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Age-Related Hypertension: A Cross-Sectional Analysis of Influencing Factors

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ABSTRACT

Background:Hypertension is characterized by high blood pressure, with systolic pressure above 140 mmHg and diastolic pressure above 90 mmHg, and it commonly affects the elderly population. There are two types of risk factors for hypertension, namely modifiable and non-modifiable factors. Method: This research employed a quantitative method with an analytical survey design using a case-control method. The sample size consists of 60 respondent, selected using a purposive sampling technique. Results: Statistical tests indicated a significant correlation for variables such us family history (ρ-value 0.0001), salt consumtion (ρ-value 0.0001), stress/anxiety (ρ-value 0.005), and compliance with a healthy lifestyle (ρ-value 0.003), with the occurrence of hypertension. On the other hand, age (ρ-value 0.278), gender (ρ-value 0.091), obesity status (ρ value 0.390), smoking status (ρ-value 0.243), and caffeine/coffee consumtion habits (ρ-value 0.196) did not show any significant correlation with hypertension occurrence. Conclusion: Family history, salt consumtion, stress/anxiety, and compliance with a healthy lifestyle are factors affecting the occurrence of hypertension in the elderly at Sokaraja 1 Public Health Care Center. However, age, gender, obesity status, smoking status, and caffeine/coffe consumtion habits do not contribute to hypertension.

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1. INTRODUCTION

Hypertension is high blood pressure where the systolic pressure is above 140 mmHg and the diastolic pressure is above 90 mmHg and you have a history of hypertension. Hypertension is divided into two types, namely primary (essential) hypertension, and secondary hypertension [1]. The elderly group is an age group that is easily affected by hypertension [2].

There are two risk factors for hypertension, namely factors that can be changed and factors that cannot be changed. Factors that can be changed are obesity, diabetes mellitus, alcohol, smoking, physical activity, consumption of salty foods and stress. Meanwhile, factors that cannot be changed are age, gender, and family history[3].

The incidence of hypertension in the world is 1.3 billion people and is described as 31% of the adult population who have a history of hypertension, an increase of 5.1% compared to the incidence in 2000-2010, the highest incidence of hypertension occurs in developing countries. with a prevalence of 8.1% [4].

In Indonesia, hypertension is the most common disease suffered by the elderly, with a prevalence of 60.3% of sufferers[5]. Hypertension is mostly suffered by the age group 31-44 years (31.6%), age 45-54 years (45.3%), age 55-64 years (55.2%), age 65 years and over (63.2 %). The estimated number of hypertension cases

in Indonesia in 2018 was 63,309,620 people, while the death rate in Indonesia due to hypertension was 477,218 deaths[6].

Data from the Central Java Provincial Health Service in 2019 shows that hypertension is the most common disease experienced by the people of Central Java with a prevalence of 68.6%[7]. Data from the Banyumas District Health Service in 2019 shows that the incidence of hypertension was 396,657 cases[8].

Based on a preliminary study, researchers conducted interviews with several nurses at Sokaraja 1 Community Health Center regarding the incidence of hypertension. The nurse said that the incidence of hypertension at Sokaraja 1 Community Health Center, Banyumas Regency reached 100-150 cases every month and 1,800 cases every year. Based on data from the last month at Sokaraja 1 Community Health Center, the incidence of hypertension reached 162 cases. Based on this data, the majority of hypertension sufferers are elderly, namely 142 people.

Research on risk factors for hypertension at the Sokaraja 1 Community Health Center has not previously been carried out and the incidence of hypertension in the elderly is still high. So the author is interested in conducting research on "Analysis of Factors that Influence the Incident of Hypertension in the Elderly at the Sokaraja 1 Community Health Center".

2. RESEARCH METHOD

This research uses quantitative research methods and analytical survey research design using the case control method. This research was carried out on March 6–April 12 2023 at Sokaraja 1 Community Health Center. The population in this study were elderly people who had their health checked at Sokaraja 1 Community Health Center with a total of 150 elderly people. The number of samples in this study was 60 respondents using a purposive sampling technique. Sample selection in this study was based on inclusion and exclusion criteria. In the questionnaire on obesity status, smoking status, and caffeine/coffee consumption habits, the researchers adopted it from Dewi[9]. In the healthy lifestyle compliance questionnaire, the researchers adopted the questionnaire from Riskesdas[10], which consists of 15 questions. while in the stress questionnaire, researchers adopted the Zung-self anxiety rate scale questionnaire.

3. RESULT AND DISCUSSIONS

a. Result

3.1. Univariat

Table 1. Frequency Distribution of Respondent Characteristics

Characteristics of Respondents	f	%
Age		
a. Elderly	51	85,0
b. Old	9	15,0
Gender		
a. Women	42	70,0
b. Men	18	30,0
Education		
a. Elementary School	37	61,7
b. Junior High School	10	16,7
c. Senior High School	7	11,7
d. College	6	10,0

Based on table 1, it shows that the majority of the elderly respondents were 51 (85.0%) respondents, most of the respondents were female, 42 (70.0%) respondents, 37 (61.7%) had elementary school education.

Table 2. Frequency distribution of hypertension risk factor variables

Variabel	f	%
Family history		
a. Yes	36	60,0
b. No	24	40,0
Obesity status		

a. Obesity	17	28,3
b. Not Obesity	43	71,7
Smoking status		
a. Smoking	16	26,7
b. Do not smoke or have quit >6 months	44	73,3
Habit of consuming caffeine/coffee	31	51,7
a. More	29	48,3
b. Enough		
Consume salt		
a. ≥1 teaspoon	34	56,7
b. <1 teaspoon	26	43,3
Stress/anxiety		
a. Anxious	7	11,7
b. Not Anxious	53	88,3
Compliance with a healthy lifestyle	21	35,0
a. Disobedient	39	65,0
b. Obedient		
Blood pressure		
a. Hypertension	30	50,0
b. Not hypertensive	30	50,0

Based on table 2, it shows that the elderly who were respondents mostly had a family history of 36 (60%) respondents, were not obese as many as 43 (71.7%) respondents, did not smoke as many as 44 (73.3%) respondents, had a habit of consuming caffeine/ coffee in the more category was 31 (51.7%) respondents, salt consumption ≥1 teaspoon was 34 (56.7%) respondents, stress/anxiety in the no anxiety category was 53 (88.3%) respondents, lifestyle compliance healthy with the obedient category as many as 39 (65.0%) respondents.

3.2 Bivariat

Table 3. Results of bivariate analysis

Variabel	**Blood pressure**				**Sum**	**%**	***p Value***
	Hypertension		**Not Hypertensive**				
	n	**%**	**n**	**%**			
Age							
Elderly (60-74 old)	24	80,0	27	90,0	51	85,0	0,278
Old (75-90 old)	6	20,0	3	10,0	9	15,0	
Gender							
Women	18	60,0	24	80,0	42	70,0	0,091
Men	12	40,0	6	20,0	18	30,0	
Family history							
Yes	27	90,0	9	30,0	36	60,0	0,0001
No	3	10,0	21	70,0	24	40,0	
Obesity status							

Variabel	Blood pressure				Sum	%	*p Value*
	Hypertension		Not Hypertensive				
	n	%	n	%			
Obesity	10	33,3	7	23,3	17	28,3	0,390
Not Obesity	20	66,7	23	76,7	43	71,7	
Smoking status							
Smoking	10	33,3	6	20,0	16	26,7	0,243
Do not smoke or have quit >6 months	20	66,7	24	80,0	44	73,3	
Habit of consuming caffeine/coffee							
More	13	43,3	18	60,0	31	51,7	0,196
Enough	17	56,7	12	40,0	29	48,3	
Consume salt							
≥1 teaspoon	28	93,3	6	20,0	34	56,7	0,0001
<1 teaspoon	2	6,7	24	80,0	26	43,3	
Stress/anxiety							
Anxious	7	23,3	0	0,0	7	11,7	0,005
Not Anxious	23	76,7	30	100	53	88,3	
Compliance with a healthylifestyle							
Disobedient	16	53,3	5	16,7	21	35,0	0,003
Obedient	14	46,7	25	83,3	39	65,0	

3.3 Multivariat

Table 4. Results of simple logistic regression analysis for the bivariate selection stage on independent variables

Variabel				95,0% C.I.for EXP (B)	
	B	Sig	Exp (B)	Lower	Upper
Gender	-20,308	0,999	.000	.000	
Family History	2,715	0,015	15,105	1,694	134,657
Smoking status	-19,658	0,999	.000	.000	
caffeine consumption	-2,445	0,113	.087	.004	1,788
consume salt	3,639	0,001	38,036	4,583	315,671
Anxiety Level	-,205	0,879	.815	.058	11,434
Healthy lifestyle	2,362	,079	10,615	0.764	147,481
Constant	16,564	1,000	15611676,457		

Tabel 5. Hasil analisis multivariat

Variabel	B	Sig	Exp (B)	95,0% C.I.for EXP (B)	
				Lower	Upper
Family History	2,933	0,007	18,787	2,245	157,222
consume salt	3,791	0,0001	44,317	5,470	359,031
Constant	-3,944	0,001	0.004		

Y = -3.944 + 2.933 (family history) + 3.791 (salt consumption)

From the equation above it can be interpreted as follows:

1. A client without a family history of hypertension and without excessive salt consumption, the probability/chance of suffering from hypertension is 1.95%.
2. A client with a family history of hypertension and excessive salt consumption, the probability/chance of suffering from hypertension is 94.05%.

b. Discussions

Characteristics of the elderly at Sokaraja 1 Community Health Center

Based on the results of research that has been carried out, it shows that the majority of respondents are elderly, 51 elderly (85%). According to[11] this happens because at that age the large arteries lose their flexibility and become stiff therefore the blood with each heart beat is forced to pass through narrower blood vessels than usual and causes blood pressure to rise.

Meanwhile, based on research results, the majority of respondents were female, 42 elderly with a percentage of 70%. According to Novitaningtyas, 2014 women who have not yet reached menopause are protected by the hormone estrogen which plays a role in increasing High Density Lipoprotein (HDL) levels. Low HDL cholesterol levels and high LDL cholesterol (Low Density Lipoprotein) influence the atherosclerosis process and result in high blood pressure[11].

The education level of the majority of research respondents was at elementary school level with 37 elderly people with a percentage of (61.7%). The higher a person's education, the greater their knowledge about hypertension and the dangers that arise, the higher a person's participation in controlling hypertension[12]. Knowledge and attitudes are not directly related to health behavior, but there are still barrier factors that can influence health behavior, including personality systems, experiences, individual habits and the existence of supporting factors or conditions, including adequate facilities[13].

Factors that influence the incidence of hypertension in the elderly at Sokaraja 1 Community Health Center

a. The influence of family history on the incidence of hypertension in the elderly at Sokaraja 1 Community Health Center

The results of the research show that there is a relationship between family history factors and the incidence of hypertension in the elderly at the Sokaraja 1 Community Health Center with the Chi Square test results showing that the p value is 0.0001 (p value < 0.05). Meanwhile, the logistic regression test shows that the p value is 0.007 (p value < 0.05), which means there is a significant relationship between family history and the incidence of hypertension in the elderly at the Sokaraja 1 Community Health Center.

This is in line with research conducted by[14] and[15] which states that there is a significant relationship between family history and the incidence of hypertension. This research is also in line with research conducted in Rural Ethiopia which stated that there was a significant relationship between family history and the incidence of hypertension in the elderly[16].

Someone who has a family history of hypertension has a greater risk of developing hypertension. Apart from that, genetics is also related to the regulation of salt (NaCl) metabolism and cell membrane renin[17].

b. The influence between salt consumption and the incidence of hypertension in the elderly at Sokaraja 1 Community Health Center

The research results show that there is a relationship between salt consumption factors and the incidence of hypertension in the elderly at the Sokaraja 1 Health Center with the Chi Square test results showing that the p value is 0.0001 (p value < 0.05). Meanwhile, the logistic regression test shows that the p value is 0.0001 (p value < 0.05), which means there is a significant relationship between family history and the incidence of hypertension in the elderly at the Sokaraja 1 Community Health Center.

According to Rawasiah & Wahiduddin, 2014[18] sodium absorbed into the blood vessels from high salt consumption results in water retention, so that blood volume increases. This causes blood pressure to rise.

This is in line with research conducted by[3] and[18] which states that there is a relationship between salt consumption and the incidence of hypertension in the elderly. This research is also in line with research conducted at the Neglasari Community Health Center in Bandung City which said that there is a relationship between salt consumption and the incidence of hypertension in the elderly[19].

c. The influence of stress/anxiety on the incidence of hypertension in the elderly at Sokaraja Community Health Center 1

The results of the research show that there is a relationship between anxiety factors and the incidence of hypertension in the elderly at the Sokaraja 1 Community Health Center with the Chi Square test results showing that the p value is 0.005 (p value < 0.05).

This research is in line with research conducted by[3] and[20] which states that there is a relationship between anxiety and the incidence of hypertension in the elderly. This research is in line with research conducted by[21] which states that there is a relationship between stress and the incidence of hypertension. Stress is a person's physiological, psychological and behavioral response to adapt to pressure. Stress can also stimulate the kidneys to release the hormone adrenaline which causes blood pressure to rise and increases blood viscosity[3].

d. The influence between adherence to a healthy lifestyle and the incidence of hypertension in the elderly at the Sokaraja 1 Community Health Center

The results of the research show that there is a relationship between the factor of adherence to a healthy lifestyle and the incidence of hypertension in the elderly at the Sokaraja 1 Community Health Center with the Chi Square test results showing that the p value is 0.003 (p value <0.05).

This research is in line with research conducted by[22] and[23] which states that there is a relationship between lifestyle compliance and the incidence of hypertension in the elderly. Many respondents who suffer from hypertension do not exercise every day and do not do housework. Apart from that, he has sleep disorders so he wakes up easily. Another lifestyle that is more dominant in hypertension sufferers is the habit of smoking. Smoking habits can trigger hypertension. This research is in line with research conducted at SUN (Seguimiento Universidad de Navarra), Spain which states that there is a relationship between healthy living habits and cardiovascular disease[24].

Factors that do not influence the incidence of hypertension in the elderly at Sokaraja 1 Community Health Center

a. The influence of age on the incidence of hypertension in the elderly at the Sokaraja 1 Community Health Center

The results of the study showed that there was no relationship between the age factor and the incidence of hypertension in the elderly at the Sokaraja 1 Community Health Center with the Chi Square test results showing that the p value was 0.278 (p value > 0.05).

This research is in line with research conducted by[14] and[25] which said that the majority of hypertension sufferers are in the elderly category 60-74 years. This shows that there is no relationship between age and the incidence of hypertension in the elderly.

As age increases, the risk of developing hypertension increases. This is caused by changes in the structure of blood vessels such as narrowing of the lumen, and blood vessel walls becoming stiff and their elasticity reduced, causing an increase in blood pressure[17].

b. The influence of gender on the incidence of hypertension in the elderly at Sokaraja 1 Community Health Center

The results of the study showed that there was no relationship between the gender factor and the incidence of hypertension in the elderly at the Sokaraja 1 Community Health Center with the Chi Square test results showing that the p value was 0.091 (p value > 0.05).

This research is in line with research conducted by[26] and[27] which states that there is no relationship between gender and the incidence of hypertension in the elderly.

According to Anggraini, 2009 women who have not yet gone through menopause are protected by the hormone estrogen which plays a role in increasing High Density Lipoprotein (HDL) levels. Low HDL and high LDL levels will influence the atherosclerosis process and result in high blood pressure[28].

c. The influence between obesity status and the incidence of hypertension in the elderly at Sokaraja 1 Community Health Center

The research results showed that there was no relationship between obesity factors and the incidence of hypertension in the elderly at the Sokaraja 1 Health Center with the Chi Square test results showing that the p value was 0.390 (p value > 0.05).

This research is in line with research conducted by[3] and[29] which stated that there is no relationship between obesity and the incidence of hypertension in the elderly.

People with hypertension will experience a decrease in blood pressure if they reduce their salt intake. So, even if someone has an underweight or normal body mass index, if they consume too much sodium, they are at risk of hypertension[3].

d. The influence between smoking habits and the incidence of hypertension in the elderly at Sokaraja 1 Community Health Center

The research results showed that there was no relationship between smoking habits and the incidence of hypertension in the elderly at the Sokaraja 1 Community Health Center with the Chi Square test results showing that the p value was 0.243 (p value > 0.05).

This research is in line with research conducted by[3] and[30] which stated that there is no relationship between smoking habits and the incidence of hypertension in the elderly.

However, the results of this study contradict research[31] which states that there is a relationship between smoking habits and the incidence of hypertension in the elderly.

The differences in the results of this study were influenced by several factors, including that the majority of respondents did not smoke, amounting to 44 respondents (73.3%), another thing was that the majority of respondents were women, amounting to 42 respondents (70%).

e. The influence between caffeine/coffee consumption habits and the incidence of hypertension in the elderly at the Sokaraja 1 Community Health Center

The results of the study showed that there was no relationship between the habitual factor of caffeine/coffee consumption and the incidence of hypertension in the elderly at the Sokaraja 1 Community Health Center with the Chi Square test results showing that the p value was 0.196 (p value > 0.05).

This research is in line with research conducted by[32] and[33] which states that there is no relationship between caffeine/coffee consumption and the incidence of hypertension. The side effects of caffeine cause very small and short changes in blood pressure, and caffeine does not cause blood vessel disorders that can trigger high blood pressure[32]. This research is in line with research conducted at SUN, Spain which stated that there was no relationship between caffeine/coffee consumption and the incidence of hypertension[34].

However, the results of this study contradict research conducted by[35] which states that there is a relationship between caffeine/coffee consumption and hypertension in the elderly.

4. CONCLUSION AND RECOMMENDATION

In this study, the factors in the incidence of hypertension in the elderly at the Sokaraja 1 Community Health Center were family history, salt consumption, stress/anxiety, and adherence to a healthy lifestyle. Meanwhile, what is not a factor in the incidence of hypertension in the elderly at Sokaraja 1 Community Health Center is age, gender, obesity status, smoking status, and caffeine/coffee consumption habits. Future researchers can add other variables that may have a relationship with the incidence of hypertension, such as hormonal balance, physical activity, and junk food consumption habits.

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