



THE EFFECT OF MOSQUITO BANANA (*Musa paradisiaca. S*) ON BLOOD PRESSURE IN HYPERTENSION PATIENTS

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ABSTRACT

Hypertension is a degenerative disease that is often found in the elderly. Hypertension is also called the " *silent killer* " disease . Treatment can be done with pharmacology or non pharmacology. The disadvantages of pharmacological treatment have many side effects. Pisang ambon moss (*Musa Paradisiaca. S*) contains high potassium which play a role in lowering blood pressure that is through the mechanism of the diuretic. The purpose of this study was to determine the effect of Ambon mossbanana on blood pressure in hypertensive patients . The method of this research is *quasi experiment* with *pre post test design*. Respondents were selected using *purposive sampling technique* as many as 16 people. The data were processed using the *Wilcoxon Signed Ranks Test* . The results of the analysis of the mean systolic and diastolic blood pressure before therapy were 147.81 / 95 mmHg and the mean systolic and diastolic blood pressure after therapy was 125.31 / 84.38 mmHg. The result of the *Wilcoxon Signed Ranks Test* shows that the difference between the average blood pressure before and after therapy is 22.5 mmHg with a *p value* of 0.000 ($p \leq 0.05$) for systolic and 10.624 mmHg with a *p value* of 0.009 ($p \leq 0.05$) for diastolic. It can be concluded that there is a significant effect of Ambon moss banana on the blood pressure of hypertensive patients. It is hoped that the public and health workers will actively consume Ambon moss banana as an alternative to prevent and treat hypertension.

Keywords: *Hypertension, Elderly, Pisang Ambon Lumut*

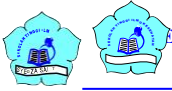
INTRODUCTION

Hypertension can cause organ damage, either directly or indirectly. The cause of organ damage is a direct result of an increase in blood pressure or an indirect effect, namely the presence of antibodies to angiotensin II receptors, stress, *down regulation* , and others. Hypertension can cause damage to the function of body organs, such as the brain, cardiovascular (heart), kidneys and retinopathy (Tambayong, 2013).

According to WHO, the normal limit of blood pressure is 120-140 mmHg systolic pressure and 80-90 mmHg diastolic pressure. A person is declared to have hypertension if the blood pressure is $> 140/90$ mmHg. Hypertension or high blood pressure is one of the diseases that result in numbers morbidity (*morbidity*)

and death (*mortality*) high , so getting attention from all circles of society.

Hypertension is often referred to as 'The Silent Disease' or hidden disease, many of the sufferers are initially unaware that they have hypertension before they do blood pressure checks (Sutanto, 2010). Hypertension is one of the many public health problems in Indonesia. As many as 1 billion people in the world or 1 in 4 adults suffer from hypertension. It is estimated that the number of hypertension sufferers will increase to 1.6 billion by 2025 (Pudiasuti, 2013). The Indonesian Ministry of Health noted that the prevalence of hypertension in Indonesia was still high in 2013, namely 25.8%. The incidence in women is higher than men, namely 28.8% in women and 22.8% in



men, while in West Sumatra it is 24% (Riskesdas, 2013). The 2015 West Sumatra health profile data contained 84,345 cases. Based on data from the Padang Pariaman Health Office in 2016, hypertension is the second rank of the highest reported disease cases, which is 23,061 cases. Judging from the number of sufferers, the Lubuk Alung Community Health Center work area has the highest incidence of hypertension, which is 1061 cases. Of the 1061 cases, there were 771 cases of hypertension in the elderly.

Pharmacological

management consists of administering anti-hypertensive drugs that are diuretics, calcium channel blockers (*Calcium Channel Blockers*, CCB), ACE inhibitors, *alpha-blockers*, and *beta-blockers* by taking into account the location, mechanism of action, and level of compliance (Ward & Aaronson, 2008). Medicines to control blood pressure have several side effects including continuous dry cough, fatigue, palpitations, dizziness, nausea, cold sweats, increased blood pressure if the drug is stopped suddenly, angina or chest pain typical of heart problems, swollen ankles and others.

Given the side effects caused by pharmacological treatment, non-pharmacological treatment or without drugs is a good way of treatment for hypertension sufferers because of the few side effects caused, hypertension management without drugs has benefits, especially in the treatment of hypertension. mild and moderate. (Widyanto & Triwibowo, 2013).

One of the non-pharmacological treatments is lifestyle modification by adjusting the diet or diet. Vegetables and fruit are important components of a healthy diet, for example fruits like Ambon banana have great health benefits. Consuming medium-sized fresh bananas with a weight of ± 140 grams can meet 23% of potassium needs. The role of potassium is similar to sodium, namely

potassium helps maintain osmotic pressure in the intracellular space while sodium maintains osmotic pressure in the extracellular space so that high potassium levels can increase sodium excretion in the urine, decreasing blood volume and blood pressure, but conversely decreasing potassium in space. Intracellular causes fluid in the intracellular space to tend to be attracted to the extracellular space and sodium retention due to the body's response to the osmolality in both compartments at equilibrium, but this can increase blood pressure. Potassium helps reduce extra fluid load and lower blood pressure (Sutanto, 2010). Based on research and trials in Pokhara Nepal in 2015 and research at Coimbatore medical college India in 2012, it was concluded that eating two bananas a day causes blood pressure to decrease by up to 10%. The researchers found that the naturally occurring compounds in bananas work in a similar way to anti-hypertensive drugs. According to research (Sania Taufik et al., 2012) which analyzed the levels of potassium in 4 types of bananas, it was found that the average potassium level in Ambon Lumut banana was 747.6 mg / 100 gr, this is the highest potassium content among the 4 types of bananas are studied. The average weight of Ambon Lumut banana is ± 140 grams, so that in one Ambon Lumut banana contains 1046.64 mg of potassium. Bananas Ambon Moss (*Moses Parasadiaca S*) can be used as one of the treatment of hypertension in non-pharmacological because it contains a high potassium. Based on the background behind the problems on the formulation of the problem in the study of this is whether there is the effect of granting P Isang Ambon Lumut (*Musa Paradisiaca S*) against the pressure of the blood of patients with hypertension. Known to influence the provision of P Isang Ambon Lumut (*Musa Paradisiaca S*) against the pressure of the blood of Patients with hypertension in 2017.



MATERIAL AND METHODS

This study uses a *Quasi Experiment* research type with *pre post test design*, which is to compare the conditions before and after being given treatment. (Saryono, 20 11). The research was conducted at the Korong Singguling Posyandu for the Elderly of the Work Area of the Lubuk Alung Health Center, Padang Pariaman Regency on 23 August to 5 September 2017.

The population of this research is all elderly Patients hipertens i in IHC Elderly Korong Singguling Lubuk AlungHealth Center. District Padang Pariaman as many as 97 ora ng, the number of samples in the study of 16 people and up to 10%. , In this study using *purposive sampling technique* . Samples were taken based on the criteria: Elderly Patients with hypertension with blood pressure of 140/90 mmHg -

160/100 mmHg , am not enderita complication sep erti heart, kidney disorders, m engkonsumsi anti-hypertension and treatment of non f armakologi in addition to intervention research. Blood pressure meter, stethoscope. moss ambon banana. Research stages: Respondents must be in a state of rest at least 5-10 minutes after doing the activity , Measure the respondent's blood pressure for pre data. give 1 moss ambon banana 2 times a day, namely 1-2 hours before or after breakfast and evening for 14 consecutive days. Re-measure the respondent's blood pressure on day 15 as post data .The analyst is univariate used to obtain a picture of the average (*mean*) blood pressure of hypertensive patients before and after DIBE ri intervention and bivariate analysis using the test *Wilcoxon Signed Ranks Test* ($\alpha = 0.05$).

RESULT

a) Average Average Pressure Da ra h Systolic and Diastolic Before Giving Pisang Ambon Lumut (*Moses Paradisiaca. S*).

Table 1
Distribution of Average Systolic and Diastolic Blood Pressure Before Giving Ambon Moss Banana to Patients with Hypertension

Blood pressure	Maximum (mmHg)	At a minimum (mmHg)	Mean (mmHg)	SD
Systolic	160	140	147.81	7.521
Diastolic	100	90	95	5,164

The average blood pressure of the respondents before being given the Ambon Lumut banana was 147.81 mmHg for systolic blood pressure and 95 mmHg for diastolic blood pressure.

b) Average Systolic and Diastolic Blood Pressure After Giving Ambon Lumut Banana (*Musa Paradisiaca.S*).

Table 2
Distribution of Average Systolic and Diastolic Blood Pressure After Giving Ambon Moss Banana to Patients with Hypertension

Blood pressure	Maximum (mmHg)	At a minimum (mmHg)	Mean (mmHg)	SD
Systolic	145	110	125.31	11,470



Diastolic	110	70	84.38	13,467
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c) **Effect of Giving Ambon Lumut Banana (*Musa Paradisiaca. S*) on Blood Pressure of Patients with Hypertension**

Table 3

Effect of Giving Ambon Lumut Banana (*Musa Paradisiaca. S*) on Blood Pressure of Patients with Hypertension

Blood pressure	Difference in Average (mmHg)	t Count	z	p value
Systolic	22.5	7,699	-3,539	0.000
Diastolic	10,625	3,296	-2,631	0.00 9

DISCUSSION

1) **Average Average Pressure Da rah Systolic and Diastolic Before Giving Pisang Ambon Lumut (*Moses Paradisiaca. S*).**

The results of this study are also the same as the research conducted by Dini Tryastuti (2012) on the effect of consumption of Ambon bananas on the blood pressure of the elderly with moderate hypertension at the Tresna Werdha Sabai Nan Aluih Sicyar Social Institution, it was found that before the intervention the average systolic and diastolic blood pressure are 170.65 mmHg and 98.80 mmHg. As we get older, almost everyone will experience an increase in blood pressure. Systolic pressure continues to increase until a person is 80 years old and diastolic pressure cont 55-60 years. Increased blood pressure can lead to hypertension if the level is higher than normal (K hasanah, 2012).

The high level of hypertension with increasing age is caused by changes in the structure of the large blood vessels, so that the lumen becomes narrower and the walls of the blood vessels become stiffer, as a result of which there is an increase in systolic blood pressure .

Research conducted in 6 big cities such as Jakarta, Padang, Bandung, Yogyakarta, Denpasar and Makassar on the elderly (55-85 years), found the largest prevalence of hypertension 52.5% (Ministry of Health, 2006).

The assumption of researchers is that the respondents' lack of knowledge of the many dangers posed by complications from hypertension so that respondents have not implemented a healthy lifestyle, our society's habits tend to consume excessively fatty foods and from the characteristics of respondents who are elderly, they are at risk for developing hypertension

2) **Average Systolic and Diastolic Blood Pressure After Giving Ambon Lumut Banana (*Musa Paradisiaca. S*).**

Based on the analysis of Table 2 test known to average-average systolic blood pressure respondent was 125.31 mmHg and the average blood pressure diastolic respondents was 84.38 mmHg. From the results of this study, after the intervention, there was a decrease in systolic blood pressure of 20 mmHg 9 (56.25%) respondents, 30 mmHg 3 (18.75%) respondents, 35 mmHg 1



(6.25%) respondents, 50 mmHg 1(6.25%) of respondents and 10 mmHg 1 (6.25%) of respondents. Diastolic reduction of 20 mmHg 5 (31.25%) of respondents, 30 mmHg 2 (12.5%) of respondents and 10 mmHg 3 (18.75%) of respondents, this means that most respondents experienced a decrease in blood pressure which means there is an effect of banana consumption. Ambon Lumut on the respondent's blood pressure. From the decrease in systolic, there was one respondent who experienced a significant decrease in blood pressure, namely 50 mmHg, the researchers assumed this was because the respondent did not have too much physical activity, the respondent applied a low salt diet and had no previous history of hypertension. In line with the research conducted by Suwandi (2014) which examined the effect of consuming Ambon banana on blood pressure in elderly people with hypertension at the Mojopahit Nursing Home, Mojokerto Regency, there were 16 respondents who were in the mild hypertension category after being given Intervention to become respondents with normal hypertension as many as 12 people and 4 respondents were still in the mild category of hypertension. Hypertension treatment must be carried out by sufferers throughout their life, requiring comprehensive and integrated long-term management. Ambon banana has a good content for health. The most prominent content in bananas is potassium (Wardhany, 2014).

The role of potassium is similar to sodium, namely potassium helps maintain osmotic pressure in

the intracellular space while sodium maintains osmotic pressure in the extracellular space so that high potassium levels can increase sodium excretion in the urine, reducing blood volume and blood pressure. The administration of banana moss banana diet therapy twice a day for 14 days showed a decrease in the respondent's blood pressure. The assumption of the researchers was that the potassium content in Ambon moss banana was able to have an effect on the blood pressure of elderly people with hypertension because potassium functions as a diuretic mechanism, this is in accordance with what was experienced by responding while consuming Ambon banana, respondents said they often urinated. This, if done continuously, will have a good effect on the blood pressure of hypertension sufferers so that it can improve their health status.

The results of this study also found that 1 (6.25%) respondents experienced an increase in systolic blood pressure of 5 mmHg, 2 (12.5%) of respondent experienced an increase in diastolic blood pressure of 10 mmHg and 4 (25%) of respondents had an increase in their diastolic pressure. According to the assumption of researchers this condition can be caused by other factors such as an unhealthy diet, excessive activity and not having a healthy lifestyle. In addition, seen from the characteristics of respondents who are elderly, the risk of developing hypertension is greater because arteries lose their elasticity so that the response of blood vessels to enlarge and shrink is reduced, automatically blood pressure will rise. If seen from the sex of the respondents, the majority of them are



women, this is because women have less physical activity than men so that their risk of developing hypertension is also high. The increase in blood pressure with age is often caused by natural changes in the heart, blood vessels and hormones.

3) Effect of Giving Ambon Lumut Banana (*Musa Paradisiaca. S*) on Blood Pressure of Patients with Hypertension

The results in the get together with the results obtained by Adriyanti (2013) on diet therapy bananas to the reduction of blood pressure in hypertensive patients in Puskesmas Sukamerindu Bengkulu, where the research results show a decline in blood pressure after respondents were given diet therapy bananas as many as three a day during one week. The mean reduction in systolic and diastolic blood pressure was 9,545 mmHg and 9,091 mmHg, respectively ($p = 0.000$).

A slightly different result was obtained by Bahtiar (2016) regarding the effect of banana consumption on the blood pressure of hypertensive patients in Jitengan Hamlet Balecatur Gamping Sleman Yogyakarta, the paired t test results on systolic blood pressure, p value 0.002 ($p < 0.05$) and systolic blood pressure value. p value 0.104 ($p > 0.05$), so it can be concluded that banana consumption has an effect on reducing the stolic blood pressure but has no effect on diastolic blood pressure.

The results of research by Menti Juliana Pandiangan, a student of the Nursing Faculty of

the Adventist University of Indonesia on the effect of consuming Ambon moss bananas on blood pressure in prehypertensive students at Advent Indonesia University in Bandung showed a significant decrease after consuming 3 bananas for 3 days with $p = 0.000$ which means that there is the effect of consumption of moss ambon bananas on decreasing blood pressure of respondents

This is in accordance with research in America which reported (Frank et al. 2003 in Tryastuti 2012) hypertensive patients aged 35-50 years who consume 2 bananas every day experience a decrease in blood pressure by 10% in 1 week. Some of the important components in bananas are *angiotensin converting enzyme* (ACE) inhibitors. The ACE inhibitor in bananas works by curbing the action of the ACE which commands the release of Angiotensin II. This enzyme regulates the release of angiotensin II, which is a substance that causes increased blood pressure through blood vessel contraction (Megia, Rita and Seta, 2008). The decrease in blood pressure occurs because bananas contain high potassium. Banana is known as a fruit that is high in potassium which can cause vasodilation of blood vessels by hyperpolarization of the smooth muscle of blood vessels. In addition, potassium can cause an increase in the excretion of sodium ions from the body, followed by an increase in fluid excretion from the body so that blood volume decreases. Reduced blood volume causes a decrease in blood pressure (Adrian & Dalimartha, 2013). Potassium (*potassium*) can lower systolic and diastolic blood



pressure . Hal supported by researcher Donald & Alesandro(2008), bahwa supplementation of *potassium* for 6 weeks in systolic blood pressure values Obtained after an average of 6 weeks of administration of 7.60 mmHg and diastolic by 6,46mmHg. The content of potassium (*potassium*) triggers the work of muscles and nerve nodes. In the body, potassium will have a function in maintaining fluid-electrolyte balance and acid-base balance. In addition, along with calcium and sodium, potassium will play a role in nerve transmission,

enzyme regulation and muscle contraction (Irawan, 2007).

Consumption of moss ambon bananas 2 times a day regularly can reduce blood pressure in the elderly. The assumption of researchers, there is an effect of giving Ambon moss banana to the blood pressure of hypertensive patients. This non-pharmacological treatment is very good and needs to be applied to elderly people with hypertension because it does not have a bad effect on the health of the elderly even though it is consumed for a long time and the ingredients are easily available

CONCLUSION

Based on the results of this study, it can be concluded , namely: The average blood pressure of the respondents before being given the Ambon Lumut banana was 147.81 mmHg for systolic blood pressure and 95 mmHg for diastolic blood pressure. The mean blood pressure of respondents after being given moss ambon bananas was

125.31 mmHg for systolic blood pressure and 84.38 mmHg for diastolic blood pressure. There is an effect of giving Ambon moss banana to the respondent's systolic and diastolic blood pressure with a *value of 0.000* for systolic blood pressure and a *value of 0.009* for diastolic blood pressure.

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