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Determinants of Hypertension Occurrence in Women of Reproductive Age (15-49 Years) in the Working Area of the Sungai Tering Community Health Center, East Tanjung Jabung Regency in 2022

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ABSTRACT

The incidence of hypertension is increasing in the world. Many factors cause hypertension both socio-demographic factors, behavior, physical and history of the disease. The purpose of this study was to analyze the determinants of the incidence of hypertension in women of childbearing age (15-49 years) in the Working Area of the Sungai Tering Public Health Center, East Tanjung Jabung Regency in 2022. This study used a cross sectional design. The research variables were age, family history, obesity, physical activity, seafood consumption, and hormonal contraception. Data collection used a questionnaire by conducting interviews, measuring blood pressure, measuring body weight and height. Sampling used Stratified random sampling, 120 samples of women of childbearing age were analyzed using the Cox-Regression test. The proportion of hypertension in the Sungai Tering Health Center working area is 43.35%. Factors associated with the incidence of hypertension in women of childbearing age are family history, physical activity, and consumption of seafood. Factors that are not related are age, obesity, and hormonal contraception. Healthy lifestyle behaviors such as a balanced diet, diligent physical activity, and regular health checks reduce the risk of developing hypertension.

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INTRODUCTION

Hypertension is an important health problem and a challenge that must be faced. The World Health Organization (WHO) estimates that the prevalence of hypertension globally is estimated at 22% of the total world population. Of these figures, it is estimated that only less than one-fifth of sufferers make efforts to control their disease. Hypertension that is not treated can cause several complications to become a risk factor for other chronic diseases such as stroke, heart disease, kidney failure, and diabetes (Kartika & Mirsiyanto, 2021).

Globally, the African region has the highest prevalence of 27% and Southeast Asia is in third place with a disease prevalence of 25% of the total population. It is estimated that 1 in 5 women worldwide suffer from hypertension and this number is greater than the male group, which is 1 in 4 (Ministry of Health RI, 2019). It was found that hypertension affects up to 42.1 million people and from that number Riskesdas data revealed that only 30% of these cases were detected or diagnosed. The other 70% have not been detected in health care facilities. This of course will cause delays in medical services that sufferers get so that it can cause complications, disability, and increase premature death rates in the community (KemenKes RI, 2016).

The high prevalence of female sex has a higher risk of experiencing hypertension. This is caused by an unhealthy lifestyle such as the use of hormonal drugs or consumption of fast food which can cause obesity, use of hormonal contraception, pregnancy, menopause and family history of hypertension can also be risk factors for hypertension in women of childbearing age (Ministry of Health RI, 2013; Situmorang, 2018). Women of childbearing age can be defined as women aged 15 to 49 years who are considered to be of reproductive age because they can still have children. In Indonesia, the prevalence of hypertension in childbearing age (15-49 years) is around 28.2% of the national prevalence.

Based on Riskesdas data for 2018, the prevalence of hypertension in Indonesia was 34.11%. Jambi Province is one of the provinces with a high prevalence of hypertension, which is 28.99%. Districts in Jambi Province that had the highest prevalence of hypertension were Kerinci District with a rate of 37.74%, SungaiFull District 33.92%, and Tanjung Jabung Timur 33.82% (Jambi Province Health Research and Development Agency, 2018). The second highest prevalence of hypertension cases in East Tanjung Jabung Regency is at the Sungai Tering Health Center. Based on data from the Health Profile of East Tanjung Jabung Regency, the percentage of hypertension at the Sungai Tering Health Center is 36.8% (2019), 33.7% (2020), 53.4% (2021).

The high number of cases of hypertension both on a global, national and provincial scale is caused by several factors. Judging from the cause, hypertension is divided into two, namely primary and secondary. Primary hypertension is hypertension that affects about 95% of people but the exact cause is not known. It is estimated that primary hypertension is caused by hereditary factors, increasing age in line with blood pressure, gender where women have a higher risk than men, as well as factors from daily living habits which can be physical activity, excessive salt consumption, consumption of

seafood, obesity, stress, smoking, drinking alcohol, and use of hormonal contraception. Whereas secondary hypertension is caused by a clear consequence, namely the presence of renal artery stenosis (Kartika & Mirsiyanto, 2021), (Maulidina et al., 2019).

This study aims to determine the proportion and analyze the factors associated with the incidence of hypertension in women of childbearing age (15-49 years) which include age, family history, obesity, physical activity, consumption of seafood, and hormonal contraception in the working area of the Puskesmas. Tering River East Tanjung Jabung Regency in 2022.

THEORETICAL REVIEW

Hypertension

Hypertension comes from the Latin hyper and tension. Hyper can be interpreted as excessive pressure and tension can be interpreted as tension. So that hypertension can be defined as a condition where there is a long-term increase in blood pressure which can be painful and ultimately fatal for a person (Ainurrafiq et al., 2019). A blood vessel condition called hypertension can prevent blood from carrying necessary nutrients and oxygen to the body's tissues. Hypertension is a well-known cardiovascular disease that affects a large proportion of the population (Kartika & Mirsiyanto, 2021). According to the 2018 Riskesdas, if a person's measurement results meet the JNC VII criteria and their systolic or diastolic pressure is 140 mmHg or 90 mmHg, they are considered to have hypertension (Ministry of Health RI, 2018).

Hypertension Classification

To be able to diagnose hypertension, it is necessary to have at least two blood measurements with an interval of 1 week. Hypertension according to JNC 7 is an increase in systolic blood pressure > 120 mmHg and an increase in diastolic blood pressure > 80 mmHg (U.S. Department Of Health And Human Services, 2004). Classification of hypertension based on the severity of the disease, as shown in Table 1 below.

Table 1. Classification of Hypertension According to JNC 7

Category	TDS (mmHg)		TDD (mmHg)
Normal	< 120	Dan	< 80
Pre-hypertension	120 – 139	Atau	80 – 89
Level hypertension 1	140 – 159	Atau	90 – 99
Level hypertension 2	> 160	Atau	> 100
Isolated systolic hypertension	> 140	Dan	> 90

Source: Joint National Commite on Prevention Detection, Evaluation, and Treatment or High Pressure VII/JNC – VII 2004

METODOLOGI

This study used an analytic cross sectional research design. The population in this study were all women of childbearing age in the Working Area of the Sungai Tering Health Center with the research sample being women of childbearing age in the working area of the Sungai Tering Health Center who met the inclusion and exclusion criteria of 120 samples. In this study, the sampling was distinguished based on the location of the sample consisting of 44 respondents in Sungai Tering Village, 24 respondents in Pemusiran Village, 25 respondents in Teluk Kijing Village, and 27 respondents in Sungai Raya Village. Data analysis was performed bivariately using Chi-Square and multivariately using Cox-Regression.

RESULTS

Table 2. Relationship of Determinants of Hypertension in Women Childbearing Age in the Working Area of the Sungai Tering Health Center

Variabel	Hipertension				Total		PR	95% CI	P-value
	Yes		No						
	n	%	n	%	n	%			
Age									
≥ 35 Years	44	53,7	38	46,3	82	100	2,549	1,334-4,871	0,002
< 35 Years	8	21,1	30	78,9	38	100			
Family History									
There	39	73,6	14	26,4	53	100	3,792	2,268-6,341	0,000
Nothing	13	19,4	54	80,6	67	100			
Obesitas									
Yes	26	61,9	16	38,1	42	100	1,857	1,253-2,752	0,005
No	16	33,3	52	66,7	78	100			
Physical Activity									
Currently	24	72,7	9	27,3	33	100	2,260	1,561-3,271	0,000
Heavy	28	32,2	59	67,8	87	100			
Consumption of Seafood Lots Less-Moderate	42	58,3	30	41,7	72	100	2,800	1,560-5,026	0,000
	10	20,8	38	79,2	48	100			
Hormonal Contraception									
Yes	46	43,0	61	57,0	107	100	0,931	0,498-1,743	1,000
No	6	46,2	7	53,8	13	100			

Source : *Primary data processed, 2022*

Based on Table 3 it can be seen that the proportion of hypertension is greater in respondents aged ≥ 35 years (53.7%) compared to respondents aged <35 years (21.1%). The results of the chi-square statistical test obtained a value (P = 0.002, PR = 2.549, 95% CI: 1.334-4.871), meaning that there is a significant relationship between age and the incidence of hypertension in the working area of the Sungai Tering Health Center, Tanjung Jabung Timur Regency. Someone aged ≥ 35 years has a risk of 2,549 times suffering from hypertension compared to those aged <35 years.

In the family history variable, it can be seen that the proportion of hypertension is greater in respondents who have a family history (73.6%) compared to those who do not have a family history (19.4%). The results of the chi-square statistical test obtained a value (P = 0.000, PR = 3.792, 95% CI: 2.268-6.341), meaning that there is a significant relationship between family history and the incidence of hypertension in the working area of the Sungai Tering Health Center, Tanjung Jabung Timur Regency. Respondents who have a family history are at risk of 3.792 times suffering from hypertension compared to those who do not have a family history.

In the obesity variable, it can be seen that the proportion of hypertension is greater in respondents who are obese (61.9%) compared to those who are not obese (33.3%). The results of the chi-square statistical test obtained a value (P = 0.005, PR = 1.857, 95% CI: 1.253-2.752), meaning that there is a significant relationship between obesity and the incidence of hypertension in the working area of the Sungai Tering Health Center, Tanjung Jabung Timur Regency. Respondents who are obese are at risk of 1.857 times suffering from hypertension compared to those who are not obese.

In the physical activity variable, it can be seen that the proportion of hypertension is greater in respondents with moderate physical activity (72.7%) compared to those with strenuous physical activity (32.2%). The results of the chi-square statistical test obtained a value (P = 0.000, PR = 2.260, 95% CI: 1.561-3.271), meaning that there is a significant relationship between physical activity and the incidence of hypertension in the working area of the Sungai Tering Health Center, Tanjung Jabung Timur Regency. Respondents who have moderate physical activity are at risk of 2,260 times suffering from hypertension compared to those who have strenuous physical activity.

In the seafood consumption variable, it can be seen that the proportion of hypertension is greater in respondents who consume seafood in the high category (72.7%) compared to respondents who consume seafood in the less-moderate category (20.8%). The results of the chi-square statistical test obtained values (P = 0.000, PR = 2.800, 95% CI: 1.560-5.026), meaning that there is a significant relationship between seafood consumption and the incidence of

hypertension in the working area of the Sungai Tering Public Health Center, Tanjung Jabung Timur Regency. Respondents who consumed seafood in the high category had a 2,800 times risk of suffering from hypertension compared to those who consumed seafood in the less-moderate category.

Regarding the hormonal contraception variable, it can be seen that the proportion of hypertension was greater in respondents who did not use hormonal contraception (46.2%) compared to those who used hormonal contraception (43.0%). The results of the chi-square test statistic obtained a value (P = 1.000, PR = 0.931, 95% CI: 0.498-1.743), meaning that there was no significant relationship between the use of hormonal contraception and the incidence of hypertension in the working area of the Sungai Tering Public Health Center, Tanjung Jabung Timur Regency.

Table 3. Multivariate Analysis of Determinants of Hypertension in Women Childbearing Age in the Working Area of the Sungai Tering Health Center

Variabel	p value	aPR	95% CI	
			Lower	Upper
Family History	0,001	2,933	1,531	5,620
Physical Activity	0,011	2,062	1,178	3,610
Consumption of Seafood	0,037	1,826	1,037	3,216

Source : *Processed Primary Data, 2022*

Based on table 4 it is known that the factors of family history (aPR = 2.933; 95% CI: 1.531 to 5.620), physical activity (aPR = 2.062; 95% CI: 1.178 to 3.610), and consumption of seafood (aPR = 1.826; 95% CI : 1.037 to 3.216) proved to be significantly related and a risk factor for the incidence of hypertension in WUS in the Sungai Tering Health Center work area. Based on the results of multivariate analysis using Cox regression, it is also known that the most dominant factor influencing hypertension in WUS is family history. Women of childbearing age who have a family history of hypertension have a 3 times higher risk of experiencing hypertension compared to WUS who do not have a family history of hypertension, after controlling for physical activity and seafood consumption.

DISCUSSION

Family History

The results of the study found that there was a significant relationship between family history and the incidence of hypertension in the working area of the Sungai Tering Health Center. From the results of the multivariate analysis, it was found that family history was the most dominant risk factor influencing the incidence of hypertension in WUS. Women of childbearing age who have a family history of hypertension have a 2.93 times higher risk of experiencing hypertension than those who do not have a family history of hypertension, after controlling for physical activity and seafood consumption variables.

This is in line with research conducted by Lawalata (2021) which showed a relationship between the incidence of hypertension and genetics with a p-value = 0.03 (p≤0.05) OR=4.046 meaning that respondents who have a family history of hypertension have a 4.046 chance times to get hypertension (95% CI = 1.203-13.613). Based on research conducted by Cuffee et al., (2022) also found that family history had an effect on the incidence of hypertension (AOR = 4.5, 95% CI: 1.70-11.76) Research conducted by Ondimu et al., (2019) also showed that a person with a BMI≥25 was 3.05 times more likely to suffer from hypertension (OR: 3.05, 95% CI 1.26, 7.40; p=0.014).

Based on the results of the study, it was found that there was a significant relationship between family history and the incidence of hypertension. In this study it was found that the proportion of respondents who had a family history of hypertension was 44.2% with family ties from parents (32.5%) and from grandparents (11.7%). Of these, 73.6% had hypertension. According to Mendel's Law, hypertension can be caused by a single inherited genetic mutation. This is in line with the theory that hypertension tends to be a hereditary disease, if both of our parents have hypertension then there is a 60% chance that we will get the disease (Maulidina et al., 2019). Parents with high blood pressure increase a person's risk of developing high blood pressure two times compared to people who have no family history of this condition (Muhamad Ridwan, 2017).

Physical Activity

The results of the study found that there was a significant relationship between physical activity variables and the incidence of hypertension in the working area of the Sungai Tering Health Center, from the results of the multivariate analysis it was found that moderate physical activity had a risk of 2.06 times the incidence of hypertension in the Sungai Tering Health Center work area. This research is in line with research conducted by Rihiantoro & Widodo (2018) which showed that light physical activity has a risk of suffering from hypertension by 2.26 times compared to those who do moderate and heavy physical activity. Based on research conducted by Zou et al., (2021) physical activity can reduce the risk of hypertension by 8% mild, moderate 28%, and severe 30% respectively. Physical activity in women can lower blood pressure and reduce the risk of hypertension caused by hormones possessed by women, this is inversely proportional to men. The results of a study conducted by Macdonald et al., (2020) which was conducted on women aged (40-65 years) also showed the same results that physical activity in the high category had a significant relationship with reducing the risk of hypertension but low activity had no results effective in reducing the risk of hypertension.

Physical activity greatly affects the stability of blood pressure. In people who are not actively doing activities tend to have a higher heart rate frequency. This causes the heart muscle to work harder with each contraction. The harder the heart muscle is in pumping blood, the greater the pressure on the arterial walls so that the peripheral resistance causes an increase in blood pressure. Lack of physical activity can also increase the risk of being overweight which will increase the risk of hypertension (R. A. Harahap et al., 2018).

Consumption of Seafood

The results of the study found that there was a significant relationship between the variables of seafood consumption and the incidence of hypertension in the working area of the Sungai Tering Health Center, from the results of the multivariate analysis it was found that seafood consumption had a risk of 1.83 times the incidence of hypertension in the Sungai Tering Health Center work area. This research is in line with the research of Cahyani et al., (2019) which found a significant relationship between seafood consumption and the incidence of hypertension in coastal communities in the working area of the Mangkang Health Center, Semarang City. This is also supported by previous research by Masengi et al., (2013) which showed that there was a significant relationship between seafood consumption and the incidence of hypertension (p=0.001). Research conducted by Rusliafa, et al (2014) in H. S. Harahap et al., (2022) shows that hypertension is more common in coastal communities. This is due to the high consumption of sodium in salted processed seafood.

The high prevalence of hypertension in the population in coastal areas in theory cannot be separated from the high daily sodium intake of the population, both through food products from seafood, for example sea fish, which contain high levels of salt and through the use of salt in food processing for human needs. daily. This is in line with research conducted by Demmalewa & Abadi (2022) which states that food consumption patterns in society are influenced by the environment where they live, especially for people who live in coastal areas, they often consume seafood. One of the risk factors for hypertension is fat content in the body as it is stated that hypercholesterolemia is a risk factor for hypertension. Meanwhile, the cholesterol content of fresh water fish tissue is generally lower than that of sea fish. High consumption of seafood and hypercholesterolemia play a role in predisposing to hypertension, especially in coastal areas. The habit of consuming large amounts of salt and cholesterol in coastal communities is a tendency for the development of high blood pressure in coastal areas.

Age

The results of the study found that there was no significant relationship between the age variable and the incidence of hypertension in the Sungai Tering Health Center work area, from the results of the multivariate analysis it was found that the age variable was not a risk factor for the incidence of hypertension in the Sungai Tering Health Center work area. This study is in line with research by Utara et al., (2023) which showed that there was no relationship between age and the incidence of hypertension. This study is not in line with this theory which based on the statistical test results obtained a p-value of 0.837 and a significance value of > 0.05 and is in line with research conducted by Ruqaiyah, (2018) that there is no relationship between maternal age and the incidence of hypertension in pregnant women at Haji Makassar Hospital in 2018. This is also supported by research which shows no significant relationship between age ≥35 years and the incidence of hypertension with a p-value of 0.549.

The results of this study are not in line with Yuniarti and Rosyada (2021) who found in their research results that there is a relationship between age and the incidence of hypertension with a p-value of 0.000 and a PR value of 2.226 (95% CI: 2.065 – 2.399), which means that people aged ≥ 35 years have 2.226 times the risk of developing hypertension compared to <35 years. This is also in line with research conducted by Kiber et al., (2019) which showed that increasing age had a 3.31 times greater likelihood of experiencing hypertension (AOR 3.31, CI 1.00, 10.99). In this study, this was possible because a relatively older age is more likely to be affected by non-communicable diseases, including the possibility of developing hypertension among hypertensive women. Research conducted by Rezaianzadeh et al., (2021) also showed that there was a relationship between age and the incidence of hypertension in Khrameh (OR = 1.03, p <0.001).

Age is a risk factor for hypertension that cannot be changed. In old age inflammation will be difficult to overcome. This is related to increased concentrations of interleukin-6 (IL-6), C-reactive protein (CRP), and tumor necrosis factor alpha (TNF-α) which can increase the risk of cardiovascular disease (Ramona et al., n.d.). As a person ages, a person's blood pressure will also increase, due to natural changes in the body that affect the elasticity of the blood vessels decreases and decreases the body's resistance.).

Obesity

The results of the study found that there was no significant relationship between the obesity variable and the incidence of hypertension in the Sungai Tering Health Center work area. The results of the multivariate analysis found that the obesity variable was not a risk factor for the incidence of hypertension in the Sungai Tering Health Center work area. This is in line with the study of Arifin et al., (2016) which showed that there was no significant relationship between obesity and the incidence of hypertension and was supported by Khotimah et al., (2021) which showed that there was no significant relationship between obesity status and risk hypertension with a p-value = 0.575 (p-value ≥ 0.05).

This study is not in line with the research of Maulidina et al (2019) which showed that there was a relationship between obesity and the incidence of hypertension (p-value = 0.003) and it was found that someone who was obese had a 1.820 times greater risk of developing hypertension than someone who was not obese. The same study also conducted in Southwest China showed that nearly 40% of hypertensive patients had obesity-related hypertension (Zhang et al., 2019). The results of other studies also show that obesity is very closely related to the incidence of hypertension which is a study conducted on adults in Debre Markos Town, Northwest Ethiopia which shows that people who are obese are at almost five times more risk than those who are not obese (Kiber et al., 2019).

Being overweight increases heart rate and insulin levels in the blood. Obesity can directly result in increased cardiac output. This is because the greater the body mass, the greater the amount of circulating blood and this causes cardiac output to increase. Meanwhile, indirectly, obesity occurs through

stimulation of the activity of the sympathetic nervous system and the Renin Angiotensin Aldosterone System (RAAS) by mediators such as cytokines, hormones and adipokines. The hormone aldosterone is one that is closely related to water and sodium retention which can increase blood volume (Tiara, 2020).

Weight loss is the most important element in the prevention and treatment of hypertension. Hypertensive patients are encouraged to lose weight if they are obese and this will have an effect on reducing blood pressure. Losing weight is expected to reduce blood pressure, because the work of the heart to pump blood can decrease (Putri et al., 2021).

Hormonal Contraception

The results of the study found that there was no significant relationship between hormonal contraceptive variables and the incidence of hypertension in the Sungai Tering Health Center work area. The results of the multivariate analysis found that hormonal contraceptive variables were not a risk factor for the incidence of hypertension in the Sungai Tering Health Center work area. This is in line with research conducted by (Norlita et al., 2018) which showed that there was no significant relationship between the use of injectable contraceptives and blood pressure in injecting family planning acceptors at the Harapan Raya Health Center in Pekanbaru. In the study (Setyorini et al., 2022) also showed the use of injectable contraception was not associated with an increase in blood pressure.

However, research conducted by Widyaningsih & Isfaizah (2019) showed different results, it was found that there was a relationship between the use of injectable contraceptives and systolic blood pressure. Research conducted by Hutasoit & Azwar (2019) also showed that the results of the Chi-square test obtained a p-value of 0.045, meaning that there is a relationship between the use of hormonal contraception and increased blood pressure. The use of hormonal contraception is also at risk of increasing blood pressure 5 times compared to non-hormonal contraception.

The theory presented by Bustan (2007) is that the estrogen content in hormonal contraceptives affects blood vessels resulting in arteriolar hypertrophy and vasoconstriction. Estrogen also affects the Renin-Aldosterone-Angiostenin system resulting in changes in fluid and electrolyte balance. Estrogen is a hormone that can increase kidney electrolyte retention, resulting in increased reabsorption of sodium and water which causes hypervolemia so that cardiac output increases and results in increased blood pressure (Widyaningsih & Isfaizah, 2019).

Based on research conducted by Chrisandra and Alexis (2020) it is said that choosing hormonal contraceptives for women can increase the risk of developing hypertension. This is because hypertension can be a relative contraindication. Therefore, the choice of hormonal contraception must be adjusted to the patient's age and level of hypertension (Shufelt & Levee, 2020). This is also supported by the research of Gunaratne et al., (2021) which said hormonal contraception can cause an average increase in systolic blood

pressure by 4mm Hg, diastolic blood pressure by 1mm Hg and increase in average arterial pressure.

CONCLUSION AND SUGGESTION

Based on the results of the research and discussion, the following conclusions can be drawn: (1) The proportion of hypertension in women of childbearing age in the working area of the Sungai Tering Health Center is 43.35%, (2) There is a relationship between family history, physical activity, and consumption of seafood with the incidence of hypertension in women of childbearing age in the working area of the Sungai Tering Health Center in 2022. There is no relationship between age, obesity, and hormonal contraception with the incidence of hypertension in women of childbearing age in the working area of the Sungai Tering Health Center in 2022.

Based on the above conclusions, the suggestions from this study are: (1) It is hoped that the Sungai Tering Health Center will be more aggressive in optimizing posbindu activities in their working area and conducting outreach or to prevent hypertension by adopting a healthy lifestyle, (2) It is hoped that the community can control their lifestyle a healthier life and can balance consumption patterns with daily physical activities.

FURTHER STUDY

The researcher realizes that this research still has shortcomings due to the limitations of the research it faces. The limitations of this study are that this research was only examined at one time so that the conditions before and after the research was carried out could not be observed. This study also only examined 120 samples from all women of childbearing age with several limited variables. Therefore, it is hoped that future researchers will conduct more in-depth research on the factors associated with hypertension in women of childbearing age by examining other variables such as smoking, alcohol consumption, sodium and fat consumption, as well as stress variables that cause hypertension.

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