

**OVERVIEW OF KNOWLEDGE ABOUT OBESITY IN
STUDENTS OF THE FACULTY OF MEDICINE,
UNIVERSITY OF TARUMANAGARA**

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Abstract

In recent years, there has been an increase in the trend of obesity survivors in Indonesia. This increase is included in the significant category where in 2013, 2016 and 2018 the percentage of male obesity survivors aged over 18 years was in the range of 19.6%, 24% and 26.6% respectively. Meanwhile, the percentage of female obesity survivors aged over 18 years was in the range of 32.9%, 41.6% and 44.4% respectively. This situation is certainly concerning for Indonesia where obesity is a trigger for several degenerative diseases that can affect the productivity of the population of a region. Lack of nutritional education and the rampant advertisements for unhealthy foods on social media are some of the factors that can affect knowledge of obesity in a population. Therefore, a study was conducted to determine the level of knowledge of obesity in Tarumanagara University students. The study was conducted by providing a questionnaire containing statements related to the definition, risk factors and treatment of obesity. Later, the distribution of answers from respondents was analyzed to see a picture of the level of knowledge of obesity. From the research conducted on 103 FK Untar students of class 2021, it can be concluded that the proportion of respondents with a good level of knowledge about obesity is 8.7% and the proportion of respondents with a sufficient level of knowledge is 57.3%. The author suggests including questions from the informal and formal sectors to provide a better picture of the risk factors and level of knowledge of respondents related to obesity in a population..

Keywords: Obesity, Obesity Knowledge Level, Obesity Trends.

INTRODUCTION

Obesity is a public health problem caused by various things and has been on the rise in various developed and developing countries (1). All countries on earth are affected by obesity and no country has experienced a decrease in the number of obesity in its population (2). It is said that 1.225 billion people were overweight in 1980 and increased to 1.6 billion overweight people and 400 million of them were obese in 2011, then increased again to 2.3 billion overweight people and 700 million people were obese in 2013. Obesity has resulted in many losses in terms of social and economic aspects. The economic impact of overweight and obesity in 2020 resulted in losses of USD 1.96 trillion which covers 2.4% of the world's GDP and is predicted to continue to increase to USD 4.32 trillion which covers 2.9% of GDP by 2035 (3).

Obesity can be determined by calculating the body mass index which is a ratio of body weight and height, where if the body mass index is above 30, it can be classified as obesity (4). Obesity is commonly associated with various health problems such as coronary heart disease, stroke, and type 2 diabetes. In addition, there are also various kinds of stigmas attached to obese people such as being lazy, weak-willed, less intelligent, less disciplined, and not complying with weight loss (5). This causes discrimination

in various fields such as in the workplace, health care facilities, educational institutions, mass media, and interpersonal relationships (6).

In one study, it was found that overweight and obese adolescents experienced higher rates of bullying including bullying due to overweight (7). People who are overweight and obese also experience a significant decline in quality of life. Weight loss turns out to improve the quality of life of a person who is obese. The decline in quality of life is due to restrictions on physical activity which results in a decrease in social activities (8). Given that people with obesity have a greater likelihood of hospitalization as obesity rates rise, there will be an increase in the number of health care providers to treat diseases associated with obesity (9).

In a study, it was also said that physical activity in obese people can improve various parameters related to health such as a decrease in serum triglycerides, more flexible blood vessel walls, increased mitochondrial respiration, increased fat oxidation and insulin sensitivity, decreased fat levels in the liver and decreased HBA1C levels. Therefore, increasing knowledge about obesity followed by action can reduce the obesity rate in Indonesia (10).

Given the importance of increasing knowledge and taking preventive action against obesity, it is essential to assess how well future

health professionals understand this issue. Medical students were chosen as research subjects because they are future health workers who play an important role in providing health education and promotion to the community. Understanding obesity is important for developing students' competence as future health workers who are capable of promoting and preventing non-communicable diseases.

The relationship between knowledge and health behavior can be explained through the Health Belief Model (HBM), in which increased knowledge can influence a person's perception of the risks of obesity and the benefits of preventive behaviors, thereby encouraging behavioral changes towards a healthier lifestyle (11)

Several studies show that medical students do not yet have an optimal level of knowledge about nutrition and obesity (12), while the integration of healthy lifestyle education into the medical curriculum has been shown to increase awareness and professional readiness in dealing with obesity (13). This confirms the important relevance of this research in medical education.

However, most of the existing studies were conducted in other countries and focused primarily on general nutrition or lifestyle education rather than specifically assessing

knowledge about obesity itself. There is still limited evidence regarding the level of obesity-related knowledge among medical students in Indonesia. Therefore, this study aims to fill this gap by evaluating medical students' understanding of obesity and its implications for healthy behavior.

This research was aimed at providing an overview of obesity knowledge in 7th semester medical students from Tarumanagara University. The findings of this study are expected to provide insights into the current understanding of obesity among future health professionals, which may serve as a basis for developing educational strategies to strengthen obesity prevention and management within medical education.

Literature Review

Definition of Obesity

Obesity is a medical condition characterized by excessive fat accumulation in the body due to an imbalance between calorie intake and energy expenditure, which can increase the risk of various diseases such as diabetes, heart disease, and hypertension (14).

Obesity Classification

Obesity can be classified based on Body Mass Index (BMI), which is calculated by dividing body weight (in kilograms) by the square of height (in meters) (15). BMI is a

commonly used tool to assess a person's weight status and identify whether they are underweight, normal, overweight, or obese. According to *World Health Organization* (WHO), the BMI classification is divided into several categories: less than 18.5 including *underweight* (underweight), 18.5–24.9 including normal, 25–29.9 including *overweight* (overweight), and 30 or more include obesity. Obesity itself is still further divided into three levels: class I obesity (BMI 30–34.9), class II obesity (BMI 35–39.9), and class III obesity (BMI 40 or more), which is also known as extreme or morbid obesity. This classification helps in determining health risks associated with weight, such as heart disease, diabetes, and other metabolic disorders (16).

Although BMI is a useful benchmark for identifying obesity, classification methods using BMI have limitations because they do not distinguish between fat mass and muscle mass. For example, athletes with high muscle mass may have a high BMI despite not having excess fat. However, for the general population, BMI remains an effective indicator for assessing weight-related health risks. Class I obesity presents an increased health risk, while class II and III obesity is associated with much more serious risks, including premature death. Therefore, regular monitoring of BMI and

management of obesity through lifestyle changes, a balanced diet, and physical activity are essential to reduce the risk of chronic diseases and improve quality of life (17).

Obesity Epidemiology

Obesity has become a global health crisis that threatens both developed and developing countries. According to the World Health Organization (WHO), in 2022, more than 1 billion adults in the world are obese (Body Mass Index/BMI ≥ 30), or about 13% of the global adult population. This figure has nearly tripled since 1975, with the fastest growth occurring in low- and middle-income countries. In developed countries such as the United States (US), the prevalence of adult obesity reached 42.4% (2020), while in the UK and Western European countries it ranged from 20–30%. In the Middle East region, Gulf countries such as Saudi Arabia and the United Arab Emirates even recorded adult obesity rates above 35%, triggered by luxurious lifestyles, consumption of high-fat foods, and minimal physical activity. In Latin America, Mexico and Brazil are also facing a surge in obesity, with prevalence exceeding 30% due to massive urbanization and reliance on processed foods. Globally, urbanization, food industrialization, and sedentary lifestyles are the main triggers, where easy access to fast food, sugary drinks, and technologies that reduce

physical activity create an "obesogenic" environment (18).

In Indonesia, the obesity trend shows a significant increase even though it has not reached the level of developed countries. Basic Health Research Data (Riskesdas) of the Ministry of Health of the Republic of Indonesia recorded that the prevalence of obesity in adults (age ≥ 18 years) increased from 15.4% (2013) to 21.8% (2018), with a projection of reaching 25–30% in 2023. This increase is faster (5–7% per decade) than in developed countries, although the absolute figure is still lower. The main factors include dietary changes, such as the consumption of fast food and sweetened beverages which increases by 10% per year (BPS, 2022), as well as a sedentary lifestyle (31.5% of the Indonesian population lacks physical activity). A unique phenomenon in Indonesia is *double burden of malnutrition*, where obesity in adults and children occurs along with malnutrition problems. For example, 30.8% of children under five are stunting (2021), while obesity in children aged 5–12 years increased from 8% (2013) to 9.2% (2018). This reflects the inequality of access to food: in urban areas, excess calories from processed foods drive obesity, while in rural areas, poverty and lack of nutrition education lead to stunting.

At the global level, obesity is closely

related to the economic and cultural levels of consumerism. In the U.S. and Europe, the habit of eating large portions, aggressive advertising of unhealthy foods, and reliance on private vehicles exacerbate the obesity problem. Meanwhile, in Indonesia, cultural factors also play a role, such as the perception that a fat body is a symbol of prosperity and health. In fact, obesity is actually the main trigger for non-communicable diseases (NCDs). Globally, 44% of cases of type 2 diabetes and 23% of ischemic heart disease are caused by obesity. In Indonesia, NCDs such as diabetes, hypertension, and stroke account for 73% of total deaths, with medical costs burdening the health system.

Developed countries are starting to implement progressive policies such as sugar taxes (UK and Mexico), warning labelling on food packaging (Chile), and ad restrictions *junk food*. However, in Indonesia, obesity prevention efforts are still hampered by a dual priority: tackling stunting and obesity. In addition, minimal nutrition education in remote areas and rampant unhealthy food advertisements on social media exacerbate the situation. To reduce the rate of obesity, policymakers can take several steps. Steps that can be taken can be in the form of the implementation of excise taxes on sweetened beverages and restrictions on advertising of high-sugar/fat foods (19).

Risk Factors for Obesity

Obesity is triggered by a combination of genetic, environmental, behavioural, and psychological factors. Genetic factors are the most important factor, where a family history of obesity increases a person's risk due to certain genes (such as the FTO gene) that can affect metabolism, fat storage, and appetite. In addition, unhealthy diets such as the habit of consuming foods with a high percentage of saturated fat and sugar and *ultra processed food* is one of the factors that can trigger obesity. Consumption of sugary drinks, *fast food*, as well as overeating without being balanced by physical activity causing excess energy accumulation. Lifestyle *sedentary* (lack of movement) due to habit *scrolling* Social media, working in front of a computer, or lack of exercise also reduce calorie burn, thus triggering weight gain. Psychological factors such as stress, depression, or *emotional eating* can encourage a person to overeat to cope with emotional distress (20)

Environmental and socioeconomic factors also play a role in triggering obesity. Easy access to fast food with food delivery service providers, unhealthy food advertisements, and urban environments that lack physical activity (e.g., lack of sidewalks or sports facilities) make it difficult to adopt a healthy lifestyle. In low-

income groups, financial constraints often lead a person to choose cheap but high-calorie foods (21). Certain medical conditions such as hypothyroidism, polycystic ovary syndrome (PCOS), or other hormonal disorders can also slow down metabolism and trigger obesity. In addition, the side effects of medications such as antidepressants, corticosteroids, or certain birth control pills can increase appetite or fluid retention. Chronic sleep deprivation is also associated with an imbalance of the hormones leptin and ghrelin, which regulate hunger and satiety, thus triggering the desire to overeat. Other factors such as aging (metabolism slows down with age) or pregnancy (weight gain that is difficult to lose after childbirth) also increase the risk of obesity (22)

METHOD

This research was carried out in December 2024. This research was carried out with a cross-sectional quantitative descriptive design, with a sample of 103 7th semester students from the faculty of medicine, Tarumanagara University. The sampling technique used was total sampling, where all eligible 7th-semester students were included as participants. Primary data from this study were obtained from a questionnaire containing 27 statements related to general knowledge, causes and ways to deal with obesity in a population. The questionnaire was run with

a yes and no statement. Later, the percentage of the frequency of yes and no answers from the respondents will be obtained which will provide

an overview of the level of knowledge of the respondents on the topic of obesity.

RESULTS AND DISCUSSION

Results

From the distribution of respondents' answers, it is known that the research respondents are dominated by students of the Faculty of Medicine, Tarumanagara University who are conducting studies in the seventh semester. The distribution of answers from respondents can be observed in table 1.

Table 1. Distribution of Research Questionnaire Respondent Answers

No.	Question	Respondent's Answer			
		True		Wrong	
		n	%	n	%
1	Obesity is not a disease, but a consequence of lifestyle choices?	48	46,6	55	53,4
2	Weight gain is always due to an increase in fat?	28	27,2	75	72,8
3	Rapid weight loss is beneficial for health?	21	20,4	82	79,6
4	Is maintaining weight after weight loss difficult?	83	80,6	20	19,4
5	Is increased body fat in obese children the cause of health problems?	88	85,4	15	14,6
6	Some children are 'destined' to be obese because of innate factors that cannot be changed?	63	61,2	40	38,8
7	Most children with increased body fat are generally healthy and will stay healthy?	22	21,4	81	78,6
8	Without genetic factors, Most obesity is caused by a lack of dietary regulation?	97	94,2	6	5,8
9	Can obesity be caused by eating too much?	98	95,1	5	4,9
10	Obesity is not related to the calorie content of food?	80	77,7	23	22,3
11	Obesity caused by eating processed foods?	29	28,2	74	71,8
12	Obesity caused by breakfast habits?	29	28,2	74	71,8
13	Can obesity be caused by pathogens (disease-causing microorganisms) in the gut (microbiome)?	43	41,7	60	58,3
14	Obesity caused by under-consumption of plant-based foods?	56	54,4	47	45,6
15	Is the addition of subcutaneous adipose tissue (fat) a sign of an unhealthy child?	65	63,1	38	36,9
16	Individuals with obesity have a low metabolic rate?	75	72,8	28	27,2
17	Are 'big-bodied' individuals potentially at a healthy weight?	71	68,9	32	31,1
18	Is a low-fat diet the best way to reduce fat in the body?	66	64,1	37	35,9
19	Is nutritional therapy medically more effective when it is based on one's own will?	91	89,3	11	10,7
20	As long as the daily calorie deficit is maintained at 500 calories, can weight loss continue?	70	68	33	32
21	Increased Physical Exercise is the most effective way to lose weight?	85	82,5	18	17,5

22	Do GYM activities and physical activity trackers make it easier to lose weight?	95	92,2	8	7,8
23	Setting realistic obesity reduction goals is more effective than aggressive targets?	93	90,3	10	9,7
24	Slow and gradual weight loss is more effective than rapid weight loss?	100	97,1	3	2,9
25	Weight fluctuations on the yoyo diet are more dangerous than maintaining weight	72	69,9	31	30,1
26	Should anti-obesity drugs not be used in children?	35	34	68	66
27	Bariatric surgery is too dangerous a procedure for both pediatric and adult patients?	37	35,9	66	64,1

Source: Data processed by Researcher (2024)

From the questionnaire that had been distributed to the respondents, it was found that the 24th question had the highest percentage of correct answers with 100 respondents answering yes to the question, while the 3rd question had the lowest percentage of correct answers where only 21 respondents answered yes to the question.

From the distribution of questionnaire answers, an overview of the respondents' knowledge of obesity in a population was obtained. In table 2, an overview of the respondents' level of knowledge about obesity can be observed.

Table 2. Percentage of Response Distribution of Research Questionnaire Respondents

Category	n	%
Good	9	8,7
Enough	59	57,3
Less	35	34
Total	103	100

Source: Data processed by Researcher (2024)

The relatively low proportion of students with good knowledge levels may be related to the structure of the medical school curriculum. At Tarumanagara University, detailed discussions about obesity and lifestyle-related diseases are generally introduced during the clinical phase, while pre-clinical courses focus more on basic medical sciences. As a result, seventh-semester students who are still in transition from pre-clinical to clinical training,

may have limited exposure to clinical aspects of obesity prevention and management. Similar patterns have been reported in other studies showing that obesity-related knowledge tends to increase after clinical exposure or targeted nutrition education programs in medical schools (12,13).

Discussion

Obesity is one of the conditions where a person has excess weight which is characterized

by excessive accumulation of body fat. People with obesity generally have a Body Mass Index (BMI) ratio of >30 . Obesity can increase the risk of heart disease because it can lead to an increase in blood pressure and high cholesterol levels, which is a risk of disorders in the blood vessels, in addition to that excessive fat accumulation in the obesity condition can also interfere with the body's ability to produce insulin effectively, which will ultimately increase the risk of type 2 diabetes. Excess weight also increases the risk of joint damage in obese patients, where the joints, especially in the extremities and pelvis, have to bear heavier loads than normal conditions which will eventually erode the cartilage which will trigger inflammation in the area (23)

Looking at the trend of obesity survivors in Indonesia, there is a significant increase from year to year. In 2013 there were 19.6% of men in the obesity category, while 32.0% of women were included in the obesity category. In 2016 there was an increase of 4.4% for men with the obesity category and 9.5% for women with the obesity category. Furthermore, in 2018 there was an increase in the number of men with the obesity category, an increase this year marked that more than $\frac{1}{4}$ men over the age of 18 years are included in the obesity category and 44.4% of women over the age of 18 are included in the obesity category. This is certainly a worrying

situation for the Indonesian people because obesity can trigger degenerative diseases such as diabetes mellitus, hypertension, osteoarthritis and others that can inhibit the productivity of a population due to lack of concentration, decreased work motivation and fatigue (24).

Knowledge of obesity has a significant correlation to the rate of obesity in a population. The higher the level of public knowledge about the causes, health impacts, and the importance of a healthy diet and physical activity, the more likely they are to adopt a lifestyle that supports obesity prevention. Conversely, low knowledge about obesity often leads to a lack of awareness of the importance of managing diet, exercising, or understanding the risks posed by obesity, thus increasing the incidence of obesity in those populations. Therefore, education and counselling on obesity is very important to reduce the prevalence of obesity in the community (25). One example of a country with a low obesity rate is Japan. In Japan, the obesity rate is very low compared to other countries, with the prevalence of obesity only around 4-5% (26). This can be attributed to a high level of knowledge regarding the importance of a healthy diet and an active lifestyle. Japanese people generally have a good understanding of the adverse effects of obesity, as well as eating habits that prioritize small portions, low-calorie

foods, and a lot of vegetables and fish. In addition, the walking and cycling culture in Japan also supports an active lifestyle. Effective public health programs, such as regular health check-ups and government policies that encourage healthy eating, also contribute to the low obesity rate in the country.

These national and global trends highlight the growing importance of equipping future health professionals with sufficient knowledge about obesity prevention. The suboptimal knowledge levels observed among the seventh-semester students in this study suggest that even future physicians may not yet be adequately prepared to address this escalating public health issue. Therefore, strengthening obesity-related content within the medical curriculum is essential to support future healthcare providers in responding effectively to this epidemic.

From the research that has been conducted on 103 FK Untar students of the 2021 batch, it can be concluded that the proportion of respondents with a good level of knowledge about obesity is 8.7% and the proportion of respondents with a sufficient level of knowledge is 57.3%. The authors suggest including questions from the informal and formal sectors to provide a better picture of the risk factors and level of knowledge of respondents related to obesity in a population.

The finding that most respondents had only a moderate level of knowledge aligns with studies by (12,27), which reported that medical students in several countries also demonstrated insufficient understanding of obesity risk factors and management strategies. Similarly, a study by (13) found that targeted obesity education programs within medical curricula significantly improved students' awareness and professional readiness to manage obesity. These findings suggest that the integration of structured obesity education early in medical training could enhance students' comprehension and promote preventive health behavior among future physicians.

CONCLUSION AND RECOMMENDATION

The understanding of medical students regarding obesity is still not optimal, so it is necessary to strengthen the material and adopt a more comprehensive learning approach. This situation highlights the need for curriculum improvement, including the addition of case studies and practice-based learning, so that students have a more complete understanding of the causes, risks, and management of obesity. In addition, research instruments also need to be refined to better capture students' knowledge. Improving nutrition education and healthy lifestyle promotion in the academic environment is expected to equip future healthcare

professionals to play a more effective role in promotive and preventive efforts against obesity in the community.

ACKNOWLEDGE

The authors extend sincere appreciation to all individuals and institutions that contributed to the completion of this study. Gratitude is addressed to the respondents who willingly participated and provided valuable information, as well as to the academic community for the support offered throughout the research process. The authors also acknowledge the contribution of Universitas Siliwangi and its research unit for providing the facilities and administrative assistance needed during the implementation of this work. The constructive input, encouragement, and cooperation from various parties have played an essential role in ensuring the successful completion of this research.

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