

Analysis of Predictors that Influence on Prevalence of Hypertension

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ABSTRACT

Introduction: Hypertension is a health problem that has an important role. If not handled properly, it can lead to various complications in the form of damage to target organs, and in fatal cases, it can lead to heart disease, kidney failure, or stroke, which often leads to death. **Objective:** To analyze predictor factors (which affect the incidence of hypertension: family history, exercise habits, obesity, saturated fat consumption pattern, and level of knowledge) on the incidence of hypertension. **Methods:** This research is descriptive with a retrospective approach. It was using the total sampling technique. The total population is 40 people in Jember. The time of the study was carried out from May 2019 – June 2019. Data collection tools used questionnaires and observation sheets. Statistical analysis using fisher exact test. **Results:** There is a relationship between the incidence of hypertension with exercise habits (P Value 0.021 analysis using Chi-square Fisher's exact test) and level of knowledge (P value 0.003 using Chi-square Fisher's exact test). There is no relationship between the prevalence of hypertension with family history, obesity, and consumption of foods containing fat (P Value 0.305, P Value 0.211, P Value 0.45 using Chi-square Fisher Exact test). **Conclusion:** The incidence of hypertension in members of Aisyiyah Glundengan Wuluhan, Jember Regency is related to exercise habits and level of knowledge.

Keyword: Exercise habits, Hypertension, Level of knowledge, Obesity

ABSTRAK

Latar belakang: Hipertensi merupakan masalah kesehatan yang memiliki peranan penting. Jika tidak ditangani dengan baik dapat menimbulkan berbagai komplikasi berupa kerusakan organ target dan pada kasus yang fatal dapat menyebabkan penyakit jantung, gagal ginjal atau stroke yang seringkali berujung pada kematian. **Tujuan:** Untuk menganalisis faktor-faktor prediktor (yang mempengaruhi kejadian hipertensi: riwayat keluarga, kebiasaan olahraga, obesitas, pola konsumsi lemak jenuh dan tingkat pengetahuan) terhadap kejadian hipertensi. **Metode:** Penelitian ini bersifat deskriptif dengan pendekatan retrospektif, menggunakan teknik total sampling. Jumlah penduduk di Jember adalah 40 orang. Waktu penelitian dilaksanakan pada bulan Mei 2019 – Juni 2019. Alat pengumpulan data menggunakan angket dan lembar observasi. Analisis statistik menggunakan Fisher Exact Test. **Hasil:** Ada hubungan antara kejadian hipertensi dengan kebiasaan olahraga (P Value 0,021 menggunakan Chi-square fisher exact test) dan tingkat pengetahuan (P value 0,003 menggunakan Chi-square Fisher's exact test). Tidak ada hubungan antara prevalensi hipertensi dengan riwayat keluarga, obesitas dan konsumsi makanan yang mengandung lemak (P Value 0,305, P Value 0,211, P Value 0,45 menggunakan uji Chi-square Fisher Exact). **Kesimpulan:** Angka kejadian hipertensi pada anggota Aisyiyah Glundengan Wuluhan Kabupaten Jember berhubungan dengan kebiasaan olahraga dan tingkat pengetahuan.

Kata Kunci: Kebiasaan Olahraga, Hipertensi, Tingkat Pengetahuan, Obesitas

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Introduction:

The health problem that challenges health development is known as the Triple Burden of Disease. In Triple Burden Disease, deadly diseases transition from being dominated by communicable diseases (malaria, tuberculosis, and HIV-AIDS) to non-communicable diseases. Globally, the priority non-communicable disease is hypertension (Ladusingh et al., 2018; Whelton et al., 2018). JNC (The Joint National Committee On Detection, Evaluation, and Treatment of High Blood Pressure, 2017) states that increased blood pressure (hypertension) is a condition where the systolic blood pressure is 140 mmHg and diastolic 90 mmHg. Hypertension is divided into three categories: systolic blood pressure of 120-139 mmHg and diastolic blood pressure of 80-89 mmHg. Stage I hypertension is the systolic blood pressure of 140-150 mmHg and diastolic blood pressure of 90-99 mmHg. Stage II hypertension is the systolic blood pressure of more than 150 mmHg and a diastolic pressure of more than 100 mmHg (Chobanian et al., 2003). The incidence of hypertension by age is most common at the age of 75 years, as much as 69.5%, and the least occurs at the age of 18-24 years, as much as 13.2%. Based on the level of education, most people with low education occurred as much as 51.6%, and the least occurred at the secondary education level (SLTA), as much as 25.9%. The majority of hypertensive patients with non-working status is 39.7% (Kemenkes RI, 2018). The health problem that is a challenge in health development is known as the Triple Burden of Disease. In Triple Burden Disease, deadly diseases undergo a transition from being dominated by communicable diseases (malaria, tuberculosis, and HIV-AIDS) to non-communicable diseases. Globally, the priority non-communicable disease is hypertension (Ladusingh et al., 2018; Whelton et al., 2018). According to JNC (The Joint National Committee On Detection, Evaluation, and Treatment of High Blood Pressure, 2017), that increased blood pressure (hypertension) is a condition where the systolic blood pressure is 140 mmHg and/or diastolic 90 mmHg.

Hypertension is divided into 3 categories including prehypertension, namely systolic blood pressure of 120-139 mmHg and diastolic blood pressure of 80-89 mmHg. Stage I hypertension is the systolic blood pressure of 140-150 mmHg and diastolic blood pressure of 90-99 mmHg. Stage II hypertension is the systolic blood pressure of more than 150 mmHg and a diastolic pressure of more than 100 mmHg (Chobanian et al., 2003). The incidence of hypertension by age is most common at the age of 75 years as much as 69.5% and the least occurs at the age of 18-24 years as much as 13.2%. Based on the level of education, most people with low education occurred as much as 51.6% and the least occurred at the secondary education level (SLTA) as much as 25.9%. The majority of hypertensive patients with non-working status is 39.7% (Kemenkes RI, 2018). Hypertension is responsible for 45% of deaths from heart disease and 51% of deaths due to stroke. Hypertension comprises 3.7% of Disability Adjusted Life Years (DALY). Even prehypertension increases the risk of death due to cardiovascular disease and stroke (Huang et al., 2014). Management of hypertension can be done with pharmacological therapy and non-pharmacological therapy. Pharmacological therapy uses drugs, while non-pharmacological therapy for hypertension begins with living a healthy lifestyle. A healthy lifestyle has been shown to lower blood pressure, and in general, can reduce the risk of cardiovascular problems. In patients suffering from hypertension in the grade 1 category, without other cardiovascular risk factors, a healthy lifestyle strategy is early-stage management, which must be followed for at least 4-6 months. If within that period time there is no decrease in blood pressure or there are other cardiovascular risk factors, it is recommended to start pharmacological therapy (Perhimpunan Dokter Spesialis Kardiovaskular Indonesia, 2012).

Based on this information, we get a picture that hypertension is a health problem that has an important role. If not handled properly, it can lead to various complications in the form of damage to target organs, and in fatal cases, it can lead to heart disease, kidney failure,

or stroke which often leads to death. Knowledge of the most influential factors in the occurrence of hypertension will be very helpful as a form of early detection of patients with high risk and can obtain immediate treatment for patients with hypertension which in turn can prevent complications due to late diagnosis of hypertension. This study aims to analyze the predictor factors that influence the incidence of hypertension in members of Aisyiyah Glundengan Wuluhan-Jember Regency.

Methods:

This type of research conducted is descriptive with a retrospective cross-sectional approach. The population in this study were all Aisyiyah members in the Aisyiyah Branch Glundengan Branch Wuluhan Jember Regency a total of 40 people. The sampling technique used in this study is non-probability sampling with the type of quota sampling by screening the entire population. Research Sample Criteria Inclusion Criteria: The community in the Aisyiyah area, the Glundengan Branch, Wuluhan-Jember Branch, is active in Aisyiyah activities. Exclusion criteria consisted of: respondents who were sick at the time of the study were not admitted at the time of the study and withdrew from the study. The research was conducted in the Aisyiyah Glundengan area, Wuluhan-Jember. The time of research was carried out in May - June 2019. in the Aisyiyah Glundengan area, Wuluhan-Jember. The data that has been obtained from the measurement results will be processed properly using the statistical package for the social sciences (SPSS) version 21 program which is then analyzed to determine the factors that influence the prevalence of hypertension in Aisyiyah members in Jember. The data were then analyzed to determine the relationship between the predictor factors of hypertension using the Chi-Square test. The data collection tool that will be used in this study is a questionnaire that has been tested for validity and reliability in people who have the same characteristics.

Results:

Table 1.1 Frequency distribution of respondents based on age, education, occupation, family history, exercise habits, obesity, systolic blood pressure, level of knowledge, and habit of consuming fat among Aisyiyah members in Jember

CATEGORIES	Frequency (n)	Percentage (%)
Age (years)	Early adulthood (26-35)	17,5
	Late adult (36-45)	45
Age (years)	Early seniors (46-55)	30
	Late elderly (56-65)	7,5
	Total	100,0
	Education	Primary Level Education
Secondary Level Education		47,5
Tertiary Level Education		5
Total		100
Profession	Housewife	90,0
	Private	5,0
	Honorary employee	5,0
	Total	100,0
Systolic Blood Pressure	Prehypertension	32,5
	Stage I HTN Hipertensi stage 1	67,5
	Total	100,0
Family History	Available	32,5
	Not Available	67,5
	Total	100,0
Exercise Habits	Available	22,5
	Not Available	77,5
	Total	100,0
Obesity	Available	27,5
	Not Available	72,5
	Total	100,0
Knowledge level	Available	65,0
	Not Available	35,0
	Total	100,0
Habit of consuming fatty food	Available	5,0
	Not Available	95,0
	Total	100,0

Based on table 1.1, the results show that the majority of respondents are in the late adult category (36-45 years) as many as 18 respondents (45%), the majority are in low education level (SD) and secondary education level (SMP and SMA) as much as 47.5%. The majority of respondents' occupations are housewives, namely 36 respondents (90%). The majority did not have a family history of hypertension, namely 27 respondents (67.5%). A total of 31 respondents (77.5%) do not have the habit of doing sports. A total of 29 respondents (72.5%) were in the category of obesity. The majority of respondents with stage 1 hypertension were 27 respondents (67.5%). A total of 26 respondents (65%) have a level of knowledge in the good category. And as many as 38 respondents (95%) have a habit of consuming foods that contain fat.

Bivariate

Table 1.2 Analysis of hypertension predictor factors (Family history, exercise habits, obesity, level of knowledge, and fat consumption habits) in Aisiyah Members in Jember

CATEGORIES	Sistolic Blood Pressure		Total	P-Value	
	Pre hypertension	Stage I HTN I			
Family History	Available	3 23.1%	10 37.0%	13 32.5%	0,305
	Not available	10 76.9%	17 63.0%	27 67.5%	
Total		13 100.0%	27 100.0%	40 100.0%	
Exercise Habits	Available	6 46.2%	3 11.1%	9 22.5%	0,021
	Not available	7 53.8%	24 88.9%	31 77.5%	
Total		13 100.0%	27 100.0%	40 100.0%	
Obesity	Available	2 15.4%	9 33.3%	11 27.5%	0,211
	Not available				

Not available	11 84.6%	18 66.7%	29 72.5%		
Total	13 100.0%	27 100.0%	40 100.0%		
Knowledge level	Enough	4 30.8%	22 81.5%	26 65.0%	0,003
	Good	9 69.2%	5 18.5%	14 35.0%	
Total	13 100.0%	27 100.0%	40 100.0%		
Habit of consuming fat	Not available	0 .0%	2 7.4%	2 5.0%	0,45
	Available	13 100.0%	25 92.6%	38 95.0%	
Total	13 100.0%	27 100.0%	40 100.0%		

Based on table 1.2, it is found that there is a relationship between hypertension and exercise habits (P-Value 0.021 using Chi-Square Fisher exact test) and level of knowledge (P-Value 0.003 using Chi-Square Fisher exact test). There is no relationship between hypertension and family history (P-Value 0.305), obesity (P-Value 0.211), and fat consumption (P-Value 0.45) using the Chi-Square Fisher exact test.

Discussion :

Based on research conducted on Aisiyah members in Jember, it was found that the respondents in this study in ketogenic suffered from stage 1 hypertension with a total of 27 respondents (67.5%). According to Aspiani (2015), Hypertension can be caused by two factors, namely primary factors and secondary factors. Primary Hypertension is Hypertension with no known cause. It is affected by about 95% of people. Primary Hypertension is thought to be caused by heredity; individual characteristics that influence the onset of Hypertension are age (if age increases, blood pressure increases), gender (men are taller than women), and race (black race is more than white), and habit factors. A

life consisting of high salt consumption, stress, smoking, drinking alcohol, taking drugs (ephedrine, prednisone, epinephrine), and being overweight or consuming excessive fat. The chemical structure of fat is divided into two: saturated fatty acids (saturated fatty acids) and unsaturated fatty acids (unsaturated fatty acids). Saturated fats are fatty acids that do not have a double bond on a carbon atom. That means saturated fatty acids are not sensitive to oxidation and forming free radicals. The dominant effect of saturated fatty acids is an increase in total cholesterol and LDL cholesterol. Secondary Hypertension due to apparent causes such as renal artery stenosis and can be caused by preexisting physical conditions such as kidney disease or thyroid disease and factors that can trigger Hypertension including pregnancy, oral contraceptive use, increased intravascular volume, stress, burns, endocrine disorders, and smoking (Kartika et al., 2021).

Most of the respondents are in the late adult category (36-45 years) as many as 18 respondents (45%). This is following what RISKESDES said that the prevalence of hypertension increases with age. As we age, the structure and function of cells, tissues, and organ systems tend to change. These changes affect the decline in physical health which ultimately affects the risk of disease. This occurs because the large arteries lose their elasticity and become stiff, changes in the elasticity of the aortic wall decrease, the heart valves become thickened and stiffer, the heart's ability to pump blood decreases, so that its volume and contraction decreases, and the resistance in peripheral blood vessels increases due to other causes. Therefore, the blood contained in each heartbeat is forced to pass through blood vessels that are narrower than before and increase blood pressure (Mulyadi, 2019; Widyakusuma putra & Manalu, 2020). Based on the description, age is a risk factor that cannot be changed and has a relationship with the incidence of hypertension. Therefore, the action that needs to be taken is to maintain physical endurance, reduce risky behaviors such as staying up late, smoking, drinking coffee,

alcohol, and other risky behaviors that can lead to an increase in blood pressure. The education level of the respondents in this study was the majority with low and middle education levels, each of which was 47.5%. Maulidina (2019) in his research said that lower education levels experienced more hypertension than respondents with higher education. Someone with a low level of education can experience hypertension caused by a lack of information that can lead to unhealthy behaviors and lifestyles such as a lack of information about the dangers, as well as efforts to prevent hypertension. From this description, the level of education also indirectly affects blood pressure. The level of education affects lifestyle, namely smoking habits, drinking alcohol habits, and the habit of doing physical activities such as sports (Maulidina et al., 2019).

Most of the respondents are housewives, with as many as 36 respondents (90%). This is in line with research conducted by Adam (2019), which states that activities carried out by housewives such as mopping, sweeping, cooking and washing are active activities that can be classified as a form of exercise. These household activities can cause the body to stay healthy, and burn calories. The accumulation of physical movements can cause the respondent to have no risk factors for stress due to work demands and pressure. Domestic activities are relatively more frequent with family and activities carried out are daily routines as housewives and wives which are carried out sincerely to reduce the risk of stress and prevent hypertension. This is different from the research conducted by Widiana & Ani (2017) which shows that the proportion of hypertension is greater in respondents who work than in those who do not work or are housewives. Respondents who work related to risk factors such as stress. From this description, it can be interpreted that household activities based on sincerity and a sincere heart can reduce stress which can reduce risk factors for hypertension (Adam, 2019; Widiana & Ani, 2017). Most of the respondents did not have a family history of hypertension, namely 27 respondents (67.5%). This is because someone who has a family

history of hypertension in some genes will interact with the environment and can cause an increase in blood pressure. The genetic role in the incidence of hypertension is proven by the finding that hypertension is more common in monozygotic twins (one egg cell) than in heterozygous twins (different eggs). A patient who has the genetic nature of primary (essential) hypertension, if left naturally without any intervention therapy, together with his environment will cause his hypertension to develop and in about 30-50 years, signs and symptoms of hypertension will appear (Musfirah & Masriadi, 2019). In this study, the results obtained a P-Value of 0.305, which means that H_0 is accepted, that is, there is no relationship between genetic history and the prevalence of hypertension. The results of this study differ from the study conducted by Ranasinghe, in hypertensive patients in Sri Lanka which stated that hypertension in adults was significantly higher in patients who had a family history of hypertension than those without a history of hypertension. From this description, it can be interpreted that the development of hypertension is within a period of 30-50 years while the majority of respondents' ages in the study area in the range of 36-45 years. So there is still the possibility that during this time hypertension can still appear if it is not balanced with a healthy lifestyle (Ranasinghe et al., 2015). In contrast to the research conducted by Mulyadi, it was found that most of the respondents who had hypertension had a family history of suffering from hypertension (Mulyadi, 2019). Based on the description above, several methods that can be used to reduce the risk of hypertension due to genetic factors are by changing lifestyle/non-pharmacological interventions in patients with hypertension, someone who is at risk for hypertension is strongly recommended to maintain or lower blood pressure if there are signs of increased blood pressure. more than usual, namely by losing weight, reducing salt intake, and stopping drinking alcohol.

Based on the results of the study, it was found that 31 respondents (77.5%) did not have the habit of doing sports. Activity or exercise

greatly affects the occurrence of hypertension, whereas less active people will tend to have a higher heart rate so that the heart muscle has to work harder with each contraction. The harder and more frequent the heart muscle in pumping, the greater the pressure imposed on the arteries. In this study, there was a relationship between exercise habits and the prevalence of hypertension, which obtained a P-Value of 0.021. This study is similar to research by Andria (2013), which is that most of the respondents exercise less, which is 68.22%. According to the study, most of the respondents did not participate in sports. Their physical condition did not allow such as being old and having a busy life in taking care of housework because most of the respondents worked as housewives. So they generally do not have time to exercise. Meanwhile, those who participate in sports are physically strong. This is reinforced by Adam (2019) who stated that there is a relationship between sports activities and the prevalence of hypertension. In this study, someone with hypertension who does sports/physical activity every day can reduce the risk of hypertension, and vice versa if someone never or rarely does exercise/physical activity every day can increase the risk of hypertension. Sports / high physical activity can prevent or lower blood pressure in patients with hypertension. Someone diligent in doing physical activities such as jogging, aerobics, and cycling regularly can improve blood circulation so can lower blood pressure. someone less active in sports, in general, tends to be overweight. Exercise can prevent and reduce obesity and reduce the process of salt intake in the body. Salt intake will come out of the body with sweat during exercise. Regular exercise (physical activity in the form of aerobics for 30-45 minutes/day) can reduce peripheral resistance which will prevent hypertension (Adam, 2019; Andria, 2013; González-Velasco et al., 2014; Prasetyo et al., 2016). From this description, it can be concluded that regular exercise can make our heart organs healthy so we can avoid hypertension because hypertension is an increase in blood pressure that gives continuous symptoms for a target

organ, such as coronary heart disease for blood vessels in the heart and heart muscle, and stroke for the brain.

A total of 29 respondents (72.5%) were in the category of BMI within normal limits or not obese. Obesity is considered to be a factor in the incidence of hypertension, especially central obesity because in central obesity there is more fat accumulation in the abdominal area. If there is excess abdominal fat, it will cause several things, including reducing the intake of intracellular free fatty acids by the mitochondria so that the oxidation process is reduced, lowering adiponectin levels, and causing the accumulation of intracellular free fatty acids. Excess-free fatty acids can trigger insulin resistance. Conditions of hyperinsulinemia can cause constriction of blood vessels and increased absorption of sodium in the kidneys which in turn causes hypertension. This is due to the sympathy excitability associated with fat accumulation. Leptin is an adipokine, and the blood concentration of leptin reflects the amount of adipose tissue. Leptin is a critical contributor to obesity-related hypertension through increased sympathetic nerve activity (Andria, 2013; Takeokaa et al., 2016). In this study, the results obtained a P-Value of 0,211, which means that there is no relationship between obesity and the prevalence of hypertension. In contrast to previous studies. Obesity is a major risk factor triggering essential hypertension, diabetes, and other morbidities (Jiang et al., 2016). Obesity raises blood pressure by increasing renal tubular sodium reabsorption, impairing pressure natriuresis, and causing volume expansion through activation of the sympathetic nervous system and the renin-angiotensin-aldosterone system and by physical compression of the kidneys, especially when there is increased visceral adiposity (Hall et al., 2014). Accumulation of fat that occurs in the intra-abdominal area is called central obesity. This type has a higher risk of experiencing health problems, especially those associated with cardiovascular disease. The location of the abdomen which is closer to the heart than the hips causes this condition to occur (Khairani et

al., 2018). Most of the respondents in this study are housewives with activities that tend to be active so that they have a Body Mass Index (BMI) in the normal category so they are not classified as obese. While some respondents who work as private workers or active workers tend to be obese due to factors other than work or activities.

A total of 26 respondents (65%) have a level of knowledge in the good category. This is following research conducted by Kilic (2016) where it was found that 62.1% of respondents had a moderate level of knowledge. In this study, some respondents did not understand that hypertension does not have direct cash characteristics, so blood pressure control by someone who is at risk of having hypertension is not carried out. In addition, someone with a low level of knowledge assumes that complaints of dizziness and headaches due to hypertension are considered cured if these complaints are no longer present. So there is no follow-up treatment from health workers. In this study, it was found that the level of knowledge about hypertension is directly proportional to a high level of education (Kilic et al., 2016). Following the research conducted by the researcher that a P-Value of 0.003 was obtained, which means that there is a relationship between the level of knowledge and the prevalence of hypertension, this is because respondents with a low level of knowledge also have greater hypertension than respondents who have a good level of knowledge. This is because someone who has a good level of knowledge also has an education level in the middle category so he gets more information than respondents with a low level of education (SD and SMP). Knowledge about hypertension is very important for someone to evaluate themselves. Measurement of blood pressure at home or in health care facilities regularly and to comply with treatment can easily find out a person's general condition so that prevention efforts can be made as soon as possible.

A total of 38 respondents (95%) have a habit of consuming foods that contain fat. The emergence of degenerative diseases including hypertension is related to lifestyle factors and

diet. There is a change in food consumption behavior, such as people prefer fast food which generally contains a lot of sodium, high in fat and cholesterol, and low consumption of fruits and vegetables. The habit of consuming excess caffeinated drinks has an impact on increasing blood pressure because it causes an antagonistic effect that affects the work of adenosine receptors (Jatu Safitri Cahyahati, Apoina Kartini, 2018). Adam (2019) states that hypertension occurs due to the narrowing of blood vessels (atherosclerosis). Where atherosclerosis is usually characterized by increased body weight or obesity. Atherosclerosis occurs due to increased levels of fat in the blood (hyperlipidemia) or the narrowing triggers the heart to work harder to pump blood so that the needs for oxygen and other substances needed by the body can be met. This is what causes blood pressure to increase. In the research conducted by the researcher, the P-Value was 0.450, meaning that there was no relationship between the consumption of foods containing fat and the prevalence of hypertension. This is because the majority of respondents in the research in the category have normal body weight as much as 72.5%. This is in line with research conducted by Jatu (2018) which states that there is no relationship between fat intake and an increase in systolic and diastolic blood pressure. Most of the sources of fat consumed by respondents came from oil. Side dishes are served in fried form. In addition, other sources of fat come from chicken meat, coconut milk, chicken eggs, or seafood. However, there are some respondents with a fat intake that exceeds the recommended limit, usually found in the elderly who often consume dairy products such as cow's milk or goat's milk. There are some limitations to our study. First, the study population consists of religious organizations located in the region, so the results cannot be generalized. Second, this is a cross-sectional study with data collection methods using techniques to remember previous information that is not yet known validly when to get information so that a person's memory ability cannot be generalized so that it can be biased.

Conclusions:

Factors that influence the prevalence of hypertension include exercise habits (P-Value 0.021 using Fisher exact test) and level of knowledge (P-Value 0.003 using Fisher exact test). Meanwhile, family history (P-value 0.305), obesity (P-value 0.211) and fat consumption (P-value 0.45) using the Fisher exact test did not have a significant relationship.

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