Journal of Health and Nutrition Research
Published by
Media Publikasi Cendekia Indonesia
https://www.journalmpci.com/index.php/jhnr/index
ISSN : 2829-9760 (Online - Elektronik)
ISSN 2829-9760

Original Research
Journal of Health and Nutrition Research, Vol. 1 No. 3 (2022): 156-160

Sodium Intake and Nutritional Status Hypertension Patients in Hative Passo Hospital

Wahyuni Sammeng[1]*, Meiske Sylvia Castanya[1], Michran Marsaoly[1], Nilfar Ruaida[1]
[1] Department of Nutrition, Poltekkes Kemenkes Maluku, Indonesia
*Corresponding author, contact: wahyunisammeng@poltekkes-maluku.ac.id

Abstract
Hypertension is the result of measuring systolic blood pressure of more than 140 mmHg and diastolic blood pressure of more than 90 mmHg carried out twice with an interval of five minutes in a calm state with provisions for someone aged ≥ 18 years. Nutritional status is one of the factors that can increase a person's risk of hypertension. Someone who is overweight tends to experience hypertension because being overweight will affect a person's physiology, namely insulin resistance and hyperinsulinemia. The purpose of this study was to determine sodium intake and nutritional status in hypertensive patients at Hative Hospital, Passo. This research method is quantitative using a descriptive approach with a sample of 8 people. The number of outpatient visits of hypertensive patients without complications during May at the hospital was only 8 people. Data collection used a research instrument in the form of a semi-quantitative food frequency questionnaire (FFQ-SQ), as well as determining nutritional status by measuring body mass index (BMI). Data analysis technique using univariate analysis. Sodium intake of patients is categorized as grade I hypertension which is recommended for 3 (100%), grade II hypertension is recommended for 3 people (75%), 1 person (25%) is not recommended and grade III hypertension is not recommended 1 person (100%). Patients often consumed junk food with high sodium, resulting in an increase in blood volume and nutritional status caused by calorie intake, lack of physical activity, and other disease disorders.

Keywords: Hypertension, Sodium Intake, Nutritional Status

Key Messages:
- Abnormal nutritional status influences blood pressure, especially for adults with obesity

Access this article online
Quick Response Code

Received: 19 November 2022
Accepted: 30 November 2022

DOI: https://doi.org/10.56303/jhnresearch.v1i3.78

1. Introduction

Hypertension is a big problem, not only in western countries but also in Indonesia. Hypertension is suffered by one billion people worldwide and it is estimated in 2025 will increase to 1.5 billion people. Based on the Riskesdas data 2018, the prevalence of hypertension has increased from 25.8% to 34.1% with an estimated number of cases of hypertension in Indonesia of 63,309,620 people, with deaths from hypertension of 427,218 people. Prevalence of hypertension based on population age ≥18 years (34.1%), namely 31-44 years (31.6%), ages 45-54 years (45.3%), and ages 55-64 years (55.2%)(1).

The Maluku Province Health Profile in 2016 regarding hypertension, stated that only 6 districts out of 11

regencies/cities reported their population. Age ≥ 18 years in the district as many as 861,308 people. Of these, only 228,319 people (26.51%) conducted blood pressure checks at health facilities, consisting of 102,410 men (24.29%) of the total male population, namely 421,696 people and 125,909 women. (28.64%) of the total female population, namely 439,612 people. Based on the measurement results, 33,679 people (14.75%) had hypertension, consisting of 14,625 men (14.28%) and 19,054 women (15.13%), this indicates that hypertension is one of the cases of degenerative diseases that are found in Maluku (2). The increase of people with hypertension is related to the increase in population and the existence of unhealthy behaviors such as wrong dietary behavior, lack of physical activity, excess body weight, and persistent stress exposure. Several factors cause a person to develop hypertension, including age, gender, and ethnicity. Apart from that, there are also genetic factors and environmental factors such as obesity, stress, salt consumption, smoking, alcohol consumption, and so on (3).

One of the factors causing hypertension related to diet is the consumption of foods high in sodium, especially for people who live in coastal areas. The results of Sri Hartati et al's 2018 research showed that some of her research subjects consumed high-sodium foods in the high category, dominated by salty and preservative foods. This is possible because of the geographical conditions which are very close to the sea. Consumption of salt and foods high in sodium can narrow the passages of the small arteries in the blood vessels, thereby burdening the work of the blood vessels. Salt also burdens the work of the renin-angiotensin-aldosterone hormone system, thereby increasing blood pressure (4). Apart from sodium intake, another risk factor for hypertension is nutritional status. The relative risk of suffering from hypertension in obese people is 5 times higher compared to people with normal weight, besides that body mass index (BMI) is directly correlated with blood pressure, especially systolic blood pressure(5). Of the many studies that have proven that there is a relationship between nutritional status and the incidence of hypertension, excess nutrition is also closely related to the preference for consuming rich foods containing high fat (6), (7). The greater the body mass, the more blood is needed to supply oxygen and food to the body's tissues. This means that the volume of blood circulating through the blood vessels becomes increased so that it gives greater pressure on the artery walls (3).

The purpose of this study was to determine the description of sodium food consumption and nutritional status in hypertensive patients at Hative Passo Hospital.

2. Methods

The type of research used in this research is quantitative research with a descriptive design. This research was carried out in May 2021, at Hative Hospital, Passo Jln. Vice Admiral Leo Wattimena, Baguala District, Ambon City, Maluku. The population in this study were all outpatients who visited the Hative Passo hospital and suffered from hypertension. The number of outpatient visits of hypertensive patients without complications during May at the hospital was only 8 people who were willing to be involved in the study and did not fail during the study. The inclusion criteria consisted of willing-to-be research respondents, hypertension sufferers who checked themselves at Hative Hospital, Passo, and hypertension sufferers aged 31-70 years.

The category of hypertension in this research is hypertension degree I when the blood pressure is 140-159/90-99 mmHg. Hypertension degree II when blood pressure is 160-179/100-109 mmHg and degree III when >180/110 mmHg. Sodium intake recommended for hypertension degree I ≤ 1200 mg/day and not recommended if > 1200 mg/day. Sodium intake recommended for hypertension degree II ≤ 800 mg/day and not recommended if > 800 mg/day. Sodium intake is recommended for hypertension degree III ≤ 400 mg/day and not recommended if > 400 mg/day. Nutritional status is expressed in BMI with the category of severe weight loss when BMI < 17.0 kg/m 2, mild weight loss when BMI is 17.0 - 18.4 kg/m 2, normal when BMI is 18.5- 25.0 kg/m 2, mild overweight when BMI 25.1 – 27 kg/m 2, severe overweight when BMI > 27 kg/m 2 (8).

Hypertension data was obtained from the results of blood pressure checks using a tensimeter. Sodium intake data was obtained by conducting interviews using the semi-quantitative FFQ form. Nutritional status data were obtained by performing anthropometric measurements based on the index of body weight for height using a stepping scale and microtome with an accuracy level of 0.1. Secondary data includes patient identity data (age, gender, education, occupation) obtained by conducting interviews. Tools and instruments used in this study are FFQ semi-quantitative, microtoice, digital/digital scales, sphygmomanometer, and informed consent.

The data was obtained by the researcher using anthropometric measurements (BB and TB) and guided interviews, namely, the researcher gave several questions to the respondents by the semi-quantitative FFQ that

the researcher had made. After filling in correctly and all items have been answered by the respondents, the researcher processes nutritional status data and semi-quantitative FFQ results using editing, coding, entry, tabulating, and pants techniques. The presentation of this data is presented in tabular and narrative form.

3. Results

Table 1 shows that the sample distribution is based on age group, most are in the 40-50 age group, namely 4 people (50%) and a small portion are in the 51-60-year age group, namely 3 people (37.5%) and 61-70 years namely 1 person (12.5%). Distribution of samples according to gender, the majority were female, namely 5 people (62.5%) and for the male sex, there were 3 people (37.5%). Blood pressure in the sample is mostly in the range of degree II hypertension, namely 4 people (50%), the smallest number is degree III hypertension, namely 1 person (12.5%), and degree I hypertension is 3 people (37,5%). Sodium intake in the sample range of grade I hypertension recommended 3 (100%), grade II hypertension recommended 3 people (75%), not recommended 1 person (25%), and hypertension degree III which is not recommended 1 person (100%). Nutritional status according to BMI is categorized as normal 4 people (50%), mildly underweight 1 person (12.5%), mildly overweight 2 people (25%), and overweight 1 person (12.5%).

Table 1 Univariate analysis of sodium intake and nutritional status in hypertensive patients at Hative Passo Hospital

Category	n	%
Age		
40 – 50	4	50
51–60	3	37.5
61–70	1	12.5
Gender		
Woman	5	62.5
Man	3	37.5
Blood pressure		
Hypertension I	3	37.5
Hypertension II	4	50
Hypertension III	1	12.5
Sodium Intake		
Hypertension I		
Recommended	3	100
No Recommended	0	0
Hypertension II		
Recommended	3	75
No Recommended	1	25
Hypertension III		
Recommended	0	0
No Recommended	1	100%
Nutritional status		
Mild underweight	1	12.5
Normal	4	50
Mild degree of overweight	2	25
Excess weight level	1	12.5

4. Discussion

Sodium Intake

The sodium intake referred to in this study is the sodium intake habits of outpatients. Salty foods can cause high blood pressure, because sodium (Na) has the property of binding a lot of water, so the higher the sodium, the higher the blood volume. From the results of the analysis, it was found that patients who consumed sodium

exceeded the recommended limit, because from the semi-quantitative FFQ results, respondents still often consumed ready-to-eat foods such as fried foods, martabak and snacks with high sodium content resulting in increased blood volume and the patient was categorized as hypertension. .

There is a significant positive correlation between sodium intake and systolic and diastolic blood pressure(9). The positive correlation means that the higher the sodium intake, the higher the systolic and diastolic blood pressure. The effect of salt intake (sodium) on the incidence of hypertension occurs through an increase in plasma volume, cardiac output, and blood pressure. Besides that, consumption of high amounts of salt can shrink the diameter of the arteries, so the heart has to pump harder to push the increased volume of blood through the narrower spaces and the result is hypertension (10). Consuming too much sodium can increase the amount of sodium in the extracellular fluid (11). But to stabilize again, the intracellular fluid must be pulled out so that the extracellular fluid volume increases. The increased volume of extracellular fluid causes an increase in blood volume, which results in hypertension (12). The results of this study are supported by research conducted by Dyah in 2021 that excessive sodium intake can cause an increase in blood pressure. Sodium is an important nutrient for the body and is associated with increased blood pressure. A high-sodium diet has very little effect in non-hypertensive patients, but is closely associated with an increase in hypertension if consumed over a long period of time (13).

In general, sodium absorbed by the body from food exceeds the body's needs, will be excreted through the kidneys with the urine, so that the sodium level in the blood remains constant. If sodium intake is excessive and the kidneys are no longer able to excrete it due to limited capacity, then the sodium level in the blood increases. As a result, the volume of blood circulating in the body's blood vessels increases so that blood pressure also increases (14).

Nutritional Status

Nutritional status is an important element in shaping health status. Nutritional status is a condition caused by a balance between the intake of nutrients from food and the body's need for nutrients. Nutritional status in the body is influenced by two factors, namely primary and secondary. The primary factor is a condition that affects nutritional intake due to the inappropriate composition of the food consumed, while the second factor is that nutrients are not sufficient for the body's needs due to disturbances in the utilization of nutrients in the body (15). Of the 8 samples, there was one person who experienced mild wasting, caused by a picture of inadequate nutrient intake based on the results of nutrisurvey calculations from semi-quantitative FFQ data. Another factor that may have an influence is disease disorders which were not studied in this study. Two people were mildly overweight and one person was overweight due to excess calorie intake and possible lack of physical activity. This is supported by the theory that states that the prevalence of hypertension in someone who is obese is much greater. The relative risk for obese people to suffer from hypertension is 5 times higher compared to people who have normal weight. Around 20-33% of people with hypertension are found to be overweight (16).

Abnormal nutritional status influences blood pressure, especially for adults with obesity. Someone with obesity requires a lot of blood as a means to supply oxygen and food to all body tissues. This will increase the volume of blood flowing through the blood vessels (13). The risk of getting hypertension with more body weight is the chance of hypertension compared to normal and thin body weight. Respondents with more body weight will accumulate fat tissue, which can cause an increase in vascular resistance increasing the work of the heart to be able to pump blood throughout the body (17). This shows that it takes effort to lose weight so that the risk of hypertension can be suppressed. In Marianawati's research, it was stated that weight loss is the most important therapy in the prevention and treatment of hypertension. Every 1 kilogram of body weight loss can reduce systolic blood pressure by 1.05 mm HG and diastolic by 0.92 mmHg (14).

5. Conclusion

Sodium intake in hypertensive patients is categorized as grade I hypertension which is recommended for 3 (100%), grade II hypertension is recommended for 3 people (75%), 1 person (25%) is not recommended and grade III hypertension is not recommended 1 person (100%). Nutritional status based on BMI showed that nutritional status according to BMI was categorized as normal 4 people (50%), mildly underweight 1-person (12.5%), mildly overweight 2 people (25%), and 1-person (12.5%) overweight. It is hoped that everyone should

have their blood pressure checked regularly and for hypertensive patients, it is strived to be able to carry out a low sodium diet so that other disease complications do not occur.

Funding: None

Acknowledge: Acknowledgments to the Leaders of Hative Passo Hospital for giving permission to carry out the research.

Conflicts of Interest: The authors declare no conflict of interest.

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