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Incidence of Hypertension of 30-50 Years Old in the Salatiga City Health Center

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Article Info

Abstract

The prevalence of hypertension in Indonesia based on measurement of blood pressure at age ≥18 years was 7.5% in 2007, an increase in 2013 by 9.5% and an increase again in 2016 by 30,9%. The purpose of this study was to analyze the factors that influence the incidence of hypertension at the age of 30-50 years at the Salatiga City Health Center. The study design in this research is case control. The population in this study were people aged 30-50 years in the working area of Puskesmas Kota Salatiga, namely Puskesmas Cebongan, Puskesmas Kalicacing and Puskesmas Sidorejo Lor. The sample consisted of 35 cases group, 35 control group as well. The sampling method used purposive sampling technique. The instrument used was a questionnaire containing questions on gender, exercise habits, stress levels / DASS questionnaires, BMI, genetic history and a tool to measure the respondent's blood pressure, namely the mercury spignomanometer. Data analysis used chi-square and logistic regression. There was no effect between sex on the incidence of hypertension ($p = 0.633$; $OR = 0.709$). There was an influence between genetic history ($p = 0.017$; $OR = 11.769$), smoking status ($p = 0.036$; $OR = 4.889$), obesity ($p = 0.049$; $OR = 5.717$), alcohol consumption ($p = 0.025$; $OR = 0.453$), salt consumption ($p = 0.017$; $OR = 4.500$) stress levels ($p = 0.026$; $OR = 4.580$), exercise habits ($p = 0.020$; $OR = 0.246$) the incidence of hypertension. The factors that most influenced the incidence of hypertension were exercise habits ($p = 0.018$; $OR = 5.006$), stress levels ($p = 0.053$; $OR = 0.251$), and salt consumption ($p = 0.035$; $OR = 0.239$).

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INTRODUCTION

Hypertension is an increase in systolic blood pressure of more than 140 mmHg and diastolic blood pressure of more than 90 mmHg at two measurements at an interval of five minutes in a state of rest / calm (Kemenkes RI, 2013). Hypertension is often referred to as the silent disease, or sufferers do not know that they have hypertension before checking their blood pressure. This disease is also known as the heterogeneous group of disease because it can affect all age groups (Divine, 2012).

Hypertension cannot be cured and is closely related to a decrease in life expectancy (Fitrianto, Azmi, & Kadri, 2014). Hypertension has increased from year to year. Not only in Indonesia, but also in the world. As many as 1 billion people in the world or 1 in 4 adults suffer from this disease. In fact, it is estimated that the number of people with hypertension will increase to 1.6 billion by 2025. Less than 10-30% of the adult population in almost all countries has hypertension, and around 50-60% of the adult population can be categorized as the main major whose health status will be higher. good if the blood pressure can be controlled (Adib, 2009). The high incidence of hypertension in the world is influenced by two types of factors, namely those that cannot be changed such as age, gender, race (Sartik et al., 2017). Factors that can be changed include obesity, alcohol consumption, lack of exercise, excessive salt consumption and smoking habits (Gita, Demi, & Lestari, 2015).

World Health Organization (WHO) said the number of hypertension sufferers will continue to increase in line with the increasing population in 2015, it is estimated that in the coming years around 29% of the world's population will be affected by hypertension. WHO states that developing economies have hypertension sufferers as much as 40%, while developed countries only 35%, the African region holds the top position for hypertension sufferers, which is 40%. America region by 35% and Southeast Asia 36%. Asia region this disease has killed 1.5 million people every year. This indicates that one in three people suffer from hypertension. In Indonesia it is quite high, reaching 32% of the total population (Widiyani, 2013).

The prevalence of hypertension in Indonesia based on measurement of blood pressure at ≥18 years of age was 7.5% in 2007, increased in 2013 by 9.5% and increased again in 2016 by 30.9% (Kemenkes RI, 2016). Based on the recapitulation of data on new cases of Non-Communicable Diseases (NCD) as a whole in Central Java from 2016-2017 there was an increase, namely in 2016 as many as 943.927 cases and an increase in 2017 as many as 1.593.931 cases. Hypertension still occupies the largest proportion of all PTM and has increased from 2016-2018, namely in 2016 as much as 60,00% and in 2017 as much as 64,83% and in 2018 it was obtained from January-June (Quarter 2) as many as 55,8 %. The highest percentage of hypertension is Salatiga City (77.72%) (Dinkes Jateng, 2018).

According to (Bustan, 2015) Risk factors that can affect the incidence of hypertension include: age, race / ethnicity, geography, gender, obesity, stress, a high salt diet, alcohol, smoking, coffee consumption, and use of birth control pills. In Indonesia, hypertension is still a health problem. This disease not only affects the elderly but also affects the productive age group. The worst impact hypertension is death where currently hypertension is estimated to cause 7.5 billion deaths or 12.8% of all deaths (WHO, 2014). A 2012 study also showed that complications due to hypertension cause 9.4 billion deaths worldwide each year. In Southeast Asia hypertension causes 1.3 billion deaths every year (Ikeda et al., 2014).

Based on a preliminary study conducted by researchers at the Salatiga City Health Center, interviews conducted by 10 hypertensive sufferers on how to ask questions, found that 7 out of 10 hypertension sufferers had a history of hypertension (genetic), had an unhealthy lifestyle such as lack of exercise, weight body overload and psychological problems. Based on the above phenomena, the number of cases of hypertension in the people of Salatiga city is caused by gender, family history of disease / heredity, psychological

problems, being overweight and sports habits that are not applied which cause hypertension.

This study aims to analyze the effect of gender, genetic / hereditary history, smoking status, obesity / overweight, alcohol consumption, salt consumption, stress levels, and exercise habits on hypertension in the Salatiga City community.

METHOD

The type of research used is quantitative research, namely analytic observational research on the type of case control or case control research, namely a study of how to compare between the event group and the control group based on their exposure status (retrospective), the direction of the investigation, the design moves from effect (disease) to cause (exposure) (Sudigdo, 2011). The population in this study were people aged 30-50

years who were recorded in the working area of Puskesmas Kota Salatiga, namely Puskesmas Cebongan, Puskesmas Kalicacing and Puskesmas Sidorejo Lor. The number of samples in this study were 70 samples. The sampling technique used in this study was purposive sampling, the sampling was based on a certain consideration, namely residents who live in the working area of the Salatiga City Health Center, namely Cebongan Health Center, Kalicacing Health Center and Sidorejo Lor Health Center. The instrument used in this study was a questionnaire containing questions on gender, exercise habits, stress level / DASS questionnaire, BMI, genetic history and a tool to measure the respondent's blood pressure, namely the mercury spignomanometer. Data analysis used chi-square and logistic regression.

RESULTS AND DISCUSSION

Table 1. Frequency distribution of Hypertension, gender, genetic / hereditary history, smoking status, obesity / overweight, alcohol consumption, salt consumption, stress levels, and exercise habits

Variable	N (n=70)	%
Sex		
Female	35	50
Male	35	50
Genetic		
No	60	85.7
Yes	10	14.3
Smoking Status		
No	56	80
Yes	14	20
Obesity		
No	59	84.3
Yes	11	15.7
Consumption of alcohol		
No	64	91.4
Yes	6	8.6
Salt consumptiom		
Normal	50	71.4
High	20	28,6
Stress level		
Low	53	75.7
High	17	24,3
Exercise habits		
No	48	68.6
Yes	22	31.4
Hypertensiom		

No	35	50
Yes	35	50

Based on table 1, it is known that the number of respondents in this study has the same ratio between hypertension and non-hypertension, namely 1: 1 with the number of each case and control group of 35 respondent.

Based on the research data in the field, it was found that the sex results at the age of 30-50 years at the Salatiga City Health Center were 35 women (50.0%) and men as many as 35 respondents (50.0%). Most of the 30-50 year olds at the Salatiga City Health Center do not have a genetic history / hereditary hypertension as many as 35 respondents (60.0%) and 10 respondents (14.3%) have a genetic history / hereditary hypertension. Most of the 30-50 year olds in the Salatiga City Health Center did not smoke as many as 56 respondents (80.0%) and heavy smoking were 14 respondents (20.0%). Most of the 30-50 year olds in the Salatiga City Public Health Center were not obese / overweight as many as 59 respondents (84.3%) and Obesity / overweight were 11 respondents (15.7%). Most of the 30-50 year olds in the Salatiga City Health Center did not consume alcohol as much as 64 respondents (91.4%) and consumed alcohol as much as 6 respondents (8.6%). Most of the salt consumption aged 30-50 years at the Puskesmas in Salatiga City are normal as many as 50 respondents (71.43%) and high as many as 20 respondents (28.6%). The stress level of most of the 30-50 year olds at the Salatiga City Health Center was mild as many as 53 respondents (75.7%) and severe as many as 17 respondents (24.3%). Most of the sports habits aged 30-50 years at the Salatiga City Health Center were heavy as many as 48 respondents (68.6%) and light as many as 22 respondents (31.4%).

Table 2. Bivariate Analysis of Factors Influencing the Incidence of Hypertension at the Age of 30-50 Years at the Salatiga City Health Center

No	Variable	Category	Hypertension						P value	OR 95%CI
			No		Yes		Total			
			n	%	N	%	N	%		
1	Sex	Female	16	22.9	19	27.1	35	50.0	0.633	0.709
		Male	19	27.1	16	22.9	35	50.0		(0.277-1.816)
2	Genetic	No	34	48.6	26	37.1	60	85.7	0.017	11.769(1.40-
		Yes	1	1.4	9	12.9	10	14.3		98.853)
3	Smoking Status	No	32	45.7	24	34.3	56	80.0	0.036	4.889(1.228-
		Yes	3	4.3	11	15.7	14	20.0		19.471)
4	Obesity	No	33	47.1	26	37.1	59	84.3	0.049	5.712(1.135-
		Yes	2	2.9	9	12.9	11	15.7		28.748)
5	Consumption of alcohol	No	35	50.0	29	41.4	64	91.4	0.025	0.453(0.346-
		Yes	0	0.0	6	8.6	6	8.6		0,593)
6	Salt consumption	Normal	30	42.9	20	28.6	50	71.4	0.017	4.500(1.411-
		High	5	7.1	15	21.4	20	28.6		14.348)
7	Stress level	Low	31	44.3	22	31.4	53	75.7	0.026	4.580(1.316-
		High	4	5.7	13	18.6	17	24.3		15.932)
8	Excersise habits	No	19	27.1	29	41.4	48	68.6	0.020	0.246(0.082-
		Yes	16	22.9	6	8,6	22	31.4		0.740)

Based on table 2 above, based on the results of calculations using the chi square test, it shows that there is no significant effect between sexes on the incidence of hypertension at the age of 30-50 years at the Salatiga City Health Center (p value = 0.633> 0.05). The results of the analysis obtained that the OR value = 0.709, meaning that male respondents did not have a risk of 0.709 times experiencing hypertension compared to female patien.

The prevalence of hypertension in men and women is the same, but premenopausal women (before menopause) is lower than men of the same age. Women who have not menopause are protected by the hormone estrogen which plays a role in increasing the levels of High Density Lipoprotein (HDL). High HDL cholesterol levels are a protective factor in preventing the atherosclerosis process which can lead to hypertension. After menopause women tend to experience a higher increase in blood pressure than men, this is because the hormone estrogen, which plays a role in increasing HDL, has decreased (Ahmad & Oparil, 2017).

There is a significant effect between genetic on the incidence of hypertension at the age of 30-50 years at the Salatiga City Health Center (p value = 0.017 <0.05). The results of the analysis showed that the OR = 11.769, meaning that respondents who had a genetic history / hereditary hypertension had 11.769 times the risk of developing hypertension compared to those without a genetic.

The existence of a genetic / hereditary history factor in a particular family will put that family at risk of suffering from hypertension (Agustina & Raharjo, 2015). Based on research (Sri Agustina, Siska Mayang Sari, 2016) shows that there is an influence between genetic / hereditary history factors on hypertension p-value ≤0.05. In addition, genetic / hereditary history factors can also be related to the metabolism of salt regulation (NaCl) and cell membrane renin (Sari, 2017).

There is a significant effect between smoking status on the incidence of hypertension at the age of 30-50 years at the Salatiga City Health Center (p value = 0.036 <0.05). The results of the analysis

obtained an OR = 4.889, meaning that respondents who have a smoking habit have a risk of 4.889 times experiencing hypertension compared to those who do not have a smoking habit..

Smoking is also linked to hypertension. Toxic chemicals such as nicotine and carbon monoxide that are inhaled through cigarettes will enter the blood circulation and damage the endothelial lining of arteries, causing atherosclerosis and high blood pressure. In autopsy studies, it is proven that there is a close relationship between smoking and the artereoskerosis process in all blood vessels. Smoking in people with high blood pressure increases the risk of damage to arteries (Kemenkes, 2013).

This powerful hormone constricts blood vessels and forces the heart to work harder due to higher pressure. In addition, the carbon monoxide in cigarette smoke replaces oxygen in the blood. This results in blood pressure because the heart is forced to pump to get enough oxygen to the organs and tissues of the body (Anggara & Priyatno, 2013)

Based on the results of a case control study conducted at the Baturiti II Health Center on the effect of smoking on the incidence of hypertension, men aged 40 years and over have a greater risk of suffering from hypertension than light smokers / non-smokers to suffer from hypertension (Astiari, 2016).

Apart from duration, greatest smoking risk depends on the number of cigarettes smoked per day. A person with more than one pack of cigarettes a day is twice as susceptible to hypertension than those who do not smoke (Price, 2012). Theoretically, some of the chemicals in smokers are cumulative, one day the dose of poison will reach the point of toxins so that the symptoms appear, so heavy smokers will feel the impact faster than light smokers (Widya, 2012).

There is a significant effect between obesity / overweight on the incidence of hypertension at the age of 30-50 years at the Salatiga City Health Center (p value = 0.049 <0.05). The results of the analysis showed that the OR value = 5.712, meaning that respondents who are obese / overweight have a risk of 5.712 times experiencing hypertension compared to those who are not obese / overweight.

Obesity / overweight is a state of accumulation of excess fat in the body. Obesity / overweight can be determined by calculating the Body Mass Index (BMI). BMI is the ratio of body weight in kilograms to height in meters squared. BMI measurements are usually performed on adults aged 18 years and over. Obesity / overweight can lead to hypertension due to disruption of blood flow and can cause hypertension (Ebsaim, 2019 & Nugroho, 2019). In this case, an obese person usually has increased levels of fat in the blood (hyperlipidemia) so that it has the potential to cause narrowing of blood vessels (atherosclerosis) (Sari, 2017 & Arum, 2019).

Muhadi (2016) in JNC8: Evedence-based Guide line Management of Adult Hypertensive Patients states that weight loss can reduce systolic blood pressure by 5-20 mmHg / 10 kg loss. for that, it is important for people with hypertension to avoid fatty foods, adopt high-fiber foods, and exercise regularly (Muhadi, 2016). Obesity can also be avoided by limiting food intake in a day. This can be done by first calculating the ideal body weight and daily energy needs (Israfil, 2018). Nurses have a role in changing the sick behavior of people with hypertension (Damayantie, 2018).

There is a significant influence between alcohol consumption on the incidence of hypertension at the age of 30-50 years at the Salatiga City Health Center (p value = 0.025 <0.05). The results of the analysis obtained an OR value = 0.453, meaning that respondents who consume alcohol have a risk of 0.453 times experiencing hypertension compared to those who do not consume alcohol.

Alcohol is also known to be a risk factor for hypertension. This is thought to be due to an increase in cortisol levels, an increase in red blood cell volume, and blood viscosity which resulted in an increase in blood pressure. Several studies have shown a direct influence between blood pressure and alcohol intake, and among them report that the effect on blood pressure only appears when consuming about 2-3 standard sized glasses of alcohol per day (Sari, 2017).

Alcohol or ethanol if taken by mouth in large quantities can increase blood pressure. It can happen because alcohol stimulates the release of epinephrine or adrenaline, which makes arteries shrink and causes water and sodium buildup (Alfiana, 2014). In addition, water and sodium accumulation that causes hypertension occurs due to kidney damage. If there is kidney damage, especially in the cortex, it will stimulate the production of renin by the kidneys which can stimulate an increase in blood pressure. When the kidneys are damaged, the water and salt excretion will be disturbed. This results in the contents of the cavity of the blood vessels increasing due to the accumulation of water and sodium which causes hypertension (Litaay & Bellytra, 2016).

The results of research by Montol, Ana (2015) This obtained a significant effect of alcohol consumption habits on the incidence of hypertension (p = 0.006), where the data obtained from the sample who experienced hypertension consumed more alcohol, namely from 47 samples, 35 of them (74.5%) had the habit of consuming alcohol. The average sample for the first time consuming alcohol was at the age of 18 years against the frequency of consumption of 2 times a week as much as 2 shots per drink. The types of drinks that are most often consumed are rat stamp and dark beer. Alcohol can raise blood pressure, weaken the heart, coagulate blood and cause spasm of the arteries. Meanwhile, caffeine is known to make the heart race faster so that more blood flows every second. However, in this case, caffeine has a different reaction for each person (Sari, 2017).

The results of other studies show that hypertension is related to the incidence of CHD where respondents who suffer from hypertension are more at risk of suffering from CHD 2,667 times than those who do not suffer from hypertension (Amisi et al., 2018).

There is a significant effect between salt consumption on the incidence of hypertension at the age of 30-50 years at the Salatiga City Health Center (p value = 0.017 <0.05). The result of the analysis showed that OR = 4,500, meaning that respondents who consumed excessive salt had 4,500 times the risk of developing hypertension compared to those who did not consume excessive salt.

Salt is a very important factor in the pathogenesis of hypertension. The effect of intake

on the emergence of hypertension occurs through an increase in plasma volume, cardiac output, and blood pressure (Yulistiana, 2017). What is meant by salt is sodium salt as found in table salt (NaCl), baking soda (NaHCO3), baking powder, sodium benzoate, and MSG (mono sodium glutamate). Under normal circumstances, the amount of sodium excreted by the body through urine must be the same as the amount consumed, so that it can balance (Almatsier S, 2010).

Salt causes fluid buildup in the body, because it draws fluid outside the cells so it doesn't get out, which increases blood volume and pressure. In humans who consume 3 grams of salt or less, they have a low average blood pressure, while 7-8 grams of salt intake has a higher average blood pressure. The recommended salt intake is no more than 6 grams or 3 spoons per day. Excessive consumption of sodium (salt) causes the concentration of sodium in the extracellular fluid to increase. To normalize the intracellular fluid is pulled out, so that the extracellular fluid volume increases. The increase in extracellular fluid volume causes an increase in blood volume, so that it has an impact on the emergence of hypertension (Mariani & Susilowati, 2015).

There is a significant influence between the level of stress on the incidence of hypertension at the age of 30-50 years at the Salatiga City Health Center (p value = 0.026 <0.05). The results of the analysis showed that the OR = 4.580, meaning that respondents who had a high stress level had a 4.580 times risk of experiencing hypertension compared to those who had no mild stress level.

Stress is a non-specific condition experienced by sufferers due to emotional, physical or environmental guidance that exceeds the power and ability to cope effectively. Stress is thought to be through the activity of sympathetic nerves (nerves that work during activity). Increased activity of the sympathetic nerves results in intermittent blood pressure. Temporary personality disorders can occur in people who are dealing with stressful situations. If the stress lasts for a long time, it can result in a fairly persistent elevation in blood pressure (Sutanto, 2010).

In another study, it was explained that stress can affect the incidence of hypertension (Kiki, 2012). Parenting stress that is not managed and occurs for a long time can cause physical disorders of hypertension (Kamerawati, 2018).

There is a significant influence between exercise habits on the incidence of hypertension at the age of 30-50 years at the Salatiga City Health Center (p value = 0.020 <0.05). The results of the analysis showed that the OR value = 0.246, meaning that respondents who have moderate exercise habits have a risk of experiencing hypertension 0.246 times compared to those who do not have heavy exercise habits.

Regular exercise is an average of 30 minutes per day. And it would be better if it was done regularly every day. It is estimated that 17% of the productive age group has less physical activity. From this prevalence rate, between 30% and 51% only do physical activity <2 hours / week (WHO, 2010 & Ravneet, 2019).

Walking can reduce blood glucose levels in patients with mild diabetes mellitus. Physical activity can lower blood glucose because it can increase glucose uptake by muscles compared to hepatic glucose respiration during activities (Pongsibidang, 2016). In addition, it is possible that this physical activity can prevent an increase in obesity which has an impact on hypertension (Fauzi, 2013 & Julianti, 2015). Healthy exercise activities in the elderly and relaxation therapy for dhikr can lower blood pressure (Moniaga, 2013 & Nur Anggraieni, 2014).

Table 3. multivariate analysis of genetic, smoking status, obesity, alcohol consumption, salt consumption, stress levels, and exercise habits on the incidence of hypertension

	coefficient	S.E.	Wald	df	p-value	OR	CI 95%	
							Min	Maks
Riwayat genetik	-1.892	1.136	2.775	1	0.096	0.151	0.016	1.397
Konsumsi garam	-1.432	0.678	4.459	1	0.035	0.239	0.063	0.902

Tingkat stres	-1.381	0.714	3.738	1	0.053	0.251	0.062	1.020
Kebiasaan olah raga	1.611	0.682	5.585	1	0.018	5.006	1.316	19.036
Konstanta	2.651	1.363	3.779	1	0.052	0.022	

Based on table 3.Multivariate analysis using logistic regression shows that of all the risk factors for hypertension, the most influential ones are exercise habits, stress levels, and salt consumption. The risk factor that most influences the incidence of hypertension is exercise habits, with an OR value of 5.006. This means that the more you never do sports, the higher the risk for hypertension. The second risk factor is the level of stress, with an OR value of 0.251. This means that the higher the stress level, the higher the risk for hypertension. The third risk factor is salt consumption, with an OR value of 0.239. This means that the higher the level of salt consumption, the higher the risk for hypertension.

According to Amissah (2015) risk factors that can affect the incidence of hypertension include age, race / ethnicity, geography, gender, obesity, stress, a high-salt diet, diabetes mellitus, alcohol, smoking, coffee consumption, and use of birth control pills. Risk factors are factors or conditions that affect the development of a disease or health status (Amissah et al., 2016).

The results of previous research by Artiyaningrum (2016) found that factors related to the incidence of uncontrolled hypertension were age (p = 0.022; OR = 2.956), partner status (p = 0.001; OR = 4.610), salt consumption (p = 0.001; OR = 4.173), consumption of coffee (p = 0.033; OR = 2.528), stress (p = 0.0001; OR = 6.33), and consumption of anti-hypertensive drugs (p = 0.010; OR = 3.095). Unrelated factors were obesity (p = 0.280; OR = 1.598), alcohol consumption (p = 0.502; OR = 1.579), smoking (p = 0.265; OR = 1.651), and sports activities (p = 0.509; OR = 1.338.). Suggestions for the community are to make lifestyle modifications and avoid uncontrolled hypertension risk factors (Artiyaningrum, 2016).

In Jumriani's research (2019) states that there is a relationship between family history, central obesity, and smoking with hypertension in posbindu visitors in the work area of Puskesmas Ballaparang Makassar City (Jumriani, 2019). Lifestyle greatly affects the occurrence of hypertension. The advice that can be given is for people with hypertension to always control blood pressure and avoid the factors that cause hypertension (Suoth,2014&Ulya,2017)

CONCLUSION

There was no effect between sex on the incidence of hypertension (p = 0.633; OR = 0.709). There was an influence between genetic history (p = 0.017; OR = 11.769), smoking status (p = 0.036; OR = 4.889), obesity (p = 0.049; OR = 5.717), alcohol consumption (p = 0.025; OR = 0.453), salt consumption (p = 0.017; OR = 4.500), stress levels (p = 0.026; OR = 4.580), exercise habits (p = 0.020; OR = 0.246) the incidence of hypertension. The factors that most influenced the incidence of hypertension were exercise habits (p = 0.018; OR = 5.006), stress levels (p = 0.053; OR = 0.251), and salt consumption (p = 0.035; OR = 0.239).

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