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Factors Associated with the Incidence of Hypertension at the Olak Kemang Health Center, Danau Teluk District, Jambi City

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A B S T R A C T

The World Health Organization (WHO) states ± 1.28 billion individuals worldwide suffer from hypertension. This study aims to determine the factors associated with the incidence of hypertension. This study used a cross-sectional design. The results of bivariate analysis showed that there was no relationship between age (p=0.454), gender (p=0.665), obesity status (p=0,154) and smoking status (p=0.520) with hypertension. There was a relationship between family history (p=0.004), physical activity (p=0,008) and consumption of fatty foods (p=0.000) with hypertension. Conclusion: Variables related to the incidence of hypertension at the Olak Kemang Public Health Center, Danau Teluk Teluk District, Jambi City, were family history, physical activity and consumption of fatty foods. It is recommended for the public to regularly check blood pressure and avoid risk factors that can cause hypertension.

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INTRODUCTION

Non-communicable diseases are a problem in Indonesia, one of which is hypertension. Hypertension is characterized by an increase in systolic blood pressure of 140 mmHg and diastolic blood pressure of 90 mmHg. Hypertension is grouped into two categories: Primary Hypertension (Essential) and Secondary Hypertension. The World Health Organization (WHO) supports countries in reducing hypertension as a public health problem in 2021, stating that ± 1.28 billion individuals worldwide suffer from hypertension. Africa is the region with the highest prevalence of hypertension in the world. If the incidence of hypertension continues to increase, it is likely that by 2025 there will be 1.5 billion individuals suffering from hypertension.

In Indonesia, seen from the results of the Riset Kesehatan Dasar Kementerian Kesehatan Republik Indonesia (RISKESDAS) in the three editions, the prevalence of hypertension in 2007 was 31.7%, in 2013 it was 25.8%, and in 2018 it was 34.1%. The largest case of hypertension identified in 2018 was the age category > 75 years at 69.53% and the smallest was in the 18-24 age category, namely 13.22%.

The prevalence of hypertension in Jambi Province according to Jambi Province's health profile shows that the prevalence of hypertension increases every year. The prevalence of hypertension in 2019 was 18.5%, in 2020 it increased to 23.63% and in 2021 it was 17.52%.

Meanwhile, the Prevalence of Essential Hypertension in Jambi City according to The Health Profile of Jambi City shows that in 2020, it ranks second with the number of hypertension cases of 18.0% (35,256 cases) and will experience an increase in 2021 of 24% (26,332 cases)). Based on data from the Olak Kemang Health Center, hypertension is always the 10 biggest diseases every year and has increased from 2019 of 52.6% (707 cases), increased rapidly in 2020 to 75.6% (1,016 cases) and in 2021 to 61.5% (826 cases).

Control efforts to reduce the incidence of hypertension can be done by living a healthy lifestyle, for example: quitting smoking, exercising regularly, limiting sodium consumption, reducing fat, eating a variety of fruits and vegetables, controlling weight, creating relaxed conditions, and so on. Furthermore, to control individuals whose examination results are hypertension, curing hypertension is expected to reduce cardiovascular morbidity and mortality due to the after-effects of hypertension. Hypertension can be caused by several different factors. Factors that may cause health problems are often referred to as risk factors. Risk factors for hypertension include age, gender, genetics, dietary history, excessive alcohol consumption, lack of physical activity, smoking status, obesity, dyslipidemia, diabetes mellitus, psychosocial and stress. The purpose of this study was to determine the relationship between age, gender, family history, obesity, physical activity, smoking status and consumption of fatty foods at the Olak Kemang Health Center, Danau Teluk District, Jambi City in 2022.

THEORETICAL REVIEW

Non-communicable diseases are a problem in Indonesia, one of which is hypertension. Hypertension is characterized by an increase in systolic blood

pressure of 140 mmHg and diastolic blood pressure of 90 mmHg. Hypertension is grouped into two categories: Primary Hypertension (Essential) and Secondary Hypertension. The World Health Organization (WHO) supports countries in reducing hypertension as a public health problem in 2021, stating that ± 1.28 billion individuals worldwide suffer from hypertension. Africa is the region with the highest prevalence of hypertension in the world. If the incidence of hypertension continues to increase, it is likely that by 2025 there will be 1.5 billion individuals suffering from hypertension.

METHODOLOGY

The type of research used is observational using a cross-sectional design. This research was conducted at the Olak Kemang Health Center, Danau Teluk District, Jambi City in May 2022. The population of this study was the community in the working area of the Olak Kemang Health Center who visited the Health Center from five urban villages and aged ≥ 18 years. The sample used in this study was 91 respondents using accidental sampling technique. The collection of data used in this research is primary and secondary data. Primary data was obtained through interviews using questionnaires and measuring blood pressure and measuring weight and height. Secondary data contains the number of cases of hypertension in the working area of the Olak Kemang Public Health Center.

Univariate analysis was used to determine the frequency distribution for blood pressure, age, gender, history of hypertension, obesity, physical activity, smoking status and consumption of fatty foods. Bivariate analysis was used with the Chi-Square test with $\alpha < 0.05$ which was used to find out which variables were related to the incidence of hypertension.

RESULTS

Univariate analysis

Table 1. Frequency Distribution of Respondent Characteristics at the Olak Kemang Health Center

Karakteristik	(*f*)	(%)
Usia		
≥ 46 Tahun	83	91,2
< 46 Tahun	8	8,8
Total	**91**	**100**
Jenis Kelamin		
Laki-laki	50	54,9
Perempuan	41	45,1
Total	**91**	**100**
Pendidikan		
Tidak Tamat SD	11	12,1
SD	21	23,1
SMP SMA	7	7,7
Perguruan	41	45,1
Tinggi	11	12,1
Total	**91**	**100**
Pekerjaan		
PNS	12	13,2
Karyawan	12	13,2
Swasta Petani	10	11
Ibu Rumah	34	37,4
Tangga	11	12,1
Pedagang/Wira	12	13,2
swasta Lainnya		
Total	**91**	**100**

Source: Data Primer 2022

Based on Table 1. shows that the largest proportion of respondents based on age is in the age group ≥ 46 years, namely as many as 83 people (91.2%). The largest proportion of respondents based on gender was male with 50 respondents (54.9%). The largest proportion of respondents based on education was in high school graduates, namely 41 respondents (45.1%). The proportion of respondents based on work is found in jobs as housewives, namely as many as 34 respondents (37.4%).

Table 2. Frequency Distribution of Research Variables at the Olak Kemang Health Center

Variabel Penelitian	*(f)*	*(%)*
Hipertensi *Ya*		
Tidak	*58*	*63,7*
	33	*36,3*
Total	***91***	***100***
Riwayat Keluarga		
Ada	*70*	*76,9*
Tidak Ada	*21*	*23,1*
Total	***91***	***100***
Status Obesitas		
Obesitas Tidak	*16*	*17,6*
Obesitas	*25*	*82,4*
Total	***91***	***100***
Aktivitas Fisik		
Ringan-Sedang	*39*	*42,9*
Berat	*52*	*57,1*
Total	***91***	***100***
Status Merokok		
Ya Tidak	*51*	*56*
	40	*44*
Total	***91***	***100***
Konsumsi Makanan Berlemak	*59*	*64,8*
Berlebih Baik	*32*	*35,2*
Total	***91***	***100***

Sumber: Data Primer 2022

Based on Table 2. shows that the largest proportion of respondents experienced hypertension as many as 52 respondents (57.1%). Based on the family history of the respondents, there were 70 respondents (76.9%) with a family history. The largest proportion of respondents based on obesity status was in the non-obese group of 31 respondents (34.1%). The proportion of respondents based on physical activity in the moderate-severe physical activity group was 84 respondents (92.3%). The proportion of respondents based on smoking status in the heavy smoker group was 21 respondents (23.1%) with the largest smoking status in the smoking group being 51 respondents (56%). The proportion of respondents based on the consumption of fatty foods in the excess fat group was 48 respondents (47.3%).

Bivariate Analysis

Table 3. Frequency Distribution of Variables Associated with Hypertension Events at the Olak Kemang Health Center

Variabel	Hipertensi				Jumlah		P-Value	PR (95%CI)
	Ya		Tidak					
	n	%	n	%	n	%		
Usia								
≥46 tahun	54	65,1	29	34,9	83	100	0,454	1,301
<46 tahun	4	50	4	50	8	100		(0,639-2,648)
Jenis Kelamin								1,082
Laki-laki	33	66	17	34	50	100	0,665	(0,790-1,484)
Perempuan	25	61	16	39	41	100		
Riwayat Keluarga								
Ada	39	55,7	31	44,3	70	100	0,004	0,616
Tidak Ada	19	90,5	2	9,5	21	100		(0,479-0,791)
Status Obesitas								1,354
Obesitas	13	81,3	3	18,8	16	100	0,154	(1,004-1,827)
Tidak Obesitas	45	60	30	40	75	100		
Aktivitas Fisik								1,531
Ringan-	31	79,5	8	20,5	39	100	0,008	(1,127-2,080)
Sedang	27	51,9	25	48,1	52	100		
Berat								
Status Merokok								1,111
Ya	34	66,7	17	33,3	51	100	0,520	(0,808-1,528)
Tidak	24	60	16	40	40	100		
Konsumsi Makanan Berlemak								
Berlebih	51	86,4	8	13,6	59	100	0,000	3,952
Tidak Berlebihan	7	21,9	25	78,1	31	100		(2,037-7,665)

Source: Data Primer 2022

Based on Table 3. the relationship between age and the incidence of hypertension, those aged ≥ 46 years (65.1%) experienced hypertension more than respondents aged ≥ 46 years (56%). < 46 years (50%). Based on bivariate analysis, a p-value of 0.454 (p > 0.05) was obtained with a PR value of 1.301 (0.639-2.648) which means that there is no relationship between age and the incidence of hypertension in the working area of the Olak Kemang Health Center in 2022.

The relationship between gender and the incidence of hypertension showed that the male sex (66%) had more hypertension than the female respondents (61%). Based on bivariate analysis, a p-value of 0.665 (p > 0.05) was obtained with a PR value of 1.082 (0.790-1.484) which means that there is no

relationship between gender and the incidence of hypertension in the working area of the Olak Kemang Health Center in 2022.

The relationship between family history and the incidence of hypertension showed that those without a family history (90.5%) had more hypertension than those with a family history (55.7%). Based on bivariate analysis, a p-value of 0.004 (p <0.05) was obtained with a PR value of 0.616 (0.479-0.791) which means that there is a relationship between family history and the incidence of hypertension in the working area of the Olak Kemang Health Center in 2022.

The relationship between obesity status and the incidence of hypertension showed that those with obesity status (81.3%) had more hypertension than respondents with non-obese status (60%). Based on bivariate analysis, a p-value of 0.154 (p > 0.05) was obtained with a PR value of 1.354 (1.004-1.827) which means that there is no relationship between obesity status and the incidence of hypertension in the working area of the Olak Kemang Health Center in 2022.

The relationship between physical activity and the incidence of hypertension showed that those who had mild-moderate physical activity (79.5%) had more hypertension than respondents who had heavy physical activity (51.9%). Based on bivariate analysis, a p-value of 0.008 (p <0.05) was obtained with a PR value of 1.531 (1.127-2.080) which means that there is no relationship between physical activity and the incidence of hypertension in the working area of the Olak Kemang Health Center in 2022.

The relationship between smoking status and the incidence of hypertension shows that smokers (67.7%) have more hypertension than non-smokers (60%). Based on bivariate analysis, a p-value of 0.520 (p > 0.05) was obtained with a PR value of 1.111 (0.808-1.528) which means that there is no relationship between smoking status and the incidence of hypertension in the working area of the Olak Kemang Health Center in 2022.

The relationship between fatty food consumption and incidence shows that respondents with excess fat (86.4%) experienced hypertension more than respondents with good fats (21.9%). Based on bivariate analysis, a p-value of 0.000 (p <0.05) was obtained with a PR value of 3.952 (2.037-7.665).

DISCUSSION

Relationship between Age and Hypertension

The results of the analysis show that the p-value for the age variable is 0.454. The prevalence ratio was 1.301 (95% CI = 0.639 – 2.648) where age ≥ 45 years had a 1.3 times higher risk of developing hypertension compared to age <45 years. However, statistically, it has not been proven to be related, so there is no significant relationship between age and the incidence of hypertension.

The younger you are, the more likely you are to get hypertension. With age, veins lose some of their versatile characteristics, which can add to the increased circulatory pressure. However, children can also suffer from high blood pressure. According to this theory, hypertension generally affects all age groups, so it is not only those aged ≥ 46 years who are at risk. Other causes of each lifestyle factor can also occur because the proportion of the male sex is greater than the female sex who experience hypertension.

The results of this study are also supported by research conducted by Ramawat, Yashawant (2020) obtained p = 0.51, which means that there is no relationship between age and the incidence of hypertension. This is inversely proportional to research conducted by Widjaya, Nita, et al (2018) obtained p = 0.00, which means that there is a significant relationship between age and hypertension.

Relationship between Gender and Hypertension Incidence

The results of the bivariate analysis revealed that the p-value for the sex variable was 0.665 with a Prevalence Ratio of 1.082 (95% CI = 0.790-1.484) where the male sex had a 1.082 times higher risk of developing hypertension compared to the female sex. However, statistically, there has not been a proven relationship, so there is no significant relationship between gender and the incidence of hypertension.

Gender Men have a higher prevalence rate of hypertension than women, but if the age is over 30 years the prevalence of hypertension decreases, while women at the age of 50-59 experience an increase in the occurrence of hypertension due to hormonal changes with age. The results of this study contradict this. In proportion, there are more hypertension sufferers in men aged ≥ 46 years than in women, and in the sex of women aged 50-59 years who experience hypertension is only 39.6%. This strengthens the results of the statistical analysis which shows that there is no relationship between gender and the incidence of hypertension.

This is also the same as research conducted by Nureni, and Eni in 2019 which showed that there was no relationship between gender and the incidence of hypertension with a p-value = 0.972 with a PR value of 1.075 (95% CI = 0.54 – 2.12). However, this study had different results from the research conducted by Nurhasanah and Eti Ardiani (2017) who conducted research at the Sumanda Health Center, Pugung District, Tanggamus Regency, stating that there was a significant relationship between gender and the incidence of hypertension as evidenced by a p-value = 0.004.

Relationship of Family History with Hypertension

Based on the results of the bivariate analysis of family history with the incidence of hypertension that has been carried out, it shows a p-value of 0.004, which means that there is a relationship between family history and the incidence of hypertension. The results of the analysis also obtained PR 0.616, which means that people with a family history are 0.616 times more protective than people who do not have a family history of hypertension (95% CI = 0.479-0.791).

According to the Centers for Disease Control and Prevention (CDC), people with a family history of hypertension may live in an environment full of the same risk factors. This, especially an unhealthy lifestyle, when accompanied by genetic conditions can increase the risk of hypertension. The results of this study are following the theory, most of them have a family history derived from their biological mother (36.3%) which is the closest family and it can be concluded that the family history variable has a relationship with the incidence of hypertension. According to the assumptions of researchers who have no family

history, there are (90.5%) suffer from hypertension, this is due to the habit of the respondents consuming fatty foods, this is also supported by the respondent's job as a housewife who always cooks coconut milk. While some had a family history (55.7%) who did not experience hypertension, this was because some respondents said that they controlled what they consumed as a way to anticipate the occurrence of hypertension.

Research conducted by Kasumayanti, Erma, and Maharani (2021) showed the results obtained by a p-value = 0.000 (<0.05) and a POR value of 0.124, it can be concluded that there is a relationship between family history and the incidence of hypertension. This is inversely proportional to a study conducted by Rambling, Denilay Richardo et al (2021) obtained a p-value = 0.11 with an OR value of 2.40, where this value shows that there is no significant relationship between family history and the incidence of hypertension.

Relationship between Obesity and Hypertension

Based on the results of the bivariate analysis of the obesity variable with the incidence of hypertension that has been carried out, it shows a p-value of 0.154 with a PR of 1.354 (95% CI = 1.004-1.827) where people with obesity have a 1.354 times higher risk of developing hypertension compared to people who are not obese. However, statistically, it has not been proven to be related, so there is no significant relationship between obesity and the incidence of hypertension.

Obesity (overweight) is a condition in which there is an accumulation of excess body fat, fat can trigger the emergence of various diseases in the body. In the results of this study, when viewed based on proportion, hypertension sufferers in the obese group were greater than those in the non-obese group. This strengthens the results of the statistical analysis which shows that there is no relationship between obesity and the incidence of hypertension. However, this is contrary to general theory, in respondents who are not obese and suffer from hypertension, this can be explained as the possible influence of factors outside of physical conditions, such as food consumption and unhealthy lifestyles. Respondents who are obese are more experienced by adults (<46 years) as many as 15 people (36.6%) obesity is more experienced by women, 6 people (50%) and obesity is mostly experienced by people who work as civil servants and 5 people with junior high school education experienced hypertension (71.4%).

The results of this study are supported by the results of a study conducted by Chillo, Pilly et al (2021) which obtained a value of p = 0.281 (> 0.05), which means that there is no relationship between obesity and the incidence of hypertension. The results of this study were inversely proportional to research conducted by Musfirah and A. Nur Hartati (2021) obtained a value of p = 0.003 (<0.05) meaning that there was a significant relationship between obesity and the incidence of hypertension.

The Relationship between Physical Activity and Hypertension

Based on the results of the bivariate analysis of the variable obesity with the incidence of hypertension that has been carried out, it shows a p-value of 0.008 with a PR of 1.531 (95% CI = 1.127-2.080). Based on these results, it means that

statistically there is a relationship between physical activity and the incidence of hypertension and people who do light-moderate physical activity have a 1.531 times higher risk of getting hypertension compared to people who do strenuous physical activity.

Physical activity that is carried out regularly causes changes such as the heart will get stronger in its smooth muscles so that the capacity is large and the beats are strong and regular and the elasticity of the blood vessels will increase due to relaxation so that the accumulated fat will decrease and can increase the muscle contraction of the blood vessel walls covered. In this study, the greater proportion of mild-moderate physical activity (79.5%) was probably because most of the respondents who suffered from hypertension did light physical activity.

The results of this study are supported by research conducted by Waty, and Gerhana (2021) obtained p = 0.028 (<0.05) meaning that there is a significant relationship between physical activity and the incidence of hypertension 25. The results of this study are inversely proportional to the results of research conducted by Maulidina, Fatharani et al (2019) obtained a value of p = 0.197 (> 0.05) with a PR of 1.411 (95% CI 0.859-2.317) which means there is no relationship between physical activity and the incidence of hypertension.

Relationship between Smoking Status and Hypertension

Based on the results of the bivariate analysis of the smoking status variable with the incidence of hypertension that has been carried out, it shows a p-value of 0.520 with a PR of 1.111 (0.808-1.528) where people who smoke are at risk of 1.111 times higher for developing hypertension than people who do not smoke. However, statistically, it has not been proven to be related, so there is no significant relationship between smoking status and the incidence of hypertension.

Smoking was reported to be high in all groups, especially among men. The proportion of smokers with hypertension was greater (66.7%) due to the greater proportion of male respondents, but non-smokers experienced hypertension caused by other supporting factors such as food consumption.

It is associated with a high risk if the respondent smokes ≥15 cigarettes/day and is associated with a low risk if the respondent smokes <15 cigarettes/day. The impact of smoking will be felt after 10-20 years. In this study, most of the smoking duration was > 10 years. So, in this study, it is known that the risk of suffering from hypertension. In addition, more smokers have> 20 cigarettes/day so they are more at risk of developing hypertension.

Research conducted by Musliana and Nuraiza Meutia (2022) obtained a p-value = 0.923, this shows that there is no significant relationship between smoking status and the incidence of hypertension 28. Research conducted by Putra, Nugraha Wismoyo et al (2021) obtained p = 0 .01 which means that there is a significant relationship between smoking status and the incidence of hypertension.

Relationship between Consumption of Fatty Foods and Hypertension

Based on the results of the bivariate analysis of the variable consumption of fatty foods and the incidence of hypertension, the p-value was 0.000 with a PR of 3.952 (95% CI = 2.037-7.665). Based on these results, it means that statistically there is a relationship between the consumption of fatty foods and the incidence of hypertension and people who consume more fatty foods have a 3.9 times higher risk of developing hypertension compared to people who consume good fatty foods.

Fat is one type that is used for dietary needs/reducing weight because of the benefits of this fat to improve taste and improve shape. Too much fat intake makes you gain weight and increases your risk of developing cardiovascular disease. Increased levels of serum cholesterol and Low-Density Lipoprotein (LDL) can lead to atherosclerosis, influenced by the type and amount of consumption of fatty acids, the percentage of energy from fat

In this study, more respondents consumed fatty foods which could be a risk factor for hypertension by the above theory. The results showed that high fat intake was obtained from foodstuffs such as fried foods. Increased levels of triglycerides, total cholesterol, and LDL which come from food sources of fat can generally cause an increase in blood pressure.

Research conducted by Huzaipah, Annisa Amalia et al (2020) obtained a p-value = 0.044 (<0.05), which means there is a relationship between the consumption of fatty foods and the incidence of hypertension. Research conducted by Amalia, Nida, and A'immatul Fauziyah (2021) obtained a p-value = 0.183 (> 0.05), which means there is no relationship between the consumption of fatty foods and the incidence of hypertension.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of these studies showed no relationship between age, gender, obesity, and smoking status. However, there is a relationship between family history, physical activity and consumption of fatty foods. It is hoped that the public will further improve their healthy lifestyle such as abandoning the habit of consuming more fatty foods, bearing in mind these factors are at greatest risk for the incidence of hypertension.

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