

RELATIONSHIP BETWEEN FAMILY HISTORY, AGE, OBESITY AND SMOKING HABIT WITH HYPERTENSION OCCURRENCE AT PUBLIC HEALTH CENTER REGION PAHANDUT

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Abstract:

Hypertension is cardiovascular disease that affected 22% people in the total world population. In Indonesia hypertension prevalence according to riskesdas 2018 reaches 34,11%. Hypertension occurs inseparable from its risk factor. The purpose of this study is to analyze the relationship between family history, age, obesity, and smoking habits with the occurrence of hypertension in the region of the Public health center, Pahandut. in 2022. This research method uses a cross-sectional approach, with large of 100 samples and use purposive sampling technique. Data Analyzed using Chi-square test. The results of the bivariate analysis obtained variables related to the occurrence of hypertension are family history (p-value= 0,000), age (p-value= 0,000), obesity (p-value= 0,044) and smoking habit (p-value= 0,002). This study concludes that there is a relationship between family history, age, obesity, and smoking habits with the occurrence of hypertension in the region of the Public health center, Pahandut. in 2022

Keywords: Age; Family History; Hypertension; Obesity; Smoking Habit

Introduction

Noncommunicable disease now caused more death than communicable diseases, according to data by the World Health Organization in 2016 Noncommunicable disease are responsible for 71% of death of world people, with 35 % of death caused by cardiovascular disease.¹ Hypertension is one of the cardiovascular diseases which affected 22% of world people population.¹ Hypertension is defined as systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg, hypertension is a major cause of cardiovascular disease because hypertension leads to other cardiovascular diseases such as stroke and heart failure.²

In Indonesia hypertension prevalence based on data Riskesdas 2018, reached 34,11% of the total population in Indonesia. This situation is not much different in Central Kalimantan Province whose prevalence of hypertension reaches 34,47% and in the capital city of Central Kalimantan hypertension prevalence reaches 35,84% of the total population in Palangka Raya city. To reduce the occurrence of hypertension government through health center perform early detection and monitoring for risk factor of hypertension.³

Based on data health department of Palangka Raya city most areas affected by hypertension are in the region Public health center, Pahandut. Hypertension in Public health center, Pahandut become the second most common disease after upper respiratory tract infections with as many cases as 2710.^{4,5}

Hypertension risk factors are divided into modifiable and non-modifiable risk factors. Modifiable risk factors for hypertension such as smoking, diet and lifestyle while non-modifiable risk factors such as family history, age, and sex. These risk factors make people more at risk of developing hypertension compared to people who do not have a risk factor.⁶ The purpose of this study is to know

the relationship between family history, age, obesity, and smoking habits with hypertension occurrence in the public health center, Pahandut, Palangka Raya city.

Research Method

Sampling and data collection

This cross-sectional study design was done from June 3 to June 14, 2022. The population is those whose patients come to the Public health center, Pahandut, the minimum sample is calculated using the Lemeshow formula where 88 samples were obtained, but in this study, there were 100 samples. The inclusion criteria were people over 18 years old that come to the public health center, Pahandut. The exclusion criteria were those who were pregnant women, and children below 18 years old.

Data were collected using a questionnaire at the public health center, Pahandut. Those respondents were interviewed, and clinical measurement perform. The questionnaire consists of age, family history of hypertension or other cardiovascular diseases, history of hypertensive disease from respondents themselves, and smoking habits.

Hypertension variables in this study are divided into hypertension (systolic pressure above 140 mmHg and/or diastolic pressure above 90 and has a history of hypertension before) and non-hypertension. The family history variable in this study divides into family history positive and family history negative. The age variable in this study was grouped into elderly and non-elderly. Obesity was measured with the height and weight of respondents, then calculated on a body mass index scale, divided into groups, overweight, and obese. Smoking habits were also got by asking respondents about the number of cigarettes they're consumed in one day, it was divided into do not smoke, light smoker (1-10 cigarette/day), and moderate-heavy smoker (more than 10 cigarettes/day).

Results

Univariate analytic

The characteristic of the respondent is reported in table 1

Table 1 Respondents characteristic

Variable	Item	Frequencies	Percentage (%)
Hypertension	Hypertension	43	43
	Non-hypertension	57	57
Family history	Family history positive	40	40
	Family history negative	60	60
Age	Elderly	24	24
	Non-elderly	76	76
	Normal	38	38
Obesity	Overweight	54	54
	Obese	8	8
Smoking habit	Nonsmoker	84	84
	Light smoker	10	10
	Moderate-heavy smoker	6	6

Table 1 shows that non-hypertensive people are more dominant, by people characteristic family history negative, non-elderly, overweight and light smoker.

Bivariate analytic

The Chi-square test was used to identify the relationship between variables. Family history and age variables are related to hypertension. Obesity and smoking habits variables are also related to hypertension but must do merging cell first cause the expected

count less than 5. The chi-square test of family history will report in table 2, age variable will report in table 3. The chi-square test for obesity before merging cells will report in table 4 and after merging cells will report in table 5. The chi-square test for smoking habits before merging cells will report in table 6 and after merging cells will report in table 7.

The chi-square test for family history and hypertension is reported in table 2.

Table 2 The chi-square test for family history and hypertension

Family history	Blood pressure				value			
	hypertension		Non-hypertension		P	OR		
	n	%	n	%			N	%
positive	27	67,5	13	32,5	40	40	0,000	5,712
negative	16	26,7	44	73,3	60	60		

Based on table 2 family history positive dominant with hypertension (67,5%), *p*-value 0,000 and OR 5,712

The chi-square test for age and hypertension is reported in table 3.

Table 3 The chi-square test for age and hypertension

Age	Blood pressure				value			
	hypertension		Non-hypertension		Total	OR		
	n	%	n	%	N	%		
Non-elderly	24	31,6	52	68,4	76	76	0,000	5.712
negative	19	79,2	5	20,8	24	24		

Based on table 3 hypertension more dominant in elderly group (79,2%), p -value 0,000 and OR 8,233.

The chi-square test before merging cells for obesity and hypertension is reported in table 4

Table 4 The chi-square test before merging cells for obesity and hypertension

Body Mass Index	Blood Pressure				Value	
	hypertension		Non hypertension		Total	OR
	n	%	n	%		
Normal	11	28,9	27	71,1	38	0,030
Overweight	26	48,1	28	51,9	54	
Obese	6	75,0	2	25,0	8	

Based on table 4 hypertension more dominant in obese group (75%), p -value 0,030

The chi-square test after merging cells for obesity and hypertension is reported in table 5.

Table 5 The chi-square test after merging cells for obesity and hypertension

Body Mass Index	Blood Pressure				Value		
	hipertensi		Non hipertensi		Total	OR	
	n	%	n	%			
normal	11	28,9	27	71,1	38	0,044	2,618
Overweight-obese	32	51,6	30	48,4	62		

Based on table 5 hypertension more dominant in overweight-obese group (51,6%), p -value 0,044 and OR 2,618.

The chi-square test before merging cells for smoking habits and hypertension is reported in table 6.

Table 6 The chi-square test before merging cells for smoking habits and hypertension

Smoking habit	Blood Pressure				Value	
	hypertension		Non-hypertension		Total	P
	n	%	n	%	N	%
Do not smoke	30	35,7	54	64,3	84	84
Light smoker	8	80,0	2	20,0	10	10
Moderate-heavy smoker	5	83,3	1	16,7	6	6

Based on table 6 hypertension is more dominant in moderate-heavy smoker (83,3%), p -value 0,003.

The chi-square test after merging cells for smoking habits and hypertension on reported in table 7.

Table 7 The chi-square test after merging cells for smoking habits and hypertension

Smoking Habit	Blood Pressure				Total	Value	
	hypertension		Non-hypertension			P	OR
	n	%	n	%			
Do not smoke	30	35,7	54	64,3	84	0,002	7,800
Light-heavy smoker	13	81,3	3	18,8	16		

Based on table 7 hypertension is more dominant in light-heavy smoker group (81,3%), p -value 0,002 and OR 7,800

Discussion

Every variable in this study is based on finding in the Public health center, Pahandut. According to the result from the chi-square test, every variable has a relation to hypertension (P -value<0.05). Family history positive based on data more dominant be hypertension (67,5%), the occurrence of family history hypertension positive has to increase hypertension 5 times ($or=5,712$) than respondents without family hypertension positive, this finding is in line with previous research by Elisabeth F et al.⁷ That family history has relation to the occurrence of hypertension, they are finding family history positive for hypertension makes people 2,341 times increasing hypertension than people with a family history negative.

A person with a family history positive can have hypertension causing increasing natrium

reabsorption in the proximal kidney and higher natrium sensitivity. In family history positive also finds a change in the heart morphology where the mass and left ventricle thickness are bigger than people without a family history positive.⁸ Family history of its role influencing the occurrence of hypertension increases by next generation that affected hypertension, the first generation 25,7%, second generation 38,4% and third generation 52,6%.⁹

The relationship between age and hypertension according to the chi-square test, they have a relation (p -value < 0,05). Based on this study hypertension is more dominant in the elderly group (79,2%). along with age, the occurrence of hypertension also increased by 8,233 times greater have hypertension than that of non-elderly. This finding is in line with the Riskesdas 2018 where the elderly age has 40-69,7% prevalence of hypertension in Indonesia, also in this data the highest spike of hypertension begins in elderly age (≥ 46 years old).³ The previous study by Muli S et al.¹⁰ said

hypertension occurrence is more common in the elderly than non-elderly, it's because along with age also increased aldosterone, salt sensitivity, and inflammation factor. The most common issues are increasing calcification and arterial stiffness that induce hypertension caused due to increased arterial resistance.

Obesity in this study has a relation to hypertension, based on the chi-square test (p -value $<0,05$). According to this study, hypertension is more dominant in the overweight-obese group (51,6%). It's in line with a previous study by Hall J et al.¹¹ they find that any increase in weight will increase extracellular fluid and because of that blood volume will increase too. According to the OR value people with obesity has 2,618.times greater than non-obese people to have hypertension, this finding in line with a previous study by Rohkuswara T.D and Syarif.¹² in Bandung that people with obese have 2,008 times more likely to develop hypertension than normal body mass index.

Smoking habits in this study have a relation to hypertension, based on the chi-square test (p -value $< 0,05$). According to this study, hypertension is more dominant in light-heavy smoker (81,3%). This finding is in line with previous research by Dikalov S. et al.¹³ they find that how the body responds biochemically when smoking it will quickly cause the production of endothelial nitric oxide and antioxidants to decrease but in other ways superoxide anion increases in blood plasm, this imbalance that leads to oxidative stress mitochondrial causes endothelial dysfunction that eventually becomes hypertension, the nicotine contained in cigarette also result in vascular vasoconstriction that leads to arteriosclerosis than develop to hypertension.¹⁴ According to the chi-square test people that have a smoking habit, are potentially 7,800 times greater with hypertension than nonsmokers.

Conclusions

According to the study that has been done, it can be concluded that family history of hypertension, age, obesity, and smoking habits have a relation to hypertension. The highest risk factor that influences hypertension in this study are age and smoking habits therefore to reduce the risk factor of hypertension either modifiable or nonmodifiable, lifestyle improvement is needed.

Recommendations for future research related to this research are a larger sample number to avoid an expected count of less than 5. Multivariate analysis or another risk factor from hypertension can be included in future research on public health centers, Pahandut or other places.

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Smoking Habit	Blood Pressure				Total	Value	
	hypertensi on		Non-hipertension			P	OR
	n	%	n	%			
Do not smoke	30	35,7	54	64,3	84	0,002	7,800
Light-heavy smoker	13	81,3	3	18,8	16		