Epidemology Study of Hypertension Based on Risk Factors in Medical Clinic PT. KAI Daop 7 Madiun City Kediri

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ABSTRACT

In Indonesia, the prevalence of hypertension based on Basic Health Research 2018 is 34.1%. Knowing the epidemiological picture of hypertension sufferers at Klinik Mediska PT. KAI Daop 7 Madiun branch of Kediri City in August - October 2020. Data collection techniques with secondary data by total sampling in the form of data on hypertension patients who have been registered in August - October 2020. The number of hypertensive patients in the male gender is 68% and for females is 32%. ages> 65 years 36%, ages 56-65 years 34%, ages 46-55 years 20%, 36-45 years 6%, ages 26-35 years 4%. The remaining 40% of the smoking habit is 60%. had comorbidities 34%. BMI overweight 64%, normal 32%, underweight 4%. The risk factors for hypertension included: male gender, age> 45 years, smoking habits, comorbidities, and high BMI. Promotional and preventive efforts, as well as education, are needed to be related to several risk factors for hypertension to suffer

I. Introduction

Hypertension or high blood pressure is found in many people in both developed and developing countries, including Indonesia. Hypertension is a condition in which an increase in a person's blood pressure above normal can increase morbidity (morbidity) and mortality (mortality) (Sumartini et al., 2019). An increase in blood pressure that falls into the category of systolic hypertension is more than equal to 140 mmHg and diastolic is more than equal to 90 mmHg. Hypertension can be classified into two types, namely primary or essential hypertension whose cause is unknown and secondary hypertension which can be caused by other diseases such as kidney disease, endocrine disease, heart disease, and kidney disorders. Until now, hypertension is still a health problem that is big enough to be followed up. In 2000 it was estimated that 26.4% of the adult population or 972 million people had hypertension (Mills et al., 2016). This figure increased in 2010, 31.1% of the adult population (1.39 billion) worldwide suffer from hypertension (Mills et al., 2021).

Basic Health Research (Riskesdas) conducted by the Ministry of Health in 2018 found an increase in the incidence of hypertension compared to data in 2013. The prevalence of hypertension based on the results of the 2018 Riskesdas was 34.1%. This figure is higher than in 2013 which was 25.8%. These results are the incidence of hypertension based on the results of blood pressure measurements in Indonesian people aged 18 years and over (Kemenkes 2020). The incidence of hypertension in East Java Province has a percentage of

22.71% or about 2,360,592 residents (Kemenkes 2018). Several factors increase the risk of hypertension, such as age, gender, smoking habits, obesity, and lifestyle. Reducing risk factors is the basis for providing interventions by health workers (Tirtasari & Kodim 2019). On the other hand, hypertension is a major risk factor for global mortality and morbidity and has been associated with various cardiovascular diseases such as atherosclerosis, acute myocardial infarction, and cardiomyopathy (Song & Zheng Ma, Juan Wang, 2020).

Research on the epidemiological description of hypertension is needed to find various potential risk factors for the incidence of hypertension. Each region has a different epidemiological picture. There has been no epidemiological study on hypertension previously conducted at the Medical Clinic of PT. KAI Daop 7 Madiun Kediri City. Based on this background, the researchers wanted to examine the epidemiological description of hypertension sufferers at the Medical Clinic of PT. KAI Daop 7 Madiun Kediri City in August - October 2020.

II. Method

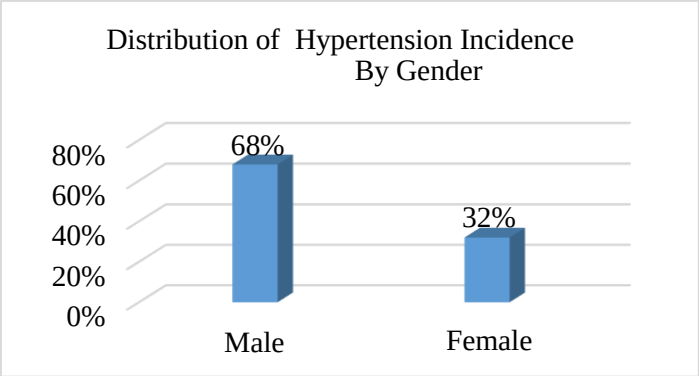
This research is a type of descriptive research using a retrospective cross-sectional approach with time-limited sampling. The population in this study consisted of patients with hypertension at the Medical Clinic PT. KAI Daop 7 Madiun, Kediri City. Determination of respondents using the total sampling technique. Data collection techniques in this study with secondary data collection in the form of data on hypertension patients who have been registered at the Medical Clinic PT. KAI Daop 7 Madiun Kediri City in August - October 2020. The study only describes the prevalence and distribution of the disease in the population at a certain point in time, without further analysis of other variables. The measurement results are presented in the form of tables and graphs.

III. Results and Discussion

Based on the results of the distribution of data in Tables and Diagram 1, it was found that the number of hypertensive patients of male sex had a higher percentage, namely 68%. While patients with female sex as much as 32%.

Tables and Diagrams 1. Distribution of Hypertension Incidence Based on Gender.

NO	SEX	f	%
1	Male	34	68,0
2	Female	16	32,0
Amount		**50**	**100**



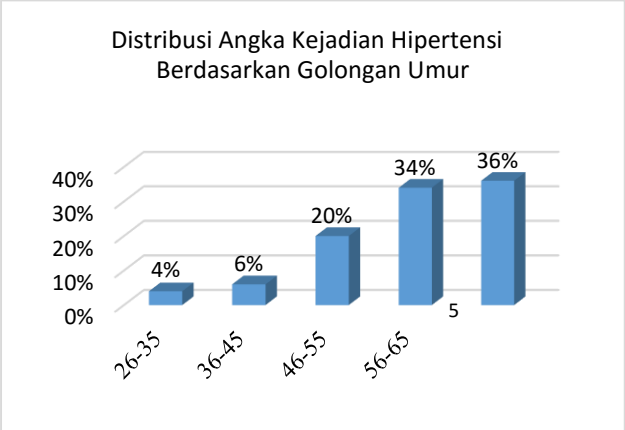
Source: Medical Clinic Register Data PT. KAI Daop 7 Madiun Kediri City

Research conducted by Wang et al (2018) in China showed that the prevalence of hypertension is higher in men > than women (24.5% > 21.9%) and in obese individuals > than women (44.5% > 15.4%) (Zengwu Wang, MD et al., 2018). Another study conducted by Ramirez & Sullivan (2018) in the United States, explaining the incidence of hypertension was higher in men than women until the age of 45 years, then tended to be the same from the age of 46 to 64 years, and increased again in men than women after the age of 65. year. The prevalence of individuals with prehypertension is also higher in men > than in women (45% > 27%) (Ramirez & Sulivan, 2018). This shows that the incidence of hypertension tends to be higher in men than women. A logical line of thought.

From the distribution results, it is shown in Table 2 that the incidence of hypertension tends to be high in patients in the age group >65 years (seniors) as much as 36%, followed by patients in age group 56-65 years (late elderly) as much as 34% and age group 46-65 years. 55 years (early elderly) as much as 20%. Meanwhile, in the age group of 26-35 years and 36-45 years, hypertension rates tend to be lower by 4% and 6%, respectively.

Tables and Diagrams 2. Distribution of Hypertension Incidence Rates by Age Group.

NO	AGE GROUP	n = 50	
		f	%
1	26-45 Years old	2	4,0
2	36-45 Years old	3	6,0
3	46-55 Years old	10	20,0
4	56-65 Years old	17	34,0
5	> 65 Years old	18	36,0
Amount		**50**	**100**



Source: Medical Clinic Register Data PT. KAI Daop 7 Madiun Kediri City

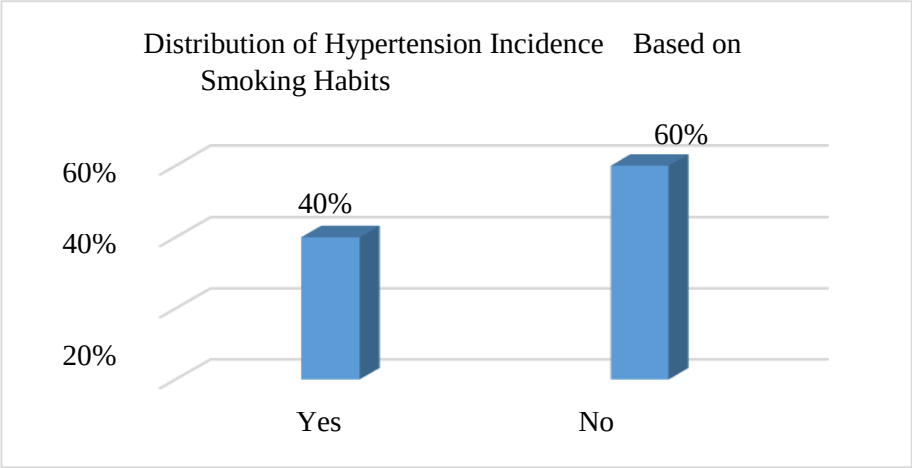
The research conducted by Jannah et al (2016) showed a significant result of p = 0.01 in the test of the relationship between age and hypertension (Jannah et al., 2016). In a study conducted by Pramana (2016) which analyzed the factors causing hypertension, age was one of the factors causing hypertension. This is because arterial pressure increases with age

(Pramana, 2016).e results of the research by Anggara & Prayitno (2013) found that the highest hypertension patients were found in the age group >65 years. Increasing age causes changes in physiological conditions in the body such as the thickening of arterial walls due to a buildup of collagen in the muscle layer, so that blood vessels narrow and become stiff starting at the age of 45 years. In addition, there is also an increase in peripheral resistance and sympathetic activity and a lack of baroreceptor sensitivity. As people age, they are more prone to inflammation, oxidative stress, and endothelial dysfunction, making people more susceptible to hypertension (Anggara & Nanang, 2013). Arterial stiffness is not only the result of structural changes in the arterial wall but is also caused by endothelial-derived vasoactive mediators such as endothelin 1 and reduced nitric oxide (NO) bioavailability, leading to endothelial dysfunction (Walsh et al., 20019). In contrast to younger patients with hypertension whose increase in blood pressure is determined by increased peripheral arterial resistance, elderly hypertension is more caused by increased stiffness of the arteries. In a study conducted by Widjaya et al (2019), 22 respondents (19.1%) normal blood pressure, 27 respondents (23.5%), stage 1 hypertension 32 respondents (27.8%) and hypertension stage 2 as many as 34 respondents (29.6%). This shows that the increasing age, the higher the prevalence of hypertension (Widjaya et al., 2018).

The results of the distribution of the incidence of hypertension based on smoking habits (Table 3), as many as 20 people (40%) of patients had a smoking habit. While the rest (60%) did not. However, of patients with smoking habits, all of them were male. This means, that as many as 59% of male patients (20 out of 34 male patients) have a smoking habit

Tables & Diagrams 3. Distribution of Hypertension Incidence Based on Smoking Habits.

NO	SMOKING HABIT	n = 50	
		f	%
1	Yes	20	40,0
2	No	30	60,0
Amount		**50**	**100**



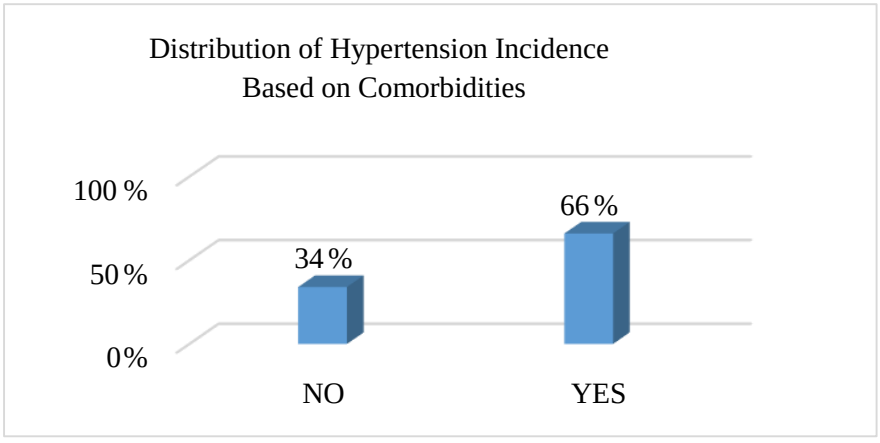
Source: Medical Clinic Register Data PT. KAI Daop 7 Madiun Kediri City

The research conducted by Rhee et al (2007) examined the effect of smoking on the incidence of hypertension. This study was conducted on 30 people with normotension and 22 people with hypertension. The study was conducted by measuring the Heart rate (HR) and Blood Pressure (BP) or the blood pressure of the two groups before the intervention and after the intervention. After measuring basal HR and BP, both groups were asked to smoke with 0.9 mg nicotine content in 5 minutes. Then HR and BP were re-measured at 5-minute, 10-minute, and 15-minute intervals. The study showed that smoking acutely increases the Heart Rate (HR) and Blood Pressure (BP) of the brachial artery in both normotensive and hypertensive groups with $p < 0.05$ (Rhee et al., 2007). Smoking acutely exerts a persistent pressor and tachycardic effect through the mechanism of stimulation of the sympathetic nervous system which then increases plasma catecholamines and eventually increases blood pressure (Virdis et al., 2010). Smoking has been shown to have the effect of increasing blood pressure.

From the distribution results in Table and Diagram 4 show that as many as 34% of respondents with hypertension have comorbidities. These comorbidities include cardiovascular disorders (heart disease; heart failure; angina pectoris), neurological disorders (stroke), neurological disorders metabolism (DM), etc.

Tables and Diagrams 4. Distribution of Hypertension Incidence Based on Comorbidities / Complications.

NO	COMORBID DISEASE	n = 50	
		f	%
1	Yes	17	34,0
2	No	33	66,0
Amount		**50**	**100**



Source: Medical Clinic Register Data PT. KAI Daop 7 Madiun Kediri City

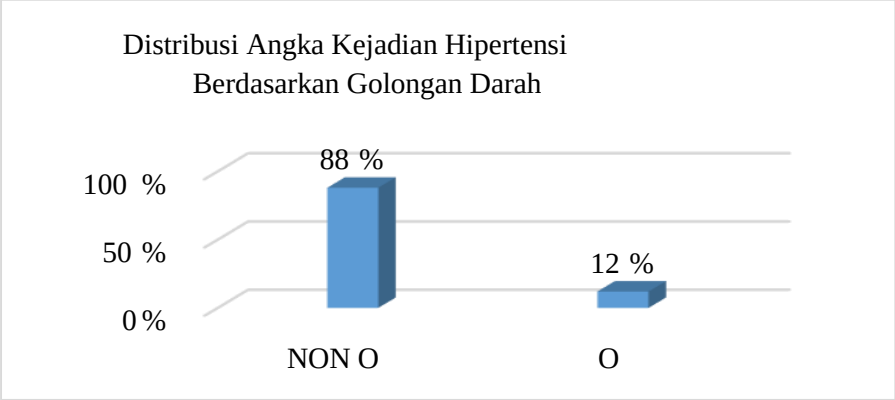
In a study conducted by Noh et al (2016) hypertensive patients had comorbidities, including obesity, diabetes mellitus, dyslipidemia, cardiovascular disease, chronic kidney disease, and thyroid disease. Most chronic comorbidities are more common in people with hypertension than in those without hypertension. Common comorbidities were obesity (60.1%), dyslipidemia (57.6%), and impaired fasting blood glucose (45.1%). Hypertensive patients with two or more comorbidities were 42.2% and with those three or more diseases

17.7%. ($p < 0.05$) (Noh et al., 2016). This shows that hypertensive patients are more likely to have comorbidities.

The distribution results in Table and Diagram 5 show that in patients with blood group non-O (blood types A, B and, AB) the incidence of hypertension is 62% higher. While in patients with blood group O only as much as 12%.

Tables and Diagrams 5. Distribution of Hypertension Incidence Based on Blood group.

NO	GROUP BLOOD	n = 50	
		f	%
1	NON O	44	62,0
2	0	6	12,0
Amount		**50**	**100**



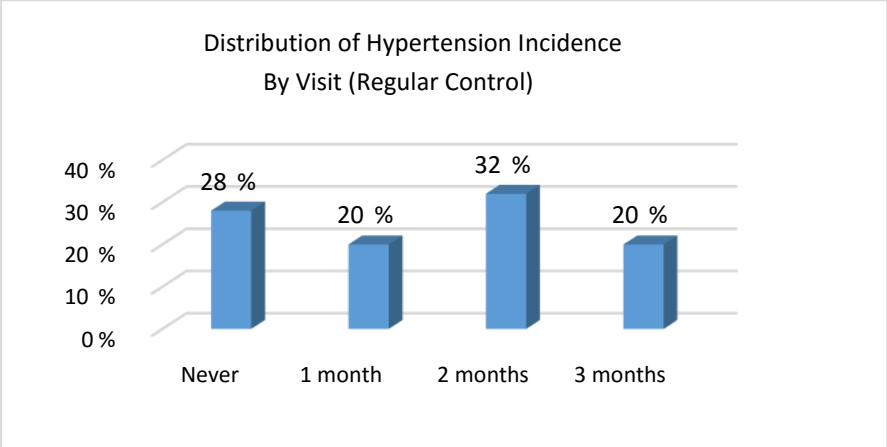
Sumber : Data Register Klinik Mediska PT. KAI Daop 7 Madiun Kota Kediri

Research conducted by Murni & Mayenti (2019) examined the incidence of hypertension with blood type from the respondent group with blood group 0 as many as 37 people and blood group non 0 (A, B, and AB) as many as 67 people (Murni & Mayenti, 2019) The results of this study explain that respondents with blood group 0 who suffer from hypertension < do not suffer from hypertension (37.8% < 62.2%), while respondents with blood group non 0 (A, B, and AB) who suffer from hypertension > do not suffer from hypertension. (67.0% > 31.3%). And found a significant relationship between blood type and the incidence of hypertension with $p < 0.05$. This is because individuals with Non-O blood types, namely A, B, and AB have higher levels of vWF in the blood which leads to thrombosis in blood vessels. In addition, individuals with blood type Non-O (A, B, AB) have a weakness in protein metabolism, resulting in heart muscle disorders and abnormalities in animal fat metabolism which have implications for the formation of atherosclerosis. The whole process results in increased pressure in the blood vessels and other cardiovascular disorders (Murni & Mayenti, 2019). However, another study conducted by Singh et al (2018) on 150 students aged 19 – 27 years at the Department of Physiology of Rohilkhand Medical College and Hospital India stated that there was no significant relationship between systolic blood pressure and different blood groups with $p = 0.148$ ($p > 0.05$) (Singh et al., 2018). Therefore, further research is needed on the relationship between blood type and the incidence of hypertension with a wider research scale.

Table 6 shows the distribution of patients based on regular visits or controls to the Medical Clinic. The calculation of routine visits/controls is based on the presence/absence of the patient's visits to the Medika Clinic every month, calculated in the last 3 (three) months. From these data, patients with regular visits every month in the last 3 months (regular control) were 20%, patients with regular visits in 2 months were 32%, and visits only once in the last 3 months were 20%. Meanwhile, patients who had no visits in the last 3 months (not routinely controlled) were 28%. This shows that the number of patients who do not control is not more than the number of patients who control regularly.

Tables and Diagrams 6. Distribution of Hypertension Incidence Based on Visits (Regular Control).

NO	ROUTINE VISIT/ CONTROL (In the last 3 Months)	n = 50	
		f	%
1	3 months	10	20,0
2	2 months	16	32,0
3	1 month	10	20,0
4	Never (no visits)	14	28,0
Amount		**50**	**100**



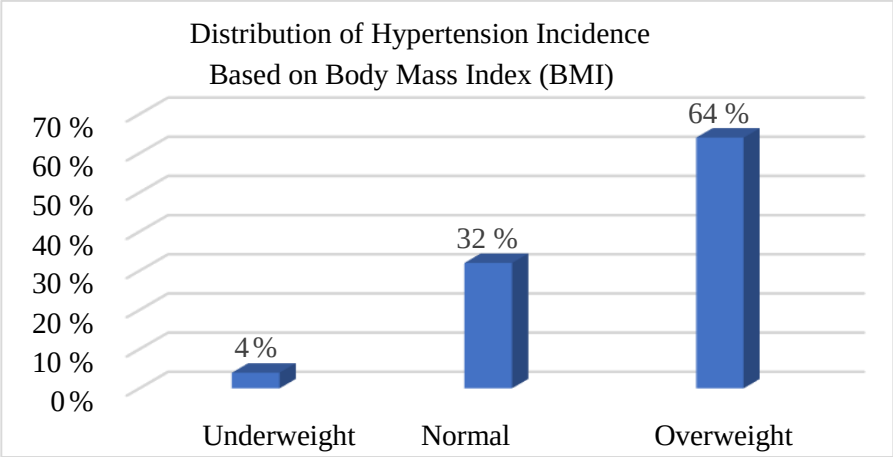
Source: Medical Clinic Register Data PT. KAI Daop 7 Madiun Kediri City

Research Puspita et al (2017) the proportion of Prolanis patients who do not comply with controls is smaller than those who adhere to routine control of hypertension treatment (Purpita et al., 2017). The results of Puspita et al's research (2017) show that family members who provide good support and show a caring attitude to family members who suffer from hypertension have an important role in control compliance (Puspiya et al., 2017). This is also in line with the research of Sinuraya et al (2018), respondents who have experience in experiencing related complications will be more obedient to control than those who do not experience complications at all. Generally, after experiencing complications, patients will become more obedient to treatment, because complications will have an impact on decreasing the patient's quality of life and activities are more disrupted. Therefore, this is a factor that spurs patients to recover and improve their quality of life (Sinuraya et al., 2018).

Based on the results of Tables and diagrams 7, the prevalence of hypertension is distributed based on Body Mass Index (BMI) indicating that the highest percentage is patients with overweight BMI, which is 64%. Meanwhile, patients with underweight BMI are only 4%.

Tables and Diagrams 7. Distribution of Hypertension Incidence Based on Body Mass Index (BMI).

NO	BODY INDEX (BMI)	n = 50	
		f	%
1	Underweight	2	4,0
2	Normal	16	32,0
3	Overweight	32	64,0
Amount		**50**	**100**



Source: Medical Clinic Register Data PT. KAI Daop 7 Madiun Kediri City

Research by Ulumuddin and Yhuwono (2018) that the overweight and obese categories have the highest proportion of 52.9%, the normal category is 35.2% and the underweight category is 11.9%22. In obese patients, there is an increase in the work of the heart to pump blood. The greater the body mass, the more blood supply is needed to supply oxygen and nutrients to body tissues. This causes the volume of blood circulating through the blood vessels to increase so that the pressure on the arterial walls becomes greater. The role of obesity in high blood pressure is also due to the stimulation of the sympathetic nervous system and the Renin-Angiotensin-Aldosterone System by mediators such as hormones, adipokines, cytokines, and so on. One of them is the hormone aldosterone which is closely related to water and sodium retention, so that blood volume increases (Ulumuddin & Yhuwono, 2018).

IV. Conclusion

Hypertension or high blood pressure is found in many people in both developed and developing countries, including Indonesia. Hypertension is a condition where there is an increase in a person's blood pressure above normal which can lead to an increase in morbidity and mortality (mortality). An increase in blood pressure that falls into the category of systolic

hypertension is more than equal to 140 mmHg and diastolic is more than equal to 90 mmHg. Hypertension can be classified into two types, namely primary or essential hypertension whose cause is unknown and secondary hypertension which can be caused by other diseases such as kidney disease, endocrine disease, heart disease, and kidney disorders. Some of the risk factors for hypertension are age, gender, smoking habits, obesity, and lifestyle. Hypertension Incidence Rate Based on Gender, it was found that the number of hypertensive patients of the male sex had a higher percentage, namely 68%. While patients with female sex as much as 32%. Hypertension Incidence Rate Based on Age Group The incidence of hypertension tends to be high in patients in the age group >65 years (seniors) as much as 36%, followed by patients in the age group 56-65 years (late elderly) as much as 34% and age group 46-55 years (early elderly) as much as 20%. Meanwhile, in the age group of 26-35 years and 36-45 years, hypertension rates tend to be lower by 4% and 6%, respectively. The incidence of hypertension based on smoking habits was obtained in as many as 20 people (40%) patients who had a smoking habit. While the rest (60%) did not. However, of patients with smoking habits, all of them were male. This means, that as many as 59% of male patients (20 of 34 male patients) has a smoking habit. Hypertension Incidence Rate Based on Comorbidities / Complications obtained as many as 34% of respondents with hypertension have comorbidities. These comorbidities include cardiovascular disorders (heart disease; heart failure; angina pectoris), neurological disorders (stroke), and metabolic disorders (DM). Hypertension Incidence Rate Based on Blood Type, the non-O blood group (blood types A, B, and AB) has a higher incidence of hypertension by 62%. The incidence of hypertension is based on monthly visits (routine control), calculated in the last 3 (three) months. From these data, patients with regular visits every month in the last 3 months (regular control) were 20%, patients with regular visits in 2 months were 32%, and visits only once in the last 3 months were 20%. Meanwhile, patients who had no visits in the last 3 months (not routinely controlled) were 28%. This shows that the number of patients who do not control is not more than patients who control regularly. Hypertension Incidence Rate Based on Body Mass Index (BMI), the highest percentage in patients with overweight BMI, which is 64%. Meanwhile, patients with underweight BMI are only 4%.

Carry out promotive and preventive efforts to the community by providing easily accessible information facilities such as health education, socialization, distribution of leaflets, posters, and the like as an effort to prevent and control hypertension. Education is needed for hypertensive patients to recognize several controllable risk factors for hypertension, such as smoking habits, body mass index, medication adherence, and medication adherence for comorbidities to control hypertension.

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