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Uncontrolled Blood Pressure in Hypertension Patients in Semarang City

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Abstract

Hypertension is blood pressure above the normal threshold of 120/80 mmHg. Uncontrolled blood pressure is blood pressure >140/90 mmHg. The purpose of this study was to analyze factors related to uncontrolled blood pressure. Controlled in Hypertension Patients in Semarang City. This study used a cross-sectional method, the research sample was 400 people with convenience sampling technique. Data collection techniques using questionnaires and medical records. Data analysis was carried out using the chi-square test and logistic regression. The results showed that there was a significant relationship between the variables of age p value 0.043 <0.05; PR1.141, drug consumption compliance 0.027 <0.05; PR 0.864, obesity incidence p value 0.023 <0.05; PR1.157 , education level p value 0.020 <0.05; PR1,190, smoking status p value 0.017<0.05; PR1,271, exercise habits p value 0.012<0.05; PR1,186, stress events p value 0.036<0.05; PR1,146, marital status p value 0.39<0.05; PR0,865, and there is no relationship between gender p value 0.151>0.05 , with uncontrolled blood pressure in hypertensive patients in Semarang City. The obesity variable (p value 0.023<0.05) is the most risky variable or the most related to uncontrolled blood pressure in hypertensive patients in Semarang City. The conclusion of the results of this study is that there is a relationship between age, drug compliance, obesity events, education level, smoking status, exercise habits, stress events and marital status with uncontrolled blood pressure in hypertensive patients in Semarang City.

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INTRODUCTION

Non-communicable diseases (NCDs) or what are commonly classified as chronic diseases usually last for a long time, which are the result of a combination of genetic, physiological, environmental and behavioral factors, or are also called cardiovascular diseases (heart attacks and strokes), cancer, chronic diseases (chronic obstructive pulmonary disease and asthma), and diabetes (WHO, 2023).

Hypertension or commonly known in the general public as blood disease above the normal threshold of 120/80 mmHg, uncontrolled blood pressure is when systolic blood pressure ≥140 mmHg and diastolic blood pressure ≥90 mmHg, hypertension is divided into several stages, namely pre-hypertension 120-129 / 80-90 mmHg, stage 1 hypertension 140-150 / 90-99 mmHg, stage 2 hypertension >160 /> 110 mmHg (WHO, 2023).

Decreased elasticity of blood vessels can result in increased peripheral vascular resistance resulting in (HR x Stroke volume) x Peripheral resistance (Permata Sari Lubis et al., 2022). Hypertension generally has no specific symptoms, when viewed from a physical perspective, hypertension does not have any physical disorders. Generally, symptoms of hypertension are a pounding heart, blurred vision, headaches and nausea or even vomiting, ringing in the ears, feelings of restlessness and chest pain. The body gets tired easily, the face looks red and there is bleeding from the nose or nosebleeds. In 2010 the prevalence of hypertension was 26%, but this figure has not reached the global target of 25% (with a relative target of 25% in 2010-2025).

Based on Riskesdas 2018, the prevalence of hypertension in Indonesia was 34.1%, an increase compared to the prevalence of hypertension in Riskesdas 2013 of 25.8%. Based on Riskesdas 2018, the prevalence of hypertension in Central Java Province was 37.57%, an increase compared to the prevalence of hypertension in Riskesdas 2013 of 26.4%. Based on Riskesdas 2018, the prevalence of hypertension in Semarang City was 37.02%, an increase compared to the prevalence of hypertension in Riskesdas 2013 of 22.5%.

Based on the background above, the researcher is interested in conducting a study entitled "Analysis of Factors Affecting Uncontrolled Blood Pressure in Hypertension Patients in Semarang City", the specific objective of this study is to analyze the relationship between independent variables, namely age, gender, compliance with drug consumption, obesity incidence, education level, smoking status, exercise habits, stress incidence and marital status to the dependent variable, namely uncontrolled blood pressure in hypertension patients in Semarang City.

METHOD

This study is a quantitative study, using a cross-sectional approach which is to study the relationship between several independent variables, namely age, gender, drug consumption compliance, obesity incidence, education level, smoking status, exercise habits, stress incidence and marital status with the dependent variable, namely uncontrolled blood pressure and taking momentary measurements (Dahlan, 2010). The population in this study was people with hypertension with a total of 290,910 cases, 148,615 of whom were women and 142,294 of whom were men (Dinkes, 2022).

The population in this study was 290,910 people with hypertension in the city of Semarang and the sample in this study amounted to 400 samples, which were taken from three Health Centers with the highest ranking of hypertension cases in the city of Semarang, namely Tlogosari Kulon Health Center (16,117), Tlogosari Wetan Health Center (17,1879), Kedungmundu Health Center (22,935), 400 samples were obtained by calculating samples from the absolute proportion estimate, using Slovin to determine the number of samples. Selection sample use convenience sampling. Convience engineering sampling is a way of taking respondents based on individuals encountered during data collection at the Tlogosari Kulon Health Center, Tlogosari Wetan Health Center, Kedungmundu Health Center during the data collection process who are willing to be respondents and meet the inclusion criteria, this study was conducted in August 2024-September 2024.

Data collection is primary and secondary. Primary data collection was conducted using a questionnaire with structured interviews, the variables collected primarily were, drug consumption compliance, obesity incidence, education level, smoking status, exercise habits, stress incidence and marital status. Secondary data collection used identity cards (KTP) and patient medical record data at the Health Center where the data was collected, the variables collected secondary were age, gender and blood pressure of hypertensive patients.

Bias factors in this study may occur such as there are patients who refuse to be respondents, there are patients who have difficulty remembering to answer questions from researchers, and there are patients who have comorbidities such as diabetes. The steps that can be taken to minimize this bias are that researchers first conduct a questionnaire trial or validity test on 30 patients with hypertension at the Harapan and Doa Hospital in Bengkulu City, there are many elderly respondents in this study so that difficulty remembering often occurs therefore researchers take elderly respondents who can still clearly remember the answers to the questions and there are also some patients who are accompanied by their closest family so that this is quite helpful for researchers. In this study, researchers only analyzed the independent variables and dependent variables, did not analyze confounding variables such as comorbidities.

The inclusion criteria for sampling in this study were hypertension patients who underwent examination at the local Health Center during the data collection period and patients were willing to become respondents. The exclusion criteria in this study were hypertension patients who were not willing to become respondents, who had difficulty communicating and did not have a companion.

Data analysis techniques using univariate analysis, bivariate analysis and multivariate analysis. Univariate analysis in this study is to analyze the percentage of each research variable using distribution and frequency. The frequency distribution table in the univariate analysis displays the characteristics of respondents based on the variables of age, gender, drug compliance, obesity incidence, education level, smoking status, exercise habits, stress incidence and marital status with blood pressure in hypertension patients in Semarang City.

Bivariate analysis in this study was conducted to determine the relationship between independent variables, namely age, gender, compliance with drug consumption, obesity, education level, smoking status, exercise habits, stress and marital status with the dependent variable, namely uncontrolled blood pressure in hypertension sufferers. using chi square test analysis because the following test has the advantage of comparing two or more groups on categorized data, if the chi square test does not meet the requirements then the fisher exact test is carried out. If the research results get a p value < 0.05 Ha is accepted or there is a relationship and if the research results p > 0.05 Ha is rejected or there is no relationship.

Multivariate analysis was conducted to determine the variables that have the strongest relationship or risk to uncontrolled blood pressure in hypertensive patients in Semarang City. The coding used in logistic regression is 1 for the risk category and 0 for the non-risk category. Based on multivariate analysis, the regression equation model is determined. The results of the regression equation are used to predict the probability of uncontrolled blood pressure in hypertension sufferers.

Based on Figure 1 population and sample flow diagram, there are 37 health centers in the Semarang City area, but only 3 health centers were taken as research locations because the 3 health centers are the top 3 highest hypertension cases in Semarang City based on 2022 Health Office data, including Tlogosari Kulon Health Center, Tlogosari Wetan Health Center and Kedungmundu Health Center. The other 34 health centers were not included in the research target because the researcher only took the 3 highest rankings for hypertension cases in Semarang City.

In the three health centers, structured interviews were conducted using questionnaires with hypertension patients who were undergoing treatment at the local health center at the time of the study. The samples taken were 130 samples from the Tlogosari Kulon Health Center, 136

samples from the Tlogosari Wetan Health Center, and 134 samples from the Kedungmundu Health Center.

For hypertension sufferers other than the number listed above, no data collection was carried out because the researcher only took respondents based on hypertension sufferers who were undergoing treatment and visiting the health center (Tlogosari Kulom, Tlogosari Wetan and Kedungmundu) at the time the research was conducted.

The limitations of this study are that it cannot analyze the behavior of hypertension sufferers over a certain period of time considering that many sufferers have been diagnosed with hypertension for a long time, are susceptible to respondent bias such as recall bias, interviewer bias and social acceptance bias, and cannot assess the consistency of respondents over different periods of time. The population and sample in this study can be described through the following flow diagram:

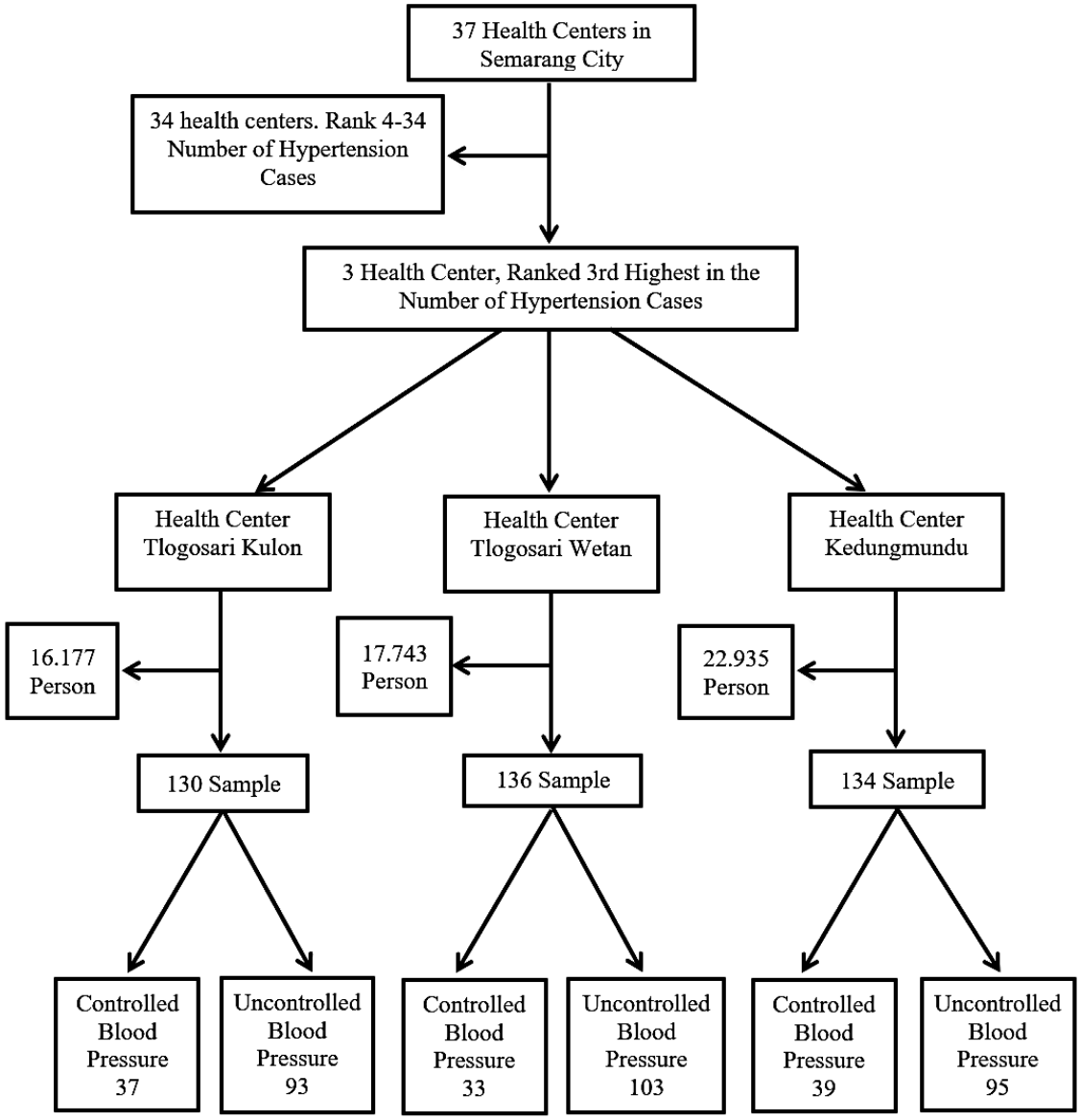

Figure 1. Population and Sample Flow Diagram

RESULTS AND DISCUSSIONS

Based on table 1, the normality test for the age variable is stated to be not normally distributed with a p value < 0.0001 with a median value of 60, mode 64, minimum 28, maximum 91 and range 63. Analysis of respondent characteristics based on age shows that there are more female respondents, 73.35% and 26.8% male respondents.

The level of education of respondents with a percentage of no school 15%, than male respondents, with a percentage of elementary school (SD) 27.8%, junior high school (SMP) 29.5%, senior high school (SMA) 18.5%, college 9.3%. Marital status with a percentage of married 71.8 %, ever married 27.3%, and not married 1%.

Based on the results of the univariate analysis in table 2 in this study, there were respondents with uncontrolled blood pressure totaling 291 (72.8%) and controlled blood pressure 109 (27.3%), aged over 59 years or elderly, namely 211 people (52.8%) and adults 189 (47.3%), male gender 107 (26.8%) and female 293 people (73.3%), non-compliant in taking antihypertensive drugs 168 (42%) and compliant in taking hypertension drugs 232 people (58%), obese 204 people (51%) and non-obese 196 (49%), have low education 289 people (72.3%) and high education 111 (27.8%), smoke 40 (10%) and do not smoke 360 people (90%), do not exercise 254 people (63.5%) and do not exercise 146 (36.5%), stress 164 (41%) and not stressed 236 people (59%), and respondents who have a partner or are married 287 people (71.8%) and not married 113 (28.3%).

The Relationship Between Age and Uncontrolled Blood Pressure in Hypertension Patients

People with elderly age or over 59 years are more likely to have difficulty controlling blood pressure, this is in line with this study which states that the majority of sufferers are over 59 years old and there is a relationship to uncontrolled blood pressure in hypertension sufferers in Semarang City. Age that has started to age, the walls of the arteries become thicker, resulting in the accumulation of collagen and loss of elastic function in the muscle layer, blood vessels narrow, are not straight, and become stiff (Astuti et al., 2021).

The results of the chi square test stated that there was a significant relationship between age and the incidence of uncontrolled hypertension p value 0.043 < 0.05 ; PR 1.141, meaning that patients who are >59 years old or elderly have a 1.141 times risk of experiencing uncontrolled blood pressure compared to patients aged 10-59 years. The results of this study are in accordance with previous research by (Artiyaningrum & Azam, 2016)which stated that age has a relationship with uncontrolled blood pressure in patients with hypertension with a p value of 0.022 <0.05. According to Munye's 2024 study, hypertensive patients aged over 50 years have a 1.57 times greater chance of uncontrolled hypertension than patients aged less than

Table 1. Description of Respondent Characteristics

Variables		***p value*** **(Normality Test)**	**Median**	**Mode**	**Minimum**	**Maximum**	**Range**
Age		<0.0001	60	64	28	91	63
Variables	**N**	**Category**		**Frequency**		**Percentage (%)**	
Age	400	Elderly		211		52.8	
		Mature		189		47.3	
Gender	400	Man		107		26.8	
		Woman		293		73.3	
Level of education	400	No school		60		15	
		Elementary school		111		27.8	
		Junior high school		118		29.5	
		Senior high school		74		18.5	
		College		37		9.3	
Marital status	400	Marry		287		71.8	
		Ever married		109		27.3	
		Not married yet		4		1	

Table 2. Results of Bivariate Analysis of Factors Related to Uncontrolled Blood Pressure in Hypertension Patients in Semarang City

Variables	Category	Blood pressure				Amount		*P Value*	PR (CI 95%)
		Uncontrollable		Under Control					
		N	%	N	%	N	%		
Age	Elderly (>59 years)	163	77.3	48	22.7	211	100	0.043*	1.141 (1.009-1.290)
	Adults (18-59 Years)	128	67.7	61	32.3	189	100		
	Amount	291	72.8	109	27.2	400	100		
Gender	Man	84	78.5	23	21.5	107	100	0.151*	1.111 (0.982-1.257)
	Woman	207	70.6	86	29.4	293	100		
	Amount	291	72.8	109	27.2	400	100		
Medication Compliance	Not obey	112	66.7	56	33.3	168	100	0.027*	0.864 (0.760-0.982)
	Obedient	179	77.2	53	22.8	232	100		
	Amount	291	72.8	109	27.2	400	100		
Obesity incident	Obesity (BMI>25)	159	77.9	45	22.9	204	100	0.023*	1.157 (1.025-1.307)
	Not Obese (BMI<25)	132	67.3	64	32.7	196	100		
	Amount	291	72.8	109	27.2	400	100		
Education Level	Low Education (Not in Middle School)	220	76.1	69	23.9	289	100	0.020*	1.190 (1.020-1.388)
	higher education (High School-College)	71	64	40	36	111	100		
	Amount	291	72.8	109	27.2	400	100		
Smoking Status	Smoke	36	90	4	10	40	100	0.017*	1.271 (1.124-1.437)
	Do not smoke	255	70.8	105	29.2	360	100		
	Amount	291	72.8	109	27.2	400	100		
Exercise Habits	No Exercise	196	77.2	58	22.8	254	100	0.012*	1.186 (1.035-1.359)
	Sport	95	65.1	51	34.9	146	100		
	Amount	291	72.8	109	27.2	400	100		
Stress event	Stres	129	78.8	35	21.3	164	100	0.036*	1.146 (1.019-1.289)
	No Stress	162	68.6	74	31.4	236	100		
	Amount	291	72.8	109	27.2	400	100		
Marital status	Marry	200	69.7	87	30.3	287	100	0.039*	0.865 (0.769-0.974)
	Not Married	91	80.5	22	19.5	113	100		
	Amount	291	72.8	109	27.2	400	100		

50 years (Munye et al., 2024). Age over 65 years has a risk of developing uncontrolled hypertension with (1.1 [1.08-1.34]) (Adediran et al., 2024).

The Relationship Between Gender and Uncontrolled Blood Pressure in Hypertension Patients

Gender is one of the risk factors for hypertension that cannot be changed, generally men are more likely to suffer from hypertension compared to women, with a ratio of around 2.29%, men experience symptoms of hypertension in their late thirties, this is thought to be because men have a lifestyle that can increase blood pressure compared to women (Astuti et al., 2021). In addition, the impact of hypertension is not uniform and women are at higher risk of experiencing many adverse cardiovascular outcomes at lower blood pressure thresholds, estrogen hormone production decreases during menopause, women lose its beneficial effects so that blood pressure increases (Connelly et al., 2022).

The results of this study indicate that there is no relationship between gender and uncontrolled blood pressure in hypertension sufferers with a p value of 0.151>0.05, this could be because the majority of respondents in this study were women with a percentage of 73.3% compared to the percentage of men 26.8%, while men are more at risk of developing hypertension than women, in addition uncontrolled hypertension can be caused by other factors such as smoking status, stress, self-awareness, and frequency of blood pressure control. In women there is the hormone estrogen which plays a role in increasing High Density Lipoprotein (HDL) levels which protect blood vessels from damage. The results of this study are in line with (Casmuti & Fibriana, 2023)which states that there is no relationship between gender and the incidence of hypertension p value of 0.272 (p>0.05). The results of the study (Astuti et al., 2021)showed that gender has no relationship with blood pressure in hypertension sufferers with a p value = 0.576> 0.05).

The Relationship Between Medication Compliance and Uncontrolled Blood Pressure in Hypertension Patients

Patients with antihypertensive drugs are likely to continue taking them throughout their lives, because the use of antihypertensive drugs is needed to control blood pressure so that complications can be reduced and avoided, elderly hypertension sufferers are required to take antihypertensive drugs to control their blood pressure, controlling blood pressure by taking antihypertensive drugs is one effort to prevent hypertension in the elderly (Mitra & Wulandari, 2019).

The results of this study stated that there is a relationship between compliance with antihypertensive drug consumption and uncontrolled blood pressure in hypertension patients with a p value of 0.027 <0.05; PR 0.864, which means that patients who are not compliant in consuming drugs are 0.864 times more likely to experience uncontrolled hypertension than patients who are compliant in consuming antihypertensive drugs. This study is in line with (Artiyaningrum & Azam, 2016) stating that there is a relationship between consuming antihypertensive drugs and uncontrolled blood pressure in hypertension patients (p value = 0.010 <0.05). The results of the study (Mitra & Wulandari, 2019)showed that there is a relationship between compliance with consuming antihypertensive drugs and uncontrolled blood pressure in hypertension patients with a p value of 0.029 OR = 2.96.

Relationship Between Events Obesity With Uncontrolled Blood Pressure In Hypertension Patients

Obesity is a condition of excess body weight of 20% to more than ideal body weight. Cardiac output and blood volume of obese people with hypertension are higher than those of normal weight people with the same blood pressure . As a result of obesity, sufferers tend to suffer from cardiovascular disease, hypertension and diabetes mellitus (Yulia, 2019).

The results of this study stated that there is

a relationship between obesity and uncontrolled blood pressure in hypertension sufferers with a p value of 0.023 and a PR value = 1.157, which means that obese hypertension sufferers are 1.157 times more at risk of experiencing uncontrolled blood pressure compared to non-obese hypertension sufferers. This study is in line with research from (Belayachi et al., 2024)which states that there is a relationship between obesity and uncontrolled blood pressure in hypertension sufferers with a p value of 0.007 and AOR 1.73. The results of the study (Yulia, 2019)also showed that there is a relationship between obesity and blood pressure in hypertension sufferers with a p value of 0.003. The results of the Almalki 2020 study stated that obesity has the most important relationship in increasing uncontrolled blood pressure (Almalki et al., 2020)

The Relationship Between Education Level and Uncontrolled Blood Pressure in Hypertension Patients

Education has an important influence in maintaining health and avoiding diseases caused by lifestyle such as hypertension, low formal education is one of the obstacles to raising awareness of hypertension risk factors in rural communities and minority populations (Astuti et al., 2021).

The results of this study indicate that education level is associated with uncontrolled blood pressure in hypertensive patients with a p value of 0.020 <0.05 and a PR value = 1.190, which means that hypertensive patients with low education are 1.190 times more at risk of experiencing uncontrolled blood pressure compared to hypertensive patients with higher education. This study is in line with the results of research from (Kwon et al., 2020)which states that there is a relationship between education level and uncontrolled blood pressure in hypertensive patients with a p value of 0.001 <0.05. The results of the study (Permata Sari Lubis et al., 2022). also stated that there is a relationship between education level and uncontrolled blood pressure in hypertensive patients with a p value of 0.002 <0.05.

The Relationship Between Smoking Status and Uncontrolled Blood Pressure in Hypertension Patients

Smoking causes various cardiovascular diseases in humans and is a major risk factor in the cause of cardiovascular disease worldwide; smoking is also a preventable cause of death in individuals with cardiovascular disease (Varghese & Muntode Gharde, 2023).

The results of the study showed that there was a relationship between smoking status and uncontrolled blood pressure in hypertension sufferers with a p value of 0.017 and a PR value = 1.271, which means that hypertension sufferers with smoking habits are at 1.271 times greater risk of experiencing uncontrolled blood pressure compared to hypertension sufferers who do not smoke. This study is in line with research from (Mitra & Wulandari, 2019)which states that there is a relationship between smoking status and uncontrolled blood pressure in hypertension sufferers with a p value of 0.004. The results of the study (Casmuti & Fibriana, 2023)also stated that there was a relationship between smoking status and uncontrolled blood pressure in hypertension sufferers with a p value of 0.000. The results of the Mars 2019 study stated that uncontrolled hypertension was related to smoking (P = 0.018) (Mars et al., 2019).

The Relationship Between Exercise Habits and Uncontrolled Blood Pressure in Hypertension Patients

There are important functions of exercise in everyday life, exercise is highly recommended to minimize the occurrence of hypertension. Regular and structured exercise can minimize the occurrence of osteoporosis and lower cholesterol levels in the blood and prevent cardiovascular disease (WHO, 2017).

The results of the study showed that there was a relationship between exercise habits and uncontrolled blood pressure in hypertension sufferers with a p value of 0.012 and a PR value = 1.186, which means that hypertension sufferers who do not exercise are 1.186 times more at risk of experiencing uncontrolled blood pressure

compared to hypertension sufferers who exercise. This study is in line with research from (Aberhe et al., 2020) which states that there is a relationship between exercise habits and uncontrolled blood pressure in hypertension sufferers with a p value of 0.013.

The Relationship Between Stressful Events and Uncontrolled Blood Pressure in Hypertension Patients

Stress levels are related to increased blood pressure, people with stressful conditions will experience an increase in catecholamines in their bodies, which can affect the sympathetic nervous system, so that the sympathetic nerves can increase, when the sympathetic nerves increase, the contraction of the heart muscle can also increase which can result in increased cardiac output, the following conditions can be a factor in the occurrence of hypertension (Ramdani et al., 2017).

The results of the study showed that there was a relationship between stress and uncontrolled blood pressure in hypertension patients with a p value of 0.036 and a PR value = 1.146, which means that hypertension patients who are stressed have a 1.146 times greater risk of experiencing uncontrolled blood pressure compared to hypertension patients who are not stressed. This study is in line with research from (Artiyaningrum & Azam, 2016) also stated that there is a relationship between stress and uncontrolled blood pressure in hypertension patients with a p value of 0.0001 and OR=6.333).

The Relationship Between Marital Status and Uncontrolled Blood Pressure in Hypertension Patients

Marital status is the condition of the patient whether or not there is a life partner such as a husband/wife in his/her daily life. Marital status has a 69.2% relationship with the occurrence of uncontrolled hypertension (Artiyaningrum & Azam, 2016).

The results of the study showed that there was a relationship between marital status and uncontrolled blood pressure in hypertension sufferers with a p value of 0.039 with a PR value of 0.865, which means that hypertension sufferers with married status are 0.865 times more at risk of experiencing uncontrolled blood pressure compared to hypertension sufferers with unmarried status. This study is in line with research from (Khairani et al., 2022)which states that there is a relationship between marital status and uncontrolled blood pressure in hypertension sufferers with a p value of 0.031; OR = 5.055. The results of the study (Artiyaningrum & Azam, 2016)also stated that there was a relationship between partner status and uncontrolled blood pressure in hypertension sufferers with a p value of 0.001 and OR = 4.610.

The results of the multivariate analysis with logistic regression in the multivariate analysis results table show that age, obesity, education level, smoking status, exercise habits and stress have a P Value < 0.05 , meaning that the six variables have a relationship. which is significant with uncontrolled blood pressure in hypertension patients in Semarang City. The variable that has the smallest p value and the largest wald value is the variable that is most at risk with uncontrolled blood pressure. So it can be drawn

The conclusion is that the obesity variable is the most dominant variable at risk for uncontrolled blood pressure in hypertension sufferers in Semarang City.

Table 3. Results of Multivariate Analysis of Factors Related to Uncontrolled Blood Pressure in Hypertension Patients in Semarang City

Variables	B	SE	Wald	*p value*	PR	CI 95%	
Age	0.540	0.243	4.956	0.026	1.716	1.067	2.761
Event Obesity	0.624	0.240	6.768	0.009	1.866	1.166	2.986
Level of education	0.500	0.250	3.980	0.046	1.648	1.009	2.692
Smoking Status	1.142	0.555	4.238	0.040	3.134	1.056	9.300
Exercise Habits	0.489	0.238	4.226	0.040	1.631	1.023	2.600
Event Stres	0.497	0.248	4.014	0.045	1.644	1.011	2.673
Constant	-0.498	0.309	2.593	0.107	0.608		

Based on the results of the multivariate analysis, there are no five variables that are stated as protective variables. Based on the results of the multivariate analysis (table 4), the regression equation can be determined as follows:

y = -0.498 + 0.540 (elderly age) + 0.624 (obesity) + 0.500 (low education level) + 1.142 (smoking) + 0.489 (no exercise) + 0.497 (stress)

In the equation above, the constant value and coefficient value (a) are listed in column B in table 3, while the independent variables containing elderly age, obesity, low education level, smoking, no exercise and stress are coded 1 for those at risk and coded 0 for those not at risk. After being coded. The constant value is added to the value of the variables age , obesity, education level, smoking status, exercise habits, and stress to find out the value of the regression equation results (y).

Table 4. Results of Calculation of Probability of Uncontrolled Blood Pressure in Hypertension Sufferers in Semarang City

Respondents	Age	Obesity	Level of Education	Smoking Status	Exercise Habits	Stres	Probability of Uncontrolled Blood Pressure (%)
A	Elderly	Obesity	Low education	Smoke	No Sport	Stres	96%
B	Elderly	Obesity	Low education	Smoke	No Sport	No Stress	94%
C	Elderly	Obesity	Higher education	Smoke	No Sport	Stres	94%
D	Mature	Obesity	Low education	Smoke	No Sport	Stres	94%
E	Elderly	Not Obese	Low education	Smoke	No Sport	Stres	93%
F	Elderly	Obesity	Low education	Do not smoke	No Sport	Stres	89%
G	Elderly	Obesity	Low education	Smoke	Sport	Stres	84%
H	Mature	Not Obese	Higher education	Smoke	Sport	No Stress	65%
I	Mature	Obesity	Higher education	Do not smoke	Sport	No Stress	53%
J	Elderly	Not Obese	Higher education	Do not smoke	Sport	No Stress	51%
K	Mature	Not Obese	Low education	Do not smoke	Sport	No Stress	50%
L	Mature	Not Obese	Higher education	Do not smoke	Sport	Stres	49%
M	Mature	Not Obese	Higher education	Do not smoke	No Sport	No Stress	49%
N	Mature	Not Obese	Higher education	Do not smoke	Sport	No Stress	37%

CONCLUSION

From the research results and hypotheses, it was concluded that there was a relationship between age (p=0.043<0.05; PR1.141), drug consumption compliance (p=0.027<0.05;PR 0.864), obesity incidence (p=0.023<0.05;PR1.157), education level (p=0.020<0.05;PR1.190), smoking status (p=0.017<0.05;PR1.271), exercise habits (p=0.012<0.05;PR1.186), stress events (p=0.036<0.05;PR1.146), marital status (p=0.39<0.05;PR0.865) with uncontrolled blood pressure in hypertension sufferers in the city of Semarang, while the variable type (p=0.151>0.05) there is no relationship with uncontrolled blood pressure in hypertension sufferers in Semarang City. Based on the results of multivariate analysis, there are factors that are associated with uncontrolled blood pressure in hypertension sufferers in Semarang City, namely age (p=0.026), obesity incidence (p=0.009), education level (p=0.046), smoking status (p=), exercise habits (p=0.040), stress events

(p=0.045), and the dominant variable, namely smoking status (p=0.040).

Based on the results of the research, the researchers provided several suggestions to policy makers in the Non-Communicable Diseases Division of Tlogosari Kulon Community Health Center, Tlogosari Wetan Community Health Center, and Kedungmundu Community Health Center, which could serve as information and consideration in conducting education or health promotion regarding uncontrolled blood pressure in hypertension sufferers with priority targets being elderly, non-compliant with taking antihypertensive drugs, obesity, low education level, smoking, not exercising, stress, and being married. For hypertensive patients in the Tlogosari Kulon Health Center, Tlogosari Wetan Health Center and Kedungmundu Health Center health facilities who are not compliant with taking antihypertensive medication, are overweight or obese, have a low level of education, have a smoking habit, don't exercise, suffer from stress, marital status, and uncontrolled blood pressure, be aware of the dangers of uncontrolled hypertension, monitor your personal health regularly to find out the condition of your blood pressure, avoid several factors of uncontrolled hypertension. For future researchers in the field of hypertension, especially uncontrolled blood pressure, it is hoped that the results of this research can be used as a basis for research. Future researchers are expected to examine patients with certain age criteria and if elderly patients are taken, those who do not have problems remembering and have a companion or guardian when carrying out treatment. Future researchers are expected to examine confounding factors or comorbidities of hypertension with uncontrolled blood pressure such as diabetes. Future researchers are expected to look at patient hypertension medical record data not only from three measurements.

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