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Analysis of the Relationship between Modifiable Hypertension Risk Factors and Hypertension Incidence in the Adult Population

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Abstract
Introduction: *Hypertension, defined as systolic blood pressure >140 mmHg and diastolic >90 mmHg, is a major health issue that may lead to complications in various organs. It is influenced by modifiable and non-modifiable risk factors.* ***Objective:*** *This study aims to analyze the relationship between modifiable risk factors and the incidence of hypertension in Jemah Village, Sumedang Regency, in 2024.* ***Method:*** *This research used a quantitative cross-sectional design and was conducted in April 2024 in Jemah Village. The population included all residents aged ≥18 years, with 50 respondents selected using purposive sampling based on the Lemeshow formula. Central obesity was chosen as the primary variable due to its highest required sample size.* ***Results and Discussion:*** *Among the 50 respondents (24% male, 76% female), 70% were aged 18–64 years. Key modifiable risk factors identified included 66% non-smokers, 82% with excessive salt intake, 54% moderate physical activity, 44% with central obesity, and 54% with dyslipidemia. Chi-square analysis showed significant associations between hypertension and dyslipidemia (p=0.001), smoking (p=0.036), physical activity (p=0.046), and salt consumption (p=0.024).* ***Conclusion:*** *Hypertension was more prevalent among women. Dyslipidemia, smoking, physical inactivity, and high salt intake were significantly associated with hypertension.*

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Introduction

According to the World Health Organization (WHO), the International Society of Hypertension (ISH) and the Joint National Committee on Prevention, Detection, Evaluation, and Treatment High Blood Pressure (JNC VIII) the definition of hypertension is an increase in systolic blood pressure of more than or equal to 140 mmHg and diastolic of more than or equal to 90 mmHg (Al Saffar, Al Khazragy, & Ali, 2013; Oktaviarini, Hadisaputro, Suwondo, & Setyawan, 2019); (Cai et al., 2021). WHO estimates the prevalence of hypertension in the world from the total world population of 22% in 2019. Based on WHO data, in 2023 there will be 1 in 3 people suffering from hypertension. WHO reported that in the same year, only 54% of adults with hypertension were diagnosed, 42% received treatment, and only 21% had their hypertension controlled. (Al Saffar et al., 2013; Indonesia, 2019; Kemenkes, 2019).

If we look at the situation based on region, the percentage of adult hypertension sufferers in 2019 decreased in the European region compared to 1990, but increased in the Asian region, especially in the Western Pacific Region which was found from 24% to 28%. The Western Asia Pacific region includes countries such as Australia, New Zealand, China, the Republic of Korea, the Philippines, Malaysia, Vietnam, and Japan. The Southeast Asian region has a figure of 29% to 32%, which includes countries such as India, Nepal, Indonesia, and Thailand. Southeast Asia is ranked third for the highest prevalence of hypertension, namely 25% of the total population (Cheng et al., 2022; Gu et al., 2023; Kowalski, Goniewicz, Moskal, Al-Wathinani, & Goniewicz, 2023; Pradono, Kusumawardani, & Rachmalina, 2020; Yuling, Agustian, & Enggar, 2018).

The prevalence of hypertension in Indonesia from the results of blood pressure measurements in the population aged ≥18 years in 2013, was 25.8% and increased to 34.1% in 2018. The Health Profile of West Java Province in 2019 recorded the prevalence of hypertension in West Java in 2019 of 41.1%, while the results of the Basic Health Research (Riskesdas) in Indonesia in 2018 were 39.6%, an increase compared to the results of the 2013 Riskesdas of 29.4%. And Sumedang Regency is one of the areas with an increasing prevalence of hypertension, namely in 2016, as many as 69,328 people, in 2017, as many as 71,506 people, and in 2018 to 84,162 people. West Java is ranked second after South Kalimantan (Kemenkes, 2022; Maulidina, Harmani, Suraya, & Masyarakat, 2019; SIMATUPANG, 2020).

Hypertension sufferers are patients with the highest risk of stroke and cardiovascular disease. According to data from the WHO in 2013, there were 9.4 million people per 1 billion people in the world who died due to cardiovascular disease disorders, including hypertension. The prevalence of hypertension is increasing fastest in developing countries (80% in the world), where hypertension treatment is still difficult to control, thus contributing to the increasing epidemic of cardiocerebrovascular disease (CVD). Hypertension causes the deaths of around 8 million people each year, of which 1.5 million deaths occur in Southeast Asia. In Indonesia, the 2018 Riskesdas showed an increase in the prevalence of hypertension with a population of around 260 million, which was 34.1% compared to 25.8% in the 2013 Riskesdas. It is estimated that only a quarter of hypertension cases in Indonesia are diagnosed, and data shows that only 0.7% of diagnosed hypertension patients take antihypertensive drugs (Angga & Elon, 2021; Hardati & Ahmad, 2017; Herdiani, 2019; Menggasa, Kaunang, & Kalesaran, 2018)

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The high incidence of hypertension is closely related to the high prevalence of hypertension risk factors. According to the classification adopted by WHO, risk factors can be classified into modifiable and non-modifiable. Modifiable risk factors include factors that are influenced by a person's attitudes and behavior, such as excessive salt intake, smoking, low physical activity, overweight, obesity and excessive alcohol consumption. Non-modifiable risk factors are factors that are influenced by a person's structural characteristics, not their behavior. These include, but are not limited to, age, gender, and genetic makeup. These risk factors become potential hypertension because they can reduce the elasticity of blood vessels so that blood vessels become stiff and cause plaque in blood vessels which causes high cardiac output so that the heart's workload increases (Hanifah, 2020; Lutfi, Fauziyah, & Abdillah, 2019; Melini & Tanuwijaya, 2021). This study aims to investigate the relationship between modifiable risk factors and the incidence of hypertension in a population in Jemah Village, Sumedang Regency, West Java. Through a better understanding of the factors that influence hypertension, it is hoped that it will enable the development of more effective prevention strategies and targeted interventions.

Method

This research design uses a quantitative cross-sectional research method, which aims to analyze the causal relationship of hypertension with modifiable hypertension risk factors. Data collection for this study used primary data through direct measurements (blood pressure, weight, height, waist circumference, blood sugar levels, total cholesterol levels), filling out questionnaires, and direct interviews in Jemah village in April 2024.

Location and Time of Research: The research was conducted in Jemah Village, Jatigede District, Sumedang Regency in April 2024**. Population:** The population to be studied is all groups aged ≥ 18 years who live in Jemah Village, Jatigede District, Sumedang Regency in April 2024. **Sample:** The sampling technique is purposive sampling using the Lemeshow formula to obtain representative data so that the research results can be generalized. The number of samples obtained was 50 respondents. **Research Instruments:** Research instruments are tools used in a research activity, especially for measuring and collecting data. The research instruments used in this study are primary data, with a questionnaire as an instrument to determine the characteristics and modifiable risk factors for hypertension. **Data Analysis:** All data that has been entered or entered is analyzed in two ways, namely univariate and bivariate. Furthermore, all data that has been entered into the computer is analyzed and interpreted further

Result and Discussion

1. Result

The study was conducted in jemah village, sumedang regency in april 2024 on 50 samples studied. Patient data collected in this study were age, education, occupation, smoking status, daily salt consumption, daily fiber consumption, quality of physical activity, blood glucose levels, total cholesterol levels, body weight, height, and waist circumference.

Table 1 is the data of respondent characteristics based on age, gender, education and occupation. The data indicates that the frequency of the research sample is the most in the 18-64 year age group with the most hypertension incidents in that age group. In addition, from the table above it is also found that there are 41 sample people who work

as housewives, 5 people as entrepreneurs, 1 person as a teacher, 1 person as a midwife, 1 person as a government employee. and 1 person as an honorary. Hypertension occurs most often in the group who work as housewives, which is 48%. When viewed from the last level of education, there are 22 sample people whose last education is elementary school, 12 people whose last education is junior high school, 13 people whose last education is high school, 1 person whose last education is D3, and 2 people whose last education is S1. The most hypertension incidents are in the group whose last education is elementary school, which is 38%.

Table 1
Respondent Characteristics

Characteristics	Frequency	Percentage	Hypertension		Not Hypertension	
			Frequency	Percentage	Frequency	Percentage
Age						
18–64 years	35	70	13	26	22	44
≥ 65 years	15	30	11	22	4	8
Gender						
Male	38	76	19	38	19	38
Female	12	24	5	10	7	14
Education						
Elementary School	22	44	19	38	3	6
Junior High School	12	24	4	8	8	16
Senior High School	13	26	3	6	10	20
Diploma 3	1	2	0	0	1	2
Strata 1	2	4	0	0	2	4
Job						
Housewife	41	82	24	48	17	34
Self-Employed	5	10	1	2	4	8
Teacher	1	2	0	0	1	2
Midwife	1	2	0	0	1	2
Government Employee	1	2	0	0	1	2
Honorary	1	2	0	0	1	2

Table 2 presents data on univariate analysis which includes: Blood Pressure Distribution data; Smoking Status Distribution; Fiber Consumption Distribution; Salt Consumption Distribution; Physical Activity Quality Distribution; General Obesity Distribution; Central Obesity Distribution; Dyslipidemia Distribution; Blood Glucose Level Distribution.

Table 2
Univariate Analysis

Categories	Frequency	Percentage
Blood Pressure Distribution		
Hypertension	26	52
Not Hypertension	24	48
Smoking Status Distribution		
Smoking	17	34
Not Smoking	33	66
Fiber Consumption Distribution		
Enough	27	54
Not Enough	23	46
Distribution of Salt Consumption		
≤ 5 grams	9	18
> 5 grams	41	82
Distribution of Physical Activity Quality		
Light physical activity	23	46
Heavy - moderate physical activity	27	54
General Obesity Distribution		
< 25 kg/m^2	28	56
≥ 25 kg/m^2	22	44
Distribution of Central Obesity		
Waist circumference ≥ 90 cm (men), and ≥ 80 cm (women)	28	44
Waist circumference < 90 cm (men), and < 80 cm (women)	22	56
Distribution of Dyslipidemia		
< 200 mg/dl	27	54
≥ 200 mg/dl	23	46
Blood Glucose Level Distribution		
< 126 mg/dl	46	92
≥ 126 mg/dl	4	8

Blood Pressure Distribution

Systolic and diastolic blood pressure were obtained by measuring with a Sphygmomanometer. Blood pressure is categorized into 4 groups based on JNC VIII 2014. The distribution of descriptive statistics of solid blood pressure is seen in Table Blood Pressure Distribution Based on JNC VIII Classification. Of the 50 research samples, there were 26 people who were not classified as hypertensive and 24 people who were classified as hypertensive.

Smoking Status Distribution

This study describes the distribution of smoking status among a total of 50 respondents. 17 (34%) were smokers, while 33 (66%) were non-smokers. This distribution analysis highlights the variation in smoking behavior in the population studied. Although the majority of respondents did not smoke, the presence of a significant number of smokers indicates the need for special attention to smoking-related risk factors,

including the risk of hypertension. The practical implications of these findings emphasize the importance of public health interventions that focus on reducing smoking prevalence, as well as increasing awareness of the health risks associated with this habit.

Fiber Consumption Distribution

This study showed an even distribution between the two categories of fiber consumption among the 50 participants. With 27 people (54%) having fiber consumption that met or exceeded daily requirements, and 23 people (46%) consuming fiber below the expected standard. The existence of equal proportions in these two categories raises the question of what factors might influence fiber consumption patterns among this population. Do factors such as dietary habits, accessibility to fiber-rich foods, or inadequate nutritional knowledge play a role in this even distribution. The even distribution between the two categories indicates that there is variation in fiber consumption patterns among the studied population. These findings provide valuable insights in efforts to raise awareness of the importance of fiber intake in the daily diet, as well as to identify groups that may require special attention in prevention programs and nutrition-related health interventions.

Distribution of Salt Consumption

This study used the SQ-FFQ questionnaire and software in the form of Nutrisurvey to measure the daily salt consumption of 50 research sample people. Based on the table, it can be seen that out of 50 research samples, there are 9 people (18%) who consume salt ≤ 5 grams per day, and 41 people (82%) whose daily salt consumption is > 5 grams per day. The largest group is the group of people who consume salt > 5 grams per day

Distribution of Physical Activity Quality

This physical activity is a body movement that can expend power and energy, and based on the intensity or amount of calories used when doing physical activity, it is categorized into light, moderate, and heavy physical activity. Doing physical activity is very important because it can prevent heart disease, stroke, diabetes, and obesity (Directorate General of P2PTM, 2017). Distribution of respondents based on physical activity shows that out of 50 samples, 23 respondents (46%) had light physical activity, and 27 respondents (54%) had heavy-moderate physical activity.

General Obesity Distribution

Anthropometric examination of BMI and waist circumference is criteria used to classify obesity. Obesity classified based on BMI is defined as general obesity. BMI is obtained by dividing body weight in kilograms by the square of height in meters squared, so that kilograms per meter squared (kg / m2) are obtained. WHO recommends criteria for overweight (BMI 23.0-24.9) and obesity (BMI ≥ 25). Based on the table, it can be seen that from 50 research samples, the distribution results of respondents with BMI <25 kg/m2 were 28 people (56%) and respondents with BMI ≥25 kg/m2 were 22 people (44%). Thus, respondents with BMI <25 kg/m2 were more than respondents with BMI ≥25 kg/m2.

Distribution of Central Obesity

The circumference of the stomach is an indicator of central obesity. Measuring the circumference of the stomach using a measuring tape which if it produces a number ≥ 90 cm for men, and ≥ 80 cm for women, can be considered to have central obesity according to the Ministry of Health, Based on the table, it can be seen that from 50 research samples, there are 28 people (44%) who can be categorized as having central obesity because they have a waist circumference of ≥ 90 cm (men), and ≥ 80 cm (women), and 22 people (56%) who are not classified as having central obesity because they have a waist circumference of <90 cm (men), and <80 cm (women).

Distribution of Dyslipidemia

The main lipid fraction abnormalities are increased levels of total cholesterol (≥240 mg/dl), LDL cholesterol (high 160-189 mg/dl, very high ≥190 mg/dl), triglycerides (high 200-499 mg/dl, very high ≥500 mg/dl), and decreased HDL cholesterol (lk <40 mg/dl, pr <50 mg/dl).Based on the table, it can be seen that out of 50 research samples, there were 27 people whose blood lipid levels were below 200 mg/dl, and 23 people whose lipid content was more or equal to 200 mg/dl. The largest group was the group of people whose lipid content was less than 200 mg/dl. It can be concluded that out of 50 research samples, there were 27 people who were not hyperlipidemic and 23 people who were hyperlipidemic.

Blood Glucose Level Distribution

Blood glucose levels are obtained from measurement results using an independent blood glucose test tool, where the research sample is asked to fast for at least 6 hours and then their blood glucose levels are checked. Based on the Ministry of Health, fasting blood glucose levels are said to be high or hyperglycemia occurs if the measurement results show ≥ 126 mg/dL. The descriptive statistical distribution of solid blood glucose levels is seen in the Blood Glucose Level Distribution Table Based on the Ministry of Health. Based on the table, it can be seen that from 50 research samples, there were 46 people whose fasting blood glucose levels could be categorized as not hyperglycemic because they were <126 mg/dL, and 4 people were classified as hyperglycemic because their fasting blood glucose levels were ≥ 126 mg/dL

Table 3 is the data from the results of the Bivariate Analysis of the significance of the relationship between variables.

Table 3
Bivariate Analysis

Variable	Hypertension		Not Hypertension		P-Value
	Frequency	Percentage	Frequency	Percentage	
Smoking					
Yes	12	24	5	10	0.036
No	12	24	21	42	
Fiber Consumption					
Enough	14	28	9	18	0.155
Not Enough	10	20	17	34	
Salt Consumption					
≤ 5 grams	1	2	8	16	0.024
> 5 grams	23	46	18	36	
Physical Activity					
Heavy - Moderate	9	18	18	36	0.046
Light Physical Activity	15	30	8	16	
General Obesity					
Yes	10	20	12	24	0.783
No	14	28	14	28	
Central Obesity					
Yes	12	24	16	32	0.569
No	12	24	10	20	
Dyslipidemia					
Yes	18	36	9	18	0.001
No	6	12	17	34	
Hyperglycemia					
Yes	3	6	1	2	0.340
No	21	42	25	50	

2. Discussion

Relationship between Smoking Status and Blood Pressure

This variable was subjected to a bivariate analysis using the chi-square test to determine whether or not there was a relationship between smoking status and the incidence of hypertension in Jemah Village, Sumedang Regency. From the data collected, it can be seen that out of a total of 50 samples, respondents with smoking habits had 70.5% experiencing hypertension, and respondents who did not have smoking habits experienced hypertension of 36.36%. The resulting p-value (0.036) shows statistical significance, confirming that the relationship between smoking habits and hypertension is not a coincidence. Thus, this finding indicates the importance of interventions to reduce smoking habits to reduce the risk of hypertension in this population. In the study of Iren et al. (2019), it was stated that there was a significant relationship between smoking and the incidence of hypertension (P value = 0.016). This is in line with the study of Yashinta (2015), which also explained that there was a relationship between smoking and the incidence of hypertension in men aged 35-65 years. The relationship between smoking and the incidence of hypertension is due to nicotine. The nicotine in cigarettes can affect a person's blood pressure, either through the formation of atherosclerotic plaque, the direct effect of nicotine on the release of the hormones epinephrine and norepinephrine, or through the effect of CO in increasing red blood cells. However, according to research by Farabi et al. (2017), there is no relationship between smoking status and the incidence

of increased blood pressure in grade XI students of SMKN Padang, this is supported by research by Rahmatika (2021) which states that if the respondent is <45 years old, there is most likely no significant relationship with hypertension. Age is the risk factor that has the greatest influence on increased blood pressure due to the accumulation of collagen which makes the artery walls thicken, stiffen and narrow.

Relationship between Fiber Consumption and Blood Pressure

In this variable, a bivariate analysis was conducted using the chi-square test to determine whether or not there was a relationship between fiber consumption and the incidence of hypertension in Jemah Village, Sumedang Regency. From 50 sample data collected, respondents who had more or sufficient fiber consumption experienced hypertension of 60.86% and those who had a habit of consuming less fiber experienced hypertension of 58.8%. Using the chi-square statistical test, the p value obtained is around 0.155. This indicates that there is no significant relationship between fiber consumption habits and the incidence of hypertension. Therefore, H0 in this study is accepted and Ha is rejected. This is in line with research conducted by Melini et al with p value results (p = 1,000). This occurs because fiber intake is not the only factor that triggers hypertension. In contrast to the research of Lutfi M et al with p value results (p = 0.001) which states that fiber intake has a significant relationship with hypertension. Intake of cereals and fibrous vegetables has been shown to lower blood pressure.

Relationship between Salt Consumption and Blood Pressure

On this variable, a bivariate analysis was conducted using the chi-square test to determine whether or not there was a relationship between daily salt consumption and the incidence of hypertension in Jemah Village, Sumedang Regency. Based on the table above, it is known that the number of samples who consumed ≤ 5 grams of salt experienced hypertension of 11.15% and respondents who had a habit of consuming >5 grams of salt experienced hypertension of 56.09%. Then a bivariate analysis was carried out with the chi-square test to assess whether there was a relationship between daily salt consumption and the incidence of hypertension, and a p value of 0.024 (<0.05) was obtained, indicating that there was a significant relationship between these two variables. The results of the relative ratio of salt consumption to the incidence of hypertension were 2.025, which means that people who consume >5 grams of salt per day have a 2.025 times greater chance of developing hypertension compared to the group of people who consume ≤5 grams of salt. According to the analysis to assess the relative ratio of the relationship between these two variables, it was found that salt consumption above WHO recommendations, which is > 5 grams per day, can increase the risk of someone suffering from hypertension by 10.22 times. The findings in this study are in line with the research of Fillipini, et.al which explained that in the dose-response analysis of sodium reduction in clinical trials, they identified a linear relationship between sodium intake and decreased systolic and diastolic blood pressure across the range of dietary sodium exposure. Although this occurred independently of baseline blood pressure, the effect of sodium reduction on blood pressure levels was more pronounced in participants with higher blood pressure levels. This study is also inconsistent with research conducted by Adhikara WS, Budhitresna AG conducted in Karangasem Village, Bali, which found that cases with salt consumption ≥ 6 grams per day had a risk of hypertension 2 times higher than those who consumed <6 grams of salt per day.

Relationship of Physical Activity Quality with Blood Pressure

In this variable, a bivariate analysis was conducted using the chi-square test to determine whether or not there was a relationship between physical activity and the incidence of hypertension in Jemah Village, Sumedang Regency. Respondents with heavy - moderate physical activity had a chance of experiencing hypertension of 33.33% and respondents with light physical activity had a chance of experiencing hypertension of 65.21%. Then a bivariate analysis test was conducted with the chi-square test to determine whether there was a relationship between physical activity and the incidence of hypertension. The results obtained a p value of 0.046 (<0.05) which indicated a significant relationship between the two variables. According to the relative ratio analysis of the relationship between the two variables, it was found that low moderate-heavy physical activity and high light physical activity can increase the risk of 1.197 times for someone with hypertension compared to people who do moderate-heavy physical activity. Therefore, the HA of this study is accepted and H0 is rejected. This is in line with research conducted in Medan by Lay, et al., that there is a relationship between physical activity and the incidence of hypertension, meaning that people who do physical activity, especially light physical activity, have a three times greater risk of suffering from hypertension compared to people who do moderate and heavy physical activity, with an RR value of 3.619. This can be said to be in line, because physical activity, especially exercise, increases the production of nitric oxide and vascular endothelial growth factor (VEGF) and angiopoietin which actively lower blood pressure. Lack of physical activity is one of the risk factors for hypertension because it can inhibit blood flow or cause irregular blood flow which leads to increased blood pressure. This analysis data is not in line with research conducted by Cindy Debora, et al., because it was found that lack of physical activity (metabolic equivalent/week < 600) causes hypertension compared to the population that has physical activity (metabolic equivalent/week ≥ 600).

Relationship between General Obesity and Blood Pressure

On this variable, a bivariate analysis was conducted using the chi-square test to determine whether or not there is a relationship between general obesity and the incidence of hypertension in Jemah Village, Sumedang Regency. Respondents who experienced general obesity had an incidence of hypertension of 45.45% and respondents who did not experience general obesity had a chance of experiencing hypertension of 50%. Then, a bivariate analysis was conducted using the chi-square test to assess whether there was a relationship between general obesity and the incidence of hypertension, and a p value of 0.783 (> 0.05) was obtained, indicating that there was no significant relationship between these two variables, therefore H0 in this study was accepted and Ha was rejected. This is in line with research conducted by Menggasa et al. that there was no significant relationship between obesity and blood pressure in hypertensive patients (p = 0.320). This is because the prevalence of obese respondents who experienced hypertension was too low compared to obese respondents who did not experience hypertension. In addition, the results of this study are not in line with the results of research conducted by Herdiani that there was a relationship between general obesity and the incidence of hypertension (p = 0.006).This can be caused by an increase in BMI followed by an increase in blood pressure. This means that the higher a person's BMI, the higher the chance of developing hypertension.

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Relationship between Central Obesity and Blood Pressure

On this variable, a bivariate analysis was conducted using the chi-square test to determine whether or not there was a relationship between central obesity and the incidence of hypertension in Jemah Village, Sumedang Regency. Respondents who experienced central obesity had a chance of experiencing hypertension of 42.8% and respondents who did not experience central obesity had a chance of experiencing hypertension of 54.54%. Then bivariate analysis was conducted with the chi-square test to assess whether or not there was a relationship between central obesity and hypertension. A p value of 0.569 (> 0.05) was obtained, indicating that there was no significant relationship between these two variables. This indicates that there is no significant relationship between central obesity status and hypertension at a significance level of 0.05. This means that although there is a difference in the distribution of hypertension between the central obesity group and those without central obesity, the difference is not statistically large enough to conclude that there is a significant relationship between the two variables. So there is not enough statistical evidence to state a significant relationship between central obesity status and hypertension in this study sample. This is in line with research conducted by Rosidawati, et al (2025) in the journal "The Relationship between Central Obesity and High Blood Pressure in the Elderly at the Panti Werdha Hana Foundation and Sasana Tresna Werdha Ria Pembangunan" that there is no significant relationship between central obesity and blood pressure in hypertensive patients (p = 0.318), but this study is not in line with research conducted by Hadiputra, et al (2022) in the journal "The Relationship between General Obesity and Central Obesity with Hypertension Incidents at the Palaran Health Center" which found in the results of the discussion that central obesity shows a relationship with hypertension and shows that people with central obesity are 2.3 times more likely to suffer from hypertension than people who do not suffer from central obesity. In addition, there is also research conducted by Nudiantami Y, et al., which found that someone with central obesity is 1.50 times more likely to suffer from hypertension. Therefore, H0 is accepted in this study, and HA is rejected.

Relationship between Dyslipidemia and Blood Pressure

On this variable, a bivariate analysis was conducted using the chi-square test to determine whether or not there was a relationship between lipid levels and the incidence of hypertension in Jemah Village, Sumedang Regency.respondents who experienced dyslipidemia had an incidence of hypertension of 66.66% and respondents who did not experience dyslipidemia had a chance of experiencing hypertension of 26.08%. According to this study, dyslipidemia is associated with hypertension (p value = 0.0001). The results of the relative ratio of dyslipidemia to the incidence of hypertension were 3.578, indicating that individuals with dyslipidemia or lipids at levels greater than 200 mg/dL have a 3.578 times higher chance of experiencing hypertension compared to those without dyslipidemia. This is in line with research conducted in Ethiopia by Putri,et al that hypertension also increases twofold in people who have high triglyceride levels. Dyslipidemia is one of the predictors of heart disease or disorders. Dyslipidemia causes damage to the vascular wall, resulting in impaired vasomotor function.

Relationship between Hyperglycemia and Blood Pressure

A bivariate analysis was conducted using the chi-square test to determine whether there was a relationship between blood glucose levels and the incidence of hypertension in Jemah Village, Sumedang Regency, on this variable. respondents who experience hyperglycemia have a 75% chance of experiencing hypertension, and respondents who do not experience hyperglycemia have a 45.65% chance of experiencing hypertension. Therefore, H0 is accepted in this study, and HA is rejected. This is in line with Asemu MM, where in this study also obtained insignificant results or there was no significant relationship between increased blood glucose levels and hypertension. In addition, the results of this study are not in line with those of research conducted by Dwi N on residents of Mersi Village, Central Java Province, which obtained significant results indicating a strong relationship between blood glucose levels and blood pressure. The inconsistency of these findings can be attributed to differences in the age of the research sample, such as the elderly group studied by Dwi N. This age group is more likely to experience a decline in various organ functions, including those that regulate blood glucose, such as the pancreas, and those that affect blood pressure, such as blood vessels. In addition, women's fertility rates tend to decrease with age, which is exacerbated by the increasing risk of degenerative diseases in old age, such as diabetes, which can increase the risk of hypertension.

Conclusion

This study shows that several modifiable risk factors have a significant relationship with the incidence of hypertension in Jemah Village, Sumedang Regency. These factors include dyslipidemia, smoking habits, physical activity levels, and daily salt consumption. In contrast, no significant relationship was found between the incidence of hypertension and fiber consumption, blood glucose levels, central obesity, or general obesity. These findings underline the importance of controlling modifiable risk factors in efforts to prevent and manage hypertension at the community level.

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