

The Influence of Lifestyle with the Incidence of Hypertension in the Community at the Parmonangan District Health Center

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ABSTRACT

Background: Hypertension remains one of the leading non-communicable diseases worldwide and is closely associated with unhealthy lifestyle behaviors. Lifestyle factors such as dietary habits, physical activity, smoking, caffeine consumption, and family history may contribute to the development of hypertension. This study aimed to analyze the influence of lifestyle on the incidence of hypertension among the community in the working area of the Parmonangan District Health Center.

Methods: This quantitative study employed a cross-sectional design and was conducted from April to May 2026. The study population consisted of 203 community members registered at the Parmonangan District Health Center, with a sample of 135 respondents selected using simple random sampling based on the Slovin formula. Data were analyzed using univariate, bivariate (Chi-square test), and multivariate (multiple logistic regression) analyses with a significance level of $p < 0.025$.

Results: The bivariate analysis showed significant relationships between family history ($p=0.001$), dietary habits ($p=0.025$), smoking habits ($p=0.034$), duration of smoking ($p=0.007$), number of cigarettes smoked per day ($p=0.025$), and caffeine consumption ($p=0.012$) with the incidence of hypertension. However, physical activity ($p=0.556$) and cigarette type ($p=0.078$) were not significantly associated with hypertension. Multivariate analysis revealed that family history was the strongest predictor of hypertension (OR=22.732; 95% CI=7.736–66.804; $p=0.001$).

Conclusion: Lifestyle factors, particularly dietary habits, smoking behavior, smoking duration, cigarette consumption, and caffeine intake, are associated with the incidence of hypertension. Family history was identified as the most dominant risk factor. Preventive strategies should emphasize healthy lifestyle promotion, smoking cessation, moderation of caffeine intake, healthy dietary practices, regular blood pressure screening, and early intervention for individuals with a family history of hypertension.

INTRODUCTION

Hypertension is among the most common noncommunicable diseases. Hypertension is defined if systolic >140 mmHg and diastolic > 90 mmHg, with 2x measurements at 5-minute intervals in resting conditions. Hypertension is ranked 444th as the leading cause of death due to non-communicable diseases. WHO shows that

the main cause of death is related to cardiovascular disease, Indonesia occupies the top position with 26.4%. (Dungga, 2020).

Hypertension is a major global challenge, leading to an increased incidence of cardiovascular disease, stroke, and kidney failure, resulting in premature death and impaired bodily function. Proper lifestyle adjustments manage and prevent high tension. Lack of understanding and negative views about making lifestyle adjustments are the biggest problem in this regard. The factors that cause high blood pressure are mainly environmental factors such as smoking, excessive alcohol consumption, and excessive fat intake, as well as genetic and behavioral factors.

Smokers have a >4.8 x greater chance of developing hypertension. Smoking is one of the causes of a person's risk of developing hypertension. Researchers believe that smoking contributes to the appearance of hypertension. Smoking contains nicotine which can result in increased blood flow (Akmal et al., 2023).

Reports show that there are 1.3 billion smokers aged 15 years and older in the world. According to a report from the Southeast Asia Tobacco Control Alliance, Indonesia is identified as the country with the largest smoking population in the ASEAN region. Among the total population aged 25-64 years, 36.3% are smokers, consisting of 66% men and 6.7% women. As a result, the habit of smoking is quite common among adolescents and adults (Pasaribu et al., 2023).

Lifestyle changes can help manage these risk factors. WHO shows that the incidence of hypertension and various cardiovascular diseases is increasing in developing countries. This increase is linked to an aging demographic, urban expansion, and socioeconomic changes that are driving sedentary habits. High blood pressure can be controlled through medication and healthy living. In addition to lowering blood pressure, this can also reduce risk factors (Hijriana et al., 2022).

Lifestyle, such as stress, lack of physical activity, and unhealthy eating habits can increase high blood pressure. Poor diet is a causative factor that can increase the likelihood of hypertension, including eating foods rich in sodium, fatty fast food, and lack of fruits and vegetables (Dungga, 2020). Excessive fat consumption results in an increase in body fat levels, especially cholesterol, which contributes to weight gain, thereby increasing fat levels.

Another important aspect to keep in mind is the need for exercise to maintain balance. High blood pressure of the heart works more, making it easier to damage the inside of blood vessels. Lack of physical activity increases

The possibility of developing high blood pressure increases the risk of obesity. Inactive individuals usually show a faster heart rate, and the heart muscle works harder with each beat; The more often and strongly the heart pumps blood, the greater the pressure on the arteries (Marlita et al., 2022).

Data from the health report of Parmonangan District (2025) shows that the number of hypertensive patients is still quite high and tends to increase every year with a total of 203 hypertensive patients with the result of 75 people affected by the male sex and 128 people for women.

RESEARCH METHODS

This study uses a quantitative method with a cross-sectional design, specifically examining data collected simultaneously to identify the relationship between independent and dependent variables. The research was conducted at the Parmonangan Health Center and was carried out from April to May 2026.

Population and Research Sample

It consisted of individuals who visited the Parmonangan Public Health Center, with data collected from January to December 2025, totaling 203 people. The sample size for this study was determined using the Slovin formula with a simple random sampling technique. The number of samples in this study was 135 people.

Data Analysis Methods

Univariate Analysis

It involves examining each variable in a study to describe or clarify the attributes of each variable.

Bivariate Analysis

Bivariate analysis involves examining two variables that are considered interconnected, with the aim of establishing whether there is a relationship between the two through a chi-square test.

Multivariate Analysis

Multivariate analysis refers to an examination conducted to determine the lifestyle elements that have the greatest or most important impact on the onset of hypertension, using several regressive tests with a significance level of $p < 0.025$.

RESEARCH RESULTS**Univariate Analysis****Respondent Characteristics**

Table 1 Frequency Distribution Characteristics of Respondents by Age, Gender, Religion, Education, Occupation, Ethnicity, Family History

Variabel	Category	Quantity (n)	Percentage(%)
Age	35-44Years	39	28,9
	45-54Years	36	26,7
	55-64Years	41	30,4
	>65 Years	19	14,1
Gender	Male	79	58,5
	Women	56	41,5
Religion	Christian Protestant	132	97,8
Education	SMP	1	0,7
	SMA	115	85,2
	Bachelor	19	14,1
Jobs	PNS	7	5,2
	Self-employed	13	9,6
	Farmer	77	57,0
	Private Employees	27	20,0
	Retirees	11	8,1
Suku	Batak Toba	135	100
Family history	There is a history	58	43,0
	None	77	57,0

Table 1, obtained from the findings of the study involving 135 participants, shows the age distribution of respondents as follows: The largest group consisted of individuals aged 55-64 years, totaling 41 respondents (30.4%), followed by 39 respondents (28.9%) in the age range of 35-44 years, 36 respondents (26.7%) in the age range of 45-54 years, and 19 respondents (14.1%) who were over 65 years old. Gender, male (58.5%), female as much (41.5%). By religion, Protestant Christians (97.8%), Catholics (2.2%). Based on the level of education, the majority of respondents had a high school education level, namely 115 respondents (85.2%). Undergraduate (14.1%) and junior high school (0.7%). Based on work, the majority of respondents work as farmers, namely 77 respondents (57.0%). Private employees (20.0%), self-employed (9.6%), retirees as many as 11 respondents (8.1%) and civil servants as many as 7 respondents (5.2%). Based on the tribe, the majority of respondents to the Toba Batak tribe were 135 respondents (100%). Based on family history, most respondents did not report a family history of hypertension, especially 77 respondents (57.0%), while 58 respondents (43.0%) showed a family history of hypertension.

Lifestyle

Table 2 Distribution Frequency by Lifestyle by Diet, Physical Activity, Smoking Habits, Type of Cigarette, Length of Time Smoking, Number of Cigarettes, Caffeine Consumption

Lifestyle	Frequency	Percentage (%)
Diet		
Not good	105	77,8

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Good	30	22,2
Physical Activity		
Not enough	39	28,9
Enough	96	71,1
Smoking Habits		
No smoking	47	34,8
Moderate smokers	2	1,5
Heavy smokers	86	63,7
Types of Cigarettes		
No smoking	47	34,8
Kretek	15	11,1
Filter	73	54,1
Length of Time	47	34,8
No smoking		
1-10Years	14	10,4
11-20Years	22	16,3
>20Years	52	38,5
Number of Cigarettes		
No smoking	47	34,8
1-10 Bars	21	15,6
11-20 Stems	52	38,5
>20 Bars	15	11,
Caffeine Consumption		
No consumption	1	0,7
Low consumption	27	20,0
Moderate consumption	107	79,3
Total	135	100

According to the findings of a study involving 135 participants, most of them had unhealthy eating habits, namely 105 participants (77.8%), while those who had healthy eating habits amounted to 30 participants (22.2%). According to the level of physical activity, most of the participants who did adequate physical activity amounted to 96 respondents (71.1%), while those who did inadequate physical activity amounted to 39 respondents (28.9%). According to smoking patterns, most respondents were classified as heavy smokers, i.e. 86 individuals (63.7%). At the same time, there were 47 respondents who did not smoke (34.8%), while there were 2 moderate smokers (1.5%).

Of the respondents, 47 (34.8%) did not smoke, while 15 (11.1%) reported using clove cigarettes. According to the duration of smoking, the majority of respondents had smoked for more than 20 years, i.e. 52 individuals (38.5%). There were 47 respondents who did not smoke (34.8%), 22 respondents who had smoked for 11-20 years (16.3%), and 1-10 years (10.4%). According to daily cigarette consumption, most respondents smoked 11-20 cigarettes daily, which was 52 respondents (38.5%). Respondents who did not smoke amounted to 47 people (34.8%), respondents who smoked 1-10 cigarettes per day amounted to 21 people (15.6%), while respondents who smoked more than 20 cigarettes daily amounted to 15 people (11.1%). Based on caffeine consumption, the majority of respondents were in the moderate consumption category, which was 107 respondents (79.3%). Respondents with low consumption were 27 respondents (20.0%), did not consume caffeine (0.7%).

Bivariate Analysis

The Relationship of Family History to the Incidence of Hypertension

Table 3 Relationship of Lifestyle with Incidence of Hypertension

		Incidence of Hypertension						
Riwayat		Ya		No		Total		P-Value
Family		n	%	n	%	N	%	
There is a history		53	39,3	5	3,7	58	43,0	0,001
None		25	18,5	52	38,5	77	57,0	
Total		78	57,8	57	42,2	135	100	

Based on table 3, it was revealed that of the 58 participants with a family history of hypertension, 53 individuals (39.3%) had hypertension, while 5 individuals (3.7%) did not have hypertension. Of the 77 participants without a family history of hypertension, 25 respondents (18.5%) suffered from hypertension, while 52 respondents (38.5%) did not have hypertension. Shows a significant relationship between family history and hypertension incidence.

The Relationship between Diet and the Incidence of Hypertension

Table 4. The Relationship between Diet and the Incidence of Hypertension

Diet	OccurrenceHypertension						P-Value
	Ya		No		Total		
	N	%	N	%	n	%	
Not good	66	48,9	39	28,9	105	77,8	0,025
Good	12	8,9	18	13,3	30	22,2	
Total	78	57,8	57	42,2	135	100	

Table 4 shows that a poor diet (48.9%) has hypertension and 39 respondents (28.9%) do not have hypertension. A good diet, as many as 12 respondents (8.9%) have hypertension and 18 respondents (13.3%) do not have hypertension. Based on the results of the chi-square test, a value of $p = 0.025$ (<0.05) was obtained, so it can be concluded that there is a significant relationship between diet and the incidence of hypertension.

The Relationship of Physical Activity with the Incidence of Hypertension

Table 5 Relationship between Physical Activity and Hypertension Incidence
Incidence of Hypertension

Activities	Ya		No		Total		P-Value
	n	%	n	%	n	%	
Physical							
Not Enough	21	15,6	18	13,3	39	28,9	0,556
Enough	57	42,2	39	28,9	96	71,1	
Total	78	57,8	57	42,2	135	100	

Based on Table 5, it can be seen that of the 39 respondents with inadequate physical activity, 21 respondents (15.6%) suffered from hypertension while 18 respondents (13.3%) did not suffer from hypertension. Of the 96 participants who did adequate physical activity, 57 respondents (42.2%), while 39 respondents (28.9%) did not suffer from hypertension with p calculated as = 0.556 (> 0.05),

The Relationship between Smoking Habits and the Incidence of Hypertension

Table 6 Relationship of Smoking Habits with Hypertension Incidence
Incidence of Hypertension

Habits	Ya		No		Total		P-Value
	n	%	n	%	n	%	
Smoking							
No smoking	21	15,6	26	19,3	47	34,8	0,034
Moderate smokers	2	1,5	0	0	2	1,5	
Heavy smokers	55	40,7	31	23,0	86	63,7	
Total	78	57,8	57	42,2	135	100	

Based on Table 6, it is clear that of the 47 respondents who did not smoke, 21 respondents (15.6%) suffered from hypertension, while 26 respondents (19.3%) did not suffer from hypertension. In the moderate smoking group, there were 2 individuals (1.5%) who suffered from hypertension. Of the 86 heavy smoker respondents, 55 individuals (40.7%) had hypertension, while 31 individuals (23.0%) did not have hypertension. The value of p is determined by = 0.034 (< 0.05).

The Relationship between Cigarette Type and Hypertension Incidence

Table 7 Relationship between Types of Cigarettes and Hypertension Incidence

Incidence of Hypertension							
Types of Cigarettes	Ya		No		Total		P-Value
	n	%	n	%	n	%	
No smoking	21	15,6	26	19,3	47	34,8	0,078
Kretek	10	7,4	5	3,7	15	11,1	
Filter	47	34,8	26	19,3	73	54,1	
Total	78	57,8	57	42,2	135	100	

Based on table 7, it is known that of the 47 respondents who did not smoke, as many as 21 respondents (15.6%) experienced hypertension and 26 respondents (19.3%) did not experience hypertension. Of the 73 respondents who used clove cigarettes, as many as 47 respondents (34.8%) experienced hypertension and 5 respondents (3.7%) did not experience hypertension. Meanwhile, of the 73 filter cigarette users, as many as 47 respondents (34.8%) had hypertension and 26 respondents (19.3%) did not have hypertension with a p value = 0.078 (>0.05).

Long-Term Relationship with Hypertension Incidence

Table 8 Relationship of Smoking Time with Hypertension Incidence

Incidence of Hypertension							
Length of Time	Ya		No		Total		P-Value
	n	%	n	%	n	%	
No smoking	21	15,6	26	19,3	47	34,8	0,007
1-10 Years	11	8,1	3	2,2	14	10,4	
11-20 Years	9	6,7	13	9,6	22	16,3	
>20 Years	37	27,4	15	11,1	52	38,5	
Total	78	57,8	57	42,2	135	100	

Based on table 8, it is known that of the 47 respondents who did not smoke, as many as 21 respondents (15.6%) had hypertension and 26 respondents (19.3%) did not have hypertension. Of the 14 respondents with a smoking period of 1-10 years, as many as 11 respondents (8.1%) had hypertension and 3 people (2.2%) did not have hypertension. Of the 22 respondents with a smoking period of 11-20 years, as many as 9 respondents (6.7%) had hypertension and 13 respondents (9.6%) did not have hypertension. Meanwhile, of the 52 respondents with a smoking period of >20 years, as many as 37 people (27.4%) had hypertension and 15 people (11.1%) did not have

hypertension. Based on the results of the chi-square test, a value of $p = 0.007$ (<0.05) was obtained, so that there was a significant relationship between the length of time smoking and the incidence of hypertension.

The Relationship between the Number of Cigarettes and the Incidence of Hypertension

Table 9 Relationship between the Number of Cigarettes and the Incidence of Hypertension

Number of Cigarettes	Incidence of Hypertension						P-Value
	Ya		No		Total		
	n	%	n	%	n	%	
No smoking	21	15,6	26	19,3	47	34,8	0,025
1-10 Bars	16	11,9	5	3,7	21	15,6	
11-20 Stems	29	21,5	23	17,0	52	38,5	
>20 Bars	12	8,9	3	2,2	15	11,1	
Total	78	57,8	57	42,2	135	100	

Based on table 9, it is known that of the 47 respondents who did not smoke, as many as 21 respondents (15.6%) had hypertension and 26 respondents (19.3%) did not have hypertension. Of the 21 respondents with the number of cigarettes 1-10 cigarettes, as many as 16 respondents (11.9%) had hypertension and 5 respondents (3.7%) did not have hypertension. Of the 52 respondents with a total of 11-20 cigarettes, twenty-nine participants (21.5%) suffered from hypertension, while 23 participants (17.0%) did not. Of the 15 participants who smoked more than 20 cigarettes, twelve (8.9%) had hypertension, while three (2.2%) did not. The chi-square test showed a p-value of 0.025 (<0.05), which showed a significant relationship between cigarette consumption and the occurrence of hypertension. The Relationship between Caffeine Consumption and the Incidence of Hypertension

Table 10 Relationship between Caffeine Consumption and Hypertension Incidence

Caffeine Consumption	Incidence of Hypertension						P-Value
	Ya		No		Total		
	n	%	n	%	n	%	
No Consumption	0	0	1	0,7	1	0,7	0,012
Low consumption	10	7,4	17	12,6	27	20,0	
Moderate consumption	68	50,4	39	28,9	107	79,3	
Total	78	57,8	57	42,2	135	100	

Based on table 10, it is known that out of 135 respondents, most of the respondents have moderate caffeine consumption, namely 107 respondents, of which 68 respondents (50.4%) experience and 39 respondents (28.9%) do not. Respondents with low caffeine consumption were 27 respondents, of which 10 respondents (7.4%) had hypertension and twelve points six percent of respondents, or seventeen people, did not have hypertension. Only

one participant (0.7%) avoided caffeine and did not have hypertension. According to the findings of the chi-square test, the p-value is 0.012 (<0.05).

Multivariate Analysis

Variabel	p (<0.025)	OR	CI 95%
Family history	0,001	22.732	7.736 – 66.804
Diet	0,269	1.980	0.590 – 6.652
Smoking habits	0,868	0.936	0.432 – 2.032
Length of time	0,991	1.005	0.398 – 2.538
Number of cigarettes	0,984	0.989	0.337 – 2.903
Caffeine consumption	0,081	0.340	0.101– 1.142

Based on the results of the multivariate analysis in table 11, it is known that the variable that has a significant relationship with the incidence of hypertension is family history with a p-value of 0.001 (<0.025) with an OR of 22.732. The diet variable showed a p value of 0.269 (>0.025) with an OR of 1.980, the smoking duration variable was found to be a p value of 0.991 (>0.025) and an OR of 1.005, the variable on the number of cigarettes showed a p value of 0.984 (>0.025) with an OR of 0.989, the consumption variable showed a p value of 0.081 (>0.025) and an OR of 0.340.

DISCUSSION

Relationship of Family History with Hypertension in the Community at Parmonangan Health Center

The results shown in table 3 show that there is a relationship between family history and the incidence of hypertension. The results of this study showed that there were more participants with a family background of hypertension compared to those without such a background. This indicates that genetic or hereditary factors affect a person's increased blood pressure.

Basically, family history is a fixed risk factor for hypertension. Individuals who have parents or relatives with a history of hypertension are at higher risk of developing hypertension compared to individuals who do not have a family history of hypertension. Hereditary or genetic factors can affect the regulation of blood pressure, blood vessel elasticity, sodium metabolism in the body, and the function of hormones that play a role in blood pressure control (Elsi Setiandari L.O, 2022).

Research (Akmal et al., 2023) shows that there is a significant relationship between genetic factors or family history and the occurrence of hypertension, which is indicated by a p value of 0.042 (<0.05). The researchers suggest that the increased incidence of hypertension in participants with a family history of the disease may be influenced by genetic factors, and exacerbated by poor lifestyle choices. Individuals who are genetically predisposed to hypertension are more prone to high blood pressure if they follow a pattern rich in salt, smoke, be inactive, and consume caffeine.

The findings of this study show that there is a relationship between family history and the incidence of hypertension. Therefore, those with a family history of hypertension should implement prevention strategies early, including a balanced diet, consistent exercise, not smoking, reducing salt and caffeine intake, and undergoing regular blood pressure monitoring.

The Relationship between Diet and Hypertension in the Community at the Parmonangan Health Center

Based on the findings presented in Table 4, it shows a relationship between eating habits and the incidence of hypertension. This suggests that individuals with unhealthy diets experience a higher incidence rate of hypertension compared to those with healthy eating habits.

In principle, diet is a risk factor that can affect the onset of hypertension. Unhealthy diets, including diets rich in salt or sodium, high in fat, fried foods, fast food, and fermented products and drinks, can increase blood

pressure (Inayah et al., 2022).

This finding is in line with a study (Maqfirah, 2024) that shows a relationship between eating habits and the incidence of hypertension. The results of the study showed that respondents who had an unhealthy diet were more at risk of hypertension compared to respondents who applied a healthy diet. Therefore, the pattern is one of the factors that play an important role in the occurrence of hypertension.

The link between diet and hypertension does exist because a poor diet can lead to high blood pressure. Eating foods rich in salt or sodium causes the body to retain more fluids, which increases blood volume and raises blood pressure. The results of the study showed that there was a relationship between eating habits and the development of hypertension. Individuals with poor eating habits are generally at a higher risk of developing hypertension compared to those who maintain a healthy diet. Therefore, eating habits are an important aspect that must be considered in hypertension prevention and management strategies.

The Relationship between Physical Activity and Hypertension in the Community at the Parmonangan Health Center

Based on table 5, it is known that among the 39 respondents with inadequate physical activity, 21 respondents (53.8%) had hypertension, while 18 respondents (46.2%) did not have hypertension. Of the 96 respondents with adequate physical activity, 57 respondents (59.4%) had hypertension, while 39 respondents (40.6%) did not have hypertension. The results of the chi-square test showed a p-value of 0.556 (>0.05), which led to the conclusion that there was no association between physical activity and the occurrence of hypertension.

In principle, doing physical activity is very important because it offers various benefits such as lowering the likelihood of metabolic syndrome and cardiovascular events, lowering systolic and diastolic blood pressure, improving insulin sensitivity and glycemic management, and achieving a healthy weight. Lack of activity inhibits the function of body organs and interferes with blood and oxygen circulation, resulting in various health problems such as weight gain and high blood pressure (Ramdhika et al., 2023).

This research is in line with the research by (Hijriana et al., 2022). The results of the analysis of the relationship between physical activity and the incidence of hypertension showed that 23 respondents (59.0%) with low levels of physical activity suffered from hypertension, while 16 respondents (41.0%) with adequate levels of physical activity also suffered from hypertension.

The results of the study showed that there was no correlation between physical activity and the occurrence of hypertension, because the majority of people who farmed so they did a lot of movement. The researcher assumes that people in Parmonangan District who suffer from hypertension are supported by other factors such as family history, diet, smoking habits, and caffeine consumption.

The Relationship between Smoking Habits and Hypertension in the Community at the Parmonangan Health Center

Based on Table 6, it can be observed that among the 47 respondents who were not smokers, 21 respondents (44.7%) suffered from hypertension, while 26 respondents (55.3%) did not suffer from hypertension. In the moderate smoking group, there were 2 respondents (4.3%) who all suffered from hypertension. Among the 86 respondents who were heavy smokers, 55 respondents (63.9%) had hypertension, while 31 respondents (36.1%) did not suffer from hypertension. A p value of 0.034 (<0.05) indicates that there is a relationship between smoking habits and the occurrence of hypertension.

In theory, smoking is a risk factor that can increase blood pressure. Nicotine levels in cigarettes can affect blood pressure through a variety of mechanisms, including atherosclerotic plaque buildup in blood vessels, direct stimulation of the release of the hormones epinephrine and norepinephrine, as well as the influence of CO that can increase red blood cell production (Rahmatika et al., 2025).

These findings are consistent with research (Alba & Roza, 2025) showing that the majority of participants with heavy smoking patterns face a greater risk of hypertension compared to those who have light or moderate smoking patterns. The nicotine found in cigarettes can cause narrowing of blood vessels.

The link between smoking and hypertension in this study is suspected to be due to the fact that the majority of participants were heavy smokers. Research shows that heavy smokers have a higher chance of developing hypertension compared to non-smokers or moderate smokers. Regular smoking can cause narrowing of blood vessels due to nicotine and carbon monoxide found in cigarettes.

The results of the study showed that there was a significant relationship between smoking behavior and the occurrence of hypertension. Individuals who smoke heavily have a higher risk of hypertension compared to non-smokers or those who smoke moderately. As a result, smoking is a factor that can increase the incidence of hypertension. Therefore, the public is urged to reduce or eliminate the habit of smoking to maintain normal blood pressure and avoid additional health problems.

The Relationship between Cigarette Type and Hypertension in the Community at Parmonangan Health Center

Theoretically, every type of cigarette contains nicotine. Nicotine has free radical characteristics that can increase blood clotting in blood vessels due to injury to the vascular endothelium and contribute to the formation of atherosclerosis, that is, narrowing of blood vessels (Nurhaeni et al., 2022). This study is in line with the findings (Zahran & Umar, 2023) which showed that there was no correlation between the type of cigarette and hypertension, with a p value of 1.000 for systolic blood pressure and a p value of 0.294 for diastolic blood pressure.

The researchers argue that the absence of a link between the type of cigarette and hypertension in the study may be more influenced by the number of cigarettes smoked and the length of time smoked than by the type of cigarette itself. Both filter cigarettes and clove cigarettes contain nicotine, which can be physiologically harmful to health. The results of the study showed that there was no relationship between the type of cigarette and the occurrence of hypertension. Therefore, interventions to prevent hypertension should emphasize the complete cessation of smoking, regardless of the type of cigarette.

Long-Term Relationship with Hypertension in the Community at Parmonangan Health Center

According to Table 8, among the 47 non-smokers, 21 participants (15.6%) had hypertension, while 26 participants (19.3%) did not have hypertension. Of the 14 participants who had smoked for 1-10 years, 11 individuals (8.1%) had hypertension while 3 individuals (2.2%) did not have hypertension. Among the 22 participants who smoked for 11-20 years, 9 participants (6.7%) had hypertension, while 13 participants (9.6%) did not have hypertension. In total, among 52 respondents who had smoked for more than 20 years, 37 individuals (27.4%) had hypertension while 15 individuals (11.1%) did not have hypertension. A p-value of 0.007 (<0.05) indicates a relationship between e-cigarette smoking and the occurrence of hypertension.

In theory, the length of time you smoke is the duration or period of time a person has a smoking habit calculated in units of years. Smoking habits can trigger hypertension if done for a long period of time, which is around 10-20 years. The longer a person has a smoking habit, the higher the risk of hypertension due to continuous exposure to harmful substances in cigarettes to blood vessels and the cardiovascular system (Arifin Mohammad, 2024).

This research is consistent with the work of Nuriani (2021). According to the distribution of smoking duration, most respondents had smoked for ≥ 10 years, i.e. 88.7%, while those who smoked for <10 years represented 11.3%, indicating a significant correlation between the duration of smoking and the occurrence of hypertension. This shows that the longer a person smokes, the higher the likelihood of developing hypertension.

The researchers showed that the high rates of hypertension in participants with an extensive smoking history were caused by prolonged exposure to substances contained in cigarettes. In addition, chronic smoking behaviors typically involve large amounts of cigarettes smoked and other detrimental lifestyle choices, such as lack of exercise and poor eating habits, which further increase the risk of hypertension.

Based on the results of the study, it can be concluded that there is a long association between smoking time and the incidence of hypertension. Respondent The longer the exposure of harmful substances from cigarettes to the body, the greater its effect on the increase in blood pressure and damage to blood vessels.

The Relationship between the Number of Cigarettes and Hypertension in the Community at the Parmonangan Health Center

In principle, smoking is a risk factor that can affect blood pressure. The more cigarettes a person smokes, the stronger their dependence on cigarettes. This happens because nicotine in the bloodstream triggers the release of adrenaline and inhibits insulin function. As a result of the release of adrenaline, smokers experience an increase in heart rate, an increase in blood pressure, and a breathing pattern that becomes faster and heavier (Maqfirah, 2024).

These findings are consistent with research by Zahran and Umar (2023), which showed a significant relationship between daily cigarette consumption and blood pressure. The prevalence ratio findings showed that individuals who smoked 11-20 cigarettes daily were 3.5 times more likely than those who smoked 1-10 cigarettes daily.

According to the researcher, the high incidence of hypertension in respondents who smoke is due to the habit of smoking every day in a considerable amount, especially in the group of respondents who consume 11-20 sticks/day. This habit causes exposure to harmful chemicals in cigarettes to occur continuously, affecting the work of the heart and blood vessels.

The results of the study showed a correlation between cigarette consumption and the occurrence of hypertension. Participants who smoked more cigarettes were at greater risk compared to those who smoked fewer cigarettes or did not smoke.

The Relationship between Caffeine Consumption and Hypertension in the Community at the Parmonangan Health Center

In principle, coffee is a beverage that is enjoyed daily by most people around the world. As a result, the

impact of caffeine in coffee has been researched in recent years through various observational studies and clinical trials. Caffeine can increase the secretion of adrenaline, leading to a variety of impacts on the cardiovascular system, including increased blood pressure, endothelial disorders, inflammation, and decreased insulin sensitivity, which are potentially linked to the risk of cardiovascular disease (James W, Elston D, 2024).

The findings of this research are supported by research conducted by (Nurlela H Humolungo, 2025). Results of bivariate analysis with Spearman rating test

showed a p value of 0.002, which was below the threshold of 0.05, indicating a relationship between coffee consumption habits and hypertension at the Kamonji Health Center. The correlation coefficient (r) of $r = 0.360$ showed a very strong relationship (0.76 - 0.99). The correlation produced a positive value, indicating that coffee drinking habits in individuals with hypertension were common.

This study is also in line with (James W, Elston D, 2024), the results of research that show that the majority of respondents with hypertension have the habit of consuming coffee with frequent frequency, namely 29 respondents (36.70%). This can be interpreted by consuming coffee with frequent frequencies that can cause an increase in Systol > 140 mmHg with Diastol > 90 mmHg so that it can cause hypertension.

The researcher assumes that the results of the study that show a link between caffeine consumption and the incidence of hypertension occur because the majority of people in Parmonangan sub-district are farmers and private workers who use night working hours, therefore people who farm generally consume caffeinated drinks such as coffee to increase energy and reduce fatigue when working for a long time. Likewise, private workers who work at night tend to consume caffeine to help maintain concentration and reduce drowsiness while working at night.

Based on the results of the study, it can be concluded that caffeine consumption has a relationship with the incidence of hypertension. Respondents who consume coffee with frequent frequency and in excess amounts can cause a risk of hypertension. Therefore, participants were expected to limit their daily caffeine intake. They should also monitor the caffeine levels in the coffee and check their blood pressure frequently.

Variables Most Associated with Hypertension Incidence

Family history significantly impacts the likelihood of developing hypertension. A family history of hypertension indicates that there are genetic or hereditary factors that can increase a person's chances of developing high blood pressure.

This research is in line with the findings from the hospital. KII. DR. R. Hardjanto Balikpapan, East Kalimantan, who showed that the most significant variable was family history, with a p value of 0.000 and OR = 290.184 (Tk et al., 2025).

The results of the study showed that family history is the most significant factor associated with the occurrence of hypertension in the population. Individuals with a family history of hypertension have a higher risk of developing the condition than those without a history. Therefore, individuals with a family background with hypertension should monitor their blood pressure more frequently, maintain a healthy lifestyle, reduce salt intake, quit smoking, and avoid other risk factors that can cause hypertension.

CONCLUSION

Based on the results of the study, researchers can draw conclusions: There is a relationship between family history and the incidence of hypertension in the community, between eating habits and the incidence of hypertension among the population, there is no correlation between physical activity and the incidence of hypertension in the community, smoking behavior and the incidence of hypertension, there is no correlation between the type of cigarette and the incidence of hypertension in the community, the correlation between the duration of smoking and the incidence of hypertension, There is a correlation between cigarette consumption and hypertension rates in the community, and there is a relationship between caffeine consumption and the incidence of hypertension in the community.

ADVICE

The government is expected to improve hypertension management and management programs through promotional and preventive measures such as health education, healthy living initiatives, and regular community blood pressure checks. In addition, the government is also expected to strengthen tobacco consumption control policies and increase access to health services for early detection of hypertension.

It is hoped that the research site can increase health education to the public about hypertension risk factors, in addition to the research site is expected to conduct regular blood pressure checks, increase hypertension screening activities, and provide health counseling so that the community better understands the importance of maintaining normal blood pressure.

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