

RELATIONSHIP OF FATTY NUTRIENT INTAKE, PHYSICAL ACTIVITY AND SMOKING WITH THE OCCURRENCE OF HYPERTENSION IN THE COMMUNITY IN KARO DISTRICT, NORTH SUMATRA PROVINCE, INDONESIA

Novalina Taruli Sitorus¹, Lita Sri Andayani², Fazidah Aguslina Siregar³

¹Graduate Student of Department of Promotion Health Faculty of Public Health University of Sumatera Utara

²Department of Promotion Health Faculty of Public Health University of Sumatera Utara

*Corresponding author: Jl.Universitas No.21, Kampus USU, Medan, 20155, Indonesia

Email : novalinataruli@gmail.com

ABSTRACT

Background: Behavior is the most important factor that greatly influences people's lives. Behavior greatly affects a person's physical and psychological condition. Along with the times there has been a change in people's behavior. One form of this change is the low healthy lifestyle such as poor diet, the proportion of rest that is not balanced with the activities undertaken, the lack of exercise, unhealthy habits such as smoking, drinking alcoholic beverages, consumption of certain drugs. The low behavior of healthy living has impact on the changes of disease pattern. The changes of disease pattern that were originally dominated by infectious diseases turn to non-communicable diseases (PTM). One of these PTM is hypertension. Approximately 1.13 billion people in the world have hypertension, which means that 1 in 3 people in the world are diagnosed with hypertension

Materials and Methods: This type of research was quantitative analytic with cross sectional design. The population in this study was 247,829 with a total sample of 270 obtained by using multistage random sampling. Multi-stage random sampling technique is used because the population in the study is quite large and the geography of the research area is quite extensive. The instruments in this study were questionnaires, FFQ forms, recall forms, PAL forms.

Result: The results showed there was a correlation between consumption habits of fat nutrient intake ($p = 0,000$), there was no relationship of physical activity ($p = 0.086$) and there was a relationship of smoking ($p = 0,000$) with the incidence of hypertension in Karo District, North Sumatra Province, Indonesia.

Conclusion: Fatty nutrient intake and smoking are risk factors that cause hypertension in the community in Karo District, North Sumatra Province, Indonesia

Keywords: Fatty Nutrient Intake, Physical Activity, Smoking, Hypertension

1.0 Introduction

Behavior is the most important factor that greatly influences people's lives. Along with the times there is a change in people's behavior. One form of change is the low healthy living behavior such as poor eating patterns, the proportion of rest that is not balanced with the activities carried out, the lack of exercise, unhealthy habits such as smoking, drinking alcoholic beverages, consumption of certain drugs and stress that has an impact on changing the pattern of diseases in the community from infectious diseases to non-communicable diseases (Istiningtyas, 2010).

Indonesia is one of the countries included in the changing pattern of the disease. This can be seen from the results of Riskesdas (2018) which shows the prevalence of non-communicable diseases has increased when compared to the results of Riskesdas (2013). Non-communicable diseases include stroke, chronic kidney disease, diabetes mellitus, and hypertension. Cancer prevalence rose from 1.4 percent (Riskesdas, 2013) to 1.8 percent in 2018 with the highest prevalence in DI Yogyakarta Province.

PTM increase has a negative impact on the economy and productivity of human resources (HR). This is because PTM requires a long treatment time, large costs and can cause disability (Ministry of Health, 2017). One PTM that has a lot of attention is hypertension. That is because hypertension is one of the important factors triggering other PTM such as heart disease and stroke. Approximately 1.13 billion people in the world have hypertension, which means that 1 in 3 people in the world are diagnosed with hypertension.

The number of people with hypertension continues to increase every year, it is estimated that in 2025 there will be 1.5 billion people affected by hypertension, and it is estimated that every year 9.4 million people die from hypertension and its complications (WHO, 2015). According to Smelzer and Bare (2011) hypertension that the factors that cause hypertension are age, sex, lifestyle, and obesity.

Meanwhile, the prevalence of hypertension in Indonesia itself according to Riskesdas (2018), which was obtained through measurements at ≥ 18 years of age, was 34.1 percent, the highest was in South Kalimantan, 44.1 percent, while the lowest was in Papua at 22.2 percent. Hypertension occurred in the 31-44 years age group 31.6 percent, 45-54 years 45.3 percent, 55.2 percent aged 55-64 years.

Based on data from the North Sumatra Province Health Office (2017) there were 380,676 people with hypertension aged ≥ 18 years. There are three districts with the highest number of hypertension, namely Central Tapanuli with 67,360 patients (36.02%), Karo with 36,751 people (15.21%) and Sibolga with 5,691 hypertension sufferers (10.57%) and Karo Regency. was in the second position with the highest number of hypertension sufferers from 33 districts / cities in North Sumatra in 2017.

Data of hypertension sufferers in Karo District based on the Profile of the Karo Health Office in (2018), the number of hypertension sufferers was 36,751 people. The number of people with hypertension continues to increase from the previous year, where in the previous year there were 24,793 people (Profile of Karo Health Office, 2017).

Based on the results of research conducted in Karo District that people in Karo District have a habit of consuming foods that contain high fat such as pork and dog meat, they say that they have a habit of consuming foods that contain high fat (pork and dog meat). Besides that the people in Karo Regency also have a smoking habit. They believe that smoking can reduce the cold feeling in the body and in almost every meeting, such as in food stalls, fields and parties, they are accustomed to consuming cigarettes.

2.0 Materials and Methods

This type of research was a quantitative research using analytic cross sectional approach, simple logistic regression test, with a confidence level of 95%. If $p < 0.05$, the statistical results are related. This research was conducted in Karo Regency, because Karo Regency is the second area with the highest cases of hypertension with 36,751 (15.21%) sufferers (Health Profile of North Sumatra 2017). The population in this study is the people in Karo District.

Sample selection using multistage random sampling method by combining three sampling techniques in stages, namely cluster random sampling, simple random sampling, and proportional random sampling. Then the number of samples in this study is 270. The criteria in this study were that they had no hereditary history of hypertension, were not pregnant, aged 20-64 years and were willing to be research subjects or become respondents, while the exclusion criteria were people who had disorders that disturbed measurements such as unable to stand. The method of data collection using questionnaires, FFQ forms, Food recall, PAL forms, scales, tensimeters, and microtoxes

3.0 Result

3.1 Characteristics of Respondents and the Occurrence of Hypertension

Based on the results of this research found that the characteristics respondents that the distribution of male respondents is 61.1 percent. While the distribution of female respondents was 38.9 percent. The distribution of respondents with the 20-35 year age group was 20.4 percent, the 36-51 percent age group was 53.3 percent, and the 52-64 year age group was 26.3 percent. Respondents with no education level were 13.3 percent, while respondents whose education level reached tertiary education was only 1.9 percent.

Respondents according to the level of fat adequacy as much as 6.7 percent have less fat intake, both 12.2 percent, and 81.1 percent more. Respondents experienced heavy physical activity as much as 54.8 percent, while moderate physical activity as much as 26.7 percent and light activity as much as 26.7 percent. respondents with smoking status were 54.8 percent and respondents with non-smoking status were 47.8 percent. Respondents had hypertension, which was 58.9 percent. While respondents who did not experience hypertension were 41.1 percent.

Table 1. Distribution of Respondents by Age, Gender, Fatty Nutrient Intake, Physical Activity, Smoking and Occurrence of Hypertension.

Characteristics of Respondents	n	%
Gender		
Male	165	61,1
Female	105	38,9
Age		
20-35 years	55	20,4
36-51 years	144	53,3
52-64 years	71	26,3
Fatty Nutrient Intake		
More	219	81,1
Good	33	12,2
Minus	18	6,7
Physical Activity		
Weight	148	54,8
Medium	72	26,7
Lightweight	50	18,5
Smoking		
Smoking	141	52,2
No Smoking	129	47,8
Incidence of Hypertension		
Hypertension	159	58,9
No Hypertension	111	41,1

3.2 Relationship of Fatty Nutrient Intake, Physical Activity and Smoking with Hypertension in the Community in Karo District.

Based on the results samples with hypertension, 65.8 percent of them had a higher level of fat adequacy. In the sample without hypertension, 72.2 percent of them were deficient fat. The results of bivariate analysis using a simple logistic regression test showed that there was a significant relationship between the level of fat intake and the incidence of hypertension where the p value = 0.000.

In the physical Activity variabel showed that 69.2 percent of respondents who had light physical activity experienced hypertension. The results of the bivariate analysis test using simple logistic regression test showed that there was a relationship between physical activity and the incidence of hypertension where the p value = 0.001.

In the Smoking variabel 72.1 percent of respondents who smoked had hypertension. The results of the bivariate analysis using the simple logistic regrei test showed that there was a relationship between smoking and the incidence of hypertension where the p value = 0.000.

Table 2. Relationship of Fatty Nutrient Intake, Physical Activity and Smoking with Hypertension in the Community in Karo District.

Fatty Nutrient Intake	Kejadian Hipertensi						P
	Hypertension		No Hypertension		Total		
	n	%	n	%	n	%	
More	144	65,8	75	34,2	219	100,0	0,000
Good	10	30,3	23	69,7	33	100,0	
Minus	5	27,8	13	72,2	18	100,0	
Physical Activity							
Weight	40	44,4	50	55,6	90	100	0.001
Medium	45	61,6	28	38,4	73	100	
Lightweight	74	69,2	33	30,8	107	100	
Smoking							
Smoking	93	72,1	36	27,9	129	100	0,000
No Smoking	66	46,8	75	53,2	141	100	

4.0 Discussion

4.1 The Relationship of Habitual Consumption of Fat Nutrition Consumption with the Occurrence of Hypertension.

According to South (2014), one part of a lifestyle that causes hypertension can be seen from food consumption habits. Food consumption habits are the routine for a person to consume food that is consumed every day. Food consumption habits are defined as behavior in consuming food for individuals that is done repeatedly to meet their needs so as to form the characteristics of each person. According to Patricia 2010, consumption of foods that trigger hypertension is the consumption of foods containing sodium and fat.

The results of the Food Frequency Questionnaire (FFQ) interview show that respondents with excess fat intake often consume saturated fat sources such as pork, fried meat, and coconut milk. The high habit of consuming pork in Karo Regency is due to the high availability of pork, where almost along the road in Karo Regency there are many karo food stalls selling pork. The people in Karo Regency are also people who often gather and hold parties such as vegetable festivals, fruit and flowers, weddings, annual parties and other parties. In the party, pork and cassava leaves mixed with coconut milk are definitely served. Apart from pork, fried food is also a food that contains high fat and for the people in Karo Regency fried food is one of the snacks that they never forget to consume.

Based on the bivariate test results found there is a relationship between fat intake and the incidence of hypertension where the p value = 0,000. This is supported by research by Munawan, et al (2016) that there is a relationship between fat intake and the incidence of hypertension.

Excessive fat intake, will cause an increase in free fatty acids in the body. The increase in free fatty acids can increase blood levels of Low Density Lipoprotein (LDL), so that it can trigger atherosclerosis which can cause blockages in blood vessels and cause hypertension (Michael et al., 2014).

4.2 The Relationship between Physical Activity and the Occurrence of Hypertension in the Community in Karo District.

One of the elements of a lifestyle is physical activity which most people can do and provides many benefits. The main cause of the increase in PTM, especially in Indonesia, is a modern lifestyle with minimal activity and physical or sedentary movement. Physical activity is a body movement produced by skeletal muscles that requires an expenditure of energy, inadequate physical activity is an independent risk factor for chronic disease and is generally estimated to cause death globally (WHO, 2010).

Respondents who have strenuous physical activity mostly do their activities working in the fields for more than 7 hours a day because their work is farmers, where respondents manage their fields using traditional tools such as hoes, so they require physical activity or a lot of body movement. Apart from that, respondents also walk when they want to go to the fields even though they have a vehicle at home. The reason they don't use the vehicle is because they are afraid that the vehicle will be lost. Respondents who have light activities tend to cook, sit, watch television and talk. Respondents who have light activity tend to be 52-64 years old. This is due to physiological changes that cause respondents to be unable to perform a lot of body movements.

Based on the results of the bivariate test analysis showed there was no relationship of physical activity with the incidence of hypertension with a value of $p = 0.001$. This is in line with the results of the study of Suci (2017) which shows that there is no relationship between physical activity and blood pressure because the value of $p = 0.5$ which means $p > 0.05$

The importance of exercise and body movement since childhood for the formation of stronger heart muscles. The heart that has been trained since a young age is thicker and stronger than the untrained muscle. It can be concluded that respondents who have moderate physical activity tend to be at greater risk of developing hypertension but vice versa respondents who have heavy physical activity tend to be less at risk of developing hypertension. So the respondent's physical activity affects the occurrence of hypertension (Welis and Rifki, 2013).

4.2 The Relationship between Smoking and the Occurrence of Hypertension in the Community in Karo District

In Karo District, smoking is a common thing related to culture, where in traditional events, cigarettes are always served to families who are considered to have a higher position in adat. They also believe that cigarettes are a means of connecting communication if they are at a party or gathering. Besides that, in children who are starting to reach adulthood, smoking is a symbol that states that children are starting to enter adulthood and have applied tribal customs. Cigarettes are given to boys, while girls and women are used to injecting. The number of respondents who smoke is because also they believe that smoking can warm their bodies, because the location of Karo Regency is at a temperature of 16 degrees Celsius to 23 degrees

Celsius. Respondents said that when you finish eating, you don't smoke, there is a strange taste in the mouth. Respondents smoke an average of > 20 cigarettes a day and the cigarettes consumed by respondents are filter cigarettes.

Based on the results of the bivariate test analysis shows there is a relationship between smoking and the incidence of hypertension where the value of $p = 0,000$. This is in line with the results of research conducted by Harahap (2017) at the Bromo Health Center in Medan City who said that smoking affects the incidence of hypertension obtained by test results with an OR value of 3.619 (95% CI 1,275-10,421).

Toxic (toxic) chemicals in cigarettes can cause high blood pressure or hypertension. One of these toxic substances is nicotine. Nicotine can increase adrenaline which makes the heart beat faster and work harder, the frequency of the heart increases, and heart contractions increase, leading to increased blood pressure. The levels of cigarette chemicals in the blood are determined directly from the consumption of cigarettes. The more the number of cigarettes consumed per day, the more severe the hypertension suffered by someone (Hall, 2010).

Nicotine stimulates the sympathetic nervous system, so that nerve endings release the stress hormone norepinephrine and immediately bind to alpha-1 hormone receptors. This hormone flows in blood vessels throughout the body. Therefore, the heart will beat faster (tachycardia) and the blood vessels will experience vasoconstriction. Furthermore, it will cause narrowing of blood vessels and block normal blood flow, so that blood pressure will increase (Tawbariah et al, 2014)

5.0 Conclusion and Recommendation

The results showed there was a correlation between consumption habits of fat nutrient intake ($p = 0,000$), there was no relationship of physical activity ($p = 0.086$) and there was a relationship of smoking ($p = 0,000$) with the incidence of hypertension in Karo District.

Recommendation: 1). To the Health Office to supervise the puskesmas in each area so that outreach and posbindu activities can run well. 2). To the puskesmas to conduct counseling and PTM posbindu activities, especially hypertension when people carry out religious activities such as perpulungen or wirid, and rungun events in areas where farmers live. So, the implementation of counseling and Posbindu activities can be carried out well. 3). Religious and community leaders such as the head of the environment to provide active support in providing information to the public regarding Posbindu PTM, especially hypertension. 4). The community is expected to be able to regulate a lifestyle that is a risk factor by not smoking, reducing consumption of fat intake such as reducing consumption of pork, dog meat and reducing consumption of fried foods. Farmers are also expected to reduce their consumption of sodium such as sauce, soy sauce, salted fish, salted eggs, and not use flavorings in their daily cooking.

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Declaration

The authors declare that this article is our original work and has never been published before.

Authors contribution

Author 1 : Research concepts and designs, preparing research proposal, collecting data, analyzing data, and writing manuscripts.

Author 2 : Research concepts and designs, supervising the research process, actively involved in data analysis, reviewing manuscripts and final editing.

Author 3: Research concepts and designs, supervising the research process, actively involved in data analysis, reviewing manuscripts and final editing.

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