

Conference Paper

## Comparison of The Effectiveness of Consuming Watermelon and Ambon Bananas on The Blood Pressure of Elderly People with Hypertension

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### ABSTRACT

Hypertension is a disease factor that affects around 1.3 billion adults worldwide, significantly increasing the risk of heart, brain, and kidney disease, is the main cause of death globally, claiming around 10.8 million lives. Treatment of hypertension can be pharmacological, by taking antihypertensive drugs and Non-pharmacological therapy, namely watermelon and Ambon banana therapy. This study aimed to see the difference in the effectiveness of consuming Ambon bananas and watermelon in reducing blood pressure in elderly people with hypertension. This type of research was quasi-experimental with a pre-post test design with the control group, of 15 elderly people treated with Ambon bananas and 15 elderly people treated with watermelon. Statistical tests use the independent t-test. The results of this study were obtained using an independent t-test for blood pressure, and systolic pressure, the t value was  $2.219 > t_{table} 2.048$  with a p-value of 0.035 (intervention group), and the same t value was obtained, namely  $2.219 > t_{table} 2.048$  with a p-value of  $0.036 < \alpha 0.05$  (control group). Meanwhile, for diastolic blood pressure, the t value was  $2.435 > t_{table} 2.048$  with a p-value of 0.022 (intervention group) and the same t value was  $2.435 > t_{table} 2.048$  with a p-value of  $0.023 < \alpha 0.05$  (control group).so it can be concluded that  $H_0$  is accepted, meaning there is a statistically significant difference in effectiveness consumption of Ambon bananas and watermelon reducing systolic and diastolic blood pressure in elderly people with hypertension in the work area work at the Jemaja Timur Anambas Community Health Center. Suggestions for further research: this research can provide information for further research related to the factors that cause hypertension.

*Keywords: Hypertension, watermelon, Ambon banana, elderly, pharmacology, non-pharmacology*

### Introduction

The aging process is an inevitable biological process experienced by everyone. Entering old age means experiencing a physical and psychological decline (Rusmin et al., 2017). hypertension is a disease factor affecting approximately 1.3 billion adults worldwide, significantly increasing the risk of heart, brain, and kidney diseases, and is a leading global cause of death, claiming about 10.8 million lives. according to the World Health Organization (WHO), hypertension affects about 1.3 billion adults worldwide, significantly increasing the risk of heart, brain, and kidney diseases, and is one of the top three global causes of death, claiming about 10.8 million lives in 2019 in the age group of 30-79 years, with an increase from 650 million to 1.28 billion over the last thirty years (WHO, 2022). From 2013 to 2018, according to the Indonesian Central Bureau of Statistics (BSI), The prevalence of high blood pressure in the elderly by Province: In the Riau islands, it increased from 22.4% to 25.8%, a 3.4% increase in the population, ranking ninth out of fourteen provinces in Indonesia 2018. According to the results of Riskesdas 2018, non-communicable diseases among the elderly increased. stroke increased from 7% to 10.9%, chronic kidney disease

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increased from 2% to 3.8%, and diabetes increased from 1.5% to 2%, as did hypertension from 25.8 per thousand to 34.1 per thousand (Dinas Kesehatan Provinsi Kepulauan, 2019).

Hypertensive patients in the kepulauan anambas regency numbered 5,648. meanwhile, for hypertensive elderly patients in the Kepulauan Anambas Regency from January to December 2021, there were 658 cases (BPS-Statistik Indonesia Kabupaten Kepulauan Anambas, 2021). In 2022, the number of hypertension cases in the elderly increased from the previous year, with 658 cases in 2021 and 1,023 cases in 2022. Among the 10 community health centers (Puskesmas) in the Kepulauan Anambas Regency, puskesmas Siantan Selatan ranked fourth in the highest number of hypertension cases in the elderly, with 163 cases (BPS-Statistik Indonesia Kabupaten Kepulauan Anambas, 2021).

Ways to lower blood pressure include pharmacological (using medication) and non-pharmacological methods (without medication). Anti-hypertensive drugs have long been proven effective in controlling blood pressure, but plant resources also play an important role and can be used to control blood pressure. Resources that can be used to control blood pressure include fruits, and vegetables high in fiber, rich in vitamins, and minerals (Wulandari, 2011). One fruit that can be used to lower and stabilize blood pressure is watermelon and Ambon banana (Fatmawati et al., 2017).

## Material and Methods

This type of research was a quasi-experimental design with a pre-post test design with the control group, 15 elderly people treated with Ambon bananas (intervention group), and 15 elderly people treated with watermelon (control group). Statistical tests use the independent t-test. The research was conducted on elderly people in the South Siantan Health Center Working Area, Anambas Islands Regency in August-December 2023. The research subjects were elderly people who had hypertension and were able to follow the procedure. Consuming 3 x 303 gr Ambon bananas for 7 days. Consumption (intervention group) and watermelon for 7 days with dose 2 times 350 grams/glass/day (control group).

## Results and Discussion

### *Respondent characteristics*

Table 1. Frequency distribution of respondent characteristics

No	Sample characteristics	Intervention		Controls	
		n	%	n	%
<b>1</b>	Gender				
	a. Man	8	53 %	5	33 %
	b. Woman	7	47 %	10	67 %
<b>2</b>	Age				
	a. 60-65 Years	8	53 %	11	73 %
	b. 66-70	6	40 %	3	20 %
	c. 71-75	1	67 %	1	67 %
<b>3</b>	Work				
	a. IRT	8	53 %	7	47 %
	b. Farmer	3	20 %	2	13 %
	c. Entrepreneur	4	27 %	6	40 %

### *Comparison results of the effectiveness of consuming ambon bananas and watermelon on the blood pressure of elderly people with hypertension*

Table 2 states the results of statistical tests using the independent t-test, which obtained a calculated t-value of 2.219 > t table 2.048 and a p-value of 0.035 <  $\alpha$  0.05. These results can be

concluded that  $H_0$  is rejected, meaning there is a difference in the effectiveness of Ambon bananas and watermelon in reducing systolic blood pressure in elderly people with hypertension.

Table 2. Comparison of effectiveness after treatment with ambon bananas and watermelon in reducing systolic blood pressure in the elderly

Group	N	Mean (mmHg)	t	<i>p-value</i>
Intervention	15	133.33	2,219	0.035
			2,219	0.036

Table 3 shows the results of statistical tests using the independent t-test, which obtained a calculated t-value of  $2.435 > t$  table  $2.048$  and a p-value of  $0.022 < \alpha$   $0.05$ . It can be concluded that  $H_0$  is rejected which means there is a difference in effectiveness. There is a difference in the effectiveness of Ambon banana and watermelon on reducing diastolic blood pressure in elderly people with hypertension.

Table 3. Comparison of effectiveness after treatment with Ambon bananas and watermelon to reduce diastolic blood pressure in the elderly

Group	N	Mean (mmHg)	t	<i>p-value</i>
Intervention	15	77.33	2,435	0.022
			2,435	0.023

Several factors influence changes in blood pressure, including genetics, age and gender, diet, body weight such as overweight (obesity), and lifestyle. Apart from that, the use of hormonal contraception (estrogen), renal parenchymal and vascular disease, endocrine disorders, aortic coarctation, and stress can also cause hypertension (Gunawan, 2007 & Udjianti, 2016). Lack of awareness among hypertension sufferers causes various complications in the body's organs. Complications that occur due to uncontrolled increases in high blood pressure will cause problems with body organs such as damage to the function of the brain, kidneys, heart, and vision, and permanent disability and sudden death (Nuraini, 2015). Efforts to treat hypertension apart from conventional medicines (chemical medicines) which cause side effects and require expensive treatment, can also be made by using fresh fruit (Widodo & Sutanta, 2019).

Research results show that consumption of Ambon bananas is very effective for lowering blood pressure. The reduction in blood pressure is caused by Ambon bananas containing high levels of potassium and low levels of sodium. 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 (natriuresis), which can reduce blood volume and blood pressure, but on the contrary, a decrease in potassium in the intracellular space causes fluid in the intracellular space. The intracellular tends to be attracted to the extracellular space and sodium retention is due to the body's response so that the osmolality in both compartments is at the equilibrium point, but this can increase blood pressure (Winarno, 2017). The potassium content in Ambon bananas is high and sodium is lower. Previous research conducted in the United States stated that foods rich in potassium such as bananas can help in the process of lowering blood pressure. The potassium in bananas can cause vasodilation, thereby causing a decrease in total peripheral retention and increasing cardiac output. Apart from that, another function of potassium is to regulate peripheral and central nerves which affect blood pressure (Sutria & Insan, 2015). Apart from potassium, bananas also contain vitamin A and vitamin C. Vitamin A

can prevent free radicals from becoming inactive and thus protect LDL cholesterol in the blood. LDL cholesterol is a substance that can damage the vascular system so that macrophages in the blood circulation decrease. Vitamin C is a type of antioxidant in the vitamin group that can cause a vascular remodeling process, causing vasodilation of blood vessels (Ayu, 2018). This research is in line with research by Nurleny (2019) with the results of the t-test for the systolic treatment group before and after showing a p-value of 0.000 and a diastolic p-value of 0.004. This shows the significant influence of Ambon bananas on blood pressure.

Watermelon flesh contains 93.4% water, 0.5% protein, 5.3% carbohydrates, 0.1% fat, 0.2% fiber, various vitamins (A, B, and C), antioxidants such as amino acids (citrulline and arginine), acetic acid, malic acid, folic acid, lycopene, carotene, bromine, potassium, sylvite, lysine, fructose, dextrose, and sucrose. The ingredients in watermelon that are efficacious in reducing high blood pressure are potassium, vitamin C, carbohydrates, and lycopene which functions to improve heart function as well as citrulline which can encourage blood flow to all parts of the body, and vitamin B6 which can stimulate hormones in the brain to overcome anxiety. High levels of potassium also act as a natural diuretic which can help the heart work and lower blood pressure.

From several research results, it was found that consuming 300-350 grams of watermelon twice a day has been proven to reduce blood pressure in the elderly. One way to treat hypertension is by giving watermelon. Watermelon contains vitamin A and potassium which can lower blood pressure. Watermelon can be consumed directly or in juice. Watermelon contains a lot of nutritional value such as vitamin A and vitamin C as well as potassium which is good for health. For people suffering from hypertension, watermelon can be consumed so that it can neutralize blood pressure. Apart from that, watermelon can treat canker sores, cleanse the kidneys, and increase the work of the heart. Apart from that, watermelon also contains citrulline, an amino acid that can vasodilate blood vessels (Sobir, 2015). Watermelon has the property of balancing body fluids, maintaining normal blood pressure, maintaining kidney health, increasing liver urea levels, maintaining heart function, maintaining healthy nails and skin, and maintaining eye health (Lavin-tang et al., 2019).

The results of this research are in line with Nurjannah (2020) with the title the effect of watermelon on Reducing blood pressure in hypertension sufferers in the working area of the Nangalo Community Health Center. Based on the results of statistical tests, the p-value = 0.000 (p 0.05), so this research is accepted, meaning there is an effect. giving watermelon to reduce blood pressure in hypertensive sufferers. This was then supported by the research results of Pardede et al. (2019) on the effect of giving watermelon juice on changes in blood pressure in hypertension sufferers. The systolic p-value was 0.022 and the diastolic p-value was 0.019. It was concluded that there was an effect of giving watermelon on changes in blood pressure in hypertensive sufferers.

Watermelon is a fruit that can lower blood pressure. Because there are ingredients in anti-hypertension drugs. The contents of watermelon are potassium, beta-carotene, and potassium. Watermelon is very rich in water, amino acids, and L-arginine which can maintain healthy blood pressure (Maya, 2016). Increasing dietary potassium intake has been associated with lower blood pressure because potassium triggers natriuresis (loss of sodium through urine). It is thought that increasing potassium intake to offset sodium in the diet is beneficial for heart health. The daily dose of potassium is 3500 mg. The potassium content in watermelon is quite high which can help the heart work and normalize blood pressure. Lycopene is an antioxidant that is superior to vitamins C and E. The seeds are rich in nutrients with a yellow oil content of 20% 45%, 30% 40% protein, citrulline, vitamin B12, and the enzyme urease. The active compound curcucitrin in watermelon seeds can stimulate kidney function and keep blood pressure normal. Watermelon contains the amino acid citrulline which plays a role in lowering blood pressure. Apart from that, the carotenoid content in watermelon can prevent hardening of the walls of arteries and veins, thereby reducing blood pressure (Maya, 2016).

## Conclusion

Untreated hypertension can cause a variety of serious and potentially life-threatening health problems. Pharmacological treatment has high side effects so it needs to be combined with non-pharmacological therapy. The results of this study. Elderly people with hypertension are advised to consume Ambon bananas and watermelon.

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