



Risk Factors of Hypertension in the Elderly at the Work Area of the Sihepeng Health Centre, Siabu District, Mandailing Natal Regency

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Abstract. Hypertension is often found in the elderly and usually the systolic pressure increases. Elderly with hypertension are at risk of experiencing various kinds of complications. The most likely complication of hypertension is stroke. This study aims to determine the risk factors for hypertension in the elderly. This type of research is quantitative with a cross-sectional research design. The population of this study was the elderly. Sampling using accidental sampling technique. The number of samples is 73 using the Slovin formula. Data analysis using Chi Square Test. The results of this study indicate that there is a relationship between smoking habits where $p = 0.001 (<0.05)$, there is a relationship between physical activity where $p = 0.001 (<0.05)$, there is a relationship between obesity where $p = 0.028 (<0.05)$, and there is a relationship between age and the incidence of hypertension in the elderly in the work area of the Sihepeng Public Health Center with p value = $0.000 (<0.05)$. It is recommended for people with hypertension to increase physical activity such as following elderly gymnastics, maintaining a diet, and a healthy lifestyle such as quitting smoking so as to reduce the risk of hypertension.

Keywords: risk factors · hypertension · the elderly

1 Introduction

Currently the world is facing triple burden disease, triple burden disease is a term for various diseases that have an increasing incidence in Indonesia, where triple burden disease consists of non-communicable disease, communicable disease, and re-emerging disease. According to the Ministry of Health, the triple burden is a threat to the nation because the large population of productive age should contribute to development. Unfortunately, the contribution is threatened due to the disruption of health by PTM and unhealthy living

behavior. The three burdens of disease are, first, communicable diseases have shifted to non-communicable diseases, such as heart disease, hypertension, kidney failure, diabetes, cancer, and so on. Second, emerging threats of new infectious diseases, such as bird flu, Ebola, and drug-resistant tuberculosis. Third, the community is still faced with unresolved infectious disease problems, such as Dengue Fever, TB, Malaria, HIV/AIDS, Filariasis, and Worms (Kemenkes 2019).

One of the PTM diseases with a high prevalence is hypertension or increased blood pressure. Hypertension can be defined as persistent blood pressure where the systolic pressure is above 140 mmHg and the diastolic pressure is above 90 mmHg. Hypertension is said to be mild if the diastolic pressure is between 95–104 mmHg, moderate hypertension if the diastolic pressure is between 105 and 114 mmHg and severe hypertension when the diastolic pressure is 115 mmHg or more. This division is based on an increase in diastolic pressure because it is considered more serious than an increase in systolic.

According to data from the World Health Organization (WHO) in 2015 showed around 1.13 billion people in the world suffer from hypertension, meaning that 1 in 3 people suffer from hypertension, the number of people with hypertension increases 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.

Based on the prevalence of hypertension in the elderly in Indonesia, 34.5% for those aged 55–64 years, 26.2% for those aged 65–74 years and 39.3% for those aged over 75 years. The prevalence of hypertension in Indonesia based on blood pressure measurements at the age of more than 18 years is 25.8%, the highest prevalence is in Bangka Belitung (30.9%), followed by South Kalimantan (30.8%), East Kalimantan (29.6%) [1]. Hypertension has resulted in deaths every year, of which 1.5 million deaths occur in Southeast Asia, where 1/3 of the population suffers from hypertension, causing an increase in health costs. Hypertension that is not treated properly can cause complications such as stroke, coronary heart disease, diabetes, kidney failure and blindness. Stroke (51%) and coronary heart disease (45%) are the leading causes of death in the world.

The number of elderly people in developing countries in recent years has increased. Currently, the number of elderly people in Indonesia is around 24 million people and in 2020 it is estimated that there are 30 to 40 million people [7]. From the results of the socio-economic and health studies of the elderly conducted by the National Commission for the Elderly in 10 provinces in 2006 it was found that the most common diseases suffered by the elderly were joint disease (52.3%), hypertension (38.8%), anemia (30.7%) and cataracts (23%) [8]. Hypertension was included in the top 10 most diseases in Blitar Regency in 2013.

According to the 2018 Riskesdas, the prevalence of hypertension based on measurement results in the population aged 18 years was 34.1%, the highest was in South Kalimantan (44.1%), while the lowest was in Papua (22.2%). The estimated number of hypertension cases in Indonesia is 63,309,620 people, while the death rate in Indonesia due to hypertension is 427,218 deaths. Hypertension occurs in the age group 31–44 years (31.6%), age 45–54 years (45.3%), age 55–64 years (55.2%). From the prevalence of hypertension of 34.1%, it was known that 8.8% were diagnosed with hypertension and 13.3% of people diagnosed with hypertension did not take medication and 32.3% did

not take medication regularly. This shows that most people with hypertension do not know that they are hypertension so they do not get treatment.

The prevalence of hypertension based on the results of measurements in the population aged 18 years in the province of North Sumatra in the 18–24 year age group is 10.71%, the 25–34 year age group is 15.57%, the 35–44 year age group is 26.10%, 45–54 years old 41.49% 55–64 years old is 53.57%, 65–74 years old is 60.91% and 75 + is 68% then according to male gender the prevalence is 27.70% while female is 30, 63% by Regency/City Characteristics in North Sumatra Province.

Based on the percentage of the frequency of hypertension sufferers in Mandailing Natal Regency in 2018 is 25.82%, it is estimated that in 2025 it will continue to rise due to changing lifestyle patterns and many people who consume salt and smoke. Elderly (elderly) is a phase of declining intellectual and physical abilities, which begins with some changes in life. As is known, when humans reach adulthood, they have the ability to reproduce and give birth to children. When living conditions change, a person will lose this task and function, and enter the next, namely old age, and then die. For normal humans, whoever the person is, of course they are ready to accept new circumstances in every phase of their life and try to adapt to their environmental conditions [3].

Hypertension is often found in the elderly and usually has an increased systolic pressure. According to the current hypertension threshold, it is estimated that 23% of women and 14% of men over the age of 65 have hypertension. Elderly with hypertension are very at risk of experiencing various kinds of complications. The most likely complication of hypertension suffered by the elderly is stroke. Stroke can occur in chronic hypertension when the arteries that supply the brain are hypertrophied and thickened, so that blood flow to the areas where the blood supply is reduced is reduced [10].

Factors for hypertension are age, gender, family history, genetics, habits, smoking, obesity, lack of physical activity, stress, use of estrogen and excessive salt consumption patterns (Risli/kesdas, 2018). The incidence of hypertension can be prevented by avoiding the factors that cause hypertension by adjusting the diet, the right lifestyle, avoiding coffee, smoking and alcohol, reducing excessive salt consumption and adequate activities such as regular exercise [2].

Based on an initial survey conducted by researchers, the number of people with hypertension in Sihepeng Village, the working area of the Sihepeng Public Health Center, Siabu District, Mandailing Natal Regency in 2019 was 318 people, while in 2020 there were 352 people. Of the 87 people interviewed who smoked as many as 25 people, 35 people who were physically active had hypertension.

Based on the survey above, the researchers are interested in conducting research on the risk factors for the incidence of hypertension in the elderly in the work area of the Sihepeng Health Center, Siabu District, Mandailing Natal Regency in 2021.

2 Method

The research design used in the study is a quantitative design. With a cross sectional approach. Quantitative research requires researchers to explain how variables affect other variables. This type of research uses the correlation method, namely research that is directed to find the effect of the independent variable, namely the risk factor and the dependent variable, namely the incidence of hypertension.

3 Result

Based on Table 1, the percentage of smoking habits in the incidence of hypertension Yes is 40 people (55%) and those who are not hypertensive are 8 (11%), those who do not smoke with Hypertension Yes are 11 people (15%) and those who do not smoke and do not have hypertension are a total of 11 people. 14 people (19%). From the results of the chi square test, it was obtained that $P = 0.001 (<0.05)$, or ($P <$), then the H_0 data was rejected and H_a was accepted. This indicates that there is a relationship between smoking habits and the incidence of hypertension in the work area of the Sihepeng Public Health Center, Siabu District, Mandailing Natal Regency in 2021. The results of the prevalence value of respondents who smoke are 1.8 times more likely to have hypertension compared to those who do not smoke.

Table 2 shows that the majority of respondents who lack physical activity have hypertension. Yes, there are 30 respondents with a percentage (41.1%). Who have good physical activity with hypertension (9.6%) or 7 people, and those with sufficient physical activity are some (19.2%) or 14 people. From the results of the Chi Square test, $P = 0.001 (<0.05)$ or ($p <$), then H_0 data is rejected and H_a is accepted. This shows that there is a relationship between physical activity and the incidence of hypertension in the work area of the Sihepeng Public Health Center, Siabu District, Mandailing Natal Regency.

Table 3 shows that respondents who are not obese have hypertension. Yes, there are 36 respondents with a percentage (49%) and those with obesity and hypertension are

Table 1. Risk Factors for Hypertension in the Elderly Based on Smoking Habits in the Work Area of the Sihepeng Public Health Center, Siabu District, Mandailing Regency

Smoking Habit	Hypertension				Total		P	PR
	Yes		No		F	%		
	n	%	n	%				
Yes	40	55	8	11	48	66	0,001	1,8
No	11	15	14	19	25	34		
Total	51	70	22	30	73	100		

Table 2. Risk Factors for Hypertension in the elderly based on physical activity in the Work Area of the Sihepeng Health Center, Siabu District, Mandailing Natal Regency

Physical activity	Hypertension Total						P
	Yes	%	No	%	F	%	
Good	7	9,6	8	10,9	15	20,5	0,001
Enough	14	19,2	11	15,1	25	34,3	
Not Enough	30	41,1	3	4,1	33	45,2	
Total	51	69,9	22	30,1	73	100	

Table 3. Risk Factors for Hypertension in the Elderly Based on Obesity in the Work Area of the Sihepeng Public Health Center, Siabu District, Mandailing Natal Regency

Obesity	Hypertension Total						P	Pr
	Yes		No					
	n	%	n	%	n	%		
Yes	15	21	1	1	16	19,1	0,028	1,4
No	36	49	21	29	57	80,9		
Total	51	70	22	30	73	100		

Table 4. Risk Factors for Hypertension in the Elderly Based on Age in the Work Area of the Sihepeng Health Center, Siabu District, Mandailing Natal Regency

Respondent's age	Hypertension Total						P
	Yes	%	No	%	F	%	
45–59	4	5,4	20	10,9	24	32,9	0,000
60–74	41	56	2	15,1	43	58,9	
75–90	6	8,21	0	4,1	6	8,2	
Total	51	70	22	30,0	73	100	

(21%) or 15 people. From the results of the Chi Square test obtained $P = 0.028 (<0.05)$ or ($p < \alpha$), then the data H_0 is rejected and H_a is accepted. This shows that there is a relationship between obesity and the incidence of hypertension in the Work Area of the Sihepeng Health Center, Siabu District, Mandailing Natal Regency in 2021. The results of the prevalence value of respondents who are obese are 1.4 times more likely to have hypertension than those who are not obese.

Table 4. Shows that the majority of respondents who have hypertension aged 60–74 are 41 people or 56%. From the results of the Chi Square test, $P = 0.000 (<0.05)$ or ($p < \alpha$), then H_0 data is rejected and H_a is accepted. This shows that there is a relationship between obesity and the incidence of hypertension in the work area of the Sihepeng Public Health Center, Siabu District, Mandailing Natal Regency.

4 Dicussion

4.1 The Relationship Between Smoking Habits With The Incidence of Hypertension

Based on Table 1 shows that the majority of respondents who smoke with hypertension Yes are 40 people. From the results of the chi square statistical test, $P = 0.001 (<0.05)$ or ($p < \alpha$) then H_0 data is rejected and H_a is accepted, this shows that there is a relationship between smoking habits and the incidence of hypertension.

While research conducted by Setyanda (2018) states that there is a significant relationship between smoking habits and the incidence of hypertension with a P value (p-value) of 0.003, Nicotine in cigarettes can affect a person's blood pressure, can be through the formation of atherosclerosis, a direct effect nicotine on the release of the hormones epinephrine and norepinephrine, as well as through the effect of CO which can bind to red blood cells [9].

The results of a study similar to the incidence of this study stated that there was a relationship between smoking and the incidence of hypertension with a p value of 0.001 which was carried out in patients with hypertension in the working area of Peukan Bada Public Health Center, Aceh Besar. Likewise, the results of research conducted by Firmansyah (2017) on hypertensive patients at Pembina Palembang Public Health Center stated that there was a relationship between smoking habits and hypertension with a P value of 0.014 (<0.005).

Of the 73 respondents in the study, more people had hypertension, namely 40 people (55%) than those without hypertension, namely 11 people (15%). Based on the established criteria, someone who is said to be mildly hypertensive with systolic: 140–159 mm Hg with diastolic: 120–90 mm Hg. Moderate hypertension with systolic: 160–179 mm Hg with diastolic: 120–90 mm Hg. Meanwhile, severe hypertension with systolic: 180–209 mm Hg with diastolic: 120–90 mm Hg. Blood pressure can be measured using a sphygmomanometer and stethoscope (auscultatory method) or an electronic blood pressure measuring device. In the auscultation method, we need to hear the first and fifth Korotkoff sounds (the emergence and disappearance of the pulse sound) which are related to systolic and diastolic blood pressure [11].

4.2 The Relationship Between Physical Activity With The Incidence Of Hypertension

Based on Table 2, the results of the Chi Square test show that the P Value Sig 0.001 < 0.05 or (p $<$) means that H₀ is rejected and H_a is accepted. It means that there is a relationship between physical activity and the incidence of hypertension in the working area of the Sihepeng Health Center, so those who have a capacity level of less physical activity with a total MET 600 have a risk of experiencing hypertension of 41.1% or 30 people compared to those who have a sufficient level of activity with a total MET. 600 is 19.2% or 14 people, and those who have good physical activity with a total of MET 3000 are 9.6% or 7 people.

Physical activity is a series of muscle movements that produce energy from burning calories. Lack of physical activity increases the risk of high blood pressure because of the increased risk of becoming obese. People who are inactive tend to have a faster heart rate and their heart muscle has to work harder with each contraction, the harder and often the heart has to pump, the greater the force pushing against the arteries.

This research is in line with Ilyasa Gusti, 2018 which states that there is a significant relationship between physical activity and hypertension with a P Value of 0.002 having a risk of hypertension, with an OR of 4.449 times compared to people with sufficient physical activity. In addition, research conducted by Anggara 2016, also states that there is a significant relationship between physical activity and the incidence of hypertension with a P value of 0.000 and irregular exercise has a risk of hypertension with an OR of

44.1 when compared to people who have sufficient physical activity, or regular exercise [4].

This is supported when the researcher asks about the physical activity carried out by the respondent, having good physical activity is quite lacking. The results of the questionnaire questions indicate that many respondents are less active in daily life, so from the results of these questions it can be concluded that most respondents have physical activity less than 600 MET. Based on the results of the study, it can be concluded that lack of physical activity (<600 MET) is a risk factor for the incidence of hypertension in the work area of the Sihepeng Health Center, Siabu District, Mandailing Natal Regency in 2021.

4.3 The Relationship Between Obesity and the Incidence of Hypertension

Based on Table 3. The results of the Chi Square test show that the P Value Sig 0.028 < 0.05 means that there is a relationship between obesity status and the incidence of hypertension in the working area of the Sihepeng Public Health Center, Siabu District, Mandailing Natal Regency. So the obese with hypertension Yes by 21% or 15 people, and those without hypertension as much as 1% or 1 person while those who are not obese with hypertension Yes are 49% or 36 people, and those who are not obese and not hypertension are 29% or 21 people.

Obesity is an abnormal accumulation of body fat that can pose a risk to health. It is said that obesity is if a person's weight exceeds the normal limit, the weight is measured by the body mass index (WHO). In addition, it can also be explained that obesity will increase sodium reabsorption in the kidneys which causes an increase in blood pressure.

This research is in line with Kurniasih, 2018 which results that some people with hypertension have a body mass index (BMI) which is categorized as obesity (50%). Furthermore, it was analyzed with multivariate test and got a significant value ($p = 0.002$). Which means that there is a statistically significant relationship between body mass index (BMI) and the incidence of hypertension in patients seeking treatment at the Srondol Public Health Center Semarang. This is in accordance with the theory that body mass index is directly correlated with blood pressure, especially systolic blood pressure [6]. The relative risk of suffering from hypertension in obese people is 5 times higher than that of a normal person Another study conducted by Anggara (2013) which was carried out at the Tegal Pure Health Center, Cikarang, West Java, showed that there was a relationship between obesity and hypertension with a p value = (0.05).

Based on the results of the study, it can be concluded that obesity is a risk factor for the incidence of hypertension in the elderly in the work area of the Sihepeng Public Health Center, Siabu District, Mandailing Natal Regency in 2021.

4.4 The Relationship Between Age With The Incidence Of Hypertension

Table 4 shows that the majority of elderly people with hypertension aged 60–74 years are 41 people or 56%. From the results of the Chi Square test obtained $P = 0.000$ (<0.05) or ($p < \alpha$), then the H_0 data is rejected and H_a is accepted. This shows that there is a relationship between obesity and the incidence of hypertension in the Sihepeng Health Center Work Area, Siabu District, Mandailing Natal Regency in 2021.

The results of this study are in accordance with the results of research by Ardiani, et al. (2015) which showed that the elderly are at risk of developing hypertension ($p = 0.028$), Mahendrappa (2014) ($p = 0.015$) and Adriani (2013) ($p = 0.000$).

Based on the results of the study, it can be concluded that age is a risk factor for the incidence of hypertension in the elderly in the work area of the Sihepeng Public Health Center, Siabu District, Mandailing Natal Regency in 2021.

5 Conclusion

Smoking habit is a variable that is a risk factor for the incidence of hypertension in the elderly in the work area of the Sihepeng Health Center, Siabu District, Mandailing Natal Regency in 2021. There is a relationship between smoking habit and the incidence of hypertension with p value = 0.001 (<0.05), there is a relationship between physical activity with the incidence of hypertension with a value of $p = 0.001$ (<0.05), there is a relationship between obesity and the incidence of hypertension with a value of $p = 0.028$ (<0.05), there is a relationship between age and the incidence of hypertension with a value of $p = (0.000)$ (<0.05).

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