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Relationship between Gadget Use, Sleep Patterns, Stress and the Incidence of Central Obesity in Adolescents in Jambi City

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ABSTRACT : *Obesity is a condition in which the body has excess body weight as measured by several measurements. The accumulation of fat in the body's subcutaneous tissue, or under the skin, around organs, and sometimes even in the tissues of those organs, is a sign of obesity. In the last five years, the prevalence of adolescent obesity in Indonesia has almost doubled. The purpose of this study was to determine the factors associated with the incidence of central obesity in adolescents in Jambi City. This descriptive quantitative research used a cross-sectional study. In this study, the Solvin formula was used to calculate the sample size, which consisted of 96 adolescents living in the working area of the Putri Ayu health center in 2024. Data collection used a questionnaire. Data processing was univariate and bivariate analysis. The analysis used was chi-square. The results showed that there was no relationship between the use of gadgets (p=0.219) with the incidence of central obesity in adolescents there was a relationship between sleep patterns (p = 0.000), stress (p = 0.001) with the incidence of central obesity in adolescents in Jambi City. Factors that can cause obesity in adolescents include unhealthy eating habits, it is important to maintain a balanced diet, rich in fiber, and frequently consume fruits and vegetables.*

Keywords*:*Adolescent; Central Obesity; Knowledge

1. INTRODUCTION

According to the World Health Organization (2000), obesity is the long-term accumulation of excessive fat caused by an imbalance between the amount of energy consumed and expended. The World Health Organization (WHO) has set a target in 2025 to return the number of obese people to 2010 levels. However, until now, the number of obese people is still quite high. (Hamzah and B, 2020)

Obesity is a condition in which the body has excessive body weight as measured by several measurements. The accumulation of fat in the body's subcutaneous tissue (under the skin) and around organs, sometimes even in the organ tissue itself, is a sign of obesity. To find out if someone is obese, you can use the body mass index (BMI), which is calculated by dividing body weight by height. The body produces more energy through the consumption of foods that contain sources of energy and fat, while the body does not do physical activity or live a healthy lifestyle can reduce energy expenditure..(Ministry of Health of the Republic of Indonesia, 2012)

In Indonesia, there are two nutritional crises: malnutrition and overnutrition. Unbalanced eating habits cause an imbalance between the body's energy intake and daily energy expenditure, which leads to overweight and obesity. When energy intake is unbalanced, fat accumulation occurs in adipose tissue. Fat accumulation is very dangerous because it can increase the risk of type 2 diabetes mellitus, hypertension, dyslipidemia, cardiovascular

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disease, heart disease, and cancer. Obesity can cause many health problems and emotional and social problems if ignored..(Access, Qatrunnada and Direct, 2022)

The results of the 2015–2019 RPJMN index show that 13.5% of adults in Indonesia aged 18 years and over are obese, 28.7% have a BMI of 25 or more, and 15.4% have a BMI of 27 or more. Children aged 5–12 years who are obese 10.8% and overweight 18.8% increased to 20.7%, and adults with a BMI of 25 or more increased to 33.5%.(Ministry of Health of the Republic of Indonesia, 2018).

As the prevalence of obesity continues to increase, obesity remains a health problem for children and adults. High levels of obesity can lead to various diseases, especially hypertension, cardiovascular disease, and cancer. Obesity remains a serious health problem in Indonesia. Obesity in adulthood increases the risk of type 2 diabetes, cancer, and other cardiovascular diseases, which have negative impacts on health and premature death.(Safitri and Rahayu, 2020)

To prevent obesity in adolescents from increasing, it is important to know the risk factors associated with obesity. One of the many factors that can cause obesity in adolescents is the consumption of foods high in fat and sugar. Then, an unhealthy lifestyle, such as an unhealthy diet, lack of physical activity, and socio-economic progress. In addition, knowledge about nutrition can also be a factor causing obesity, because poor food choices and lack of knowledge about nutrition have an impact on nutritional problems which then have an impact on a person's nutritional status. A person's diet can determine a person's nutritional status. A healthy diet depends on balanced, natural, and healthy foods..(Sineke et al., 2022)

A person's food intake is one of the causes of obesity besides other factors mentioned above. One of them is energy and carbohydrate intake. Because the energy consumed by the body is not used effectively, the body's fat tissue accumulates. The body will store more calories in the form of fat, but storing calories continuously causes obesity. Because carbohydrates are essential to meet the body's energy needs, excessive carbohydrate intake can cause obesity.(Peralta-argomeda et al., 2016)

2. METHOD

This research is a quantitative research with Cross Sectional Design. This research aims toto determine factors related to the incidence of central obesity in adolescents in Jambi City (Notoatmodjo.S, 2012). The population in this study were all teenagers.Putri Ayu Health Center working area in 2024by using the formulaSolvin was used to calculate the number of samples, consisting of 96 adolescents living in the Putri Ayu health center work area in 2024.by

using proportional random sampling techniques. Data collection using questionnaires. Data processing in the form of univariate and bivariate analysis. The analysis used is chi-square. The study was conducted from April to May 2024.(Arikunto S, 2006)

3. RESULTS AND DISCUSSION

Table 1. Frequency distribution based on variables Gender, Knowledge and physical activity, central obesity in adolescents in Jambi City

Variables	f	%
Gender		
Man	42	43.8
Woman	54	56.2
Use of Gadgets		
Tall	59	61.5
Low	37	38.5
Sleep Pattern		
Not good	62	64.6
Good	34	35.4
Stres		
Stres	55	57.3
Normal	41	42.7
Central obesity in adolescents		
Central Obesity	33	34.4
No Central Obesity	63	65.6
Total	96	96

Table 1shows that of the 96 respondents in the working area of Putri Ayu Health Center in 2024, there were 42 (43.8%) male respondents and 54 (56.2%) female respondents. Thus, it can be seen that there are more female respondents than male respondents.The results showed (61.5%) using high gadgets, and 37 teenagers (38.5%) using low gadgets. Of the 96 respondents, 62 (or 64.6%) had poor sleep patterns, and 34 (or 35.4%) had good sleep patterns. The results showed that respondents with higher stress variables, at 57.3%, and normal variables, at 42.7% andThose who experienced central obesity were 33 people (34.4%) and those who experienced central obesity were 63 people (65.6%).

Analysis*bivariate*In this study, the chi-square statistical test was used to determine whether the independent variable was related to the dependent variable. The dependent variable used in this study was obesity based on the consumption of female adolescents in the last three months and every day during menstruation. The complete results are as follows

Table 2. Relationship between gadget usagewith the Incidence of Central Obesity in Adolescents in Jambi City.

Variables	The incidence of central obesity in adolescents		Total (N = 96)	*P-Value*
	Central Obesity	No Central Obesity		
	%	%	%	0.219
Use of Gadgets				
Tall	28.8	71.2	100	
Low	43.2	56.8	100	

Table 2 shows that out of 59 respondents with high gadget usage, there are 17 (28.8%) respondents with central obesity in adolescents and out of 37 respondents with low gadget usage, there are 16 (43.2%) respondents who are not centrally obese. The results of the chi-square statistical test obtained a p value of 0.219 (p> 0.05), this means that there is no relationship between gadget usagewith the Incidence of Central Obesity in Adolescents

According to Hamalding's research (2019), obese adolescents often engage in passive activities, such as watching TV, playing games, playing electronic devices, relaxing while listening to songs, and spending 3 to 5 hours outside of school hours. This is different from adolescents who have normal bodies who only spend 1 to 2 hours outside of school hours. Several factors cause high levels of gadget use, such as lack of physical activity and lack of healthy food consumption.(Hamalding et al., 2019). In another study, Kumala (2019) found that addiction to electronic devices can affect adolescent development; the study found that adolescents who are addicted to electronic devices can ignore their surroundings, which can result in a decline in their academic performance.(Kumala et al., 2019)

Table 3. Relationship between sleep patternswith the Incidence of Central Obesity in Adolescents in Jambi City.

Variables	The incidence of central obesity in adolescents		Total (N = 96)	*P-Value*
	Central Obesity	No Central Obesity		
	%	%	%	0,000
Sleep Pattern				
Not good	48.4	51.6	100	
Good	8.8	91.2	100	

Table 4 shows that out of 62 respondents with poor sleep patterns, there are 30 (48.4%) respondents with central obesity in adolescents and out of 34 respondents with good sleep patterns, there are 3 (8.8%) respondents who are not centrally obese. The results of the chi-square statistical test obtained a p value = 0.000 (p <0.05), this means that there is no relationship between sleep patterns with the Incidence of Central Obesity in Adolescents

This study is in line with research conducted by Kristiana et al. (2020) which showed that there is a significant relationship between sleep habits and obesity rates in Melhayati University students with a value (p-value 0.000 <0.05) due to poor sleep habits. and causes hunger at night.(Kristiana et al., 2020)This is in accordance with research conducted by Purnamasari et al. (2021) on students of the Faculty of Medicine, Udayana University, showing that there is a relationship between sleep quality and body mass index with a value of p = 0.000 (p <0.05). , this is due to lack of time. Sleep can cause fatigue and prevent a person from doing physical activities.(Purnamasari et al., 2021)

Rachmawati E (2021) also said the same thing, showing that shorter sleep time correlates with higher levels of obesity in students with (p value = 0.000 <0.05).(Rachmania Eka Damayanti et al., 2019)

All living things, especially humans, need sleep, which is a process of body recovery so that stamina can return to ideal conditions. A person's sleep quality also shows how long he sleeps and ensures that rest needs are met according to the amount he gets. Poor sleep quality can affect your physical condition. Poor sleep quality can cause you to be unable to concentrate at work and become tired, which leads to decreased physical activity and unhealthy lifestyles. In the long term, unhealthy lifestyles can lead to an increase in body mass index.

Overweight and obesity are health problems that can increase the risk of several diseases. There are many factors that can help you lose weight, one of which is your sleep pattern. Good sleep patterns help you avoid obesity because they affect various physiological and behavioral processes related to controlling weight. Poor sleep patterns also affect hormones and body metabolism, which have an impact on weight gain.(Hsieh et al., 2023)

Table 4. Stress relationshipswith the Incidence of Central Obesity in Adolescents in Jambi City.

Variables	**The incidence of central obesity in adolescents**		**Total (N = 96)**	***P-Value***
	Central Obesity	**No Central Obesity**		
	%	%	%	0.001
Stres				
Tall	49.1	50.9	100	
Normal	14.6	85.4	100	

Table 4 shows that out of 55 respondents with high stress, there were 27 (49.1%) respondents with central obesity in adolescents and out of 41 respondents with normal stress, there were 6 (14.6%) respondents who were not centrally obese. The results of the chi-square statistical test obtained a p value of 0.001 ($p < 0.05$), this means that there is no relationship between stress and obesity in adolescents.with the Incidence of Central Obesity in Adolescents.

Misperception of body image and emotional states related to eating are two major factors that cause adolescent obesity. Adolescents are usually too concerned about their body posture so that they choose unhealthy diets, which in turn causes nutritional imbalances. Stress conditions that often occur in adolescents also cause them to choose foods that make them feel comfortable. They usually eat foods that are low in fiber, high in fat, and sugar.(Ministry of Health of the Republic of Indonesia, 2018)

This study follows research conducted by Mirda et al. (2022). Based on the results of the previous Spearman test, a sig. 2-tailed value of 0.000 (<0.05) was obtained, indicating a relationship between stress and obesity cases. In addition, a correlation value of 0.517 indicates a strong relationship. According to this study, stress can be the result of changes in life events

that occur at school, home, and society. The adjustment itself causes psychosocial stress that arises in adolescents. If the adjustment fails, people can experience various problems, one of which is eating disorders. A high stress score certainly indicates that the nutritional status indicator is worse.(Suryawan et al., 2023)

In a study conducted by F. Mayataqillah et al. (2023) found a significant relationship between stress levels and obesity cases in adolescents, with a p-value of 0.027 and POR 0.261. According to the study, eating can calm negative emotions caused by stress and cause someone to behave unhealthy. In stressful situations, people eat more fatty, caloric, and sugary foods.(Mayataqillah et al., 2023)

The results of the study showed that respondents experienced higher levels of stress. These signs include being tense, getting angry over small and trivial things, and tending to overreact to circumstances. The results of the study showed that the cause of stress in adolescents is due to the fact that most adolescents choose to consume foods that contain high levels of caffeine, fat, and sugar. This can certainly lead to obesity. Consumption of food when in a stressful situation becomes more uncontrolled and chooses to stop eating after the situation or stress returns to normal. So, stress management is important for adolescents to prevent obesity. Listening to music or doing physical activities are some examples of how to manage stress effectively without causing additional health problems.

4. CONCLUSION

The proportion of central obesity incidents in adolescents in Jambi City is 34.4%.For health centers, it is recommended to improve health promotion efforts on nutritional knowledge such as detecting obesity cases as early as possible so that it will be easier to carry out appropriate interventions. Efforts to find these cases are carried out through Posbindu (Integrated Development Post) activities to detect obesity early in the community or through independent health checks by individuals by measuring BMI at least once a month regarding obesity, impacts, causes, and prevention methods. Implementing physical activity levels, and reducing fat with body weight movements, walking together, and gymnastics together.

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