

Original Research/Systematic Review

Overview of Risk Factors in Hypertension Disease

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ABSTRACT

Background : Hypertension can generally be defined as systolic pressure of more than 140 mmHg and diastolic pressure of more than 90 mmHg. Human blood pressure naturally fluctuates throughout the day. Modifiable risk factors are (salt consumption, obesity, physical activity, smoking, stress). The purpose of this study was to determine the Description of Risk Factors in Hypertension Disease.

Methods: The research design used is descriptive of the Tanjung Paku Health Center Working Area, Solok City in 2024, in March - April 2024, data was collected from March 25 to April 6, 2024, the population was hypertensive patients in the Tanjung Paku Health Center Working Area, Solok City. The sample was taken by accidental sampling, formulating the sample with the slovin formula with a total of 55 respondents. Data was taken by filling out a questionnaire with respondents and observation.

Results: The results of the study obtained from the description of risk factors for hypertension showed that 45 (81.8%) respondents consumed 1 teaspoon of salt per day, 36 (65.5%) respondents were not obese, 31 (56.4%) respondents did not do physical activity, 43 (78.2%) respondents did not smoke, 54 (98.2%) respondents experienced mild stress.

Conclusion: Hypertension risk factors include salt consumption, obesity, lack of physical activity, smoking, and mild stress, which can increase the risk of complications.

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INTRODUCTION

Non-Communicable Diseases (NCDs) are diseases that individuals suffer during life and require long-term treatment, if not treated, it will worsen the individual's condition and threaten life. NCDs are the leading cause of death worldwide (Roosihermiati et al., 2023). Hypertension can generally be defined as a systolic pressure of more than 140 mmHg and a diastolic pressure of more than 90 mmHg. Human blood pressure naturally fluctuates throughout the day. High blood pressure is a problem if the blood pressure is persistent. This blood pressure makes the circulatory system and organs that receive blood supply (termasuk jantung dan otak) tense (Manutung, 2019).

High blood pressure is very dangerous because it can aggravate the work of the heart organ. In addition, the flow of high blood pressure harms the arteries, heart organs, kidneys, and eyes. Hypertension is often called a "silent killer" because it does not provide typical symptoms, but can increase the incidence of stroke, heart attack, chronic kidney disease and even blindness if not properly controlled and controlled (Prasetyaningrum, 2014).

The World Health Organization (WHO) states that hypertension is the number one cause of death in the world. In Indonesia, the prevalence continues to increase. According to Riskesdas in 2018, the prevalence of hypertension in the population aged 18 years was 34.1%, the population aged 31-44 years was 31.6%, the population aged 45-54 years was 45.3% while the population aged 55-64 years was 55.2%. The Indonesian Ministry of Health explained that until now, hypertension is a disease whose prevalence has increased from 25.8% in 2013 to 34.1% in 2018. West Sumatra Province 25.16% In 2023, from data from the Solok City Health Office, the prevalence of hypertension in Solok City in 2023 is 33%. From a preliminary study conducted at the Tanjung Paku Health Center, data on hypertension patients in 2023 was obtained at 14.80% (587 people).

Risk factors for triggering hypertension can be caused by hereditary factors, aging, excessive body mass, salt consumption exceeding the threshold, offspring who have a history of hypertension, unhealthy diet and lifestyle, and lack of sports activities. One of the triggering factors for the emergence of hypertension is the intake of foodstuffs that are less qualified as healthy foods (Ridwan, 2017). Consuming too much salt can increase the risk of hypertension. This is because salt (NaCl) contains sodium which can attract fluid outside the cell so that it is not excreted, causing fluid buildup in the body. This is what makes the volume of blood pressure increase (Andika, 2023).

An unhealthy lifestyle such as smoking, drinking alcohol, obesity, lack of exercise greatly affects blood pressure (Kurnia, 2020). Lack of physical activity increases the risk of suffering from hypertension. People who are not physically active tend to have a higher heart rate than people who are physically active with the same volume of blood pumps. The heart muscles of people are rarely physically active, working more often and harder on each contrast. The greater the pressure placed on the arteries, the higher blood pressure will increase (Widiyono, 2022).

Consuming alcohol can increase the risk of hypertension because alcohol can damage the heart and blood vessels. This can cause blood pressure to rise. In addition to alcohol consumption, smoking habits can also increase the risk of hypertension. Nicotine in cigarettes can increase systolic blood pressure by 4 mmHg (Widiyono, 2022). Hypertensive patients should maintain and maintain weight, reduce foods that contain cholesterol, reduce salt consumption in food, follow a high-fiber diet, and consume more fruits and vegetables to prevent the recurrence of hypertension. Practicing a healthy lifestyle to reduce hypertension complications. Such as physical activity, diet and keeping the mind from something that triggers stress (Anshari, 2020).

Research conducted by (Putra, 2016) obtained the results of a high proportion of hypertension (43%), more hypertension patients at the age of ≥ 40 years (53.8%); have a family history of diseases related to hypertension, have a history of smoking (52.9%); have a history of alcohol consumption (52.4%); obese status (51.4%); as drug users (51.7%); experiencing stress (48.1%); have a coaching period of 1 year (44.8%); lack of family support (45.2%); lack of physical activity (45.1%); and usually consume sodium (57.7%).

Hypertension can be fatal if not controlled properly or commonly referred to as complications. Complications of hypertension occur due to organ damage caused by a very high increase in blood pressure for a long time and the organs that are most often damaged are the brain. In the brain, eyes, heart, arterial blood vessels, and kidneys, hypertension will cause quite deadly complications. (Hutagaluh, 2019).

In research (Yulianto, 2021) it was found that there is a relationship between hypertension and the occurrence of stroke, both in women and men, both bleeding and non-bleeding strokes although there is no clear limit on who will be affected or who will not, the number of strokes increases 2 times for every 7.5 mm Hg diastole increase in tension. From the description of the background above, the researcher is interested in conducting a study with the title "Overview of risk factors for hypertension in the working area of the Tanjung Paku Health Center, Solok City in 2024".

MATERIALS AND METHOD

The research design used in this study is descriptive. Descriptive research is research with a method to describe the results of a research. As the name implies, this type of descriptive research aims to provide descriptions, explanations, and validation of the phenomenon being studied, namely an overview of hypertension risk factors. The sampling technique is by accidental *sampling*. *Accidental sampling* is a method of sampling by taking respondents or cases that happen to exist or are available based on a certain consideration made by the researcher himself. The sample size in this study was 55 respondents from the entire population.

Univariate analysis is used to describe each variable studied in the study, namely by looking at the distribution of data on all variables. Numerical data is presented in the form of tables. Analysis is in the form of general data and special data. General data includes gender and age. Meanwhile, the data in particular, namely factors related to hypertension disease. The data obtained will be processed descriptively by presenting in the form of tables, to determine the frequency and percentage of each table.

RESULT

Table 1. Distribution of Respondents' Frequency Based on Salt Consumption
In the Tanjung Paku Health Center Work Area in 2024

No	Salt Consumption	Value	Presented
1	Yes	45	81,8 %
2	Not	10	18,2%
	Sum	55	100%

From the table above , 81.8% of respondents consumed 1 teaspoon of salt per day. The results of this study show that the incidence of hypertension is high in respondents consuming 1 teaspoon of salt per day.

Table 2. Frequency Distribution of Respondents Based on Obesity
In the Tanjung Paku Health Center Work Area in 2024

No	Obesity	Value	Presented
1	Skinny 17 < 18.5	11	20,0%
2	Normal 18,5 – 15,0	36	65,5%
3	Fat >25- 27	2	3,6%
4	Obesity >27	6	10,9%
	Sum	55	100%

From the table above, 65.5% of respondents experienced normal weight. From the results of this study, the incidence of hypertension is not in obese people.

Table 3. Frequency Distribution of Respondents Based on Physical Activity
In the Tanjung Paku Health Center Work Area in 2024

No	Physical Activity	Value	Presented
1	Not Doing	31	56,4%
2	Done 1 time a week	6	10,9%
3	Done 3-5 times a week	3	5,5%
4	Done 1 time a day	15	27,3%
	Sum	55	100%

From the table above, 56.4% of respondents did not do physical activity. The results of this study show that the incidence of hypertension is more in respondents who do not do physical activity.

Table 4. Distribution of Respondents' Frequency Based on Smoking
In the Tanjung Paku Health Center Work Area in 2024

No	Smoke	Value	Presented
1	Already	12	21,8%
2	No	43	78,2%
	Sum	55	100%

From the table above, 78.2% of respondents did not smoke. The results of this study show that the incidence of hypertension experienced by respondents is not in people who smoke.

Table 5. Frequency Distribution of Respondents Based on Stress
In the Tanjung Paku Health Center Work Area in 2024

No	Stress	Value	Presented
1	Severe Stress	1	1,8 %
2	Mild Stress	54	98,2%
		55	100%

From the table above , 98.2% of respondents experienced mild stress. The results of this study show that the incidence of hypertension experienced by respondents has mild stress.

DISCUSSION

Based on table 1, it shows that 81.8% of respondents consume 1 teaspoon of salt per day. The results of this study show that the incidence of hypertension is high in respondents consuming 1 teaspoon of salt per day. Eating foods high in salt is one of the risk factors for hypertension. Excessive salt intake which can theoretically lead to Hypertension. The recommended sodium < 2.4 g (100 mEq)/day. Consuming excessive salt (5-15 grams/day) can increase blood pressure. The effect of salt intake on high blood pressure occurs through an increase in plasma volume, cardiac output and blood pressure (Kurnia, 2020) Salt attracts fluid outside the cell so that it does not come out. This causes a buildup of fluid in the body. This accumulation of fluid will increase blood volume and pressure (Andika, 2023).

Table salt is a very influential factor in the pathogenesis of hypertension. Hypertension is almost never found in ethnic groups with minimal salt intake. Salt intake of less than 3 grams per day causes low hypertension If salt intake is between 5-15 grams per day, the prevalence of hypertension increases to 15-20%. The effect of salt intake on the onset of hypertension occurs through an increase in plasma volume, cardiac output

and blood pressure. Salt contains 40% sodium and 60% chloride. People who are sensitive to sodium are more prone to increased sodium, which causes fluid retention and increased blood pressure (Manutung, 2019).

Based on the results of a study conducted by Purwono (2020), the pattern of salt consumption for respondents has a great influence on the occurrence of hypertension. Salt has a comparable relationship with the onset of hypertension. The more salt in the body, the more plasma volume, cardiac output, and blood pressure will increase. In addition, high salt consumption can shrink the diameter of the arteries, so the heart has to pump harder to push the increased blood volume through the narrow catalytic space, which can lead to hypertension.

A study conducted in Madhya Pradesh examined 520 hypertensive patients and found that 23% of hypertensive patients were unable to receive any dietary advice ($P < 0.05$), whereas the habit of consuming additional sodium was higher among the age group of 15-25 years ($P < 0.05$) [27]. In addition, supplemental sodium intake habits were found to be significantly influenced by younger age, diagnosis, and lack of dietary advice ($P < 0.05$, $P < 0.05$, and $P < 0.05$). Another survey based on the WHO-STEPI approach in Punjab (Bhattacharya et al., 2022).

Based on table 2, it shows that 65.5% of respondents experience normal weight. From the results of this study, the incidence of hypertension is not in obese people. Being overweight and obese is not only the result of a bad diet. Inequality in calorie intake and expenditure can be caused by many factors. These factors are genetic, metabolic, behavioral, and environmental. The interaction of these various factors, chronically, will be the cause of obesity (S.pikir, 2015).

A person who is obese or overweight will need more blood to work to supply food and oxygen to the body's tissues. This will make the volume of blood circulating through the blood vessels will increase, the work of the heart will increase and this will cause blood pressure to also increase (Tiara, 2020). Obesity, especially in the upper body (the "apple-shaped body"), with an increased amount of fat around the diaphragm, waist, and abdomen, is associated with the development of hypertension. People who are overweight but have the most weight in the buttocks, hips, and thighs ("pear-shaped" body) are at much less risk of developing secondary hypertension than weight gain alone. The combination of obesity with other factors can be characterized by metabolic syndrome which also increases the risk of hypertension (Black, 2014).

Being overweight, indicated by body mass index (BMI – Weight in kilograms divided by height in square meters – 27 or more, excess fat is strongly associated with increased blood pressure. For people with hypertension whose weight is 10% greater than the ideal weight, a weight loss of at least 4.5 kg can lower blood pressure by up to 10 mmhg (Black, 2014).

Research examining the relationship between obesity and the incidence of hypertension has been widely conducted. There are research results that have been carried out proving that obesity is the most dominant risk factor to affect the occurrence of hypertension. From the results of research that has been conducted by Talia (2015), it is said that respondents who are obese have a 2.16 higher risk of hypertension compared to normal respondents.

Research that has been conducted by Kartika (2016), which found that respondents with excess fat intake are 4,246 times more likely to experience hypertension than respondents with low fat intake. Based on table 3, it shows that 56.4% of respondents do

not do physical activity. The results of this study show that the incidence of hypertension is more in respondents who do not do physical activity.

Lack of physical activity increases the risk of suffering from hypertension. People who are not physically active tend to have a higher heart rate than people who are physically active with the same volume of blood pumps. The heart muscles of people are rarely physically active, working more often and harder on each contrast. The greater the pressure placed on the arteries, the higher blood pressure will increase (Widiyono, 2022).

The results of Hasanudin (2018) research show that lack of physical activity can be at risk of high blood pressure, people in the Tlogosuryo RT/RW area routinely do physical activities such as going up and down stairs, morning and evening hygiene activities and taking the time to walk. Research by Budiono Mayasari (2019), stated that there is a relationship between physical activity and hypertension health status. It can be concluded that lack of physical activity makes the organs of the body and the supply of blood and oxygen stalled, increasing blood pressure. Regular exercise or physical activity can lower and stabilize blood pressure.

Based on table 4, it shows that 78.2% of respondents do not smoke. The results of this study show that the incidence of hypertension experienced by respondents is not in people who smoke. In the distribution table of smoking habits frequency above, it is said that there are 43 respondents who do not smoke but respondents experience hypertension. From the events researched by the researcher, the risk factors for hypertension experienced by the respondents were not smoking habit factors. The respondents with hypertension had a smoking habit, but not to all respondents who experienced hypertension, only some respondents had a smoking habit.

Smoking is one of the factors that can be changed, the relationship between smoking and hypertension is that nicotine will cause an increase in blood pressure because nicotine will be absorbed by small blood vessels in the lungs and circulated by blood vessels to the brain, the brain will react to nicotine by signaling the adrenal glands to release epinephrine (adrenaline). This powerful hormone will constrict blood vessels and force the heart to work harder due to higher pressure. In addition, the carbon monoxide in cigarette smoke replaces the oxygen in the blood. This will result in blood pressure because the heart is forced to pump to put enough oxygen into the organs and tissues of the body (Manutung, 2019).

In general, cigarettes contain various harmful chemicals such as nicotine and carbon monoxide. These substances will be inhaled through cigarettes so that they enter the bloodstream and cause damage to the endothelial lining of arterial blood vessels, as well as accelerate the occurrence of atherosclerosis. Carbon monoxide contained in cigarettes is known to bind hemoglobin in the blood and thicken the blood. Hemoglobin itself is a protein that contains iron in red blood cells that functions to transport oxygen. In this case, carbon monoxide replaces the oxygen bonds in the blood so that it forces the heart to absorb enough oxygen in the organs and tissues of the body. This is what can increase blood pressure.

Research from Sinadia (2019) shows that there is a meaningful relationship between smoking habits and hypertension. Based on the results of a study conducted by Numansyah (2019) at the Kawangkoan Health Center, most of the respondents got moderate smokers and most of the respondents got grade II hypertension. There is a relationship between smoking and hypertension at the Kawangkoan Health Center. Based on table 5, it shows that 98.2% of respondents experience mild stress. The results

of this study show that the incidence of hypertension experienced by respondents has mild stress.

The incidence of hypertension is greater in individuals who have a tendency to emotional stress. Situations such as depression, moodiness, resentment, fear, and guilt can stimulate the onset of the hormone adrenaline and trigger the heart to beat faster, triggering an increase in blood pressure (Manutung, 2019). When a person is stressed, the hormone adrenalin will be released and then it will increase blood pressure through arterial contraction (vasoconstriction) and increased heart rate. If stress continues, blood pressure will remain high so the person will experience hypertension.

Based on the results of a study conducted by Subrata (2020), the results of 50 respondents showed that there was a relationship between the incidence of stress and hypertension in the elderly at the Correctional Center. Elderly Senjah Cerah, Mapanget District, Manado City with an incidence of stress and hypnosis totaling 38 respondents (92.7%). The study proved that some people with hypertension are caused by stress factors that can cause an increase in blood pressure or often called hypertension.

CONCLUSION

Based on the research findings, hypertension is influenced by various risk factors, including excessive salt consumption, lack of physical activity, obesity, stress, and smoking habits. High salt intake can increase blood pressure through fluid retention, while obesity increases the blood volume that the heart must pump. Lack of physical activity also contributes to elevated blood pressure by increasing the heart's workload. Stress triggers the release of adrenaline, which accelerates heart rate and raises blood pressure. Although most respondents did not smoke, hypertension still occurred, indicating the presence of other more dominant risk factors. Therefore, managing these risk factors is essential for preventing and controlling hypertension.

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