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Overview of Eating Behavior, Physical Activity, and Parental Obesity History in Relation to Obesity Incidence Among Medical Students at Universitas Muslim Indonesia

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Abstract

Obesity is a global epidemiological problem that poses a threat to world public health, the Word Health Organization annually publishes that obesity is the cause of death of 2.8 million people. Low physical activity is an important predictor of obesity, besides that the family environment has a big influence on the incidence of obesity in a person. The purpose of the study was to determine the description and relationship of eating behavior, physical activity, and parental obesity history with the incidence of obesity. Methods This study is an analytical descriptive study with a cross sectional method, data were collected once from each participant and analyzed with SPSS using the chi-square test. The results revealed that there were 50 umi medical faculty students who were obese, with poor eating behavior as many as 34 people or 68%, less physical activity as many as 36 people or 72%, obese father's obesity status as many as 33 people or 66% and obtained obese mother's obesity status as many as 30 people or 60%. Data analysis shows that there is a relationship between eating behavior and the incidence of obesity in UMI medical students, there is a relationship between physical activity and the incidence of obesity in UMI medical students, and there is a relationship between a history of parental obesity and the incidence of obesity in UMI medical students. Based on the results obtained, it is concluded that eating behavior, physical activity, and a history of parental obesity are one of the factors that cause obesity in UMI medical students.

Introduction

Obesity is a global epidemiological problem that poses a serious threat to world public health, the World Health Organization (WHO) annually publishes that overweight or obesity is the cause of death of 2.8 million people and 35.8 million people (about 2.3%) disability-adjusted life years. According to WHO more than 1.9 billion adults aged 18 years and over are overweight at least 650 million of whom are clinically obese and are major contributors to the

global burden of chronic disease and disability. The general health consequences of overweight and obesity impact a wide range of chronic diseases such as diabetes, cardiovascular disease, hypertension and stroke, and can lead to musculoskeletal disorders including osteoarthritis (Minghelli et al., 2015; Williams et al., 2018; Fernandes & Valdes, 2015). Obesity is also associated with several cancers, such as endometrial, breast, ovarian, prostate, liver, gallbladder, kidney and colon. The risk of these non-communicable diseases increases even when a person is only slightly overweight and becomes a serious problem as the body mass index (BMI) rises (Hewage et al., 2023; Mohajan & Mohajan, 2023; Upadhyay, 2022). The health consequences range from an increased risk of premature death, to serious chronic conditions that reduce overall quality of life (GoI, 2018; Bauer et al., 2014; Francis et al., 2024).

Sedentary work, technological advances, and unhealthy food are key factors leading to the global prevalence of obesity. Global obesity rates are increasing dramatically, this issue has become a challenge facing public Healthcare systems and Global economies (Wolfenden et al., 2019; Okunogbe et al., 2021; Okunogbe et al., 2022). The main cause of obesity and overweight is the energy imbalance between calories consumed and expended due to the current lifestyle where new forms of work are more related to computers and long working days causing an increase in sedentary behavior and reduction in physical activity of the population. This situation also encourages the consumption of high-calorie foods and fast food (Benarroch et al., 2011; Mohammed et al., 2018).

Low physical activity is also an important predictor of obesity. in the era of globalization, human lifestyles are influenced by modernization. without realizing it has a negative impact on humans, especially in health. In addition to physical activity, the family environment also has a big influence on the incidence of obesity in a person, families have the same eating habits and physical activity habits, so the relationship between parental genes and also the influence of the surrounding environment supports each other naturally when their children do the habits of their parents (Atika & Damayanti, 2022; Thivel et al., 2018).

Methods

This type of research is descriptive analytic with cross sectional method, data collected once from each participant to determine the description of eating behavior, physical activity, and a history of parental obesity with the incidence of obesity in umi medical faculty students. The sample used in this study was 50 samples, with the sampling technique in this study using purposive sampling technique, namely by determining the sample method by selecting certain samples that are considered in accordance with the objectives or research problems in a population (Prasiwi, 2012; Suryadinata & Sukarno, 2019).

The type of data used is primary data, namely data obtained directly during the study, in the form of personal data, parental identity data, anthropomentry data, eating behavior data, and physical activity level data. Subject identity data includes name, gender, date of birth, age, residential address, and telephone number obtained by filling out questionnaires online, anthropometric data obtained by filling out questionnaires in the form of , height, and mass index, parental identity data includes the names of both , age, height, and weight, Determination of eating behavior using a questionnaire from previous research, categorization of eating behavior results from summing 9 questions and then looking for the median as a cut off point that distinguishes between bad and good eating behavior. While measuring the level of physical activity using the Global Physical Activity Questionnaire (GPAQ) which consists of 16 simple questions related to daily activities carried out during the last week using a physical activity index which includes four dominant, namely physical activity while studying / working, travel activities from one place to another, recreational activities and sedentary activities (Rares et al., 2022).

Before conducting the research, the researcher has conducted a validity test so that the instrument used is valid. The sample used for the validity test was 50 respondents. Researchers conducted validity tests using the Pearson correlation formula. From the results of the valid test of each question item, the value of r count is greater than r table. This states that all questions on the questionnaire are valid and can be used. Reliable means that the instrument as a measuring tool can obtain consistent or fixed measurement results. The results of the instrument reliability test for the eating behavior variable found that Cronbach's Alpha was 0.926 and for the physical activity variable instrument was 0.641. The interpretation of these results is that the questionnaire tested is reliable (Barcın-Güzeldere & Devrim-Lanpir, 2022).

Result and Discussion

This research was conducted at the medical faculty of the Indonesian Muslim University by involving 50 respondents who were students of the medical faculty of the Indonesian Muslim University with the criteria that the research respondents were medical students of the 2021 and 2022 batches who were obese, physically and mentally healthy, willing to fill out questionnaires, and students were not fasting or dieting and not taking anti-depressant drugs. The questionnaire made consists of two parts, namely the respondent's identity and statements regarding each variable studied such as gender, age, nutritional status, eating behavior, physical activity, and nutritional status of parents. The results of distributing questionnaires to respondents were then analyzed and obtained an overview of the characteristics of the respondents as follows:

Univariate Analysis

Table 1. Characteristics of Respondents Based on Gender

No	Gender	Frequency	Percentage
1.	Male	22	44%
2.	Female	28	56%
	Total	**50**	**100%**

Based on table 1, it can be seen that the respondents used in this study were mostly women as many as 28 people or 56%, while male respondents were 22 people or 44%.

Table 2. Characteristics of Respondents Based on Age

Age Characteristics	Frequency	Percentage
17 Years	1	2%
18 Years	13	26%
19 Years	26	52%
20 Years	10	20%
Total	**50**	**100%**

Based on table 2, it can be seen that the respondents used in this study were mostly 19 years old with a total of 26 people or 52%, respondents aged 17 years were 1 person or 2%, aged 18 years were 13 people or 26%, and respondents aged 20 years were 10 people or 20%.

Table 3. Eating Behavior in Obese Students

Eating Behavior	Frequency	Percentage
Less Good	34	68%
Good	16	32%
Total	**50**	**100%**

Based on table 3, it can be seen that the respondents used in this study mostly had poor eating behavior with a total of 34 people or 68%, while students who had good eating behavior were only 16 people or 32%. This indicates that students of the general medical faculty of the

Indonesian Muslim University class of 2021 and 2022 must pay attention to eating behavior in order to avoid various health problems.

Table 4. Physical Activity in Obese Students

Physical Activity	Frequency	Percentage
Less	36	72%
Simply	14	28%
Total	**50**	**100%**

Based on table 4, it can be seen that the respondents used in this study mostly had poor physical activity with a total of 36 people or 72%, while students who had sufficient physical activity were only 14 people or 28%. This indicates that students of the general medical faculty of Indonesian Muslim University class of 2021 and 2022 must pay attention to physical activity so that the condition remains fit so that the learning process is maximized and also increases endurance and the immune system.

Table 5. Father's nutritional status

Father's Nutritional Status	Frequency	Percentage
Not Obese	17	34%
Obesity	33	66%
Total	**50**	**100%**

Based on table 5, it can be seen that the respondents used in this study mostly had fathers with obese nutritional status with a total of 33 people or 66% while 17 people had fathers with non-obese nutritional status or 34%. Based on these results it can be seen that 66% of students who are obese have fathers who are also obese.

Table 6. Nutritional status of mothers

Father's Nutritional Status	Frequency	Percentage
Not Obese	20	40%
Obesity	30	60%
Total	**50**	**100%**

Based on table 6, it can be seen that the respondents used in this study mostly had mothers with obese nutritional status with a total of 30 people or 60% while 20 people had mothers with non-obese nutritional status or 40%. Based on these results it can be seen that 60% of students who are obese have mothers who are also obese.

Univariate Analysis

Table 7. Relationship between Eating Behavior and Nutritional Status

Eating Behavior	Nutrition Status		Total	P-value
	Obesity I	Obesity II		
Good	11 (22%)	5 (10%)	**16**	0,002
Less Good	8 (16%)	26 (52%)	**34**	
Total	**19**	**31**	**50**	

Based on table 7 shows that of the 16 respondents with good eating behavior, 11 people or 22% have a nutritional status of Obesity I and 5 others or 10% obesity II. While of the 34 respondents with poor eating behavior 26 people or 52% had a nutritional status of obesity II and 8 others or 16% obesity I. It can be seen that the tendency for students with poor eating behavior to have obesity II students is higher (52%) compared to students who have good eating behavior who have obesity II (10%).

The results of the statistical test between the eating behavior variable and the obesity variable showed a significant value of 0.002 at α 0.05, which means 0.002< 0.05, so based on the decision-making value Ho is rejected and Ha is accepted, thus it can be concluded there is a relationship between eating behavior and the incidence of obesity in UMI medical faculty students.

Table 8. Relationship between Physical Activity and Nutritional Status

Activities Physical	Nutrition Status		Total	P-value
	Obesity I	Obesity II		
Simply	10 (20%)	4 (8%)	**14**	0,002
Less	9 (18%)	27 (54%)	**36**	
Total	**19**	**31**	**50**	

Based on table 8 shows that of the 14 respondents with sufficient physical activity 10 people or 20% had obesity I nutritional status and 4 others or 8% obesity II. While of the 36 respondents with less physical activity 27 people or 54% had obesity II nutritional status and 9 others or 18% obesity I. It can be seen that the tendency of students with less physical activity is experienced by obese II students. It can be seen that the tendency of students with less physical activity experienced in obesity II students is higher (54%) compared to students who have sufficient physical activity who experience obesity II (8%).

The results of statistical tests between the physical activity variable and the obesity variable showed a significant value of 0.002 at α 0.05, which means 0.002< 0.05, then based on the decision-making value Ho is rejected and Ha is accepted, thus it can be concluded that there is a relationship between physical activity and the incidence of obesity in UMI medical faculty students.

Table 9. Relationship between Parents' Obesity History and Nutritional Status

Parental History of Obesity		Nutrition Status		Total	P-value
		Obesity I	Obesity II		
Father's History of Obesity	Obesity	8 (16%)	25 (50%)	**33**	0,005
	Not Obese	11 (22%)	6 (12%)	**17**	
	Total	**19**	**31**	**50**	
Maternal History of Obesity	Obesity	6 (12%)	24 (48%)	**30**	0,001
	Not Obese	13 (26%)	7 (14%)	**20**	
	Total	**19**	**31**	**50**	

Based on the father's obesity history in table 9 shows that of the 33 respondents who had fathers with a history of obesity 25 people or 50% had a nutritional status of obesity II and 8 other people or 16% of obesity I. While of the 17 respondents who had fathers with a history of not obese 11 people or 22% had a nutritional status of obesity I and 6 other people or 12% obesity II. It can be seen that the tendency of students who have obese fathers is experienced in obese II students (50%), it is higher than students who have non-obese fathers (12%).

The results of statistical tests between the variable father's obesity history and the obesity variable found a significant value of 0.005 at α 0.05 which means 0.005< 0.05, then based on the decision-making value Ho is rejected and Ha is accepted, thus it can be concluded that there is a relationship between father's obesity history and the incidence of obesity in UMI medical faculty students.

Based on the history of maternal obesity in table 3.9 shows that of the 30 respondents who had mothers with a history of obesity 24 people or 48% had a nutritional status of obesity II and 5 other people or 12% obesity I. While of the 20 respondents who had mothers with a history of not obese 13 people or 26% had obesity status I and 7 other people or 14% obesity II. It can be

seen that the tendency of students who have obese mothers is experienced in experiencing obesity II (48%), it is higher than students who have mothers who are not obese (14%).

The results of the statistical test between the variable maternal obesity history and the obesity variable found a significant value of 0.001 at α 0.05 which means 0.001< 0.05, then based on the decision-making value Ho is rejected and Ha is accepted, thus it can be concluded that there is a relationship between maternal obesity history and the incidence of obesity in UMI medical faculty students.

Relationship between Eating Behavior and Nutritional Status

Eating behavior greatly affects a person's nutritional status, especially if in a condition of poor eating behavior. Good eating behavior can be seen from the quantity and quality of food to be consumed. One of the causes of overweight or obesity is unhealthy eating behavior. Unhealthy eating behavior is related to the selection and consumption of foods that contain high levels of fat and sugar, and unbalanced portion control (Makmun & Radisu, 2021; Powell et al., 2010).

Based on research by Rumida (2014), it shows that there is a significant relationship between attitudes about eating behavior and the incidence of obesity in students (Rumida, 2014). Meanwhile, Ratih et al. (2020) conducted research on adolescent girls showing that the relationship between respondents' eating behavior and nutritional status obtained the results of p (0.01)< α (0.05) which means that there is a relationship between respondents' (Ratih et al., 2020)eating behavior and nutritional status at SMAN 2 Tambang . This is similar to the research of Sisthaningrung N (2022) from the results of data analysis showing that the variable that has the most influence on nutritional status is eating behavior with a P value of 0.035, it can be concluded that there is a significant relationship between eating behavior and the nutritional status of adolescents in 2018 medical faculty students of Universitas Kristen Indonesia (Sisthaningrum, 2022). Based on this research, it can be concluded that eating behavior and nutritional status are closely related.

Overeating behavior tends to be shared by people. Obese people are usually more responsive than people who have a normal body weight to external hunger cues, such as the taste and smell of food, or the time to eat (Salam, 2010; Brondel et al., 2022). Fast food consumption is also the main cause of unbalanced quantity and quality of food entering the body (Masdarwati et al., 2022).

Eating habits that are often seen in adolescents include eating snacks, skipping meals, especially , irregular meal times, often eating fast food, rarely consuming vegetables, fruit and or livestock products (dairy food) and incorrect weight control in adolescent girls. This can result in food intake that does not meet the needs and balanced nutrition with the result of under or over nutrition (Rikandi & Elvisa, 2021).

Relationship between Physical Activity and Nutritional Status

Physical activity is the movement of the limbs produced by muscle contractions to produce energy that functions to maintain physical and mental health and maintain quality of life to stay healthy and fit throughout the day. One of the impacts of a lack of physical activity is that it causes a decrease in fitness, besides that limited physical activity also causes adolescents, in this case students, to experience excess . Excess weight is caused by an increase in energy deposits in the form of fat tissue, usually in the abdominal cavity (Delimasari & Anjarwati, 2017; Grundy, 2015).

The college period is also a time when students start to be active and take up rest time, thus affecting physical activity (Riskawati et al., 2018). The convenience brought by technological advances makes students do a sedentary lifestyle, namely the habit of often sitting, watching TV, using high-tech equipment such as computers, which causes less movement (Liando et al., 2021). It is known that 80.6% of students have less physical activity. This physical activity is

used to burn energy, if the energy intake is too much, and physical activity is not balanced, it will increase body weight, on the other hand, if the calories burned are high plus less calorie intake will cause a calorie deficit and lead to weight loss (Kurdanti et al., 2015).

This study is in line with Multazami 2022 with the result that there is a relationship between physical activity and the nutritional status of students, students who are not active in physical activity will be at risk three times to have abnormal nutritional status (Multazami, 2022). These results are also supported by the research of Permatasari et al. (2021) which obtained the results that there is a relationship between physical activity and nutritional status in adolescents aged in Medan City (Permatasari et al., 2022). In contrast to Nurkhopipah's research, (2017) which took a sample of 218 UNS undergraduate students, and showed the results that there was no relationship between physical activity and the nutritional status of UNS undergraduate students (Nurkhopipah, 2017).

Respondents who were not physically active were due to not doing any other activities other than studying and playing cellphones. In addition, distance learning is still applied, which requires students to study online and sit in front of a computer for a long time. This habit can be called a sedentary lifestyle. Sedentary lifestyle is a major risk factor for obesity (Tremblay et al., 2010).

Relationship between Old Obesity History and Nutritional Status

Parental fatness is a genetic factor that has a major role in the incidence of obesity in children. If both parents are obese, about 80% of their children will become obese, if one parent is obese, the incidence of obesity in children will be 40% and if both parents are not obese, the incidence of obesity in children will drop to 14%. The increased risk of becoming obese is likely due to the influence of genes or environmental factors in the family (Permatasari et al., 2013).

Although it is now widely suggested that environmental interactions are more important than genetics, having obese parents is likely to lead to an increase in food supply and caloric intake accompanied by reduced levels of physical activity. Food preferences are shaped by a combination of genetic and environmental factors. The development of children's food preferences involves a complex interaction of genetic, familial and environmental factors. There is evidence of a strong genetic influence on appetite traits in children, but the environment plays an important role in modeling children's eating behavior (Permatasari et al., 2013; Scaglioni et al., 2011; Wood, 2018).

The increased risk of becoming obese is caused by the influence of genes or environmental factors in the family. According to research from the Public Library of Scienece (PLOS) Medicine, it turns out that genetic factors account for 23 percent of the increase in body mass. A strong genetic basis makes the development of obesity more vulnerable. Many genes have been linked as predisposing factors for excess fat. Some obesity genes that have been found in humans are Lep(ob) (Andini et al., 2016; Socol et al., 2022; Jiménez-Cortegana et al., 2022; Veerabathiran et al., 2023).

LepR(db), POMC, MC4R, PC-1. In an international study of twins and adoption, it was found that genetics has a strong influence on BMI variation at all ages, and its influence is stronger than environmental influences. Obesity is often the result of interactions between genes and genes and the environment. Identification of specific susceptibility genes difficult. More than 430 genes or chromosome parts are involved as the etiology of obesity (Juliantini & Sidiartha, 2021).

The results of this study are in line with research by Puspitasari (2018) which states that there is a relationship between genetic factors and the incidence of obesity (p-value=0.003). The results of this study are also in line with the research of Tchernof & Despres (2013) which states that genetics can affect a person's level of obesity. This is also evident from Tchernof &

Despres' (2013) research on adults whose childhood was adopted found that their weight was close to the weight of their biological parents. So it appears that genetics affect the level of obesity compared to the environment. Genetic factors have a 25%-75% effect on the incidence of central obesity. However, there are other influential factors, namely parenting and the interaction between genes and the environment. In , research conducted by Tchernof and Despres (2013) stated that genetics can affect a person's obesity level. If a person comes from a family that is centrally obese, then that person is 2-8 times more likely to experience central obesity (Puspitasari, 2018; Tchernof & Després, 2013) than coming from a family that is not obese.

Conclusion

Based on research and discussion, it can be concluded that: 1) There are 50 students of the general medical faculty of the Indonesian Muslim University class of 2021 and 2022 who are obese; 2) In 50 students with obese status have poor eating behavior, namely 34 people or 68%; 3) In 50 students with obesity status have less physical activity, namely 36 people or 72%; 4) In 50 students with obese status had fathers who were obese as well as 33 people or 66% and it was found that in 50 students with obese status had mothers who were obese as well as 30 people or 60%; 5) It was found that there was a relationship between eating behavior and the incidence of obesity in medical faculty students at the Indonesian Muslim University; 6) It was found that there was a relationship between physical activity and the incidence of obesity in medical faculty students at the Indonesian Muslim University; 7) It was found that there was a relationship between the history of parental obesity and the incidence of obesity in medical faculty students at the Muslim University of Indonesia.

Based on the research process that has been carried out, the researcher suggests: 1) For medical students, this research can be an input for students to understand the importance of a good diet and sufficient physical activity to keep the body fit so that the learning process becomes more optimal; 2) For agencies, especially campuses, they can create programs that remind students to maintain a diet and also programs that support physical activities such as leisurely walks, fun futsal or others.

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