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Differences in Hypertension Risk Factors Between Coastal and Non-Coastal Communities in Kolaka Regency

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ABSTRACT

Introduction: Based on data on hypertension cases at the Watubangga Community Health Center, there were 1,022 cases (54%) in 2022, 1,183 cases (65%) in 2023, and 1,789 cases (91%) in 2024. Meanwhile, at the Kolaka Community Health Center in 2022, there were 4,503 cases (59%), 7,013 cases (91%) in 2022, and 9,955 cases (95%) in 2024. This study aims to analyze Differences in Hypertension Risk Factors Between Coastal and Non-Coastal Communities in Kolaka Regency.

Method: This research is a comparative study. The population consisted of 325 hypertension patients registered at the Kolaka Community Health Center and Watubangga Community Health Center. Systematic random sampling was used, with 75 respondents. The statistical tests used were the chi-square test, the Mann-Whitney test, and logistic regression.

Result: This study shows that there are differences in risk factors for caffeinated drinks with a P-value of 0.000 and a Mann-Whitney test of 0.000. Risk factors for salty foods with a P-value of 0.003 and a Mann-Whitney test of 0.003.

Conclusion: Community health centers need to carry out promotive and preventive efforts by utilizing the Integrated Non-Communicable Disease Development Post activities as an opportunity to approach the community, especially regarding hypertension risk factors.

Introduction

Hypertension is persistent blood pressure, systolic blood pressure above 140 mmHg and diastolic above 90 mmHg.[1] Hypertension is often called the silent killer because it doesn't produce any specific symptoms, but it can increase the risk of stroke, heart attack, chronic kidney disease, and even blindness if not properly controlled and managed. Complications of hypertension cause approximately 9.4 million deaths worldwide each year.[2]

According to 2021 World Health Organization data, the global prevalence of hypertension is currently 22% of the world's population. Africa has the highest prevalence at

27%, and the Americas the lowest at 18%. Southeast Asia ranks third with a prevalence of 25% of the total population. The WHO also estimates that 1 in 5 women worldwide have hypertension. This figure is higher among men, with 1 in 4 having hypertension.[3]

According to data from the World Health Organization, approximately 1.13 billion people worldwide suffer from hypertension in 2022. This means that 1 in 3 people worldwide has been diagnosed with hypertension.[4] The number of people suffering from hypertension in the world continues to increase every year, it is estimated that by 2025 there will be 1.5 billion people suffering from hypertension and it is estimated that every year 9.4 million people will die from hypertension and complications.[5] Africa has the highest prevalence at 40%, the Americas at 35%, and Southeast Asia at 36%. In Southeast Asia, the disease kills 1.5 million people annually. Overall, high-income countries have a lower prevalence of 35%, while low- and middle-income countries have a higher prevalence of 40%.[6]

In 2023, the World Health Organization (WHO) reported that hypertension was the leading cause of death worldwide, with 1.28 billion people aged 15 to 64 years suffering from hypertension.[7] More than one billion people with hypertension live in low to middle income countries, accounting for 82% of all people with hypertension worldwide.[8] In addition, it was found that 46% of adults suffering from hypertension were unaware that they had hypertension, and less than half of adults or 40% had received a diagnosis and treatment.[9]

Epidemiological research in Indonesia shows that 1.8% to 28.6% of the population aged 20 and over suffer from hypertension. Hypertension is a significant and serious problem in Indonesia, with one in 11 people worldwide suffering from high blood pressure. The prevalence of hypertension ranges from 1.8 to 28.6 percent of Indonesians aged 20 and over.[10] The 2021 household health survey showed a high prevalence of hypertension in Indonesia, at 83 per 1,000 household members. By 2022, the number of people with hypertension in Indonesia is estimated to reach 18,260,000.[11]

Based on data from the Southeast Sulawesi Provincial Health Office, hypertension is the most common disease in the top 10 list of most common diseases in Southeast Sulawesi. In 2019, the number of hypertension sufferers was 22,517 cases with a prevalence of 13.47%. Then in 2020, there were 57,160 cases with a prevalence of 19.63%. In 2021, the incidence of hypertension remained unchanged at 45,330 cases with a prevalence of 15.26%. In 2022, there were 48,218 cases with a prevalence of 16.83%.[12]

Data from the Kolaka Regency Health Office over the past three years shows that the incidence of hypertension in productive age groups (15-64 years) in 2021 was 14,404 cases (35%). In 2022, there were 26,370 cases (59%). In 2023, the number of hypertension sufferers in productive age groups (15-64 years) increased by 30,428 cases (70%). In 2023, the Community Health Center with the highest number of hypertension cases in urban areas was Kolaka Community Health Center, and the most hypertension cases in coastal areas were Watubangga Community Health Center.[13]

According to data from the Kolaka Community Health Center in Kolaka Regency, hypertension has consistently been among the top 10 most common diseases for the past three years and has consistently increased annually. In 2021, data on visits by hypertension sufferers in the productive age group (15-64 years) reached 4,503 cases (59%), followed by 7,013 cases (91%) in 2022, and an increase of 9,955 cases (95%) in 2023.

According to data from the Watubangga Community Health Center in Kolaka Regency, hypertension has consistently been among the top 10 most common diseases for the past three years and has consistently increased annually. In 2021, data on visits by hypertension sufferers in the productive age group (15-64 years) reached 1,022 cases (54%), followed by 1,183 cases (65%), and 1,789 cases (91%) in 2022.

Various risk factors associated with hypertension are closely correlated with their triggers. Uncontrollable risk factors include heredity, race, age, and gender, while controllable risk factors include smoking, consumption of caffeinated beverages, consumption of salty and fatty foods, physical activity, stress, and sleep quality.

The most important factor that greatly influences people's lives, lifestyle greatly influences a person's physical and psychological

condition.[14] Lifestyle changes and poor healthy living behavior such as poor eating habits, an unbalanced ratio of rest to activity, lack of exercise, obesity, unhealthy habits such as smoking, drinking alcohol, consuming excessive salt, consuming certain medications, and stress are some of the causes of hypertension.[15]

The increasing incidence of hypertension tends to occur in people with risk factors, one of which is productive age (over 18 years), as well as in people with unhealthy lifestyles such as smoking.[16] Generally, people of productive age lack the motivation to pay attention to their diet and health. Although 90% of hypertension is caused by family history, other factors such as diet, physical activity, and lifestyle also influence its occurrence.[17]

According to experimental research, caffeine increases the concentration of stress hormones like epinephrine, norepinephrine, and cortisol, which can lead to hypertension. People who don't drink coffee regularly have lower blood pressure than those who drink 1-3 cups of coffee per day. Men who drink 3-6 cups of coffee per day have higher blood pressure than those who drink 1-3 cups per day.[18]

Based on the background above, the author is interested in conducting research on "Differences in Risk Factors for Salty Foods and Caffeinated Drinks with the Incidence of Hypertension in Coastal and Non-Coastal Areas in Kolaka Regency".

Method

This research is a comparative study, using a two-part questionnaire: a consent form and a core questionnaire. The research instruments for the variables of hypertension incidence, salty food consumption, and caffeinated beverage consumption were used.

The population consisted of 325 hypertension patients aged 15-64 years registered at the Kolaka Community Health Center and Watubangga Community Health Center in the second quarter of 2025. The sample was drawn using systematic random sampling with a sample size of 75 respondents. The statistical tests used were the chi-square test, the Mann-Whitney test, and the logistic regression test.

Result

Table 1 shows that of the 150 respondents, the largest gender is male, with 103 respondents (68.7%) and the smallest is female, with 47 respondents (31.3%). Education level is the last level of education that respondents have ever completed, which is divided based on education level, namely: Elementary School, Middle School, High School, College and the largest occupation of respondents is fishermen with 70 respondents (46.7%) and the smallest is self-employed with 3 respondents (2%).

Table 2 shows that of the 109 respondents who eat salty foods, there are 62 respondents (41.3%) who live in coastal areas and 47 respondents (31.3%) who live in non-coastal areas. Meanwhile, of the 41 respondents who do not, there are 13 respondents (8.7%) who live in coastal areas and 28 respondents (18.7%) who live in non-coastal areas. Based on the chi-square statistical test, the P-value is 0.003 and the Mann-Whitney test is 0.003. These values indicate that there is a significant difference between the risk factors for eating salty foods and the incidence of hypertension.

Table 3 shows that of the 93 frequent respondents, there are 44 respondents (29.3%) who live on the coast. And 49 respondents (32.7%) who live in non-coastal areas. While of the 57 respondents who rarely, there are 31 respondents (20.7%) who live on the coast and 26 respondents (17.3) who live in non-coastal areas. Based on the chi square statistical test, the P-value is 0.000 and the Mann Whitney test is 0.000. These values indicate that there is a significant difference between the risk factors for caffeinated beverage consumption and the incidence of hypertension.

Table 1.
Frequency Distribution Based on Respondent Characteristics in Coastal and Non-Coastal Areas of Kolaka Regency

Respondent Characteristics	n	%
Gender		
Man	103	68.7
Woman	47	31.3
Education		
Graduated from elementary school	22	14.7
Graduated from junior high school	81	54.0
Graduated from high school	42	28.0
Diploma	2	1.3
Bachelor	5	2.0
Work		
Fisherman	70	46.7
Farmer	45	30.0
Trader	32	21.3
Self-employed	3	2.0
Total	150	100.0

Table 2.
Distribution of Respondents According to Risk Factors of Eating Salty Foods with Hypertension Incidence in Coastal and Non-Coastal Areas of Kolaka Regency

Eating Salty Foods	Hypertension Incident				Amount		P-value	Mann Whitney
	Coast		Non-Coastal					
	n	%	n	%	n	%		
Yes	62	41.3	47	31.3	109	72.7	0.003	0.003
No	13	8.7	28	18.7	41	27.3		
Total	75	50.0	75	50.0	150	100.0		

Table 3.
Distribution of Respondents According to Risk Factors of Caffeinated Beverage Consumption with Hypertension Incidence in Coastal and Non-Coastal Areas of Kolaka Regency

Consumption of Caffeinated Beverages	Hypertension Incident				Amount		P-value	Mann Whitney
	Coast		Non-Coastal					
	n	%	n	%	n	%		
Often	44	29.3	49	32.7	93	62.0	0.003	0.000
Seldom	31	20.7	26	17.3	57	38.0		
Total	75	50.0	75	50.0	150	100.0		

Discussion

The Relationship Between Risk Factors of Eating Salty Foods and the Incidence of Hypertension

The study results showed that the highest prevalence of salty foods was among patients living in coastal areas (62 respondents, 41.3%). This is because salty foods are often associated with specific culinary traditions. In some cultures, salty foods, such as salted fish, pickles, or foods preserved with salt, are part of the culinary heritage and are often served at special occasions or as part of everyday meals.

Social and environmental factors play a role, as food is often part of social interactions, and salty foods or snacks are often served at social events, such as parties or gatherings. In these

environments, consuming salty foods becomes a collective habit that is difficult to avoid. Social pressure, such as when salty foods like chips, pizza, or fast food are the center of attention at social events, tends to engage in such consumption even though they may not be truly hungry or in need of additional salt.

People's preference for salty foods is influenced by a combination of evolutionary factors, tongue adaptation, cultural habits, the influence of the food industry, and physiological effects.[19] Salt not only enhances the taste of food but also has neurochemical effects that make people feel comfortable and satisfied, which leads many people to unconsciously consume more salt than necessary.[20] In addition, the social environment and eating habits formed from processed and fast food also contribute to strengthening people's fondness for salty foods.[21]

People who frequently consume salty foods have a higher risk of suffering from hypertension because salt (sodium) affects blood pressure by increasing blood volume and causing narrowing of blood vessels.[22]Long-term excessive sodium consumption can damage blood vessels, impair kidney function, affect hormones that regulate blood pressure, and worsen other health conditions such as obesity.[23] Therefore, reducing salt intake is very important to prevent and manage hypertension, especially for those who are salt sensitive or have other risk factors.

The study results showed that the highest number of people who did not eat salty foods was 28 respondents (18.7%) who lived in non-coastal areas. This was due to public awareness of the importance of maintaining their personal health, the perception that foods that are too salty contain a lot of sodium, which, if consumed in excess, can increase the risk of high blood pressure (hypertension), heart disease, and kidney problems. Many people are becoming more aware of these negative impacts and are trying to reduce their salt intake to maintain their health.

A person's taste preferences can be influenced by eating habits formed since childhood. If someone is accustomed to a low-salt diet, they may dislike foods that are too salty. Cultural or dietary traditions, such as some cultures using little or even avoiding salt in their cooking, influence the eating habits of local communities. Doctors and nutritionists often advise patients to reduce their salt intake, especially those with certain medical conditions such as hypertension, kidney disease, or cardiovascular problems. Salt sensitivity is a factor, as some people have a higher sensitivity to salt. For them, even slightly salty foods can taste overwhelming, so they prefer foods with lower salt content. Although salt is an important component for adding flavor, health awareness and a preference for more subtle flavors lead many people to choose to reduce the amount of salt in their diet.

The results of this study are in line with research conducted that the results of the logistic regression analysis show that the most influential variable in coastal communities in the working area of the Cakru Community Health Center, Jember Regency is sodium salt consumption with a sig. value of 0.000.[24]

The Relationship Between Risk Factors of Consuming Caffeinated Beverages and the Incidence of Hypertension

The study results showed that the highest consumption of caffeinated beverages was among those living in non-coastal areas, with 49 respondents (32.7%). Interviews revealed that respondents felt that drinking coffee is often part of their culture and social habits. In many countries, drinking coffee is part of a daily ritual, and people enjoy it with friends, family, or colleagues in cafes or at home. Coffee is often seen as a way to socialize and spend time with others. Habits and routines are common because many people make drinking coffee part of their daily routine, such as in the morning before work or during breaks. This routine provides a sense of comfort and regularity. The relaxing effect or personal ritual, such as using coffee as a stimulant, for some people, drinking coffee is a time for relaxation. The process of making and enjoying a cup of coffee can be a moment of respite from the busyness of life.

The caffeine in coffee is known as a stimulant that can increase energy, alertness, and focus.[25] Many people enjoy these benefits, especially when they feel tired or need an energy boost in the morning or during work. Caffeine can be mildly addictive, so people who are used to drinking coffee may find it difficult to quit. Without coffee, they may experience symptoms

such as headaches, fatigue, or difficulty concentrating, which encourages them to continue drinking.[26]

Older people or those with a history of high blood pressure may be more susceptible to the blood pressure-raising effects of caffeine. Likewise, those with pre-existing hypertension may be at greater risk of experiencing a spike in blood pressure after consuming caffeine.[27] Caffeine consumption can be a risk factor for hypertension, especially in people who are sensitive to caffeine, consume large amounts of caffeine, or have an unhealthy lifestyle.[28] However, for many people, the effects may be temporary and not clinically significant, especially if caffeine is consumed in moderation. Reducing caffeine consumption or monitoring the body's response to caffeine can be a preventative measure to reduce the risk of hypertension.[29]

The results of the study showed that infrequent consumption of caffeinated beverages was highest among patients living in coastal areas, with 31 respondents (20.7%). This is due to respondents' awareness of healthy living, as people who choose to rarely or not consume caffeinated beverages often also adopt a healthier lifestyle overall. For example, they may prefer low-sugar or sugar-free drinks, pay attention to salt intake, exercise regularly, and manage stress better, all of which contribute to a reduced risk of hypertension.

Healthier beverage alternatives, such as replacing caffeinated beverages with healthier alternatives like water, decaffeinated herbal tea, or natural fruit juice, can help maintain stable blood pressure and support overall cardiovascular health. Individuals who rarely or never consume caffeinated beverages tend to have a lower risk of hypertension. This may be due to caffeine's direct effect on blood pressure, as well as other factors related to a healthy lifestyle. However, it's important to consider that responses to caffeine vary among individuals, and consultation with a healthcare professional is still recommended for optimal blood pressure management. If you're considering reducing caffeine consumption as a preventative measure for hypertension, it's recommended to do so gradually and pay attention to how your body responds to the change.

The results of this study are in line with research conducted that consuming caffeine is related to the occurrence of hypertension in productive age groups in the Andalas Health Center work area.[30]

Conclusion

Community health centers need to carry out promotive and preventive efforts by utilizing the Integrated Non-Communicable Disease Development Post activities as an opportunity to approach the community, especially regarding hypertension risk factors. Health workers are expected to further enhance elderly health programs by providing education on non-communicable diseases in general and hypertension in particular, as hypertension has become the most common disease among productive-age individuals in recent years.

It is hoped that people will change their lifestyle towards a healthier one, especially reducing or even stopping smoking, reducing the frequency of consuming salty foods, reducing the frequency of consuming fatty foods, reducing the frequency of consuming caffeinated drinks, doing physical activity and regular leisure time activities.

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