DETERMINANT FACTORS OF HYPERTENSION IN THE ELDERLY AT PUBLIC HEALTH CENTER IN PALEMBANG, SOUTH SUMATERA INDONESIA

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ABSTRACT

Background: Hypertension is one of Indonesia's highest causes of death and is known as the silent killer. Several risk factors for hypertension include age, gender, heredity, and lifestyle. This study aimed to analyze the determinants of hypertension in the elderly in the work area of the Palembang City Health Center.. **Methods:** This research is an analytical observational study with a cross-sectional design. This research was conducted from March to May 2021 in the working area of the Padang Selasa Health Center, Palembang City. Samples were taken randomly, with the number of samples as many as 106 respondents. Data were collected by interview using a questionnaire and data analysis using the chi-square test and multiple logistic regression. **Results:** Bivariate analysis showed that the variables statistically significantly related to hypertension in the elderly were heredity history and the incidence of stress with $p<0.05$. Meanwhile, the results of multivariate analysis showed that heredity (OR=0.089; p=0.0005; 95% CI= 0.033-0.239) was the most dominant factor in the incidence of hypertension in the elderly in the Padang Selasa Palembang Public Health Center working area in 2021. The elderly with a history of heredity have a risk 12 times riskier than those without a history of heredity. **Conclusion:** The majority of the elderly found with hypertension are female. The determinants of hypertension in the elderly are heredity and stress, and the most dominant factor causing hypertension in the elderly is a history of hereditary hypertension.

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INTRODUCTION

Hypertension is a degenerative disease that is the cause of death in the world and one of the most severe diseases in Indonesia. Increased blood pressure is one of the main risk factors for death worldwide. Hypertension cases are often found in primary health services (A. G. A. Adam, Nelwan, & Wariki, 2019). Based on data from the Basic Health Research in 2018, the prevalence of hypertension rose from 25.8% to 34.1%. The prevalence based on measurement results in the Indonesian population aged 18 years was highest in South Kalimantan (44.1%), while the lowest was in Papua (22.2%). Meanwhile, the prevalence of hypertension in the South Sumatra province was ranked 13th in Indonesia (30.4%) (Kemenkes RI, 2019).

Data from the South Sumatra Provincial Health Office in 2018, the number of hypertension sufferers aged > 15 years in South Sumatra Province was as many as 5,572,379 people. Of the 5,572,379 patients with hypertension, only 2.5% of the patients received health services according to the standard, namely 137,299 people (Dinkes Provinsi SUMSEL, 2019). Hypertension is a significant risk factor for atherosclerotic cardiovascular disease, heart failure, stroke, and kidney failure. Hypertension risks early morbidity or mortality, which increases as systolic and diastolic blood pressures increase. A prolonged increase in blood pressure damages blood vessels in target organs (heart, kidneys, brain, and eyes) (Smeltzer, 2016). Uncontrolled hypertension can cause several complications such as myocardial infarction, coronary heart disease, congestive heart failure, stroke, hypertensive encephalopathy, chronic heart failure, and hypertensive retinopathy. The management of hypertension itself aims to prevent comorbid morbidity and mortality by achieving and maintaining blood pressure below 140/90 mmHg. (Whelton et al., 2018).

The incidence of hypertension is caused by several risk factors, including non-modifiable factors (age, gender, heredity) and modifiable risk factors (obesity, physical activity, smoking, excessive salt consumption, stress, and hormonal balance). (Tim Bumi Medika, 2017). A study in Kemuning Subdistrict, Palembang City, found that the incidence of hypertension was related to age, occupation, eating salty food, and doing physical activity (Maksuk, 2012).

The previous study in the work area of the Sidomulyo Health Center in Pekanbaru City reported that the causal factors associated with hypertension were a history of hypertension. In contrast, the unrelated factors were salt consumption patterns, BMI, smoking habits, and physical activity (Maita, 2017). The West City Health Center in Gorontalo City showed that the most dominant factors causing hypertension were cigarette consumption, age, and other factors (Adam, 2019).

In addition, the factors that influence the occurrence of hypertension in Cibinong Market traders are obesity and gender. (Wahidin et al., 2019). Hypertension is more common in men, and the majority are 40-50 years old (Buntaa, Ratag, & Nelwan, 2018).

Based on the problems mentioned above, the study aimed to analyze the determinants of hypertension in the elderly working area of the Palembang City Health Center.

METHODS

This research was an analytical observational study with a cross-sectional design. This research was conducted in March-May 2021 in the Padang Selasa Health Center Work Area, Palembang City. The technique of data collection by simple random sampling. The sample size was determined using the Slovin formula with a calculation result of 106 respondents. Data was collected by face-to-face contact with the elderly during home visits and interviewed were conducted using a questionnaire. Elderly blood pressure was measured using a sphygmomanometer at the time of the interviewed.

The inclusion criteria for the elderly involved in the study were that they were over 45 years old, willing to be respondents, in the working area of the Padang Selasa Health Center.

Data were analyzed by univariate, bivariate using the chi-square, and multivariate using multiple logistic regression. Ethical approval from Health Polytecnic Palembang with an ethical approval certificate number: 882/KEPK/Adm2/VI/2021.

RESULTS

Data is processed using computer software, and then presented using tables. Data analysed was carried out using univariate, bivariate test by chi – square and multivariate test by multiple regression logistic. The results of data analysis are presented in the table below:

Table 1

Frequency Distribution Based on Hypertension Incident and Characteristics of Respondents

Variables	Frecuency (n)	Percentage (%)
Hypertension Incidence		
1. Yes	69	65.1
2. No	37	34.9
Age		
1. Elderly High Risk (≥70 years)	20	18.9
2. Elderly (60-69 years)	45	42.5
3. Pre-elderly (45-59 years)	41	38.7
Gender		
1. Female	76	71.7
2. Male	30	28.3
Genetic History of Hypertension		
1. Yes	61	61
2. No	45	45
Cigarette Smoke Exposure	94	88.7
1. Yes	12	11.3
2. No		
Physical Activity		
1. Slight	8	7.5
2. Medium	86	81.1
3. Severe	12	11.3
Stress	18	17
1. Yes	88	83
2. No		

Based on Table 1, hypertension was found in the majority of the elderly with female sex and in the age group 60-69 years, having a hereditary history of hypertension and smoking habits.

Table 2

Association between Hypertension Incident and Characteristics of Respondents

Variables	Hypertension Incidence					
	Yes		No		OR	*p value*
	n	%	n	%		
Age groups						
1. Elderly High Risk (≥70 years)	14	70	6	30		
2. Elderly (60-69 years)	29	64.4	16	35.6	-	0.873
3. Pre-elderly (45-59 years)	26	63.4	15	36.6		
Gender						
1. Female	49	64.5	27	35.5	-	1.000
2. Male	20	66.7	10	33.3		
Genetic History of Hypertension						
1. Yes	53	86.9	8	13.1	12.008	**0.0005**
2. No	16	35.6	29	64.4		
Cigarette Smoke Exposure						
1. Yes	62	66	31	34	-	0.749
2. No	7	58.3	5	41,7		
Physical Activity						
1. Slight	7	87.5	1	12.5		
2. Medium	57	66.3	29	33.7	-	0.094
3. Severe	5	41.7	7	58.3		
Stress						
1. Yes	17	94.4	1	5,6	11.769	**0.009**
2. No	52	59.1	36	40.9		

Based on Table 2, the results of a chi-square test showed that the variables were significantly related to hypertension were genetic history of hypertension with a p value of 0.0005 and Odd Ratio 12.008, and stress with a p value of 0.009 and Odd Ratio 11.769.

Table 3
The Last Model of Multiple Logistic Regression Test

Variables	p value	OR (95% CI)
Genetic History of Hypertension	0.0005	12.008 (0.033 to 0.239
Stress	0.038	11.769 (0.011 to 0.881

Based on Table 3, the last model of the multiple logistic regression test were obtained a genetic history of hypertension and stress were the dominant factors to determine the hypertension incident at public health center of Padang Selasa in Palembang.

DISCUSSION

The results of the study showed that the majority of respondents with hypertension were in the age group 60-69 years. According to a previous study, age is the most dominant risk factor in determining hypertension; the incidence and prevalence of hypertension increase with age (L. Adam, 2019; Maksuk, 2012). However, there is no relationship between age and the incidence of hypertension (Asari, 2017; Wahidin et al., 2019).

The majority of the elderly who experience hypertension are female. Women who experience premenopause tend to have a higher blood pressure than men. The incidence of hypertension is also influenced by obesity pre-elderly (Kartika & Purwaningsih, 2020). The incidence of hypertension was also found in most pre-elderly in the Senen District, Central Jakarta (Kartika & Purwaningsih, 2020). The majority of the elderly in Pegayut Village, Ogan Ilir Regency, have hypertension (Maksuk, Amin, & Jaya, 2021).

The results showed that a genetic history caused the majority of hypertension in the elderly, and heredity was the most dominant factor causing hypertension. This study is in line with a study in Kemuning District, Palembang City, which stated that the most dominant risk factor causing hypertension was genetic (Maksuk, 2012). It is because a genetic history has a higher risk of developing hypertension than those without a genetic history.

Most of the elderly are exposed to cigarette smoke, although there is no statistically significant relationship between exposure to cigarette smoke and hypertension. Smoking habits are associated with hypertension in the elderly (Arif, Rusnoto, & Hartinah, 2013). Exposure to cigarette smoke does not affect the incidence of hypertension (Nurwidayanti & Wahyuni, 2013). The majority of respondents did the slight physical activity.

Physical activity affects hypertension; blood pressure will be higher when doing physical activity and lower when resting. Low activity will reduce the elasticity of the heart and blood vessels system. Conversely, high activity will increase the elasticity of the heart and blood vessel system.

It follows a study at the Desa Klumpit Puskesmas Gribig, which stated that exercise was associated with hypertension in the elderly (Arif et al., 2013). Another study that is in line with research states that lack of physical activity is not associated with the incidence of hypertension (Wahidin et al., 2019). However, this study does not align with research that states that physical activity/sports are a determinant factor of hypertension in the elderly (L. Adam, 2019). Regular physical activity can help reduce hypertension in the elderly (Maksuk & Yusneli, 2021). Physical activity is a routine program of the ministry of health carried out in the working area of the public health center.

In this study, only a small number of respondents experienced stress. Statistical tests showed that the most dominant variables causing hypertension were a genetic history of hypertension and stress. However, risk factors cannot be ascertained as the cause of hypertension in the elderly because further examination is needed to diagnose stress levels in the elderly.

However, the limitation of this study is that stress examination is not carried out using a measuring instrument to determine stress. In addition, the number of samples was limited to one health center in Palembang.

CONCLUSION

There are several determinant factors that cause hypertension in the elderly, namely age, gender, physical activity, smoking habits, diet, hereditary history and stress. There are several determinant factors that cause hypertension,

namely age, gender, physical activity, smoking habits, diet, hereditary history and stress. The dominant factors determining hypertension are history of hypertension and stress experienced by the elderly.

Therefore, it is necessary to periodically monitor blood pressure measurements in the elderly in the working area of the public health center. In addition, follow-up studies related to measuring stress in the elderly use a valid measurement tool.

CONFLICT OF INTEREST

ACKNOWLEDGMENTS

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