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Original Research Paper

Analysis of Risk Factors for Obesity Incidence at Johar Baru Community Health Center, Central Jakarta

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ABSTRACT

Background: Obesity is a major contributor to degenerative diseases and continues to show high prevalence. Identifying key risk factors is essential for targeted intervention. **Objective:** This study aimed to analyze the dominant risk factors for obesity at the Johar Baru Community Health Center, Central Jakarta. **Methods:** An observational analytic study with a cross-sectional design was conducted using secondary data. From a population of 102,647 individuals, 72,680 were included through total sampling. Data were analyzed using Chi-square tests and multiple logistic regression (enter method) with a significance level of 0.05. **Results:** Bivariate analysis showed that gender, lack of physical activity, high sugar and fat consumption, and low fruit and vegetable intake were significantly associated with obesity ($p \leq 0.05$). Multivariate analysis identified gender as the strongest risk factor (OR = 12.912; p = 0.000). **Conclusion:** Gender, physical inactivity, excessive sugar and fat intake, and inadequate fruit and vegetable consumption were significantly linked to obesity. Gender emerged as the most dominant factor. These findings support the development of targeted interventions focusing on promoting balanced diets, regular physical activity, and awareness of dietary fat types to address obesity at the community level.

Introduction

Obesity, a non-communicable condition, is associated with a higher risk of developing degenerative diseases such as type II diabetes mellitus, various types of cancer, cardiovascular diseases, and hypertension. Typically, the diagnosis of obesity involves observing a significant increase in Body Mass Index (BMI) compared to the average BMI observed in the general population[1]. Obesity is identified by excessive accumulation of body fat, which is usually evaluated using metrics such as Body Mass Index (BMI) or body fat percentage. Although exact benchmarks may vary, a person is generally classified as obese if their weight exceeds a certain percentage above the average weight adjusted for height and age. Approximately 20% above the average weight for men and 25% above the average weight for women may indicate a significant accumulation of fat tissue in the body, which is associated with an increased health risk[2].

The prevalence of obesity has increased not only in developed countries but also in developing countries such as Indonesia[3]. This trend highlights a global health issue that transcends economic boundaries. Contributing factors to this rise include lifestyle changes, dietary habits, urbanization, and decreased physical activity. Addressing this problem requires comprehensive strategies that encompass education, public health initiatives, policy interventions, and the promotion of

healthy lifestyle choices across various populations[4]. Data showing an increase in obesity prevalence between 2007 and 2018, particularly among adults aged 18 years and older, underscores the urgency of tackling this significant health challenge. The prevalence rate reached 21.8%, with higher figures in women (29.3%) compared to men (14.5%), indicating that obesity has become an urgent public health problem in Indonesia[5].

Obesity is a multifaceted issue influenced by various factors[7], including genetic predisposition, lifestyle, excessive intake of sugar and macronutrients, frequent consumption of fast food, parental history of obesity, lack of sleep, and low consumption of fruits and vegetables[8]. The complex interaction between these factors makes it difficult to identify the primary contributors to obesity. Understanding the underlying risk factors behind this trend is essential for developing effective intervention strategies. These strategies must include multifaceted approaches such as education on nutrition and lifestyle, promotion of physical activity, and policy initiatives aimed at creating environments conducive to healthy living. By comprehensively addressing these factors, we can work toward curbing the obesity epidemic and improving the overall health and well-being of the population[6].

Obesity is an urgent public health issue with increasing prevalence and a high risk of various degenerative diseases. This study is important because, in Central Jakarta, the prevalence of obesity is significantly high and requires special attention. By analyzing the dominant risk factors at Johar Baru Public Health Center, this research aims to identify the specific factors influencing the occurrence of obesity in the area. The findings of this study will provide valuable insights for designing and implementing effective, evidence-based health interventions. This approach is expected to reduce obesity rates and improve the quality of life of the local community through strategies tailored to the local context.

Materials and Methods

Research Design

This study is an analytical observational study using a cross-sectional approach. It utilizes secondary data obtained from Johar Baru Public Health Center, Central Jakarta, in 2021. This research design was chosen to understand the relationship between various risk factors and the occurrence of obesity within the studied population.

Sample

This study involved a total population of 102,647 individuals. Using the total sampling method, 72,680 samples were selected based on the completeness of patient data. Total sampling was chosen to ensure comprehensive data inclusion, minimize selection bias, and enhance the representativeness of the findings. By utilizing all available and complete data records, the study aimed to produce more accurate and generalizable results regarding the analyzed variables.

Data Collection Technique

This study uses data on both independent and dependent variables. Independent variables include age, gender, physical activity level, smoking history, excessive intake of sugar, salt, and fat, poor dietary patterns (low fruit and vegetable intake), and alcohol consumption. The dependent variable is obesity incidence. Data were collected from medical records at Johar Baru Public Health Center. These variables were selected based on their relevance to obesity risk factors commonly identified in public health research. The data provide a comprehensive overview of individual lifestyle and demographic factors potentially influencing obesity, allowing for a focused analysis of key contributors to this health condition.

Data Analysis Technique

Data analysis was conducted using SPSS version 25 software. Bivariate analysis was performed to examine the relationship between each independent variable and the dependent variable using the Chi-Square test. Subsequently, multivariate analysis was carried out using multiple logistic regression with the enter method to determine the effect of each independent variable on the occurrence of obesity. The significance level used in this analysis was 0.05.

Ethical Considerations

In this study, ethical considerations such as utility, confidentiality, and fairness were carefully observed. The researchers obtained ethical approval from the Health Research Ethics Committee with the approval letter number: 056/KEPK/UNPRI/IX/2023. The researchers ensured that all data used remained confidential and were solely used for research purposes.

Result

The results of the Chi-Square test analysis (Table 1) showed that the variables gender (0.00), physical inactivity (0.00), excessive fat consumption (0.01), and low fruit and vegetable intake (0.00) have p-values ≤ 0.05, indicating a significant relationship and are eligible to proceed to the next stage of testing. Meanwhile, the variables age (0.98), smoking history (0.92), excessive sugar consumption (0.09), excessive salt consumption (0.73), and alcohol consumption (0.36) have p-values > 0.05, meaning these variables are not statistically associated with the incidence of obesity and are therefore excluded from further testing stages.

Table 1. Bivariate Analysis (Chi-Square Test) of Risk Factors Associated with Obesity at Johar Baru Public Health Center, Central Jakarta, 2021

Variable	Category	Body Mass Index		Total	Sig.
		Not Obese	Obese		
Age	Non-Productive	10.797	4.776	15.573	0.98
	Productive	39.586	17.521	57.107	
Sex	Male	23.590	9.441	33.031	0.00
	Female	26.793	12.856	39.649	
Lack of Physical Activity	Yes	38.249	17.207	55.456	0.00
	No	12.134	5.090	17.224	
Smoking History	Yes	35.202	15.570	50.772	0.92
	No	15.181	6.727	21.908	
Excess Sugar Intake	Yes	30.681	13.727	44.408	0.09
	No	19.702	8.570	28.272	
Excess Salt Intake	Yes	32.912	14.595	47.507	0.73
	No	17.471	7.702	25.173	
Excess Fat Intake	Yes	31.201	13.563	44.764	0.01
	No	19.182	8.734	27.916	
Lack of Fruit and Vegetable Intake	Yes	32.143	14.537	46.680	0.00
	No	18.240	7.760	26.000	
Alcohol Consumption	No	50.344	22.275	72.619	0.36
	Yes	0.039	0.022	0.061	

Source: *Primary Data Processed, 2024.*

Table 2. Multivariate Analysis (Multiple Logistic Regression Using Enter Method) of Risk Factors Associated with Obesity at Johar Baru Public Health Center, Central Jakarta, 2021

Variable	B	S.E.	Wald	df	Sig.	Exp(B)
Sex	0.213	0.019	120.037	1	0.00	1.238
Lack of Physical Activity	0.070	0.023	9.210	1	0.00	1.072
Excess Fat Intake	0.550	0.017	10.778	1	0.00	1.057
Lack of Fruit and Vegetable Intake	-0.073	0.017	18.193	1	0.00	0.930
Constant	-1.210	0.590	422.557	1	0.00	0.298

Source: *Primary Data Processed, 2024.*

The results of the multiple logistic regression test using the enter method (Table 2) showed that the variables gender (OR = 1.238), physical inactivity (OR = 1.072), and excessive fat consumption (OR = 1.057) all have OR values above 1, indicating that these factors can be considered risk factors for the incidence of obesity. Meanwhile, the variables low fruit and vegetable intake (OR = 0.930) and the constant (OR = 0.298) have OR values below 1, indicating a protective effect against the incidence of obesity.

Discussion

The variable gender shows a strong association with the risk of obesity, with an Odds Ratio (Exp B) of 1.238, indicating that females are 1.238 times more likely to experience obesity than males, controlling for other factors in the analysis. This finding is supported by Nugroho (2020), who stated that there is a relationship between gender (p-value 0.000; COR 0.595; 95% CI 0.493 – 0.718), interpreted as females having a 0.595 times risk of obesity compared to males[9]. Obesity is caused by various factors, including genetics, environment, lifestyle, and socioeconomic factors. Gender plays an important role and should be considered among the main risks associated with a person's physical activity[10]. Obesity is more common in females than in males, especially in low- and middle-income countries. However, this gap tends to disappear in high-income countries, possibly due to increased public awareness about healthy lifestyles, better access to healthcare services, government policy support for obesity prevention, and cultural shifts toward balanced diets and regular physical activity[11,12].

In addition to these factors, biological, genetic, hormonal, lifestyle, and socio-cultural factors also play an important role in the increasing obesity rates among women[13], with hormonal changes during the menstrual cycle[14], pregnancy, and menopause[15] also affecting weight regulation in women. The researcher assumes that gender differences in obesity risk can be explained by a number of biological, hormonal, social, and cultural factors. Biologically, women experience hormonal fluctuations that influence metabolism and body fat distribution, such as changes during the menstrual cycle, pregnancy, and menopause. Moreover, social and cultural factors, including gender expectations and eating habits, as well as differences in levels of physical activity, may increase the risk of obesity in women compared to men.

The variable of lack of physical activity shows a strong association with the risk of obesity, with an Odds Ratio (Exp B) of 1.072. This means that individuals who are physically less active have a 1.072 times higher likelihood of experiencing obesity compared to more active individuals. An Odds Ratio above 1 indicates that lack of physical activity is a significant risk factor for obesity. Low physical activity can lead to decreased energy expenditure[16], which, when combined with an imbalanced caloric intake, can result in the accumulation of body fat and weight gain[17]. Therefore, increasing physical activity is an

important strategy in the prevention and management of obesity[18]. This finding aligns with Avrialdo and Elon (2023), who stated that a more physically active lifestyle can help control body weight and reduce the risk of various obesity-related diseases[19], such as heart disease, diabetes, and hypertension.

The author assumes that low physical activity leads to decreased energy expenditure, which contributes to the accumulation of body fat if caloric intake is not balanced. Increasing physical activity is a key strategy in the prevention and management of obesity. Enhancing the promotion of physical activity through public health programs, education, and policies that support active environments—such as providing easily accessible sports facilities—is an important step to reduce the prevalence of obesity in the community.

The variable of excessive fat consumption shows a fairly strong association with the risk of obesity, as indicated by an Odds Ratio (Exp B) of 1.057. This suggests that excessive fat consumption can increase the risk of obesity by 1.057 times compared to individuals who do not consume excessive fat. This finding is supported by Alnanda and Wirjatmadi (2023), who stated that there is a statistically significant relationship between fat consumption levels and the incidence of overnutrition among female high school students at SMAN 1 Krian, with a p-value of 0.003[20]. In the context of this study, excessive fat consumption can lead to an increased caloric intake imbalance, which, if not balanced with adequate physical activity, may cause body fat accumulation and excessive weight gain[21]. Therefore, it is important to maintain a balanced diet and limit excessive fat consumption as part of obesity prevention strategies[22,23]. The author assumes that increasing public education about the importance of healthy eating patterns, including limiting fat intake, along with policy support for promoting nutritious foods in public environments, can help reduce the risk of obesity and related health problems.

Based on the multivariate analysis results, the Odds Ratio (OR) for fruit and vegetable consumption is 0.930, which is less than 1. This indicates that the relationship between fruit and vegetable consumption and the occurrence of obesity is protective. In other words, an Odds Ratio below 1 suggests that higher consumption of fruits and vegetables can reduce the risk of obesity. Conversely, a lack of fruit and vegetable intake is associated with an increased risk of obesity. These findings emphasize the importance of a diet rich in fruits and vegetables as an effective effort to reduce the likelihood of obesity.

This study is supported by Mahumud et al. (2021), who conducted research on adolescents using data from LMICs and HICs in the "Global School-Based Student Health Survey." They stated that adolescents who consumed vegetables at least twice a day had a 22% lower risk of being overweight and a 17% lower risk of obesity compared to adolescents who did not consume vegetables daily. This means that regular vegetable consumption can help reduce the risk of overweight and obesity in adolescents[24]. This reinforces that adequate fruit and vegetable intake has a protective effect in preventing obesity.

According to Wilunda (2021), increased vegetable consumption can lead to weight loss, especially with yellow/red vegetables and allium vegetables. However, increased fruit consumption may potentially lead to weight gain, particularly if the fruits consumed are low in fiber or high in energy. This phenomenon can occur across different age groups, genders, and Body Mass Index (BMI) categories. Therefore, it is important to choose fruits that are high in fiber and low in calories, as well as to pay attention to portion sizes to avoid unwanted weight gain[25].

Based on the results and discussion of the study, the researcher recommends several

strategic steps for obesity prevention at Johar Baru Health Center. First, it is important to enhance the promotion of physical activity to encourage the community to participate in regular physical exercise. Second, education on healthy eating patterns needs to be strengthened, focusing on limiting the consumption of unhealthy foods and increasing the intake of fruits and vegetables. Additionally, special programs should be developed for women, considering the significant differences in obesity risk based on gender. Emphasis on reducing sedentary behavior is also necessary by encouraging active breaks as part of the daily routine. Strong policy support and comprehensive educational efforts are crucial to changing community behaviors towards a healthier lifestyle, thereby effectively reducing the risk of obesity in the community.

Conclusion

Based on the results and discussion, it can be concluded that the variables of gender, physical inactivity, and excessive fat consumption are associated with the risk of obesity, while insufficient consumption of fruits and vegetables shows a lower correlation. Women are at higher risk of obesity, as are individuals who are physically inactive and consume excessive fat. For prevention, it is necessary to promote a healthy lifestyle, educate the community, increase awareness about the importance of maintaining a healthy weight, and support public policies that foster an environment conducive to a healthy lifestyle. Hopefully, these measures will successfully reduce the obesity rate at Johar Baru Health Center.

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