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THE EFFECT OF THERAPY OF BANANA TYPES OF MUSA PARADISIACA VAR SAPIENTUM LINN ON DECREASING SYSTOLE AND DIASTOL BLOOD PRESSURE IN HYPERTENSION PATIENTS

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ABSTRACT

Hypertension is a chronic Non-Communicable Disease which is one of the causes due to a lack of potassium intake and high sodium intake. Treatment of hypertension is carried out pharmacologically and non-pharmacologically. One of the non-pharmacological therapies that can help lower blood pressure is to consume bananas of the type musa paradisiaca var sapientum linn because of their high potassium content. This Research aim to determine the therapeutic effect of consuming three Ambon bananas (±140 g/fruit) per day for 14 days in reducing diastolic and systolic blood pressure in hypertension sufferers. The research method used was pre-experimental using the One Group Pretest-Posttest design. the sample is hypertension sufferers in the working area of the Pallangga Health Center totaling 16 respondents, selected using purposive sampling technique. The results of the Paired T-Test showed that the p-value of systolic blood pressure = 0.001 and the p-value of diastolic blood pressure = 0.008 ($p < 0.05$), which means that consumption of ambon bananas is effective in reducing systolic and diastolic blood pressure. It can be concluded that there is a significant effect of banana fruit therapy of the type Musa paradisiaca Var Sapientum Linn on reducing systolic and diastolic blood pressure in hypertensive patients. Suggestions from this study are doctors, nurses or other health workers, can provide education to the public regarding the benefits of non-pharmacological therapy in the form of consumption of Ambon bananas for people with hypertension and apply them so that they can be balanced with pharmacological therapy.

Keywords: ambon banana; hypertension; musa paradisiaca var sapientum linn

INTRODUCTION

Hypertension or high blood pressure is a Non-Communicable Disease (NCD) which is a major risk factor for cardiovascular disease and causes around 9.4 million deaths every year worldwide (Niriayo et al., 2019). It is in line with WHO data for 2019, which estimates the prevalence of hypertension is 1,696,962,982 people (22%) of the total world population (7,713,468,100). The prevalence of hypertension in Developing countries is 40%, while in developed countries is 35%. The highest is in African countries at 27%, and Southeast Asia is in third position at 25%. (Kemenkes RI, 2019; Worldometer, 2019). The above data is also proportional to the prevalence of hypertension in Indonesia which continues to increase from 25.8% in 2013 to 34.11% in 2018, with the highest case in South Kalimantan (44.13%), and the lowest in Papua (22.22%). %). Likewise, South Sulawesi also shows an increase from 29% in 2013 to 31.68% in 2018 (Riskesdas, 2013; 2018). Based on these data, the trend of the prevalence of hypertension continues to increase, so control or treatment is required through pharmacological and non-pharmacological therapy.

Pharmacological treatment aims to control hypertension, but sometimes it can cause side effects, especially on the kidneys. So that the non-pharmacological method is an alternative treatment by adjusting the diet and consuming vegetables and fruits such as bananas. One type of banana is the ambon banana (Musa Paradisiaca Var. Sapientum Linn) which has the highest potassium

content (600 mg) in 100 grams of ambon banana. There are 435 mg of potassium and 18 mg of sodiu(Adzahari et al., 2016). Research in America and India proves that consuming 2 bananas per day can reduce blood pressure by 10% in a week because of its high potassium content, where potassium can inhibit renin release, thus changing the activity of the renin-angiotensin system, regulating the work of the peripheral nerves and central nerves, and can increase vasodilation that causes changes in blood pressure (LeMone et al., 2015; Sharrock & Lusty, 2000) . Other research has shown that the intervention group of Ambon bananas consumption for seven days showed significant changes in systolic and diastolic blood pressure (p-value <0.05). (Adzahari, 2016; Tangkilisan et al., 2013) (Porouw & Yulianingsih, 2019; Yulianti et al., 2019). From some previous research the intervention was carried out for 7 days so the authors tried to provide intervention for 14 days in the hope that it would give better results in controlling blood pressure. Based on the description above, the study aims to determine find out "Effectiveness of Ambon banana (Musa Paradisiaca Var. Sapientum Linn) therapy for reducing blood pressure in hypertensive patients.

METHOD

This research is quantitative research with Quasy experimental research methods. The technique used is the one-group pretest-posttest group design. The research was conducted in the working area of Pallangga Health Center in July 2022. Researchers took secondary data at the end of 2021 and the last few months of 2022. The population in this study were all hypertension sufferers who had just been diagnosed based on non-communicable disease achievements in the working area of Pallangga Health Center in April 2022, with as many as 136 people. Determination of the sample using the Federer formula obtained 16 respondents, with an estimated dropout of 5% (Yuwono, 2022). The inclusion criteria are respondents with blood pressure ≥140/85 mmHg, aged 35-65 years, do not consume antihypertensive drugs and are willing not to consume foods that trigger hypertension. While the exclusion criteria were hypertension sufferers with complications such as stroke, hearing and vision impairment. The intervention of giving Ambon bananas was carried out for 14 days with a frequency of three times a day, one fruit each (±140 gr) in the morning (08.00), afternoon (12.00) and evening (16.00). The tools and materials used in this research were Ambon bananas, cake scales with ATS brand, banana storage boxes and observation sheets. The bananas were first weighed using a scale, and blood pressure was measured using the Digital Tension with Omron brand

RESULT

Respondents in this study were 16 people, who were determined according to the inclusion and exclusion criteria, and then were given intervention therapy by consuming 3 Ambon bananas per day for 14 days. Respondent characteristics in this study were based on gender, age, occupation, ethnicity, recent education, history of hypertension and blood pressure category before and after the intervention. The results can be seen in (table 1) below.

Tabel 1 the majority were female as many as 14 people (87.5), the majority were aged 56-65 years 8 people (50%), the majority were housewives as many as 13 people (81.3%), the majority had elementary school education 6 people (37 .5%), the majority had a family history of hypertension as many as 12 people (81.3%) and the majority suffered from stage 2 hypertension, namely 11 people (68.8%).

Table 1.
Characteristics of Respondents by Gender, Age, Occupation, Education Level, Hereditary and Hypertension category (n=16)

Characteristics	Number of respondents	
	f	%
Gender		
Man	2	12,5
Woman	14	87,5
Age		
36-45	3	18,8
46-55	5	31,3
56-65	8	50,0
Occupation		
Housewives	13	81,3
Entrepreneur	1	6,3
Retired civil servants	2	12,5
Level of Education		
No School	2	12,5
Elementary School	6	37,5
Junior High School	4	25,0
Senior High School	4	25,0
Hereditery (Hypertension)		
Have	13	81,3
Do Not Have	3	18,8
Hypertension category		
Stage 1 hypertension	5	31,3
Stage 2 hypertension	11	68,8

Table 2.
Characteristics of Respondents Based on Pre- and Post-Intervention Blood Pressure (n=16)

Hypertension category	Total Respondents	
	f	%
Pre-Intervention		
Stage 1 hypertension	5	31,3
Stage 2 hypertension	11	68,8
Total	16	100
Post-Intervention		
Normal	3	18,8
Pre-hipertention	3	18,8
Stage 1 hypertension	3	18,8
Stage 2 hypertension	7	43,8
Total	16	100

Table 2 shows that there were no respondents with normal blood pressure (0%) before the Ambon bananas intervention, and after the intervention there were 3 respondents (18.8%) with normal blood pressure.

Table 3.
Characteristics of Respondents Based on the post-intervention effect on lowering systolic and diastolic blood pressure (n=16)

Blood Pressure Effect	Number of Respondents	
	f	%
Systole		
Lowering	14	87,5
No Change	2	12,5
Diastole		
Lowering	10	62,5
No Change	6	37,5

Table 3. Shows that after the intervention of 3 Ambon bananas per day there were 14 respondents (87.5%) with a decrease in systolic blood pressure and the remaining 2 respondents (12.5%) have no change systolic blood pressure. Then there were 10 respondents (62.5%) with a decrease in diastolic blood pressure and the remaining 6 respondents (37.5%) have no change diastolic blood pressure.

Table 4.
The Effectiveness of Ambon Bananas on Lowering Systolic and Diastolic Blood Pressure Based on the results of the paired t-test

Variable	f	Mean	SD	95% CI		*p*
				lower	Upper	
Pretest - Posttest Systolic	16	19,750	20,339	8,912	30,558	,001
Pretest - Posttest Diastolic	16	4,813	10,160	-,601	10,226	,008

Table 4 shows that after the intervention of 3 Ambon bananas per day there was an average decrease in systolic blood pressure of 19.75 mmHg, while an average decrease in diastolic blood pressure of 4.813 mmHg. Based on the results of the paired t-test, a significant systolic value was obtained with a p-value = 0.001, while the diastolic with p-value = 0.008, which means that the alternative hypothesis (Ha) is accepted. So it can be concluded that the intervention of Ambon bananas consumption is effective in lowering blood pressure.

DISCUSSION

Characteristics of Respondents

The results based on the age of the respondents who participated in this study were dominated by 56-65 years old (50.0%) who suffered from hypertension. There are several factors causing hypertension, which can be divided into two, modifiable and unmodifiable such as age (Black & Hawks, 2014; Smeltzer & Bare, 2013) Increasing age affects blood pressure due to physiological changes, such as increased peripheral resistance and sympathetic nerve activity and decreased elasticity of the large blood vessels increasing blood pressure. The results showed more female respondents (87.5%) than male respondents (12.5%). The American College of Cardiology published that the hormone estrogen in women who are still premenopausal can increase the production of antioxidants which have a vascular protective effect, so they can reduce stress and prevent inflammation in the body. Therefore, estrogen levels that decrease after menopause may reduce this function and increase the risk of hypertension in women aged 60 years old (Fadli, 2021).

The results showed the majority of respondents are in elementary school education, as many six respondents (37.5%), or in other words, some respondents had a low level of education. It is in line with research conducted by (Adzahari et al., 2016) where 17 respondents had hypertension, and 16 respondents (47.1%) had low education. Low education level affects

knowledge due to lack of exposure to health information which affects a person's behavior and lifestyle. The results showed that the respondents with the most occupations were housewives, with as many as 13 respondents (81.3%). It is in line with previous research that most occupations were housewives (Inggita, 2016). It may be associated with the unbalanced pressures of life and become a trigger for stress affecting blood pressure. The results indicate that the majority of respondents have a history of hypertension in their family (81.3%). The results indicate that the majority of respondents have a history of hypertension in their family (81.3%). It may be related to hereditary factors in line with Azwar's research (2021) which states that individuals with parents who suffer from hypertension can be passed it down to their families (Azwar, 2021).

The effectiveness of Ambon bananas in lowering blood pressure

The results indicate a decrease in systolic and diastolic blood pressure in respondents after the intervention by consuming Ambon bananas with a frequency of three pieces (1 fruit ± 140 gr) per day for 14 days. It is consistent with several studies, such as (Susanti et al., 2019) stating that there was a significant difference between systolic and diastolic blood pressure before and after being given ambon bananas with a p-value of 0.000 (<0.005). The same research conducted by (Agustianingrum et al., 2020) revealed that consuming Ambon bananas could reduce diastolic blood pressure by 16.22 mmHg and systolic pressure by 12.34 mmHg. And the latest research by (Muhammad Rizky Ramadhan et al., 2021) shows that the intervention group who consumed Ambon bananas experienced a lowering systolic of 14.67 mmHg and 4.67 mmHg diastolic.

Lowering blood pressure is due to the content of potassium, serotonin, dopamine, water, minerals, and calcium in Ambon bananas. A hundred grams of Ambon bananas contain 435 mg of potassium with an average weight of ± 140 grams. So, one Ambon banana contains ± 600 mg of potassium. Potassium needs per day in adults vary, ranging from 3.5 mmol/L (minimum) and 4,500-5,000 mg (maximum). Thus the potassium content in Ambon bananas given to respondents of 1,800 mg per day can be an alternative to increase potassium levels in the body (Ramadhan, 2015; Adzahari et al., 2016; Susanto, 2016; Aulia, 2016; Handayani, 2020). The lowering of blood pressure by potassium is by reducing the production of the vasoconstrictor thromboxane while increasing the production of the vasodilator prostacyclin. So blood vessel vasodilation occurs to decrease peripheral retention and increased cardiac output(Chan et al., 2022). Previous research in Australia by (Margerison et al., 2020) also stated that a low sodium and high potassium diet from vegetables, fruits, and milk could decrease systolic blood pressure by 1.88 mmHg and 1.14 mmHg of diastolic. In addition, similar interventions have also been given to pregnant women in research (Porouw & Yulianingsih, 2019) assuming that pregnant women who consume Ambon bananas for 7 days with a dose of 2 times a day can reduce blood pressure by 10-20 mmHg. Similar to research by (Yulianti et al., 2019) which provided Ambon banana interventions for the elderly, it showed a decrease in blood pressure of 61.3%.

CONCLUSION

It can be concluded that therapy with three types of Musa paradisiaca Var Sapientum Linn bananas in one day can decrease systolic and diastolic blood pressure in hypertensive patients, which means the alternative hypothesis (Ha) is accepted. And it can be used as a reference by nurses in providing education in health services to people with hypertension.

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