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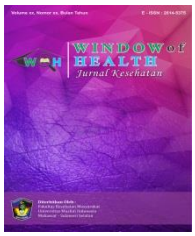

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Risk Factors for Hypertension in the Coastal Area of Tarakan City

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ABSTRACT

Hypertension is a severe medical condition and is the leading cause of premature death worldwide, significantly increasing the risk of heart, brain, kidney, and other diseases. However, not all people with hypertension are aware of their disease, and it is only discovered after complications occur. Therefore, hypertension must be prevented and controlled. Prevention and control of hypertension aims to prevent and reduce the probability of morbidity, complications, and death. Hypertension can be prevented by controlling risky behaviors. This study aims to analyze the risk factors for hypertension in coastal communities in Tarakan City. This research is quantitative research with a cross-sectional study design. The study sampled people in the working area of the Amal Beach Health Centre, Tarakan City, and met the sample criteria obtained using a purposive sampling technique. The data obtained will be processed univariate and bivariate. The results showed that there was a significant relationship between obesity (p-value 0.001), family history (p-value 0.013), and sports activity (p-value 0.009) with the incidence of hypertension. Smoking habits did not show a significant relationship (p-value 0.230) with the incidence of hypertension. This study concludes that obesity, family history, and exercise activity are risk factors for the incidence of hypertension in coastal areas of Tarakan City. Therefore, it is hoped that health promotion efforts in the form of scheduled counseling on risk factors for hypertension and preventive efforts in the form of early detection so that people can prevent or control hypertension to avoid complications.

Keywords: Hypertension; Risk factors; Coastal areas

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INTRODUCTION

Hypertension is one of the most common diseases suffered by people. Hypertension is the leading cause of death in the world each year. [1] Hypertension can significantly increase the risk of heart disease, stroke, kidney failure, and others. [2] Hypertension was the cause of over half a million deaths in the United States in 2019. [3]

The WHO estimates the international incidence of hypertension to be 22% of the world's population. Of this number, only one-fifth control their hypertension. The region with the highest incidence of hypertension is Africa at 27%, while Southeast Asia is the third highest, with an incidence of 25% of the total population. [4] The 2018 Riskesdas results show a national hypertension incidence rate of 34.11%. This incidence rate is higher than the 2013 incidence rate of 25.8%. [5,6] In 2018, the incidence of hypertension in North Kalimantan was the eleventh highest at 33.02%, while in Tarakan City it was 30.21% of the total population. [5,7]

Hypertension is often known as the silent killer because some hypertensive patients are not aware of their hypertension and only find out when complications arise. Uncontrolled hypertension will be the main cause of other diseases, such as heart disease, stroke, and kidney failure. [8] In Indonesia, it is estimated that only one-third of hypertension cases are diagnosed. [5] Therefore, hypertension must be prevented and controlled.

Prevention and control of hypertension aims to reduce the risk of morbidity, complications, and mortality. Pharmacological and non-pharmacological approaches are an effort made. Promotive and preventive efforts are part of the non-pharmacological approach. These efforts are made to increase public awareness of early detection. [9] Controlling risky behaviors such as smoking, unhealthy diet, obesity, physical inactivity, alcohol consumption, and stress are efforts to prevent hypertension. [1]

Several studies have concluded that there is a significant relationship between non-communicable diseases and socio-demographic factors, behavior, physical condition, and history of other diseases [9]. A literature review aimed at assessing the prevalence and risk factors of hypertension concluded that female gender, adults and the elderly, low education, disease, genetic and environmental factors (obesity, high sodium intake, sedentary lifestyle, stress, alcohol consumption, and smoking) are risk factors for hypertension. [10] Another study aimed at assessing the prevalence of hypertension and associated factors found that the risk of hypertension was higher in males, older age groups, those married, those upper socioeconomic class, those not in school, and those retired. In addition, tobacco and alcohol use, overweight, obesity were also associated with the incidence of hypertension. [11] Another literature review found that age, gender, obesity, genetics, stress, activity, and lifestyle factors can influence the incidence of hypertension. [12] However, research related to hypertension risk factors in coastal communities in Indonesia is still limited.

Therefore, it is hoped that people with hypertension can prevent and control it by knowing the risk factors for hypertension. This can be done by modifying the lifestyle to avoid complications that

can occur. [13] Therefore, a study was conducted to determine the risk factors for hypertension in coastal communities in Tarakan.

METODE

This type of research is quantitative research that uses a cross-sectional study approach. The research was conducted at the Tarakan Amal Beach Health Centre in August-October 2022 with a sample of 120 respondents determined by purposive sampling technique. Data were processed using the chi-square test analysis test. The instruments used in the study were questionnaires and Omron brand digital tensimeters with type HEM 8712. The questionnaire contains respondents demographic data and risk factors for hypertension, and tensimeters are used to measure respondents' blood pressure.

RESULT

Table 1. Characteristics of Respondents at Amal Beach Health Centre Tarakan City in 2022

Respondent Characteristics	Hypertension				n	%
	Yes		No			
	n	%	n	%		
Age						
Adult (26-45 years)	8	13,3	12	20	20	16,7
Elderly (46-65 years)	43	71,7	38	63,3	81	67,5
Old Elderly (>65 years)	9	15	10	16,7	19	15,8
Gender						
Male	17	28,3	16	26,7	33	27,5
Female	43	71,7	44	73,3	87	72,5
Education						
Not in School	8	13,3	3	5	11	9,2
Primary School	16	26,7	22	36,7	38	31,7
Junior High School	7	11,7	11	18,3	18	15
Senior High School	20	33,3	17	28,3	37	30,8
Higher Education	9	15	7	11,7	16	13,3
Religion						
Islam	47	78,3	50	83,3	97	80,8
Catholic	7	11,7	2	3,4	9	7,5
Protestant	5	8,3	8	13,3	13	10,8
Hinduism	1	1,7	0	0	1	0,9

Table 1 shows the results that most of the respondents were in the elderly age category, as many as 81 people (67.5%), female gender 87 people (72.5%), primary school as many as 38 people (31.7%), and Muslim religion, 97 people (80.8%).

Table 2 shows the results that most respondents are in the category of not obese as many as 67 people (55.8%), have a family history of hypertension 68 people (56.7%), rarely exercise as many as 67 people (55.8%) and do not smoke as many as 80 people (66.7%).

Table 2. Risk factors for Hypertension at Amal Beach Health Centre Tarakan City in 2022

Risk Factors	Hypertension				n	%
	Yes		No			
	n	%	n	%		
Obesity (BMI>25)						
Obese	14	23,3	39	65	53	44,2
Not Obese	46	76,7	21	35	67	55,8
Family History						
Yes	46	76,7	22	36,7	68	56,7
None	14	23,3	38	63,3	52	43,3
Exercise Activity						
Rarely exercise	27	45	40	67	67	55,8
Exercise often	33	55	20	33	53	44,2
Smoking Habit						
Smoking	25	41,7	15	25	40	33,3
No smoking	35	58,3	45	75	80	66,7

Table 3 shows the chi-square test results between hypertension risk factors and the incidence of hypertension. The statistical test results show a significant relationship between obesity (p-value 0.001).

Table 3. The Relationship between Risk Factors and the Incidence of Hypertension at Amal Beach Health Centre Tarakan City in 2022

Risk Factors	Hypertension				n	%	*p-value*
	Ya		Tidak				
	n	%	n	%			
Obesity (BMI>25)							
Obese	14	23,3	39	65	53	44,2	0,001
Not Obese	46	76,7	21	35	67	55,8	
Family History							
Yes	46	76,7	22	36,7	68	56,7	0,013
None	14	23,3	38	63,3	52	43,3	
Exercise Activity							
Rarely exercise	27	45	40	67	67	55,8	0,009
Exercise often	33	55	20	33	53	44,2	
Smoking Habit							
Smoking	25	41,7	15	25	40	33,3	0,230
No smoking	35	58,3	45	75	80	66,7	

The family history (p-value 0.013), and physical activity (p-value 0.009) with the incidence of hypertension, and there is no relationship between smoking habits (p-value 0.230) and the incidence of hypertension.

DISCUSSION

The Relationship between Obesity and The Incidence of Hypertension

Most respondents in this study were in the non-obese category, namely 55.8%. Then, the results of the analysis test using the chi-square test between risk factors for hypertension and the incidence of hypertension showed a significant relationship between obesity and the incidence of hypertension (p-value 0.001). So obesity is a risk factor for hypertension in coastal areas of Tarakan City.

The results in this study are in line with research conducted by Rohkuswara and Syarif in 2016, from which results showed that obesity has a significant relationship with the incidence of hypertension and obese patients have a 2.008 times chance of suffering from hypertension compared to patients who are not obese. [14] Similar research conducted by Ramadhani and Sulistyorini showed the results that there was a relationship between hypertension and obesity, the correlation test showed a moderate and positive correlation. Thus, if there is an increase in obesity cases, hypertension cases will also increase. [15]

Several studies conducted in coastal areas of Indonesia also showed similar results. One of them is a study conducted in the coastal community of Medan City which shows that the majority of respondents who experience hypertension have a Body Mass Index (BMI) (38.9%) [16], a study conducted in the coastal community of Siak River showed a statistically significant relationship between obesity and the incidence of hypertension, and people with obesity have a 6.47 times chance of developing hypertension compared to those who are not obese. [17]

Research conducted in coastal areas of India also showed that overweight and obesity determined by BMI were significantly correlated with hypertension [18]. A review aimed at identifying the prevalence and determinants of hypertension in coastal areas also showed that one of the risk factors for increased hypertension is weight status (overweight or obesity). [19]

The risk of developing hypertension in people with obesity is five times higher than in people with normal weight. About 20-30% of people with hypertension are overweight. [20] An increase in body weight triggers an increase in pressure on the blood vessels and heart as a result of the increase in nutrients and oxygen that must be supplied to the cells.

In obese cases, peripheral pressure will be reduced while sympathetic nerve pressure increases due to reduced plasma renin activity. The greater the body mass, the more blood is required to supply oxygen and nutrients to the body tissues. Increased intravascular volume and cardiac output are associated with obesity. The ability of the heart to pump and circulate blood in hypertensive patients with obesity is higher than in hypertensive patients with normal body weight. [21]

The Relationship between Family History and The Incidence of Hypertension

Most respondents in this study were in the category of having a family history of hypertension, namely 56.7%. Then, the results of the analysis test using the chi-square test between hypertension risk factors and the incidence of hypertension showed a significant relationship between family history and the incidence of hypertension (p-value 0.013) so that a family history of hypertension is a risk factor for the incidence of hypertension in coastal areas of Tarakan City.

The results in this study are in line with research conducted by Musfirah and Masriadi, which shows that family history is a risk factor for hypertension and has a greater chance of suffering from hypertension, whereas those with a family history have a 5.5 times chance than those without a family history. [22] The same results were also shown by Erna Krisnawati Sarumaha and Vivi Eulis Diana's

research, where respondents who had genetics had a 2.376 times chance of suffering from hypertension compared to those who did not have genetics. [23]

Similar research conducted in the coastal area of Tanjung Tiram showed that the dominant risk factor for hypertension was family history, and patients with a family history had a chance of 11.387 times suffering from hypertension. [24] One study conducted in coastal India also identified that family history of hypertension had a significant correlation with hypertension. [18]

Genetics is one of the factors that have a considerable contribution to the occurrence of hypertension. A study showed that 9-10 people suffering from hypertension were proven to be due to genetic factors. However, genetic factors will have no effect if not supported by environmental conditions. So genetic factors will become a threat if supported by various other factors such as lifestyle, stress levels, diet and lack of physical activity. [25]

Some studies suggest that there are a number of genes that affect blood pressure, including genes that play a role in sodium regulation in the kidneys, as well as genes that regulate steroid metabolism and that increase aldosterone production, thereby increasing sodium retention in the kidneys. These genes affect the kidney's sodium and potassium pumps, increasing sodium and water retention. As a result of increased sodium reabsorption in the kidneys, the volume of plasma and extracellular fluid increases so that venous return blood flow to the heart increases, which will ultimately increase cardiac output and arterial pressure. [26,27]

The relationship between sports activity and the incidence of hypertension

Most respondents in this study were in the category of rarely exercising, namely 55.8%. Then, the analysis test results using the chi-square test between hypertension risk factors and the incidence of hypertension showed a significant relationship between sports activity and the incidence of hypertension (p-value 0.009). So, family history is a risk factor for the incidence of hypertension in coastal areas of Tarakan City.

The results in this study are supported by previous research, which shows that respondents who rarely exercise are 2.520 times more likely to suffer from hypertension than those who exercise frequently. [23] A literature study that analyzed 12 research articles concluded that physical activity is one of the factors that influence the incidence of hypertension [12] Another study conducted by Fuh Princewel et al. concluded that lack of physical activity is an independent risk factor for hypertension. [28]

Another study conducted in the coastal Siak River concluded that the dominant risk factor for hypertension is physical activity, and people who rarely exercise have a chance of suffering from hypertension 13.47 times compared to people who often exercise [17]. A review aimed at identifying the prevalence and determinants of hypertension in coastal areas also shows the results that one of the risk factors for hypertension is lack of physical activity. [19]

Lack of movement due to busyness, followed by stress, can trigger various cardiovascular diseases such as hypertension. Exercise to maintain health is done 3-5 times/week [29]. Regular exercise

can lower blood pressure because it reduces blood vessel stiffness and increases heart and lung endurance. (21)

The Relationship between Smoking Habits and The Incidence of Hypertension

Most respondents in this study were in the non-smoking category, namely 66.7%. Then, the results of the analysis test using the chi-square test between hypertension risk factors and the incidence of hypertension showed no relationship between obesity and the incidence of hypertension (p-value 0.230). So, smoking is not a risk factor for the incidence of hypertension in coastal areas of Tarakan City.

The results of this study are in line with one of the studies aimed at identifying risk factors for hypertension in adults. In the study, it was concluded that there was no relationship between smoking and the development of hypertension. (28)

Several studies conducted in coastal areas also showed similar results. Research conducted in the coastal area of Medan City showed no relationship between blood pressure status (hypotension, normal, and hypertension) and the degree of smoking in smoker respondents. (17) Another study conducted in the coastal area of Siak River concluded that smoking was not proven as a risk factor for hypertension. (16)

Smoking habit is not a risk factor for hypertension in the coastal area of Tarakan City. This may be due to the low population of smokers in this study, which was 33.3%. The low smoking population in this study is because most of the population, 72.5%, is female, and women tend not to smoke.

CONCLUSIONS AND RECOMMENDATIONS

This study concluded that obesity, family history, and exercise activity are risk factors for hypertension in coastal areas of Tarakan City. While smoking is not a risk factor for hypertension in coastal areas of Tarakan City. Therefore, it is hoped that health promotion efforts in the form of scheduled counseling on risk factors for hypertension and preventive efforts in the form of early detection so that people can prevent or control hypertension to avoid complications.

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