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# The Relationship between Sodium Intake and Nutritional Status with Hypertension Incidence in the Work Area of the Alosika Health Center, Konawe Regency 

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#### Abstract

Hypertension is a condition where blood pressure exceeds $140 / 90 \mathrm{mmHg}$. Hypertension can cause complications of cardiovascular diseases such as stroke, heart disease, and diabetes mellitus. Hypertension at the Alosia Health Center in 2021 was 72 cases and increased in 2022 for the January-March period by 90 cases. The purpose of this study was to determine the relationship between sodium intake and nutritional status with the incidence of hypertension. Quantitative research design, cross-sectional study approach. The sample is partly all patients registered at the Alosika Health Center, Konawe Regency in 2022 for the January-March 2022 period as many as 89 were obtained by Simple Random Sampling. Data were analyzed using the Chi-square test. The results of the study from 89 samples, the incidence of hypertension, most of them had hypertension ( $66.3 \%$ ), then based on sodium intake, most were more ( $67.4 \%$ ) and based on nutritional status most of 56 people ( $62.9 \%$ ) nutritional status normal. Chi-Squarest obtained a p-value of .000 for the relationship between sodium intake with the incidence of hypertension and a p-value of 0.001 for the relationship between nutritional status and the incidence of hypertension. This study concludes that there is a relationship between sodium intake and nutritional status with the incidence of hypertension in the work area of the Alosika Health Center, Konawe Regency.


## INTRODUCTION

Hypertension, commonly known as high blood pressure, is an increase in blood pressure above the normal threshold, which is $120 / 90 \mathrm{mmHg}^{1}$. Hypertension can lead to heart failure, kidney failure, and stroke which can eventually result in disability or death ${ }^{2}$.

The World Health Organization (WHO) explained that hypertension is one of the causes of premature death in people in the world. Increased blood pressure is estimated to have caused 9.4 million deaths ${ }^{3}$. WHO has estimated that by $2025,1.5$ billion people in the world will suffer from hypertension each year ${ }^{4}$. The prevalence of hypertension in

Indonesia based on the 2018 Riskesdas survey in residents aged $\geq 18$ years was $25.8 \%$, while for all ages in Indonesia was $26.5 \%$ and is estimated to be $42 \%$ in $2025^{5}$.

According to data from the Southeast Sulawesi Provincial Health Office, the prevalence of hypertension cases in 2017 was $6.24 \%$, then in 2018 it increased to $9.16 \%$, and it increased even more in 2019 to $10.26 \%$. Likewise, in 2020, the prevalence in Southeast Sulawesi reached $12.81 \%{ }^{6}$. Cases of hypertension in Konawe Regency in 2020 rank fifth as the highest cases of hypertension after Kendari City, Central Buton and North Buton Regencies, and Bombana District. In Konawe

Regency in 2018 was $1.12 \%$, then it increased in 2019 to $2.05 \%$ and will increase in 2020 to $2.24 \%{ }^{7}$.

One of the areas in Konawe Regency that has high cases of hypertension is Alosika District. Research related to hypertension in the community has also never been carried out. Based on the recap of the Top 10 Diseases at the Alosika Health Center in 2022 for the January-March period, cases at the Alosika Health Center rank first with the amber of new cases of Hypertension of 90 cases, this is still higher than the previous year, namely I,n 2021 there were 72 cases of Hypertension ${ }^{8}$.

Several factors that cause hypertension include diet, especially eating habits that are high in salt, which can trigger an increase in blood pressure ${ }^{9}$. Research conducted by Bertalina states that there is a relationship between sodium intake and the patient's blood pressure ${ }^{10}$. In addition to sodium intake, hypertension can also be caused by light physical activity which has an impact on nutritional status ${ }^{11}$.

Based on the results of an initial survey of 10 Alosika residents who had hypertension, it was found that $80 \%$ consumed foods high in sodium such as dried fish and smoked fish and $20 \%$ had never eaten dried or smoked fish, then $60 \%$ were overweight and $40 \%$ of normal nutritional status. That way, important to research "The Relationship between Sodium Intake and Nutritional Status with the Incidence of Hypertension in the Working Area of the Alosika Health Center, Konawe Regency".

## METHOD

This type of research is quantitative with a cross-sectional study design. This research was conducted in the working area of the Alosika Health Center, Konawe Regency, in August 2022. The population in this study were all patients registered at the Alosika Health Center, Konawe Regency, for the January-March period of 2022, totaling 114 people. The sample in this study was a portion of all patients registered at the Alosika Health Center, Konawe Regency in 2022 for the January-March 2022 period as many as 89 people. The sampling technique uses simple random sampling.

Data collection using a semiquantitative food frequency quisionare (SQFFQ) modified form to determine sodium
intake. GEA brand sphygmomanometer to find out data on the incidence of hypertension obtained using a sphygmomanometer, in collecting blood pressure data will be assisted by nurses in diagnosing the incidence of hypertension. Camry brand scales were calibrated with an accuracy of 0.01 cm to determine body weight and GEA brand microtoice to determine height. Data analysis using the chi-square test.

## RESULTS AND DISCUSSION

## Characteristics of respondents

The characteristics of the sample in this study consisted of age, gender, education, and occupation. In detail presented below:

Table 1. Distribution of sample characteristics

| Characteristics of <br> Respondents | n (89) | \% |
| :--- | :---: | :---: |
| Age (Year) | 41 |  |
| Mean | $20-60$ |  |
| Minimum-Maksimum |  |  |
| Gender | 37 | 41,6 |
| Man | 52 | 58,4 |
| Woman |  |  |
| Education | 48 | 53,9 |
| Elementary school | 22 | 24,7 |
| Junior High School | 18 | 20,2 |
| Senior High School | 1 | 1,1 |
| S1 |  |  |
| Profession | 42 | 47,2 |
| Housewife | 32 | 36,0 |
| Farmer | 6 | 6,7 |
| Self-employed | 1 | 1,1 |
| civil servant | 6 | 6,7 |
| Student | 2 | 2,2 |
| Honorary |  |  |

Table 1 shows that of the 89 samples, in terms of age characteristics, the average age is 41 years, with the lowest age being 20 years and the highest age being 60 years. Gender mostly women as many as 52 people ( $58.4 \%$ ). Then based on education, the majority of elementary school graduates were 48 people (53.9\%) and based on mothers' work, most were housewives as many as 42 people (47.2\%).

Table 2. Distribution of Research Variables

| Variable | n (89) | $\%$ |
| :--- | :--- | :--- |
| Hypertension events |  |  |

Hypertension events

| Hypertension | 59 | 66,3 |
| :--- | :--- | :--- |
| No Hypertension | 30 | 33,7 |
| Sodium Intake |  |  |
| Enough | 29 | 32,6 |
| Over | 60 | 67,4 |
| Nutritional status |  |  |
| Normal | 56 | 62,9 |
| Mild Excess Weight | 18 | 20,2 |
| Overweight Weight Level | 15 | 16,9 |

Table 2 shows the majority experienced hypertension, namely 59 people ( $66.3 \%$ ), then based on sodium intake, most of them were more than 60 people ( $67.4 \%$ ), and based on nutritional status, some 56 people $(62.9 \%$ ) of the nutritional status of the sample are in the Normal category.
The relationship between sodium intake and the incidence of hypertension.
Table 3. The relationship between sodium
intake and the incidence of hypertension in
the working area of the Alosika Health Center, Konawe Regency

| Natrium Intake | Hypertension events |  |  |  | Total |  | $\begin{aligned} & \text { Ch- } \\ & \text { Square } \\ & \text { Test } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Hyper tension |  | NoHyperte nsion |  |  |  |  |
|  | n | \% | n | \% | n | \% |  |
| Enough | 6 | 20,7 | 23 | 79,3 | 29 | 100 |  |
| Over |  | 83,3 | 7 | 11,7 | 60 | 100 | p-value |
| Total |  | 66,3 | 30 | 33,7 | 89 | 100 |  |

Table 3 shows, 29 people consumed enough sodium and 60 people consumed more sodium. Then of the 29 people who consumed enough sodium, the majority did not have hypertension, as many as 23 people ( $79.3 \%$ ), the rest had hypertension, and as many as 6 people $(20.7 \%)$. Furthermore, of the 60 people who consumed more sodium, the majority had hypertension, as many as 53 people ( $83.3 \%$ ), the rest did not have hypertension, and 7 people (11.7\%).

The results of the statistical that there is sodium intake with the incidence of hypertension. This study shows that out of 64 samples, most of them consume more sodium. The samples have excess sodium intake. Based on interviews using Food Frequency Questionnaire, it was found that respondents are accustomed to consuming foods high in sodium, such as salted fish, with the highest frequency being $<3 \mathrm{x}$ a week where the average sample consumes salted fish weighing 20 grams and 1 gram of salted fish contains a
high sodium content of 170 mg sodium and is also used to consuming boiled fish and some respondents also consume shrimp and squid. These four types of food underlie the high intake of sodium in the Alosika community.

This study also showed that the samples that consumed more sodium, mostly $83.3 \%$ had hypertension and the samples that consumed enough sodium, most (79.3\%) did not experience hypertension, this is because sodium is one of the micronutrients that can trigger an increase in blood pressure, the higher the sodium consumption, the blood pressure will increase. Vice versa, the more sufficient or less sodium consumption, the more blood pressure can become normal. Sodium in the body causes the body to retain water at a rate that exceeds the body's normal limits so that it can increase blood volume and cause blood pressure to increase. Sodium is the main active component in changes in extracellular fluid volume ${ }^{12}$.

This study also found that samples consumed more sodium, and $11.7 \%$ did not have hypertension. routinely with adequate frequency and duration can normalize blood pressure. In addition, in this study, there were also $20.7 \%$ of the sample whose sodium consumption was sufficient, experienced hypertension. This situation is suspected because respondents rarely do physical activity so it has an impact on increasing blood pressure.

According to the researchers' assumptions, this occurs because coastal communities tend to consume foods high in sodium, which are obtained from salted fish, pindang fish, squid, and shrimp.

This research is in line with the research of Abdurrachim, et al., which found that there was a relationship between sodium intake and blood pressure ${ }^{13}$. Likewise, the research by Rahma and Baskari found that there was a relationship between sodium intake and the incidence of hypertension with a value of $p=0.000$ and OR 115.5 (14). This research is also in line with research conducted by Bertalina (2017) which states that there is a relationship between sodium intake and a patient's blood pressure ${ }^{10}$.

This research is reinforced by Shanty's theory (2018) that several factors cause hypertension, including eating habits that are high in salt ${ }^{9}$. Then the theory put forward by Mardalena (2017) is that Sodium is one of the
micronutrients needed by the body in small amounts. Food intake that can trigger the occurrence of hypertension besides fat intake is the intake of food sources of sodium. If sodium intake increases beyond the recommended adequacy limit, it can increase the risk of developing hypertension. Sodium in the body causes the body to retain water at a rate that exceeds the body's normal limits so that it can increase blood volume and cause blood pressure to increase. Sodium is the main active component in changes in extracellular fluid volume ${ }^{12}$.

## Relationship between Nutritional Status and Hypertension

Table 4. The relationship between nutritional status and the incidence of hypertension

| Nutritional Status | Hypertension Event |  |  |  | Total |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Hypertension |  | No Hypertension |  |  |  |
|  | n | \% | n | \% | n | \% |
| Normal | 30 | 53,6 | 26 | 46,4 | 56 | 100 |
| Mild Excess Weight | 17 | 94,4 | 1 | 5,6 | 18 | 100 |
| Overweight <br> Weight Level | 12 | 80,0 | 3 | 20,0 | 15 | 100 |
| Total | 59 | 66,3 | 30 | 33,7 | 89 | 100 |

Table 4 shows that of the 89 samples, there were 56 people whose nutritional status was normal, 18 people were mildly overweight and 15 people were severely overweight. Then of the 56 people whose nutritional status was normal, the majority did not have hypertension, as many as 26 people ( $46.4 \%$ ), the rest had hypertension, and as many as 30 people (53.6\%). Furthermore, of the 18 people who experienced mild overweight, the majority had hypertension as many as 17 people $(94.4 \%)$, and the rest did not have hypertension as many as 1 people ( $5.6 \%$ ). Furthermore, of the 15 people who were overweight, 12 people (80.0\%) had hypertension, the rest had no hypertension, and 3 people (20.0\%).

The results of statistical analysis using Chi-Square at the $95 \%$ confidence level, obtained a p-value of $0.001<\alpha(0.05)$, so the alternative hypothesis is accepted, which means that there is a relationship between nutritional status and the incidence of hypertension. This study showed that of the 56 people whose nutritional status was normal, most (46.4\%) did not have hypertension, and
the rest (53.6\%) had hypertension. Furthermore, of the 18 people who were mildly overweight, the majority ( $94.4 \%$ ) had hypertension. Furthermore, of the 15 people who were overweight, most of them had hypertension (80.0\%).

This study also had extreme values, namely that $5.6 \%$ of the sample was mildly overweight but did not have hypertension and $20.0 \%$ of the samples were severely overweight but not hypertensive (20.0\%). This is presumably due to other factors that can neutralize blood pressure such as intake of other foods consumed by the sample such as consuming soft drinks such as coca-cola or sprite and some even taking drugs when they have consumed foods high in sodium such as salted fish. Then in this study, there were also $53.6 \%$ of the sample whose nutritional status was normal but had hypertension, this Crituation was suspected to be due to the age Squfactor where the age factor was a factor that Textuld not be controlled where in this study the average sample age was 41 years, with the $p$ vdrweest age being 20 years and the highest age $=0, \$ 060$ years and most of the samples are adults to the elderly. This is confirmed by Suiraoka (2018) that hypertension can also be caused by age. Blood pressure tends to increase with age. In general, people with hypertension are people aged 40 years, but it does not rule out being suffered by young people. Darmoejo stated that various studies in Indonesia showed that $1.8 \%-28.66 \%$ of the population aged over 20 years were sufferers of hypertension ${ }^{11}$.

According to the researcher's assumption, the more normal a person's nutritional status, the more normal his blood pressure will be, but if the nutritional status is better, it can trigger an increase in blood pressure. Researched Rahma and Baskari (2019) found that there was a relationship between BMI and the incidence of hypertension with $\mathrm{p}=0.034$ and $\mathrm{OR}=4.85^{14}$. This research is confirmed by the theory of Supariasa, et al., that nutritional status is an expression of a state of balance in the form of certain variables or the embodiment of nutrition in the form of certain variables ${ }^{15}$. Nutritional status is related to daily food consumption and is needed to maintain one's health, help the growth of children and support the development of one's achievements ${ }^{16}$.

## CONCLUSION

There is a relationship between sodium intake and the incidence of hypertension ( p -value 0.000 ) and there is a relationship between nutritional status and the incidence of hypertension ( p -value 0.001 ).

Suggestion For the people to be a source of information to limit high-sodium foods such as salted fish, shrimp and shellfish by substituting fresh fish and consuming fruits and vegetables regularly.

## REFERENCES

1. Suddart dan Brunner. Medical Surgical Nursing. Jakarta: EGC; 2018.
2. Triyatno, E. Integrated Nursing Services for Hypertension Sufferers. Yogyakarta: Science Graha; 2014.
3. World Health Organization (WHO). Prevalence of Hypertension Patients in the World [Internet]. 2014. Available from: Http, Hypertension.Co,Id
4. World Health Organization (WHO). The Global Burden Of Disease. Geneva; 2019.
5. Agency HR and D. Regional Health Research Report. Jakarta; 2018.
6. Southeast Sulawesi Provincial Health Office. Profile of the Southeast Sulawesi Provincial Health Office for 2020. Kendari; 2021.
7. Konawe District Health Office. Profile of the Konawe District Health Office in 2020. Unaaha; 2021.
8. Center AH. Summary of Data on NonCommunicable Disease Cases at the Alosika Health Center. Konawe Regency. Southeast Sulawesi; 2021.
9. Shanty, M. Silent Killer Disease. Yogyakarta: Meita Shanty; 2018.
10. Bertalina SA. Correlation between Sodium Intake, Lifestyle, and Genetic Factors with Blood Pressure in Patients with Coronary Heart Disease. Heal J. 2017;7(2).
11. Suiraoka. Degenerative disease. Yogyakarta: Nuha Medika; 2018.
12. Mardalena Ida. Fundamentals of Nutrition Science for Nursing. Concept and Application of Nursing Care. Yogyakarta: New Press Library; 2017.
13. Abdurrachim, R., Hariyawati, I., \& Suryani N. Correlation between Sodium Intake, Frequency and Duration of Physical Activity on Elderly Blood Pressure at Tresna Werdha Budi Sejahtera and Bina Laras Budi Luhur Social Institutions, Banjarbaru City, South Kalimantan. Indones Nutr. 2017;39(1):37-48.
14. Rahma, A., \& Baskari PS. Measurement of Body Mass Index, Fat Intake, and Sodium Intake in Relation to the Incidence of Hypertension in the Adult Group in Jombang Regency. Ghidza Media Journal; 2019;1(1):5362.
15. Hardinsyah, P. and S. Nutrition Science: Application Theory. Jakarta: EGC; 2016 p.
16. Irianto K. Complete Nutrition Guide: Families and Athletes. Yogyakarta: CV. Andi Offset; 2017.
