THE RELATIONSHIP OF SEAFOOD CONSUMPTION WITH HYPERTENSION INCIDENT RATE IN COASTAL COMMUNITIES KARAWANG BEACH

Salamah Thomasita Batubara[1], Meria Woro Listyorini[2], and Wartinah[3]
[1,2,3] University Bani Saleh
*Corresponding Author : Email : salamah@ubs.ac.id

Abstract

Introduction: The prevalence of hypertension will continue to increase sharply, it is predicted that in 2025 as many as 29% of adults worldwide will be affected by hypertension, in Indonesia hypertension is the third cause of death for all ages after stroke (15.4%) and tuberculosis (7.5%), with the number reaching 6.8%. Excessive seafood consumption can increase cholesterol in the blood, which can cause a person to develop hypertension. This study aims to determine the relationship between seafood consumption and hypertension incident rates in the Karawang Coastal Community. Methodology: This research is quantitative research with cross sectional methods. The sample in this research is the community that resides in the Pakis Region, especially in RT 04 RW 06 and RT 01 RW 07 Tanjung Pakis Village, totaling 86 respondents. The sampling technique uses total sampling. The data analysis technique uses Chi-square. Research findings: The research results show that there is a relationship between seafood consumption and the incidence of hypertension in Karawang Beach coastal communities with a p value of 0.000<0.05. Recommendation : Researchers recommend that local health officials plan measures to prevent seafood over-eating habits through health education to the people living in Karawang Coastal Area.

Keywords: *hypertension, seafood, coastal.*

1. Introduction

Hypertension or increased blood pressure is one of the most common diseases with a high incidence rate. Hypertension or High blood pressure is a disorder in the blood vessels resulting in obstruction of oxygen supply and nutrients carried by the blood to reach the body's tissues that need it. (Cahyani, S, et al., 2019).

The incidence of hypertension in the world is quite high, the number of hypertensive patients in the world continues to increase every year, it is estimated that by 2025 there will be 1.5 billion people affected by hypertension, and every year there will be 9.4 million people who die due to hypoertension (Ministry of Health, 2019) . The prevalence of hypertension will continue to increase sharply, it is predicted that in 2025 as many as 29% of adults worldwide will suffer from hypertension. In Indonesia hypertension is the third cause of death for all ages after stroke (15.4%) and tuberculosis (7.5%), with the number reached 6.8%. The number of hypertension sufferers is estimated at 15 million people, but only 4% have controlled blood pressure while 50% of sufferers have uncontrolled blood pressure (Cahyani, S, et al., 2019b).

Factors that influence the occurrence of hypertension are divided into two large groups, namely factors that are inherent or cannot be changed such as gender, age, genetics and factors that can be changed such as diet, exercise habits and others. For hypertension to occur, these risk factors must play a role together (common

underlying risk factor), in other words, one risk factor alone is not enough to cause hypertension.

Hypertension is a disease that can be prevented by controlling risk factors, most of which are behavioral factors and living habits. If someone is willing to adopt a healthy lifestyle, they will most likely avoid hypertension (Saputra et al., 2013). A healthy lifestyle by adopting a regular diet and eating foods that are healthy or needed by the body will result in less risk of developing hypertension. The risk of hypertension for people who consume more than 6 grams of salt per day is 5-6 times greater, compared to people who consume low amount of salt. WHO recommends limiting salt intake to a maximum of 6 grams per day, equivalent to 2400 grams of sodium. Food ingredients that are preserved with salt need to be limited, such as pindang fish, skipjack fish, tude fish, roa fish, deho fish and oci fish.

The human body can produce some fatty acids, but there are also fatty acids that cannot be produced. These fatty acids, namely PUFA omega 3 and omega 6, are important for the body and are obtained from food. Recently, most processed foods only contain omega 6 fatty acids, therefore the ratio of omega 3 to omega 6 is very low. Fish oil is useful for quickly converting omega 3 to omega 6 in reducing BP and various risks of myocardial infarction in dangerous and life-threatening situations. To prevent a deficiency of essential fatty acids, experts recommend consuming at least 2.4 percent of the total fat consumed is omega 6 and 0.5 to 1 percent of the total fat consists of omega 3. Consuming one to four servings (around 100 grams per serving) of fish a week is good for health, considering this amount can be said to be safe, the amount of heavy metals (such as mercury) and other contaminants found in the sea, unless the fish are taken from areas without pollution controls. Several studies studying fish oil supplementation showed that in hypertensive patients, a significant reduction in BP was seen, but other studies showed minimal effects on reducing BP (Masengi et al., 2013).

High levels of seafood consumption also play a role in the tendency of hypertension in coastal areas. One of the risk factors for hypertension is fat content in the body, as stated that hypercholesterolemia is a risk factor for hypertension. Meanwhile, the cholesterol content of freshwater fish tissue is generally lower than sea fish. From the preliminary study carried out, it is necessary to carry out research on the relationship between seafood consumption and hypertension in coastal communities, especially in the working area of the Pakis Jaya Health Center, Karawang Regency.

2. Methods

2.1 Study Design

This research is a type of quantitative research with a cross sectional designed method. The sample in this research is people who live in the Pakis area, especially in RT 04 RW 06 and RT 01 RW 07 Tanjung Pakis Village, totaling 86 respondents. The sampling technique uses total sampling. The instruments used in the research used a questionnaire and a spygmonanometer/ blood pressure examination device. This questionnaire contains questions about the frequency or habits of consuming seafood in one week. This questionnaire consists of 11 questions which have been tested for validity and reliability by the researcher herself. The reliability obtained was 0.924.

2.2 Data Analysis

Data processing in this research consists of editing, coding, data entry, cleaning and tabulation. And the analysis used is univariate analysis and

bivariate analysis. In this study the statistical test used was the Chi-Square test.

3. Results

3.1 Univariate Analysis

Table 1. Frequency Distribution Based on Age (n=86)

No	Age Category	N	%
1	18-25 years old	9	10.3
2	26-35 years old	18	20.7
3	36-45 years old	35	40.2
4	46-55 years old	14	16.1
5	56-65 years old	8	9.2
6	> 65 years old	2	2.3
	Total	87	100.0

The majority of respondents were in the age category. The results of the study showed that the majority of respondents were in the 36-45 year age range, namely 35 respondents (40.2%), then respondents who were in the 26-35 year age range were 18 respondents (20.7%), respondents in the age range 46-55 years there were 14 respondents (16.1%), then respondents in the age range 18-25 years were 9 people (10.3%), respondents in the age range 56-65 years were 8 people (9.2%), and a small percentage of respondents were in the age range > 65 years as many as 2 people (2.3%).

Table 2. Distribution based on education (n=86)

No	Age Category	N	%
1	No School	10	11.5
2	SD/MI	43	49.4
3	SMP/MTS	27	31.0
4	SMA/SMK/MA	6	6.9
5	D3/S1	0	0
	Total	86	100.0

The results of the research showed that some of the respondents with primary school/MI education were 43 people (49.4%), respondents with junior high school/MTS education were 27 people (31.0%), then respondents who had no school education were 10 people (11.5%), and a small number of respondents were 6 people who had SMA/SMK/MA education (6.9%).

Table 3. Frequency Distribution Based on Gender (n=86).

No	GDP Category	N	%
1	Male	8	9.2
2	Female	78	89.7
	Total	86	100.0

The research results showed that most of the respondents were female, namely 78 people (89.7%) and a small proportion of respondents were male, namely eight people (9.2%).

Table 4. Frequency Distribution Based on Diet (n=86).

No	Job Category	N	%
1	Fishermen	33	37.9
2	Farmer	2	2.3
3	State Civil Apparatus	1	1.2
4	Labor	19	21.8
5	Entrepreneur	6	6.9
6	Health workers	0	0
7	Housewife	24	27.6
	Total	86	100.0

The research results showed that the majority of respondents worked as fishermen, namely 33 people (37.9%), then respondents who did not work/housewives were 24 people (27.6%), respondents who worked as laborers were 19 people (21.8%), respondents who worked as self-employed, namely 6 people (6.9%), and respondents who work as farmers were 2 people (2.3%) and ASN was one person (1.2%).

Table 5. Frequency Distribution Based on seafood consumption habits (n=86)

No	GDP Category	N	%
1	Often	51	59.3
2	Seldom	35	40.7
	Total	86	100.0

The research results showed that the majority of respondents had the habit of consuming seafood frequently, namely 51 people (59.3%) and a small percentage of respondents had the habit of consuming seafood infrequently, namely 35 people (40.7%).

Table 6. Frequency Distribution Based on Blood Pressure (n=86)

No	GDP Category	N	%
1	Fairly High (Hypertension degree 1)	47	54.7
2	High (Hypertension degree II)	39	45.3

The results of the study showed that the majority of hypertension sufferers in

the Karawang coastal area had blood pressure in the quite high category, namely 47 respondents (54.7%) and there were 39 respondents (45.3%) with blood pressure in the high category.

3.2 Bivariate Analysis

Table 7. Correlation between seafood consumption and the incidence of hypertension in the Karawang Coastal Community (n=86)

Seafood Consumption	Blood Pressure				Amount		OR (95% CI)	P value
	Fairly High		High					
	N	%	N	%	N	%		
Often	19	22.1	32	37.2	51	59.3	0.148 (0.054 - 0.405)	0.000
Seldom	28	32.6	7	8.1	35	40.7		
Total	47	54.7	39	45.3	86	100		

The research results showed that the majority of hypertension sufferers who consumed seafood often had blood pressure in the high category, namely 32 people (37.2%). Meanwhile, the majority of hypertensive sufferers who had a habit of consuming seafood did not often experience blood pressure in the quite high category. Based on statistical analysis using the Chi Square test in SPSS, a significance value was obtained with a p value of 0.000 (<0.05), so it can be concluded that there is a significant relationship between seafood consumption habits and the incidence of hypertension in the coastal communities of Karawang (p value = 0.000) . The results of the analysis obtained an Odds Ratio value = 0.148 (95% CI: 0.054 – 0.405), which means that hypertension sufferers who have a habit of consuming seafood frequently have a 0.148 risk of having their blood pressure increase in the high category than those who have a habit of consuming seafood infrequently.

4. Discussion

1) Age

Research shows that the majority of respondents who experience hypertension are in the age range of 36-45 years, namely 35 respondents (40.2%). The results of this research are in line with research conducted by (Manikome et al., 2016) that out of 50 respondents, the majority indicated that the majority were aged 36-45 years, 18 respondents (36.0%). However, the results of this study differ from research conducted by (Suprayitno1, 2019) his research showed that all respondents who experienced hypertension were aged >45 years, with the majority of age 56-60 years, 10 people (31.25%). Meanwhile, this research also shows that 24 respondents aged >45 years were 24 out of a total of 87 respondents.

As you get older, changes occur in the arteries in the body, becoming wider and stiffer, which results in the capacity and recoil of blood accommodated through the blood vessels becoming reduced. This reduction causes systolic pressure to increase. Aging also causes disturbances in neurohormonal mechanisms such as the renin-angiotensin-aldosterone system and also causes increased peripheral plasma concentrations and also glomerulosclerosis due to aging and intestinal fibrosis resulting in increased vasoconstriction and vascular resistance, resulting in increased blood pressure (hypertension) (Nuraeni, 2019).

2) Gender

This research shows that most of the respondents were female, namely 78 people (89.7%). The results of this research are in line with research conducted by (Masengi et al., 2013) that the majority of respondents in their research were women, 75 people (78.9%). According to Singalingging (2011), the average woman after the age of 45 years will experience an increased risk of hypertension. Women who have not yet reached menopause can help increase levels of the hormone

estrogen (HDL) High Density Lipoprotein. Low HDL cholesterol levels and high LDL cholesterol levels influence the process of atherosclerosis (Anggraini et al, 2009). The prevalence of hypertension in Indonesia is greater in women (8.6%) than men (5.8%). After the age of 65 years, the incidence of hypertension in women increases more than in men due to hormonal factors (Pramana 2016).

3) Education

This research shows that the majority of respondents had primary school/MI education as many as 43 people (49.4%). In contrast to research results (Manikome et al., 2016) shows that the majority had junior high school education, 17 respondents (34.0%).

Riskesdas states that hypertension tends to be high in low education and decreases with the increasing of education. This relationship is not solely due to differences in education level, but education level influences a healthy lifestyle by not smoking, not drinking alcohol, and exercising more often (Kivimaki, 2004 in Yuliarti, 2007). The high risk of developing hypertension in people with low education is possibly due to a lack of knowledge in patients with low education regarding health and difficulty or slow acceptance of information (counseling) provided by officers so that it has an impact on healthy behavior/lifestyle (Anggara & Prayitno, 2013).

4) Work

This research shows that the majority of respondents work as fishermen, namely 33 people (37.9%). The results of this research are in line with research conducted by (Manikome et al., 2016) that the majority work as fishermen, 20 respondents (40.0%).

Work has an influence on a person's physical activity, people who do not work do not do much activity, which can increase the incidence of hypertension. In accordance with the theory stated by (Indonesian Ministry of Health, 2019) that lack of activity is a risk factor for hypertension that can be modified/changed.

This research was carried out in Karawang coastal area, so that the average resident has a livelihood as a fisherman. Based on the researcher's analysis, people whose livelihoods are fishermen or the head of their family work as a fisherman have a pattern of consuming seafood more frequently. Based on the results of interviews with several respondents who work as fishermen, they said they consume seafood almost every day, and often consume anchovies.

5) Seafood consumption habits

Research shows that the majority of respondents have the habit of consuming seafood frequently, namely 51 people (59.3%). Research (Jumaiyah & Harlianti, 2019) conducted in the Thousand Islands region on 60 respondents showed consistent results that the majority of respondents had the habit of consuming seafood frequently.

Eating habits are the expression of each individual in choosing what to eat which will form eating behavior patterns. Therefore, each individual's expression in choosing food will be different from one another (Widyantara, 2014). Seafood is food that comes from the sea. These foods contain very high cholesterol. High cholesterol will cause problems, especially in the blood vessels and brain. If cholesterol levels exceed normal limits, it will cause atherosclerosis. This atherosclerosis will block the arteries (Nuriska & Saraswati, 2011). The walls of arteries that experience atherosclerosis will become thick and stiff due to a buildup of cholesterol. The arterial channels will experience a process of narrowing, hardening and losing their flexibility. If these arterial muscle cells experience this disturbance, diseases such as

hypertension, arrhythmia, stroke and others will occur (Maryati, 2017).

Based on the researchers' analysis, people have a habit of consuming seafood frequently because the majority of them live on the coast. Apart from that, based on questionnaire data, it was found that the majority of respondents consumed anchovies more often every day. Salted anchovies contain a lot of salt. According to (Andria, 2013) salt contains 40% sodium and 60% chloride. People who are sensitive to sodium more easily increase sodium levels, which cause fluid retention and increased blood pressure.

6) Blood pressure in hypertensive sufferers.

The incidence of hypertension in Karawang Coastal Area is quite high. In this study, researchers used 86 respondents who experienced hypertension. Most of the hypertension sufferers had blood pressure in the quite high category, namely 47 respondents (54.7%). Based on the results of research conducted by (Manikome et al., 2016), it shows that the majority of respondents had blood pressure in Grade I Hypertension category, 18 respondents (56.25%).

Many factors can increase a person's risk or tendency to suffer from hypertension, including individual characteristics such as age, gender and ethnicity, genetic factors and environmental factors including obesity, stress, salt consumption, smoking, alcohol consumption, and so on (Anggara & Prayitno , 2013). The consequences of hypertension include narrowing of the arteries that carry blood and oxygen to the brain, this is because brain tissue lack of oxygen due to blockage or rupture of brain blood vessels and will result in death of part of the brain which then can cause a stroke.

This research shows that the increase in blood pressure in hypertension sufferers in Karawang Coastal area can be caused by several things, including high consumption of seafood and excessive use of salt which can be a risk factor for hypertension.

7) The relationship between consumption of seafood and the incidence of hypertension in Karawang Coastal Area.

From the results of research conducted on 86 respondents who have the habit of consuming seafood frequently, the majority have blood pressure in the high category / are at stage 2, namely blood pressure above ≥160 / ≥100 mmHg as many as 32 people (37.2%), compared to respondents who have the habit of consuming seafood frequently. seafood consumption is not frequent.

The type of seafood that was often eaten in the last week based on the results of the questionnaire was anchovies. Generally, anchovies/salted fish are a mandatory side dish for coastal communities, because apart from being affordable, they are also easy to get. However, anchovies and salted fish are side dishes that contain high levels of salt/sodium. Consuming excessive salt can increase blood volume in the body, which means the heart has to pump harder so blood pressure rises. This increase results in the kidneys having to filter more table salt and water. The blood vessel walls then react by thickening and narrowing, to provide narrower space in the blood capillaries, and increase resistance which ultimately requires higher pressure to move blood to the organs and the result is hypertension (Cahyani, Dian, et al., 2019).

Research by Aristi et al., (2020) shows that consumption of salted fish is related to the incidence of systolic hypertension. This research is in line

with previous research conducted by (Fitriani et al., 2018) that salted fish is a type of preserved fish and has a high sodium content. The high levels of preservatives and sodium in salted fish cause an increase in blood pressure. Research conducted (Bertalina & Muliani, 2016) shows that salted fish has a relationship with the blood pressure of someone who has hypertension.

Consuming seafood is good for body health if consumed appropriately. A healthy intake of fish and seafood is 4-6 times per week, 115-170g each. Consuming fish at least 2-3 times a day can prevent disease, make you smart and healthy. Fish also contains anti-oxidant factors that protect unsaturated fatty acids from oxidation before and after the digestive process (Cahyani, Dian, et al., 2019).

For people with hypertension, the type and quantity of seafood consumption should be considered carefully. Hypertension sufferers should know what types of seafood, if consumed in large quantities, it can increase their blood pressure. Apart from that, the use of salt in fish must also be limited. Consuming high amount of sodium has a risk factor 5.6 times greater than consuming low amount. Under normal circumstances, the amount of sodium excreted by the body through urine is the same as the amount consumed, so there is a balance (Irza (2010) in (Herawati et al., 2020)). In research (Agustina & Raharjo, 2015), sufferers who consume > 7 grams of salt per day have a 5.675 times risk of experiencing hypertension compared to sufferers who consume ≤ 3 grams of salt per day.

The habit patterns of coastal communities which tend to consume high amount of sodium, salt processed seafood, and consume marine animals which have higher cholesterol levels are unwittingly risk factors for hypertension in coastal areas. According to (Gultom et al., 2016) the variable level of sodium consumption was proven to have a relationship with the incidence of hypertension in respondents in Mekar Bahalat Village, Jawa Maraja Bah Jambi District, Simalungun Regency.

Apart from the high sodium consumption, seafood consumption not only contains protein which is good for the body, but some also contain very high cholesterol levels. The research results explain that seafood such as squid, shrimp and crab have quite high cholesterol content, namely 159, 179 161 mg/dl, so that if consumed frequently and in large quantities it can increase cholesterol which can be a trigger factor for hypertension (Jumaiyah & Harlianti, 2019).

From the results of the analysis of the relationship between the two variables using the Chi Square test, a P value of 0.000 (<0.05) was obtained, which means the P value is lower than the α value: (0.05), so it can be concluded that there is a significant relationship between seafood consumption habits and the incidence of hypertension. in coastal communities of Karawang. The results of this research are in line with research conducted by (Cahyani, Dian, et al., 2019) stating that there is a relationship between the habit of consuming seafood and the incidence of hypertension in coastal communities in Mangkang Health Center Working Area, Semarang City. In this study, seafood is most often consumed. consumption includes tuna, anchovies and shrimp. Meanwhile, in research (Cahyani, Dian, et al., 2019) the seafood commodity most frequently consumed is fish, especially skipjack tuna (Katsuwonus pelamis).

Researchers are of the opinion that the high incidence of hypertension in Karawang coastal area is due to

seafood consumption patterns that are high in salt/excessive sodium such as anchovies, seeing that the water in the area is salty, so this causes an increase in blood pressure, especially in hypertension sufferers. Apart from that, consumption of seafood that is high in cholesterol is also a factor in increasing blood pressure. Researchers assume that the public does not receive enough information regarding types of seafood that are high in sodium and cholesterol, so behavior to prevent hypertension is quite low.

5. Conclusion

The conclusion from the results of this research is that the majority of respondents have an age range of 36-45 years, are female, have at least elementary school/MI education and most work as fishermen. This research also shows that the majority of respondents have the habit of consuming seafood frequently and have blood pressure in quite high category. Statistical tests carried out using the chi-square test obtained a P value of 0.000 (<0.05), which means there is a significant relationship between seafood consumption habits and the incidence of hypertension in the Karawang coastal community.

Acknowledgment

The entire writing team would like to express their gratitude to the community for granting permission to conduct the study as well as to the research respondents who, despite their busy schedules, agreed to complete research instruments.

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