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Drug Adherence with Hypertension Status at the Bajoe Community Health Centre of Bone Regency in 2016

Hardiyanti
Faculty of Public Health, Hasanuddin University,
Jl. Perintis Kemerdekaan Km. 10, Tamalanrea Indah, Tamalanrea, Tamalanrea Indah, Tamalanrea, Kota Makassar, Sulawesi Selatan 90245, Indonesia
hardiyantiskm09@yahoo.com

Ridwan M. Thaha
Faculty of Public Health, Hasanuddin University,
Jl. Perintis Kemerdekaan Km. 10, Tamalanrea Indah, Tamalanrea, Tamalanrea Indah, Tamalanrea, Kota Makassar, Sulawesi Selatan 90245, Indonesia
ridwan_609@yahoo.com

Syamsiar S Russeng
Faculty of Public Health, Hasanuddin University,
Jl. Perintis Kemerdekaan Km. 10, Tamalanrea Indah, Tamalanrea, Tamalanrea Indah, Tamalanrea, Kota Makassar, Sulawesi Selatan 90245, Indonesia
syamsiarsr@yahoo.com

ABSTRACT

This study aimed to understand the relation between compliance of taking medicine and the hypertension status in Bajoe community health centre of bone regency. The study was observational analytical and used cross sectional study design. Population of the research was all hypertension patients in working area in Bajoe Community health center of bone regency in 2015. purposive sampling technique was utilized and 310 respondents were chosen as primary hypertension patients that consume anti hypertension medicine Data were analyzed through a SPSS program with chi square and logistic regression test. Further, stratification analysis to evaluate the relationship between the main independent variable and dependent variable was standardized by each covariate variables potential confounder (age, sex, family history, salty food intake, smoking habit, physical activity and obesity). The research result indicated that more hypertension suffered from respondents who were not compliant in taking medicine (66.7%). Incompliance in taking medicine who experienced hypertension was found mostly on elderly (73.1%), females were the same as males (66.7%), family history (73.7%), consuming salty food (67.1%), smoking (67.4%), tendency not to participate in physical activity (69.6%) and obesity (89.2%) with p value <0.05. This study concluded that there is relationship between compliance in taking medicine with hypertension status after been controlled by age, sex, family history, salty food intake, smoking habit, physical activity and obesity, but the variables is not cofounder.

CCS Concepts

•**Social and professional topics** → **User characteristics**

Keywords

Hypertension; compliance; anti hypertension medicine

1. INTRODUCTION

Patients with hypertension continue to increase yearly throughout the world. As many as 1 billion people in the world or one in four adults suffer from this disease. Even estimated to increase to 1.6 billion by 2025 [1].

High blood pressure or hypertension is called silent killer because it is one of the degenerative diseases that contributes to pain and death rates due to complications [2]. Hypertension is stated as one of the most important contributors to heart disease and stroke that together form the cause of the number one premature death disability in the world [3].

Hypertension is the silent disease because people do not know they get hypertension before checking their blood pressure. If hypertension occurs on a continuous basis can trigger stroke, heart attack, heart failure, and a major cause of chronic kidney failure [4]

Data from Indonesia K.K.R [5] shows that the prevalence of hypertension in Indonesia is 25.8%. Hypertension, decreased from 31.7% in 2007 to 25.8% years 2013. The highest prevalence in Bangka Belitung is 30.9% and South Sulawesi province is in the eighth place with a hypertension prevalence rate of 28.1% still exceeding national prevalence.

The tendency of a person suffering from hypertension, including individual traits such as age, sex and ethnicity, genetic factors and environmental factors including obesity, stress, salt consumption, smoking, alcohol consumption [6].

One of the factor which relates to hypertension is blood pressure. One way to control blood pressure is by lifestyle modification and control of risk factors, such as reducing salt, quitting smoking, diligent exercise, and so forth [1].

A high level of adherence to hypertension treatment will improve the effectiveness of treatment and prevent worse episodes of the disease. Drug compliance in the long term will even decrease the morbidity and mortality of the sufferer. Obedience of taking antihypertensive drugs is a crucial factor to prevent damage to important organs of the body, such as the kidneys, brain, and heart. Protection of these vital organs can reduce the risk of kidney failure, stroke, and myocardial infarction, which can ultimately prevent death [7].

Adherence to treatment is very important in controlling blood pressure, and monitoring patient compliance important in hypertensive management, because adherence is associated with poor prognosis [8]. Research conducted Onzenoort et al. [9] suggest that adherence to treatment may decrease systolic blood pressure and diastolic blood pressure.

Research conducted by Davarian et al. [10] suggests that older age is associated with high blood pressure and higher chances of having hypertension. Gender is very closely related to the

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occurrence of hypertension. Research conducted by Helelo et al. [11] show that sex is statistically related to hypertension.
Increased risk of hypertension due to heredity can not be avoided anymore, if both parents have hypertension [1]. Research Populations in Mongolia China shows that smoking habits are significantly higher in hypertensive disease than in control [12]. Research results Anggara and Prayitno [6] showed that there is a significant relationship between smoking with blood pressure.
In addition, results of research conducted Mushtaq and Najam [13] showed a significant positive correlation between stress with hypertension, that people who experience stress have a risk of 1.37 times experienced hypertension.
Based on research results Rachmawati [4] there is a relationship between physical activity such as exercise with the incidence of hypertension, that someone never exercise has a risk of 5.152 times affected by hypertension than those who exercise regularly.
The linkage of hypertension with factors that increase the risk of someone suffering from hypertension disease at puskesmas bajoe, has never been preceded. Some factors that may affect the onset of hypertension are usually not independent, but together with the mosaic theory of essential hypertension. Thus , this study is focused on evaluating the relation of drug adherence to the status of hypertension based on the variables of age, sex, family history, salted food, smoking, stress, physical activity and obesity in Bajoe Regency Bone for the Year 2016..

2. METHODOLOGY

2.1 Research Design

Analytic observational research with Cross Sectional Study design was used in this work. The Cross Sectional Study identifies the variables to be studied and identifies risk factors and the Effect factor[20].

2.2 Location and Time of Study

The study was conducted on February 22 up to April 22, 2016. The location of this research is conducted in Bajoe Puskesmas Working Area Regency of Bone.

2.3 Population and Sample

The population of this study were all hypertensive patients recorded in the register of Bajoe Puskesmas Bone District from Year 2015. Sample in this research is part of hypertension patient that recorded in register of Bajoe Puskesmas Bone Regency from Year 2015. The sample size used were 310 people, which was calculated based on Lameshow and Stanley [14].

2.4 Data Collection

Primary data is data taken directly by the researchers from the results of respondents' answers by referring to the questionnaire which contains questions relating to research variables include drug adherence compliance variables, age, gender, family history, salty food consumption, smoking habits, stress, physical activity , and obesity. Secondary data were obtained directly from the medical records of the patients of Poli Public Bajoe Puskesmas. Secondary data were obtained directly from the medical records of the patients of Poli Public Bajoe Puskesmas

2.5 Research Instrument

Instruments used to measure each variable was don using questionnaires or interview guides with structured questions. The questionnaire contains the question of the characteristics of the sample including: age, gender and related questions of the research variables: medication adherence, salty food consumption, family history, smoking habits, stress, physical activity, obesity, and hypertension status. The instruments used to measure blood pressure are tensimeter, stethoscope, weight scales for measuring body weight, and gauges to measure height by health care workers.

2.6 Data Analysis

Data that has been collected and inputted will be processed and analyzed by computerized using SPSS program. Univariate analysis aims to explain or describe the characteristics of each study variable related to hypertension status, medication adherence, age, gender, family history, salty food consumption, smoking habits, stress, physical activity, and obesity. The goal is to be able to see how far the frequency distribution of all research variables.

Bivariate analysis was performed to see the relationship between each independent variable that is medication adherence, age, gender, family history, salty food consumption, smoking habit, stress, physical activity, obesity, and hypertension status with dependent variable. Bivariate analysis was done by using logistic regression test. The independent variable is said to be significantly related to the dependent variable if p value <0.05

3. RESULT AND DISCUSSION

3.1 Univariate Analysis

Based on the results of univariate analysis presented in table 1, it is seen that most of the respondents are adult age with 71.3% compared with the elderly respondents that is only 28.7%. Distribution of respondents by gender in this study is known that the proportion of female respondents is more with 72.3% compared with male respondents that is only 27.7%. Distribution of respondents based on family history, the proportion of respondents with a family history of hypertension is more with to 62.6% compared with respondents with no family history who experienced hypertension that is 37.4%. Distribution of respondents based on consumption of salty foods, it is seen that more respondents of salty food consumption is 92.3% compared with the respondents did not consume salty foods is 7.7%. Distribution of respondents based on smoking habits, it is seen that more respondents who do not smoke that is 82.3% compared with respondents who smoke is 17.7%. Distribution of respondents based on stress, it appears that more respondents who did not experience stress (normal) that is 65.5% compared with respondents who experienced stress is 34.5%. Distribution of respondents based on physical activity, more respondents are active in physical activity are 50.6% compared with respondents who are not active in physical activity were 49.4%. Distribution of respondents based on obesity, it is seen that more respondents with normal BMI status is 86.5% compared with the obese respondents of 13.5%.

Table 1. Distribution of Respondents Based on Covariate Variables (Categorical) in Bajoe Puskesmas Bone District Year 2016

No	Variable	Total (n = 310)	Percentage (%)
1	Age		
	Adult Age	221	71.3
	Elderly	89	28.7
2	Gender		
	Male	86	27.7
	Female	224	72.3
3	Family History		
	No History	116	37.4
	With History	194	62.6
4	Salt Food Consumption		

	No	24	7.7
	Yes	286	92.3
5	Smoking Habit		
	No	255	82.3
	Yes	55	17.7
6	Stress		
	Normal	203	65.5
	With Stress	107	34.5
7	Physical Activity		
	Active	157	50.6
	Not Active	153	49.4
8	Obesity		
	Normal	268	86.5
	Obese	42	13.5

3.2 Bivariate Analysis

Bivariate analysis is done to see the relationship between the main independent variable with the dependent variable. The result of bivariate analysis can be seen as follows.

3.2.1 The relationship between Drug Compliance with Hypertension Status

The result of bivariate analysis with logistic regression among the main independent variables ie adherence to taking medication with hypertension status in Bajoe Puskesmas Bone Regency Working Area 2016 is presented in Table 2. Based on the result of bivariate analysis between adherence to medication with hypertension status known that the respondents who did not obey exhibited more hypertension by 66,7% compared to respondents who are obedient and have hypertension that is 34,5%. The results showed that this relationship was statistically significant with p value = <0.01. This means that there is a correlation between adherence to taking medication with hypertension status in Bajoe Puskesmas Bone Regency Working Area 2016.

Table 2. Relationship between Drug Compliance with Hypertension Status in Work Area of Bajoe Puskesmas Bone Regency Year 2016

Variable	Hypertension Status					
	Hypertension		Normotensive		Total	p value
	n	%	n	%		
Disobedient	170	66.7	85	33.3	255	0.000
Obedient	19	34.5	36	65.5	55	
Total	189	61.0	121	39.0	310	

3.2.2 Relationship between Variable Covariates with Hypertension Status

The result of bivariate analysis with logistic regression between covariate variable with hypertension status in Bajoe Puskesmas Bone Regency Working Area of 2016 is presented in Table 3.It is found that in the elderly respondents more experienced hypertension (62.9%) than respondents of adult age (60.2%), with a value of p value = 0.655 is not significant (more of α = 0.05). That is, statistically shows that there is no relationship between age with hypertension status . Respondent of female gender was more hypertension (62,5%) than male respondent (57,0%), with p value = 0,372 not significant (more than α = 0.05). That is, statistically shows that there is no relationship between the gender with hypertension status. Respondents who had a family history were more likely to have hypertension (69.6%) than respondents who did not have a family history (46.6%), with significant p value = 0,000 (less than α = 0.05). That is, statistically shows that there is a relationship between family history with hypertension status. Respondents who consumed salty food were more hypertensive (62.6%) than those who did not consume salted food (45.8%), with p value = 0.114 which was not significant (more than α = 0.05). That is, statistically shows that there is no relationship between salty food consumption habits with hypertension status. Non-smokers respondents were more hypertensive (61.6%) than respondents who smoked (58.2%), with p value = 0.641 which was not significant (more than α = 0.05). That is, statistically shows that there is no relationship between smoking habits with hypertension status . Unstressed respondents(normal) were more likely to have hypertension (61.1%) than those with stress (60.7%), with p value = 0.954 which was not significant (more than α = 0.05). That is, statistically shows that there is no relationship between stress with hypertension status Respondents who were not active in physical activity were more likely to have hypertension (66.0%) than respondents who did physical activity (56.1%), with p value = 0.072 which was not significant (more than α = 0.05). That is, statistically shows that there is no relationship between physical activity with hypertension status . Obese respondents were more likely to have hypertension (83.3%) than respondents who had normal BMI (57.5%), with significant p value = 0,000 (less than α = 0.05). That is, statistically shows that there is a relationship between obesity with hypertension status.

Table 3. Relationship between Covariate Variables and Hypertension Status in Work Area of Bajoe Puskesmas Bone District 2016

No	Variable	Hypertension		Normotensive		p value
		n	%	n	%	
1	Age					0.655
	Adult Age	133	60,2	88	39,8	
	Elderly	56	62,9	33	37,1	
2	Gender					0.372
	Male	49	57,0	37	43,0	
	Female	140	62,5	84	37,5	
3	Family History					*<0.01
	No History	54	46,6	62	53,4	
	With History	135	69,6	59	30,4	
4	Salt Food Consumption					*0.114
	No	11	45,8	13	54,2	
	Yes	178	62,6	108	37,8	
5	Smoking Habit					0.641
	No	157	61,6	98	38,4	
	Yes	32	58,2	23	41,8	
6	Stress					0.954
	Normal	124	61,1	79	38,9	
	With Stress	65	60,7	42	39,3	
7	Physical Activity					*0.072
	Active	88	56,1	69	43,9	
	Not Active	101	66,0	52	34,0	
8	Obesity					*0.001
	Normal	154	57,5	114	42,5	
	Obese	35	83,3	7	16,7	

3.2.3 Stratification Analysis

The stratification analysis aims to see the relationship between the main independent variables ie adherence to taking medication with hypertension status in each strata or category of each

covariate variable. Based on the result of stratification analysis presented in table 4, it can be seen that both old age group and adult age who do not adhere to taking medication have more hypertension than the adherent group. In elderly respondents, respondents who did not adhere to taking drugs were more likely 5,833 times (95% CI: 2,047-16,624) to have hypertension than compliant respondents. This relationship was statistically significant with p value = <0.01. Meanwhile, in adult respondents, respondents who did not adhere to taking drugs more likely 3.160 times (95% CI: 1,464-6,822) to experience hypertension than comparable respondents. This relationship was statistically significant with p value = <0.01

Table 4. Drug Compliance Relationship Against Hypertension Status After controlled by Age Variables in Work Area of Bajoe Puskesmas Kabupaten Bone 2016

Variable	Obedience Taking medication	Hypertension		Normotensive		p value	Adjusted OR	95%CI	w
		n	%	n	%				0.354
Age							3.909	2.108-7.250	
Elderly	Disobedient	49	73.1	18	26.9	0.000	5.833	2.047-16.624	
	Obedient	7	31.8	15	68.2				
Adult	Disobedient	121	64.4	67	35.6	0.002	3.160	1.464-6.822	
	Obedient	12	36.4	21	63.6				

Based on the results of stratification analysis presented in table 5, it can be seen that neither the female gender group nor the males who did not adhere to taking the drug experienced more hypertension than the adherent group. In female respondents, non-adherent respondents took more than 2.750 times (95% CI: 1,349-5,607) to have hypertension compared to obedient respondents. This relationship was statistically significant with p value = <0.01. Meanwhile, respondents of male gender, non-adherent respondents taking medicine more likely 9,333 times (95% CI: 2,435-35,775) to experience hypertension than comparable respondents. This relationship was statistically significant with p value = <0.01.

Table 5. Drug Compliance Relationship Against Hypertension Status After controlled with the Sex Variable in the Work Area of Bajoe Puskesmas Bone Regency 2016

Variable	Obedience Taking medication	Hypertension		Normotensive		p value	Adjusted OR	95%CI	w
		n	%	n	%				0.108
Gender							3.760	2.036-6.944	
Female	Disobedient	124	66.7	62	33.3	0.004	2.750	1.349-5.607	
	Obedient	16	42.1	22	57.9				
Male	Disobedient	46	66.7	23	33.3	0.000	9.333	2.435 - 35.775	
	Obedient	3	17.6	14	82.4				

Based on the result of stratification analysis presented in Table 6 it can be seen that neither group with family or group history has no family history of non-adherence taking medication more hypertension than adherence group. In respondents, there was a family history, non-adherent respondents taking medication more likely 3.494 times (95% CI: 1.518-8.042) to have hypertension than compliant respondents. This relationship was statistically significant with p value = <0.01. While there were no family history, the non-adherent respondents were more likely to have 3.439 (95% CI: 1.327-8.914) to experience hypertension than those who were obedient. This relationship was statistically significant with p value = <0.01.

Table 6. Drug Compliance Relationship Against Hypertension Status After controlled by Family History Variables in the Work Area of Bajoe Puskesmas Kabupaten Bone Year 2016

Variable	Obedience Taking medication	Hypertension		Normotensive		p value	Adjusted OR	95%CI	w
		n	%	n	%				0.980
Family History							3.468	1.848 - 6.508	
With History	Disobedient	123	73.7	44	26.3	0.002	3.494	1.518-8.042	
	Obedient	12	44.4	15	55.6				
Without History	Disobedient	47	53.4	41	46.6	0.009	3.439	1.327 - 8.914	
	Obedient	7	25.0	21	75.0				

Based on the results of stratification analysis presented in table 7, it is seen that both groups who have a habitual consumption of salty foods and groups that do not have a habitual consumption of salty foods that do not adhere to taking more medication have hypertension than the obedient group. In respondents who consumed salty foods, non-adherent respondents took more than 3.477 (95% CI: 1.803-6.703) of the drug to experience hypertension compared to the obedient respondents. This relationship was statistically significant with p value = <0.01. Meanwhile, respondents who did not consume salted food, this relationship was not statistically significant with p value = 0.169, OR value 5.250 (95% CI: 0.801-34.426) with convidence interval not significant mean OR value did not have meaning to drinking compliance drugs to hypertension status after controlled by respondents who did not consume salty foods.

Table 7. Drug Compliance Relationship Against Hypertension Status After controlled by Variables of Salted Food Consumption in Bajoe Puskesmas Bone Regency Working Area 2016

Variable	Obedience Taking medication	Hypertension		Normotensive		p value	Adjusted OR	95%CI	w
		n	%	n	%				0.684
Salty Food Consumption							3.647	1.96 – 6.771	
Yes	Disobedient	161	67.1	79	32.9	0.000	3.477	1.518-6.703	
	Obedient	17	37.0	29	63.0				
No	Disobedient	9	60.0	6	40.0	0.169	5.250	0.801 - 34.426	
	Obedient	2	22.2	7	77.8				

Based on the results of stratification analysis presented in Table 8, it is seen that both groups who have smoking habits and those who do not have smoking habits that do not adhere to taking medication have more hypertension than the adherent group. In respondents who smoked, respondents who did not adhere to taking the drug more likely 16,533 times (95% CI: 1,891-144,562) to experience hypertension compared to respondents who obedient. This relationship was statistically significant with p value = <0.01. Meanwhile, for non-smokers, non-adherent respondents took more than 3,089 (95% CI: 1,599-5,965) medication for hypertension compared to those who were obedient. This relationship was statistically significant with p value = <0.01.

Table 8 Drug Compliance Relationship Against Hypertension Status Once controlled with the Variables of Smoking Habits in Bajoe Puskesmas Bone Regency Working Area 2016

Variable	Obedience Taking medication	Hypertension		Normotensive		p value	Adjusted OR	95%CI	w
		n	%	n	%				0.121
Smoking Habit							3.792	2.052 – 7.009	
Yes	Disobedient	31	67.4	15	32.6	0.003	16.533	1.891-144.562	
	Obedient	1	11.1	8	88.9				
No	Disobedient	139	66.5	70	33.5	0.002	3.089	1.599 - 5.965	
	Obedient	18	39.1	28	60.9				

Based on the results of stratification analysis in table 9, it was seen that both the stressors and non-obese stressors were more likely to have hypertension than the adherent group. In stress respondent, this relation is not statistically significant with p value = 0.141, OR 2.314 (95% CI: 0.740-7.231) with convidence interval not significant mean OR value does not have significance to drug adherence compliance to hypertension status after controlled with respondents experiencing stress. Meanwhile, in respondents who are not experiencing stress (normal), respondents who do not adhere to taking drugs more likely 4,688 times (95% CI: 2,244-9,792) to have hypertension compared to compliant respondents. This relationship was statistically significant with p value = <0.01.

Table 9 Drug Compliance Relationship Against Hypertension Status Once controlled with Stress Variables in Territory Bajoe Puskesmas Bone Regency Working Area 2016

Variable	Obedience Taking medication	Hypertension		Normotensive		p value	Adjusted OR	95%CI	w
		n	%	n	%				0.305
Stress							3.813	2.063-7.045	
Yes	Disobedient	59	63.4	34	36.6	0.141	2.314	0.740-7.231	
	Obedient	6	42.9	8	57.1				

No	Disobedient	111	68.5	51	31.5	0.000	4.688	2.244-9.792	
	Obedient	13	31.7	28	68.3				

Based on the results of stratification analysis presented in table 10, it is seen that neither active groups nor active groups who engage in non-adherent physical activity take more hypertension than the adherent group. In respondents who were not active in physical activity, this relationship was statistically significant with p value = 0.048. However, the convidence interval value of OR indicates 2,289 (95% CI: 0.995-5.267) is not significant. This means that the value of OR does not have significance to the relationship of adherence to medication hypertension after controlled by respondents who are not actively doing physical activity.Meanwhile, in respondents who are active in physical activity, non-adherent respondents took medicine more than 7,770 times (95% CI: 2,761-21,871) to have hypertension compared to compliant respondents. This relationship was statistically significant with p value = <0.01.

Table 10. Drug Compliance Relationship Against Hypertension Status Once controlled with Physical Activity Variables at Territory Bajoe Puskesmas Bone Regency Working Area 2016

Variable	Obedience Taking medication	Hypertension		Normotensive		p value	Adjusted OR	95%CI	w
		n	%	n	%				0.067
Physical Activity							3.939	2.110-7.353	
Not Active	Disobedient	87	69.6	38	30.4	0,040	2.289	0.995 – 5.296	
	Obedient	14	50.0	14	50.0				
Active	Disobedient	83	63.8	47	36.2	0.000	7.770	2.761 – 21.871	
	Obedient	5	18.5	22	81.5				

Based on the stratified analysis results presented in table 11, it was seen that both obese and non-adherent group BMDs were more likely to have hypertension than the adherent group. In obese respondents, non-adherent respondents taking medication were more likely to have 12.375 times (95% CI: 1,564-97,906) to have hypertension than compliant respondents. this relation is statistically significant with p value = 0,033. Meanwhile, in respondents with normal BMI status, respondents who did not adhere to taking drugs were more likely 3,283 times (95% CI: 1,720-6,267) to have hypertension than comparable respondents. This relationship was statistically significant with p value = <0.01.

Table 11. Drug Compliance Relationship Against Hypertension Status After controlled with Obesity Variable in Work Area of Bajoe Puskesmas Kabupaten Bone Year 2016

Variable	Obedience Taking medication	Hypertension		Normotensive		p value	Adjusted OR	95%CI	w
		n	%	n	%				0.216
Obesity							3.608	1.946-6.690	
Obese	Disobedient	33	89.2	4	10.8	0,033	12.375	1.564 – 97.906	
	Obedient	2	40.0	3	60.0				
Normal	Disobedient	137	62.8	81	37.2	0.000	3.238	1.720 – 6.267	
	Obedient	17	34.0	33	66.0				

3.3 Overall Discussion

3.3.1 Drug Compliance Relation to Hypertension

Compliance of patients is necessary to achieve the success in the treatment of non-communicable diseases. The presence of patient noncompliance can have very large negative effect. According to WHO (2003) nearly 75% of patients with a diagnosis of hypertension failed to achieve optimum blood pressure due to low medication adherence [15]. Non-adherence to drug therapy for chronic disease worldwide treatment from 25% to 50% verified by morisky-green-levine test [16]. It is also presented in the report that adherence of hypertensive patients in treatment pharmacology is still low that is around 50-70%. However, the number of hypertensive patients and taking medication is not recorded in many countries.

Non-adherence of hypertensive patients in the Bajoe Puskesmas Working Area exceeds the prevalence rate in the world and medication adherence is lower than pharmacological treatment reports. Based on the result of the research, the result of analysis about the relationship of adherence to medication with hypertension status in Bajoe Puskesmas Bone Regency. Based on the results of the study, medication adherence was associated with hypertension status with p value <0.01. This means that there is a correlation of medication adherence to the status of hypertension in the Working Area of Puskesmas Bajoe Kab. Bone.

The results of this study are in line with the study found by Brinker et al [17] that showed disobedient patients had higher diastolic blood pressure than compliant patients. The same is true of Van Onzenoort et al. [9] that Adherence to treatment can lower systolic blood pressure and diastolic blood pressure.

The results of this study indicate that by adherence to taking medication has an effect or has a positive effect on blood pressure. In patients with uncontrolled blood pressure 50% of them have problems compliance in taking antihypertensive drugs [18]

Adherence to treatment is very important in controlling blood pressure, and monitoring patient compliance is important in hypertensive management, because adherence is associated with poor prognosis [8].

3.3.2 Relationship of Covariate Variables on Hypertension Status

Based on the results of bivariate analysis, obtained p value> 0,05. This shows that, there is no relationship between age with hypertension status in this study. Results of the analysis found that more elderly, non-adherent medication group had hypertension (73.1%) than adult age group (64.4%). Where elderly non-adherent taking medication h[illegible] a greater risk of having uncontrolled blood pressure. The results of this study in accordance with the study Jaya [18] that the age of elderly have [illegible] opportunity to disobey 3.5 times compared to age not elderly. The results of this study are in line with Hashmi et al. [19] showing that age includes characteristic variables that have a relationship with compliance level.

Based on the results of bivariate analysis, obtained p value> 0,05. This shows that, there is no relati[illegible]hip between sex with hypertension status in this study. the results of this study are in line with research conducted by Kartikasari et al. [21] that statistical test results with multiple logistic regression indicate gender is not a risk factor for hypertension. Similarly, research conducted Anggara and Prayitno [6] that gender in this study was not statistically related to blood pressure (p> 0.05). Another study says that men and women have a relatively equal chance of suffering from hypertension [22]. Based on the re[illegible]ts of bivariate analysis, obtained p value <0.05. This shows that, there is a relationship [illegible]etween family history with hypertension status in this study. The results of this study are in line with research cond[illegible]d Nasta et al. [23] that a family history of hypertension was found to be statistically significant independent risk factor with hypertension.

Based on th[illegible]esults of bivariate analysis, obtained p value> 0,05. This shows that, there is no relationship between consumption of salty foods with hypertension status in this study. the results of this study commensurate with research Pan[illegible]ribuan and Lolong [24] that there is no difference in the risk of consumption of salty foods for the occurrence of hypertension.

Based on th[illegible]sults of bivariate analysis, obtained p value> 0,05. This shows that there [illegible]o correlation between smoking habit and hypertension status in this study.

Based on the resul[illegible]f bivariate analysis, obtained p value> 0,05. This shows that, there is no relatio[illegible]ip between stress with hypertension status in this study. the results of this study are in line with research conducted by Agyei et al. [25] that did not find the stress relationship associated with hypertension. Similarly, research found Khasanah [26] that there is no relationship between stress levels with blood pressure. The results showed that [illegible]jects with mild and moderate stress had a controlled sisitolic and diastolic blood pressure. Based on the re[illegible]ts of bivariate analysis, obtained p value> 0,05. This shows that, there is no relationship between physical activity with hypertension status in this s[illegible]dy.

The results of this study are in line with research conducted by Kartikasari et al. [21] statistical test results with multiple logistic regression shows activity factor is not a risk factor of hypertension. The same is also found in research conducted by Novitaningtyas [27] statistical test results conducted by using Rank Spearman test obtained p value [illegible].538 (p> 0.05), meaning there is no relationship between physical activity with systolic blood pressure in elderly in Makamhaji Village. Based on the results of bivariate analysis, obtained p value <0.05. This shows that there is a relationship between smoking habit and hypertensi[illegible] status in this study. Similarly, a study by Natalia et al. [28] that there is a significant association between obesity and the incidence of hyperte[illegible]n. Obesity is a risk factor for hypertension. Obese people have a risk of hypertension 2.2 times greater than subjects who have normal BMI.

4. CONCLUSION

This study concluded that there is relationship between compliance in taking medicine with hypertension status after been controlled by age, sex, family history, salty food intake, smoking habit, physical activity and obesity.

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