



The Impact of Obesity on Hypertension in Adults Aged 25-45 in Padang Lawas Regency in 2024

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ABSTRACT

One of the factors that influence the incidence of hypertension is obesity. The purpose of this study was to analyze the effect of obesity on the incidence of hypertension at the age of 25-45 years in Padang Lawas Regency in 2024. The research method used a case control design with a large sample size of hypertension and non-hypertension of 73 people each. Data analysis using logistic regression test. The results showed that obesity is a factor influencing the incidence of hypertension (OR = 6,056). It is necessary to conduct a public education campaign targeting young adults in Padang Lawas Regency, focusing on the importance of controlling the frequency of fat consumption, healthy types of fat, and associated obesity risks, as well as utilizing social media and holding special counseling sessions for food businesses.

INTRODUCTION

The Sustainable Development Goals (SDGs) 2030 is a global agreement declared by 193 United Nations member states in New York from September 25-27, 2015. SDGs encompass various targets, one of which falls under Goal 3: Ensure healthy lives and well-being, aiming to guarantee a healthy life and enhance the well-being of all individuals of all ages. The main message of Goal 3 is promoting healthy and prosperous living, reducing the risk of both communicable and non-communicable diseases, as well as maternal and child/infant mortality, through improving access to quality healthcare services and fostering healthy lifestyles. This is based on the fact that increasing life expectancy and lifestyle changes are correlated with the rising incidence of non-communicable diseases (WHO, 2022). SDGs focus on health sector targets to ensure healthy living and support well-being for all age groups. There are eight targets to be achieved, including reducing maternal and child mortality rates, reducing the incidence of communicable and non-communicable diseases, preventing substance abuse, reducing road traffic fatalities, improving sexual and reproductive health, and increasing healthcare service coverage (WHO, 2022).

Indonesia is one of the countries with a high commitment to implementing SDGs, as outlined in Presidential Regulation No. 59 of 2017, aiming to reduce premature deaths from non-communicable diseases by one-third by 2030. A 25 percent reduction in high blood pressure is one of the global targets for controlling non-communicable diseases by 2025. Proper hypertension control is crucial to avoid severe complications due to hypertension. In line with the formulation of SDGs at the global level, Indonesia has also developed the National Medium-Term Development Plan (RPJMN) for 2015-2019 and 2020-2024, aligning the substance of SDGs with RPJMN, which elaborates Nawacita as the President's Vision and Mission. The number of SDGs targets integrated into RPJMN for 2020-2024 exceeds 100 targets. This reflects the government's commitment to successfully implement SDGs in Indonesia because for Indonesia, implementing SDGs is essentially carrying out the national development agenda and supporting the achievement of the 2030 agenda at the global level (Ministry of National Development Planning, 2020).

Non-communicable diseases (NCDs) kill 41 million people annually, accounting for 74 percent of all global deaths. Every year, 17 million people die from NCDs before the age of 70. NCDs are not only prevalent among the elderly but also pose a threat to the productive age group. More than 15 million people aged between 30 and 69 die each year, and 85 percent of all premature deaths due to NCDs occur in low- to middle-income countries (WHO, 2022). Hypertension is one of the leading non-communicable diseases causing premature death globally, with one in four men and one in five women, and over one billion people experiencing hypertension. The burden of hypertension is felt by low- and middle-income countries, with two-thirds of cases attributed to increased risk factors in these populations, especially in the last decade (WHO, 2022).

The prevalence of hypertension varies globally in each country and is also related to the country's income. The global prevalence of hypertension is 22 percent of the world's total population. The highest prevalence of hypertension occurs in Africa at 27 percent and the lowest in the Americas at 18 percent, while Southeast Asia ranks third highest with a prevalence of 25 percent (WHO, 2022). The Basic Health Research or Riskesdas results in 2018 conducted by the Ministry of Health showed an increase in hypertension prevalence in Indonesia by 34.1 percent compared to the 2013 Riskesdas results, which stood at 25.8 percent. Based on measurements of the population aged over 18 years, the highest prevalence is in South Kalimantan at 44.1 percent, while the lowest is in Papua at 22.2 percent (Ministry of Health, 2018).

According to the 2018 Riskesdas results, North Sumatra Province ranked fourth in hypertension cases in Indonesia, with a case rate of 29.19 percent, following West Java at 39.60 percent, East Java at 36.32 percent, and Central Java at 37.57 percent (Ministry of Health, 2018). Data from the 2018 Riskesdas in North Sumatra shows that the prevalence of hypertension among the population aged 18 and over in Padang Lawas Regency is 16.37 percent. Hypertension occurs in the 25-34 age group with a doctor-diagnosed rate of 1.37 percent and in the 35-44 age group with a doctor-diagnosed rate of 3.51 percent. This indicates a significant prevalence of hypertension among individuals aged 25-45 years, many of whom were previously unaware of their condition and thus did not receive treatment. Some patients diagnosed with hypertension by a doctor are also non-compliant with treatment.

Data from the Padang Lawas Regency Health Office in 2022 shows that hypertension ranks first among the top ten most common diseases in Padang Lawas Regency. The distribution of hypertensive patients in the 25-34 age group is 315 out of 2740 patients or 11.5 percent, and in the 35-44 age group, it is 838 out of 4353 patients or 19.25 percent. The highest number of hypertensive individuals in the 25-45 age group is found in Sibuhuan Health Center, with 348 individuals, followed by Binanga Health Center with 262 individuals, while Sihapas Health Center has the lowest number of hypertensive individuals with 20. A literature review on hypertension in young adults in Indonesia aged 18-45 years, considering variables such as blood pressure, age, gender, BMI, smoking, and physical activity, was conducted by Tirtasari. S and Kodim. N in 2019. The results indicated a hypertension prevalence of 13.59 percent among young adults, with the breakdown by age group as follows: 7.35 percent for ages 18-24, 10.41 percent for ages 25-34, and 21.35 percent for ages 35-44. Regarding gender, the prevalence of hypertension was 14.79 percent among males and 12.51 percent among females. Hypertension in young age groups cannot be overlooked due to its increasing prevalence, highlighting the need for early prevention measures.

The relationship between obesity and increased blood pressure has been reported by several studies. Safitri conducted research in the community of Air Tiris Village, Kampar Health Center Working Area, in 2019. The results showed a significant relationship between obesity and the occurrence of hypertension. Body weight and body mass index (BMI) correlated directly with blood pressure, especially systolic blood pressure. Obesity is one of the causes of hypertension. (Safitri Y, 2019). A preliminary survey on hypertension data in the 25-45 age group showed that hypertension is the most common disease in Padang Lawas Regency. According to data from the Padang Lawas Regency Health Office, there is a proportion of hypertensive patients aged 25-34 years, with 814 out of 2732 patients or 29.8 percent, and aged 35-44 years, with 838 out of 4327 patients or 19.4 percent.

A preliminary survey was conducted at the Sibuhuan Health Center on 30 visitors to the integrated health service post (posbindu) who experienced hypertension in the 25-45 age group. Through interviews, it was found that the age group most affected by hypertension was 40 years old, with 12 individuals or 40 percent, followed by 42 years old, with 10 individuals or 33 percent. The highest blood pressure readings were recorded at 149 systolic and 90 diastolic mmHg, with 18 individuals or 60 percent. Additionally, 20 individuals or 67 percent were obese, and 23 individuals or 77 percent had habits of consuming coconut milk-based foods, oily/fried foods, and excessive salt, while 22 individuals or 73.33 percent had habits of consuming vegetables, and 10 individuals or 33.33 percent had habits of consuming fruits. Based on the results of the preliminary survey, it can be concluded that the incidence of hypertension in the 25-45 age group is quite high, accompanied by risk factors that are the source of the problem. Therefore, further research is needed on the "Effect of Obesity on the Incidence of Hypertension in the 25-45 Age Group in Padang Lawas Regency in 2024."

LITERATURE REVIEW

The Sustainable Development Goals (SDGs) 2030 is a global agreement declared by 193 United Nations member states in New York from September 25-27, 2015. SDGs encompass various targets, one of which falls under Goal 3: Ensure healthy lives and well-being, aiming to guarantee a healthy life and enhance the well-being of all individuals of all ages. SDGs focus on health sector targets to ensure healthy living and support well-being for all age groups. There are eight targets to be achieved, including reducing maternal and child mortality rates, reducing the incidence of communicable and non-communicable diseases, preventing substance abuse, reducing road traffic fatalities, improving sexual and reproductive health, and increasing healthcare service coverage (WHO, 2022). The prevalence of hypertension varies globally in each country and is also related to the country's income. The global prevalence of hypertension is 22 percent of the world's total population. The highest prevalence of hypertension occurs in Africa at 27 percent and the lowest in the Americas at 18 percent, while Southeast Asia ranks third highest with a prevalence of 25 percent (WHO, 2022).

Indonesia is one of the countries with a high commitment to implementing SDGs, as outlined in Presidential Regulation No. 59 of 2017, aiming to reduce premature deaths from non-communicable diseases by one-third by 2030. A 25 percent reduction in high blood pressure is one of the global targets for controlling non-communicable diseases by 2025. Proper hypertension control is crucial to avoid severe complications due to hypertension. The prevalence of hypertension varies globally in each country and is also related to the country's income. The global prevalence of hypertension is 22 percent of the world's total population. The highest prevalence of hypertension occurs in Africa at 27 percent and the lowest in the Americas at 18 percent, while Southeast Asia ranks third highest with a prevalence of 25 percent (WHO, 2022). The Basic Health Research or *Riskesdas* results in 2018 conducted by the Ministry of Health showed an increase in hypertension prevalence in Indonesia by 34.1 percent compared to the 2013 *Riskesdas* results, which stood at 25.8 percent. Based on measurements of the population aged over 18 years, the highest prevalence is in South Kalimantan at 44.1 percent, while the lowest is in Papua at 22.2 percent (Ministry of Health, 2018).

METHODOLOGY

This research is a quantitative analytic observational study using a case-control study design. The objective is to examine the influence of hypertension incidence on risk factors such as obesity. The study begins by identifying two groups: a case group that experiences hypertension and a control group that does not. Retrospective data is collected to evaluate risk factors in both groups. The research is conducted at five health centers (*Puskesmas*) in Padang Lawas Regency from January 2023 to March 2024. The selection of these locations is based on data from the local Health Department, which indicates that hypertension is the most prevalent disease in the area. This study aims to gain deeper insights into the prevalence of hypertension in the region and the impact of obesity on it.

The study population includes all residents aged 25-45 in the work areas of the selected health centers, both those with and without hypertension. The sampling was done using purposive sampling techniques, resulting in a total of 176 samples, consisting of 88 hypertension cases and 88 controls. Inclusion and exclusion criteria were established to ensure the validity of the selected samples. Data collection was conducted through direct interviews to obtain information on body mass index (BMI) measurements and blood pressure. Secondary data was obtained from reports in the ASIK PTM System application of the Padang Lawas Health Department, which provided additional information on hypertension and its risk factors. Data analysis involves two stages: univariate and bivariate analysis. Univariate analysis is used to describe the frequency distribution of the independent and dependent variables, while bivariate analysis is conducted to assess the relationships between these variables using simple logistic regression tests. The results of this study are expected to provide a better understanding of the factors contributing to hypertension and to assist in the prevention and management of this disease in Padang Lawas Regency.

RESEARCH RESULT AND DISCUSSION

Respondent Characteristics

In the context of this research, the focus is on several key dimensions of respondent characteristics, including gender, age, education level, occupation, and history of hypertension among individuals aged 25-45 years in Padang Lawas Regency in 2024.

Tabel.1 Respondent Characteristics Based on Gender, Age, Education, Occupation, and History of Hypertension

Respondent Characteristics	Case		Control	
	n = 88	%	n = 88	%
Gender				
Male	41	46,5	46	52,3
Female	47	53,5	42	47,7
Age				
< 40 years	42	47,7	57	64,7
≥ 40 years	46	52,2	31	35,3
Education				
Low	30	34,1	24	27,3
High	58	65,9	64	72,7
Occupation				
Non-Entrepreneur	55	62,5	48	54,5
Entrepreneur	33	37,5	40	45,5
History of Hypertension				
Yes	32	36,3	23	26,1
No	56	63,6	65	73,9

The table of respondent characteristics provides a comprehensive view of the variation in hypertension occurrence within the population, considering various dimensions such as gender, age, education, occupation, and history of hypertension. In terms of gender, the majority in the case category are 47 females (53.5%), while the control category consists of 46 males (52.3%). Regarding age, 46 individuals over 40 years old (52.2%) experience hypertension, compared to 57 respondents under 40 years old (64.7%) in the control category. Education is also a determining factor, with the majority of respondents in the case group having higher education levels, comprising 58 individuals (65.9%). Similarly, in the control group, the majority also have higher education levels, accounting for 64 individuals (72.7%). In terms of occupation, the majority in both the case and control groups are non-entrepreneurs, with 55 respondents (62.5%) in the case group and 48 respondents (54.5%) in the control group. In the case group, the percentage of respondents without a history of hypertension is 63.6% (56 respondents), compared to 73.9% in the control group.

Tabel.2 The influence of Obesity Status on Hypertension

Variabel	Hypertension				<i>p</i>	OR	95% CI
	Case		Control				
	n	%	n	%			
Obesity Status							
Yes	65	73,8	28	31,8	0,001	6,056	3,150 - 11,643
No	23	26,2	60	68,2			

This table provides significant insights into the influence of carbohydrate intake on the incidence of hypertension. Carbohydrate intake is evaluated in two categories: poor and good. In the case group, 73.8% of the respondents show an obesity status, while 26.2% do not have obesity. In the control group, 31.8% of the respondents are obese, and 68.2% are not. Statistical analysis shows a p-value of 0.001, which is close to the significance level of 0.05, and an Odds Ratio (OR) of 6.056, with a 95% confidence interval (CI) between 3.150 and 11.643. This indicates a significant association between obesity and the incidence of hypertension.

The distribution of obesity status among respondents shows that the majority of the case group has obesity, while the majority of the control group does not. Statistical analysis indicates a significant correlation between obesity and the incidence of hypertension. Obesity significantly influences the risk of hypertension in Padang Lawas Regency, as reflected by the high Exp B value (8.283) in the logistic regression analysis results. There are several reasons why obesity has such a substantial impact. First, obesity increases the blood volume that the heart must pump, which raises the pressure on artery walls and leads to hypertension. Second, obesity is often associated with insulin resistance, which can increase blood pressure. Third, excess fat, especially around the abdomen, can activate the renin-angiotensin system, which regulates blood pressure and causes blood vessels to constrict. Fourth, obesity causes chronic inflammation, with inflammatory cytokines damaging blood vessels. Lastly, the physical pressure on the kidneys from excess body weight can impair their ability to regulate fluid and salt balance. All these factors collectively make obesity a significant trigger in the development of hypertension, highlighting the importance of weight management and obesity reduction strategies in preventing and managing hypertension, especially among individuals aged 25-45.

Obese individuals are at increased risk of cardiovascular diseases, including hypertension (Mulyasari and Srimati, 2020). High blood triglyceride levels can result from excessive carbohydrate intake, as excess carbohydrates are converted into fat, leading to atherosclerosis and, consequently, hypertension (Masriadi, 2022). Research by Zhang (2021) indicates that obesity is significantly associated with hypertension among individuals aged 18-45. This condition is closely related to unhealthy consumption habits, with high fat and cholesterol intake leading to increased fat accumulation in the body. This fat buildup is not only found in organs but also in many blood vessels.

According to Ruban et al. (2020), obesity is a condition characterized by excessive fat accumulation in body organs. Individuals with obesity are at risk of developing hypertension due to the continuous intake of saturated and trans fats, leading to fat buildup in the blood vessels. This buildup causes artery narrowing, increasing the pressure required to circulate blood throughout the body (Asyfh et al., 2020). One of the government's programs to combat hypertension is the CERDIK program. This includes promoting a balanced diet, which involves healthy, nutritious, and balanced consumption patterns to reduce obesity in the community. The public is also encouraged to engage in regular physical activity and exercise to prevent fat and cholesterol accumulation in the body. This is expected to reduce the incidence of hypertension in productive adult ages. This research diverges from other studies in that it focuses on respondents with a history of type II diabetes mellitus, whereas the other studies involved respondents of productive age. Factors that could not be controlled in this study, such as the age of respondents and their smoking habits, influenced the results and led to findings that do not show a relationship between the variables.

CONCLUSIONS AND RECOMMENDATIONS

The conclusion of this study indicates that variables such as age, history of hypertension, and obesity have a significant impact on the incidence of hypertension among individuals aged 25-45 years in Padang Lawas Regency in 2024. The research findings suggest that obesity is a proven significant risk factor, with respondents experiencing obesity showing a higher risk of developing hypertension and are more prone to hypertension.

ADVANCED RESEARCH

Still conducting further research to find out more about The Impact of Obesity on Hypertension In Adults Aged 25-45 in Padang Lawas Regency In 2024.

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