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RISK FACTORS OF OBESITY IN YOUNG ADULTS

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ABSTRACT

Obesity is a developing global public health issue. Obesity is a significant risk factor for a variety of diseases, increasing morbidity and mortality from cardiovascular disease and Diabetes Mellitus. Since 1975, global obesity has nearly tripled, and Jakarta has the second-highest obesity rate in Indonesia. COVID-19 also contributed to this situation, as many young adults work from home. COVID-19 has an impact, such as an increase in the frequency of unhealthy eating and frequency of sitting, a decrease in physical activity, or irregular exercise, which can lead to obesity. This study aims to investigate the lifestyle risk factors associated with obesity in young adults in Jakarta. A cross-sectional design was conducted with convenience sampling of 384 respondents aged 26-35. Data was collected using an online questionnaire. Descriptive and statistical analysis was performed using chi-square. The finding revealed a significant relationship between physical activity, sedentary lifestyle, and genetics with obesity in young adults (p-value 0.004; 0.035; 0.001). Conclusion: Young adults can adopt a healthy lifestyle by increasing regular physical activity for at least 30 minutes daily and changing their sedentary lifestyle.

Keywords

Lifestyle, Obesity, Physical activity, Sedentary lifestyle, Young Adult

INTRODUCTION

Obesity is a growing concern in Southeast Asia, with projections indicating that the prevalence of obesity in both children and adults is expected to double between 2020 and 2035. This increase is particularly notable among women (3% to 11%) and men (5% to 16%) (World Obesity Federation, 2023). In Indonesia, the Jakarta Province has a notably high obesity rate, ranking second in the country with 29.8% prevalence among adults aged over 18 years. Obesity occurs when the body stores excessive fat due to an imbalance between incoming energy intake and released energy

(MOH Republic Indonesia, 2018). It is influenced by physical activity, income, and dietary habits (Darebo et al., 2019).

Prevalence data shows that 28.7% of adults have a Body Mass Index (BMI) of ≥ 25, while 15.4% have a BMI of ≥ 27 (MOH Republic Indonesia, 2018). Among adults aged 18 years and older, 33.5% have a BMI of ≥ 25, and 20.7% have a BMI of ≥ 27 (MOH Republic Indonesia, 2018). Obesity is becoming more common in children, adolescents, and older adults due to poor diet, specifically excessive consumption of foods high in sugar, salt, and fat and insufficient consumption of fruits and vegetables. About 66.7% of children aged 5 to 19 years and 64.3% of adults over 20 years consume sugar-sweetened beverages daily and fail to meet the recommended five servings of fruits and vegetables. Additionally, 27.7% of adults in Indonesia do not meet the WHO-recommended levels of physical activity (UNICEF, 2022).

The decline in physical activity is associated with a sedentary lifestyle, characterized by prolonged periods of sitting or lying down while watching television or playing online games for an extended time. This behavior is more prevalent in urban settings and among women (MOH Republic Indonesia, 2018). There is a noticeable decrease in public awareness regarding healthy diets and active lifestyles (UNICEF Indonesia, 2022). Obesity is a significant risk factor for Non-Communicable Diseases (NCDs) such as diabetes, cardiovascular disease, stroke, and various types of cancer, which account for 70% of deaths worldwide (WHO, 2023). Without effective prevention and early detection, obesity can lead to severe complications in adulthood. Given the rising obesity rates and the associated health risks, it is crucial to investigate lifestyle risk factors contributing to obesity, particularly in young adults in Jakarta Province. Previous studies demonstrated that unhealthy lifestyle habits indicated a relationship with obesity (Kerkadi et al., 2019). This study aims to fill this gap by investigating lifestyle risk factors associated with obesity in young adults in Jakarta Province.

METHOD

Study Design and Population

This study employed a cross-sectional design. The target population included 30,557.88 young adults aged 26 to 35 in Jakarta Province (Central Bureau of Statistics Jakarta, 2022). The Lemeshow formula was used to determine the sample size, resulting in a calculated sample size of 384 respondents.

Inclusion and Exclusion Criteria

Participants in this study were selected based on specific criteria. The inclusion criteria required that participants be male or female, aged 26 to 35, and reside in Jakarta. They also needed to agree to participate by completing the questionnaires and signing the informed consent form. Individuals with a history of obesity-related diseases, such as hypertension, type II diabetes mellitus, ischemic stroke, or coronary heart disease, were excluded from the study to ensure that the sample represented a population not affected by these pre-existing conditions.

Data Collection

The researchers developed a web-based survey and distributed it to a professional network of research members in the research area. The questionnaires included demographic data (age, gender, education, height, and weight), questions about physical activity and sedentary lifestyle (four questions), a history of genetic obesity (one question), and a smoking history (two questions) ((Azizah, 2016; Savitri, n.d.)). Reliability tests have been conducted in

Tangerang Province with Cronbach Alpha values > 0.60.

Data Analysis

Data analysis is performed using the Chi-square test to determine how independent variables such as physical activity, sedentary lifestyle, family history, and smoking are related to the risk of obesity in young adults. The study was approved by the Research Ethics Committee of the Faculty of Nursing Universitas Pelita Harapan (No: 053/RCTC-EC/R/I/ 2021).

Characteristics	N	%
Body mass index		
Not obese	209	54,4
Obese	175	45,6
Age		
26 – 30 years	254	66,1
31 – 35 years	130	33,9
Gender		
Male	119	31,0
Female	265	69,0
Educational level		
Junior High School	3	0.78
Senior High School	222	57,8
University	159	41.40

RESULTS

Table 1. Participant Characteristics (n = 384)

Table 1 found that the majority of respondents (54.4%) are not obese, are between the ages of 26 and 30 (66.1%), are female (69%), and have completed highschool (57.8%).

Table 2. Bivariate Analysis

Variable	Obesitas							
	Not obese		Obese		Total		p-value	PR (95% CI)
	N	%	N	%	N	%		
Physical activity								
Vigorous activity	32	8,3	14	3,6	46	12,0	0,004	2,94
Moderate activity	54	14,1	30	7,8	84	21,9		
Less activity	123	32,0	131	34,1	254	66,1		
Sedentary lifestyle								
Less activity	68	17,7	38	9,9	106	27,6	0,035	2,94
Moderate activity	92	24,0	81	21,1	173	45,1		
Vigorous activity	49	12,8	56	14,6	105	27,3		
Family history								
No	147	38,3	78	20,3	225	58,6	0,001	2,94
Yes	62	16,1	97	25,3	159	41,4		
Smoking								
No	174	45,3	137	35,7	311	81,0	0,217	1,37
Yes	35	9,1	38	9,9	73	19,0		

Table 2 shows the correlation between physical activity, sedentary lifestyle, family history, and smoking among young adults. Table 2 reveals a relationship between physical activity, sedentary lifestyle, and family history of obesity (p-values 0.004; 0.035; 0.001), and respondents who have a family history of obesity are at a 2.9 higher risk of experiencing obesity than those without a family history.

DISCUSSION

Obesity is an excess of body fat, as indicated by a BMI or BMI between 25 and 30 (MOH Republic Indonesia, 2018). Sedentary adults have more fat mass and a higher resting metabolic rate, resulting in 60% to 75% of total energy-related daily activities (da Silva et al., 2021). Physical inactivity may increase symptoms by inhibiting the immune response and reducing macrophage activation, associated

with reduced insulin sensitivity. Sports, for example, can increase a person's physiological reserves and lower the risk of obesity and cardiovascular disease (Hudson & Sprow, 2020). Physical activity is muscle movement caused by skeletal muscle contraction. Physical activity may be associated with increased long-term weight loss and weight gain following initial weight loss. Physical activity should be moderate to high enough intensity to affect body weight (Jakicic et al., 2018). Being active regularly can help adults reduce their risk of obesity. Inactivity in physical activity, on the other hand, can lead to obesity (Kazmi et al., 2022). During the COVID-19 pandemic, many activities were halted due to social distancing policies. This leads to increased consumption of unhealthy processed foods and decreased physical activity (Popkin et al., 2020). When energy intake exceeds energy expended in the long term, it can lead to metabolic disorders and obesity (Oussaada et al., 2019). According to one study in East Nusa Tenggara, there is an association between physical activity and the incidence of obesity, and most respondents (66.1%) engage in light activity (Sumael et al., n.d.). Another study is consistent with this research, which found an association between physical activity and the incidence of obesity (Boli et al., 2021; Hendi et al., 2019; Nova & Yanti, 2017).

A sedentary lifestyle is one in which a person does not move much or engages in very little physical activity (MOH Republic Indonesia, 2018). An inactive lifestyle is associated with metabolic dysfunctions such as increased plasma triglycerides, High-Density Lipoprotein (HDL) cholesterol, decreased insulin sensitivity, and inhibition of Lipoprotein Lipase (LPL) activity. This protein interacts at the cellular level (Park et al., 2020). When there is a lack of physical activity, the muscles in the body relax, inhibiting blood circulation and causing the heart to work harder. Fat burning does not work well if the muscles are weak and fat accumulation leads to obesity (Manuha et al., 2013). According to one study, there is an association between a sedentary lifestyle and the incidence of obesity, and most respondents (45.1%) engage in sedentary lifestyle behavior of moderate intensity duration. This study is supported by research on homemakers, which shows an association between a sedentary lifestyle and the incidence of obesity. This means the more time spent on sedentary behavior, the more weight gained. (Fuadianti, 2018). Another study conducted on university faculty found an association between a sedentary lifestyle, sleep duration, and the incidence of obesity. This causes an 18% decrease in leptin and a 28% increase in ghrelin, which increases appetite and, if not accompanied by a healthy lifestyle, leads to obesity (Damayanti et al., 2019; Rusmini, 2016).

Obesity is caused by an imbalance in daily energy intake and expenditure, which leads to weight gain and fat accumulation in adipose tissue as triglycerides (MOH Republic Indonesia, 2018). Adipose tissue will send signals to the hypothalamus and convert fat into energy via leptin, adiponectin, and resistin (Panuganti et al., 2023). Leptin is a type 1 cytokine that is primarily secreted to provide a signal to the brain (hypothalamus) that stimulates satiety and works to break down fat into energy for the body (Thaker, 2017). Obese people have high levels of the hormone leptin, showing that the brain (hypothalamus) does not receive signals to stimulate satiety (Hastuti, 2018). Obese people have several genes, including Lep(ob), LepR(db), POMC, MC4R, and PC-1 (Andini et al., 2016). The most commonly involved gene in obesity is MC4R, which works by receiving stimulation from Alpha-Melanocyte Stimulating Hormone (-MSH) to reduce food intake by providing agonist (satiety)

signals and antagonist signals from the Agouti-Related Protein (AgRP) hormone (Prihandini & Maharani, 2019). When combined with the hormone AgRP, the MC4R gene has a significant effect on deep-feeding consumption (CDC, 2013). Obese parents will be a genetic factor that contributes significantly to the occurrence of obesity. A person who has one obese parent has a 50% chance of being obese, and a person who has both obese parents has an 80% chance of being obese (UCSF, 2024). A study reveals genetics have an association with the incidence of obesity, with those who have obesity genetics having a 1.5 times higher risk of experiencing obesity than those who do not have obesity genetics (Puspitasari, 2018). Other research on adults in Indonesia also shows an association between genetics and the incidence of obesity (Nadimin et al., 2015; Sari et al., 2021; Suriati & Mansyur, 2020). However, research on adults conducted in Norway, the United States, and Aceh shows that genetics only has a 30% influence on the incidence of obesity, while the environment has a 70% influence, where a decrease in activity levels and an increase in the behavior of consuming fast food can cause a person to be obese (Brandkvist et al., 2019; Loos & Yeo, 2022; Winandar et al., 2021).

Smoking is the act of exhaling smoke and inhaling nicotine-containing plant material (MOH Republic Indonesia, 2018). Tobacco itself contains nicotine, which is an alkaloid that is addictive and can have a stimulating and calming psychoactive effect (Henningfield et al., 2023). Cigarette nicotine suppresses hunger and reduces taste and smell perception, making smokers less interested in food. Nicotine's effect on appetite also affects several hormones, including dopamine, norepinephrine, and leptin. Neuropeptide Y is a peptide found in the hypothalamic arcuate nucleus that can increase food intake. The nicotine in cigarettes, on the other hand, suppresses this peptide and causes a decrease in appetite (Restutiwati et al., 2019). Smoking is an unavoidable necessity for people who have a smoking habit. Active smokers are those who smoke regularly, whereas passive smokers are those who do not smoke but are frequently exposed to cigarette smoke (Su et al., 2018). The study's findings revealed no association between smoking and the incidence of obesity, with only 9% of those who smoked being obese. This study is supported by research on productive-age employees, which shows that there is no association between smoking and the incidence of obesity. This is because smoking has no direct effect on a person's nutritional status. Nicotine is a compound found in cigarettes that can increase energy expenditure while decreasing feelings of hunger (Puspitasari, 2018; Sinaga et al., 2017; Zulkarnain & Alvina, 2020).

CONCLUSIONS

This study, with its focus on investigating the risk factors for obesity in young adults, provides crucial insights. By understanding these risk factors, adults can initiate preventive measures from a young age. The prevalence of obesity, often exacerbated by a lack of physical activity and sedentary lifestyle behavior, underscores the importance of early intervention. Encouraging healthy lifestyle changes, such as increasing regular physical activity to at least 30 minutes per day, altering sedentary lifestyle behavior, and abstaining from smoking, can significantly reduce the risk of obesity. However, it's important to note that the results of this study may not be representative and cannot be generalized to all of Indonesia’s diverse regions. A study with a more representative sample is needed, considering the country's pluralism.

The factors that contribute to obesity in adults are multifaceted, including physical activity, a sedentary lifestyle, and genetics. It is crucial to underscore the role of genetics in this context. Respondents who have a genetic predisposition to obesity face a 1.5 times higher risk of experiencing obesity than those who do not have such genetics.

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