones *corticotropin-releasing* (CRH) is released by the nucleus *paraventricular* (PVN) when stress lasts in the long term, which also has an impact on reducing appetite.

Likewise, research conducted on new students at the Faculty of Public Health, Airlangga University in 2022 found that there was no relationship between stress and Body Mass Index (BMI). This is because stress is a factor that cannot directly affect BMI and can change a person's eating patterns.

Research conducted on final students at the Faculty of Public Health, Airlangga University in 2022 also found something similar, namely that there was no relationship between stress and obesity in students. This is because there are differences in how people manage stress, each student has different experiences so that the stress they experience has an influence *coping mechanism* which is conducted.

According to researchers' assumptions, there is no relationship between stress and the incidence of obesity due to academic problems or personal problems, which cause students to do so

coping mechanism By not consuming excess food, there is a possibility of gaining and losing weight.

Relationship between risky food consumption patterns and the incidence of obesity

The results of this analysis showed that students who consumed risky foods in the moderate category were obese by 28.6% and those who were not obese were 71.4%, while students who consumed risky foods in the moderate category were obese by 12.1% and those who were not obese were 87.9%.

Research conducted on teenagers in Indonesia regarding the relationship between consumption of risky foods in the form of instant noodles and fizzy drinks and the incidence of obesity, the researchers found that there was no relationship between the two. These foods are the most commonly consumed type of risky food group. There is no relationship between the two because some teenagers choose many other foods or snacks. So this means there is no relationship with obesity.

Research conducted in Banten Province in 2021 also found the same thing regarding the relationship between fatty foods and the incidence of obesity. This is because the factors causing obesity are not only fat intake, but nutritional intake such as protein, carbohydrates and micronutrients also play a role in obesity. Fatty food intake can cause changes in adipose tissue, but it is necessary to review what type of fat is consumed, because if the fat intake is saturated fat it can increase visceral and hepatic fat stores.

According to research conducted on teenagers in Indonesia in 2021, the researchers found that consumption of fast food/risky foods and carbonated drinks was not related to the incidence of obesity. In general, fast food is a type of risky food because on average it is fried, fatty, instant, salty, contains MSG so it can be dangerous for the body if consumed in excess. Meanwhile, carbonated drinks are drinks that contain soda and are usually sweet. These foods and drinks are often consumed by teenagers and adults in Indonesia because they taste delicious, sweet and are easy to obtain. There is no relationship because the role of other factors is still stronger in determining the incidence of obesity.

According to the researchers' assumptions, there is no relationship between risky food consumption patterns and the incidence of obesity in students because there is a lack of exploration of the types of food used in the FFQ questionnaire, in this case the researchers used foods that are often consumed by Indonesian people, not foods that are often consumed by

students, students consume. Therefore, the selection of the type of food that will be included in the questionnaire must be appropriate.

Relationship between Fruit and Vegetable Consumption Patterns and the Occurrence of Obesity

The results of this analysis showed that 14.5% of students who consumed fruit and vegetables in the moderate category were obese and 85.5% of students who did not experienced obesity, while 26.9% of students who consumed fruit and vegetables in the moderate category were obese and 73.1% of those who were not obese were obese.

This is in line with research conducted on teenagers in Padang City in 2023, which found that there was no relationship with the incidence of obesity. The knowledge factor about the importance of consuming fruit and vegetables plays a big role in health. Eating fruit and vegetables is very important from childhood to adulthood, because it can help maintain health and weight. Adequate intake of fruit and vegetables every day can prevent obesity, because they can reduce hunger and do not cause excessive accumulation of fat and cholesterol.

Research conducted on teenagers in Laos in 2022 regarding the relationship between fruit and vegetable consumption and obesity found that there was no relationship with the incidence of obesity. This is due to a lack of knowledge about the importance of fruit and vegetables, as well as inhibiting factors such as being influenced by consumption *fast food* the high one. Lack of consumption of fruit and vegetables can have various impacts, including increasing the risk of obesity.

Research conducted in the Philippines in 2022 regarding the relationship between fruit and vegetable consumption and obesity, found that there was no relationship with the incidence of obesity. The research states that there is no relationship because the majority of the 2.4% of teenagers who are obese consume fruit and vegetables in an inappropriate way, so that the benefits of the fruit and vegetables are lost. So consuming fruit and vegetables will be in vain if teenagers do not control unhealthy foods.

Based on the results of this research, according to the researcher's assumption, there is no relationship between fruit and vegetable consumption patterns due to the lack of types of fruit and vegetables included in the questionnaire so that students cannot choose types of fruit and vegetables that are not included in the questionnaire, and the questionnaire used only describes the frequency, not the amount in grams. This is because the majority of students who are obese

already understand what they need to consume and what not to consume, in this case the consumption of fruit and vegetables, so the proportion of students who are obese and consume enough fruit and vegetables is greater than those who lack it.

CONCLUSION

It is concluded that this study shows the proportion of obesity incidence in students of the Faculty of Medicine and Health Sciences, University of Jambi is 21%. There is a relationship with the incidence of obesity and acts as a risk factor in the variables of gender, body size, sleep quality, and physical activity. However, there is no relationship with the incidence of obesity in the variables of stress, risky food consumption patterns, and fruit and vegetable consumption patterns. It was found that the most dominant factor was the sleep quality variable.

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