

THE EFFECT OF CHIAMBER (SECHIUM EDULE) JUICE ON BLOOD PRESSURE IN HYPERTENSION PATIENTS IN THE WORKING AREA OF THE REJOSARI COMMUNITY HEALTH CENTER, PEKANBARU

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Abstract

Hypertension can pose serious risks to sufferers, even potentially life-threatening. If not managed properly, hypertension can cause serious complications, such as damage to blood vessels, heart, and kidneys, as well as the risk of stroke due to rupture of capillary blood vessels in the brain. Chayote (Sechium Edule) is one of the non-pharmacological therapies in the form of herbs that can be used to lower high blood pressure in people with hypertension. The purpose of this study was to determine the effect of chayote juice (Sechium Edule) on blood pressure in hypertensive patients in the Rejosari Pekanbaru Health Center Work Area. This study is a quantitative study, with a quasi-experimental research design with a one group pre-experimental design pretest and post-test approach. Blood pressure was measured before and after the chayote juice consumption intervention. The sample consisted of 18 people with a simple random sampling technique. The instruments used were blood pressure measurements and observation sheets. The statistical test results for blood pressure showed p value = 0.000

Keyword: : Hypertension 1; Chayote Juice 2; Blood Pressure 3.

INTRODUCTION

Hypertension is a non-communicable disease that requires serious attention and national action. Its prevalence is high, and many people are unaware that they have it. They seek medical check-ups at health services because they feel dissatisfied with themselves or others. High blood pressure is often referred to as a "silent killer" (Desiyana et al., 2020). As we age, we tend to experience various health problems. This decline in bodily function is often accompanied by a decline in function, also known as a symptom of degenerative diseases. High blood pressure, known medically as hypertension, is a condition in which blood vessels continue to dilate, and the higher the pressure within them, the more difficult it is for the heart to pump blood (Armaita, Marni Linda, 2022).

According to the World Health Organization (WHO), by 2023, an estimated 1.28 billion adults aged 30 to 79 years will suffer from hypertension. Indonesia ranks fifth among countries with the highest number of people with high blood pressure. Furthermore, the number is estimated to reach 46%. People with high blood pressure are unaware they have it. Those who are diagnosed and receive treatment account for approximately 42%. Meanwhile, only 1 in 5 adults (21%) suffer from this condition. High blood pressure can be controlled through lifestyle. The global target for non-communicable diseases aims to reduce the prevalence of this disease by 33% between 2010 and 2030.

According to data from the Riau Provincial Health Office, in 2022, the prevalence of hypertension among the population aged 15 years and over was 29.1%. Of this number, approximately 70% of people with hypertension were unaware that they had it. The incidence of hypertension increased significantly, from 22.8% in 2021 to 32.5% in 2022. This is particularly true in districts with low access, such as Pekanbaru, Pelalawan, Kampar, and Indragiri Hilir, where service coverage remains below 10%. Current data only covers patients visiting community health centers (Puskesmas); patients visiting other health facilities are not yet recorded. Healthcare services for hypertension patients have been included in the district/city Minimum Service Standards (SPM) indicators since 2019, and there has been an improvement in services since 2020, reaching 33.1% in 2022.

Hypertension can pose serious risks to sufferers, even potentially life-threatening. If not properly managed, hypertension can lead to serious complications, such as damage to blood vessels, the heart, and kidneys, as well as the risk of stroke due to ruptured capillaries in the brain. These complications are often caused by non-compliance with medication and blood pressure monitoring (Kartika et al., 2021).

Hypertension can be controlled with pharmacological and non-pharmacological treatments. Pharmacological treatment involves the use of antihypertensive medications, such as diuretics, beta-blockers, vasodilators, and angiotensin-converting enzyme inhibitors. Meanwhile, non-pharmacological or alternative treatments, such as massage therapy, reflexology, acupressure, and herbal remedies, are often considered more natural and safer (Alam & Jama, 2020). Currently, non-pharmacological approaches are becoming an alternative treatment for hypertension patients because they are considered safer and can increase the effectiveness of antihypertensive drug therapy, compared to medication alone. Non-pharmacological therapy is more effective and easier to implement, but in reality, it is less popular with the public because it takes relatively longer to achieve an effect compared to pharmacological therapy. Furthermore, it requires persistence and consistency in carrying out the therapy (Iqbal & Handayani, 2022).

Chayote (*Sechium edule*) is a non-pharmacological herbal therapy that can be used to lower high blood pressure. Chayote contains nutrients and anti-inflammatory properties. Chayote has a diuretic effect, which can reduce blood salt levels through urinary excretion. Reduced salt levels can absorb water, reducing the heart's workload when pumping blood, thus lowering blood pressure (Indriyani & Komala, 2020). Chayote contains potassium and alkaloids, which have diuretic properties that support the kidneys in eliminating excess fluid and salt from the body. This results in reduced fluid retention in the blood, thus lowering blood pressure. The fruit and leaves of chayote shoots are useful as a diuretic (stimulate urination). This diuretic effect can help lower high blood pressure (hypertension), prevent hardening and calcification of the arteries, reduce the risk of heart attacks, and dissolve kidney stones. Consuming chayote in the morning and evening is beneficial for lowering high blood pressure, as it contains amino acids and vitamin C, which are very beneficial for health (Siti et al., 2019).

Based on research conducted by (Siti et al., 2018), data showed that of 30 hypertensive patients who served as respondents, 21 (70%) had stage 2 blood pressure ($>160/100$ mmHg) and 9 (30%) had stage 1 blood pressure (140-159/90-99 mmHg) before using chayote as an alternative treatment for hypertension. After consuming chayote for 3 days, 26 (87%) of the hypertensive patients achieved normal blood pressure ($<120/80$ mmHg), and 4 (13%) had prehypertensive blood pressure (120-139/80-89 mmHg).

Based on a preliminary study conducted by researchers on October 5, 2024, data from the Pekanbaru City Health Office in Riau showed that the highest incidence of hypertension in

2023 was at the Rejosari Community Health Center, with 4,464 visits. The second highest was at the Simpang Tiga Community Health Center, with 3,146 visits, and the third highest was at the Sidomulyo Community Health Center, with 2,939 visits. Interviews with 10 people with high blood pressure at the Rejosari Community Health Center in Pekanbaru revealed that 60% of them reported using non-pharmacological therapies. They stated that they not only took medication from the Community Health Center but also believed that consuming traditional medicines could help lower blood pressure, including consuming cucumbers. During interviews, they stated they had never consumed chayote juice, stating that they only knew that chayote was consumed as a vegetable. Another 40% of patients reported only taking medication from the community health center. Based on these statements, the researchers were interested in conducting a study on "The Effect of Chayote (Sechium edule) Juice on Blood Pressure in Hypertension Patients in the Rejosari Community Health Center, Pekanbaru."

RESEARCH METHOD

This research was quantitative, using a quasi-experimental design with a one-group pre-test and post-test experimental design. This design did not have a comparison (control) group. This study was conducted in the Rejosari Community Health Center (Puskesmas) working area in Pekanbaru. This study was conducted from the planning stage to the final report, from September 2024 to February 2025.

The population of this study was hypertension patients who came for treatment at the Rejosari Community Health Center in Pekanbaru, with a total of 281 cases of hypertension. The sampling technique used the Lameshow formula, resulting in a sample size of 18 respondents. The sampling technique used in this study was simple random sampling.

In this study, the instruments used were blood pressure measurements. The tools used were an observation sheet, a pen, and a Sinoheart digital sphygmomanometer. The hypertension observation sheet and observation guidelines are a checklist used to directly assess the behaviors exhibited by respondents.

RESEARCH RESULTS

Univariate Analysis

Characteristics of Respondents

Age

Table 1. Frequency Distribution of Respondents by Age in the Rejosari Community Health Center Work Area, Pekanbaru

Age	Frequency	Presentation
Late Adulthood (36-45 years)	5	27,8%
Early Old Age (46-55 years)	10	55,6%
Lansia Akhir (56-65 tahun)	3	16,6%
Total	18	100%

Source: Primary Data Analysis 2025

Based on the data in Table 4.1, it shows that more than half of the respondents were in the early elderly age group (46-55) years, or 10 respondents (55.6%).

Gender

Table 2. Frequency Distribution of Respondents by Gender in the Rejosari Community Health Center Work Area, Pekanbaru

Gender	Frequency	Presentation
Woman	12	66,7%
Man	6	33,3%
Total	18	100%

Source: Primary Data Analysis 2025

Based on the data in Table 4.2, it shows that more than half of the respondents were female (12 respondents (66.7%).

Work

Table 3. Frequency Distribution of Respondents Based on Occupation in the Rejosari Community Health Center Work Area Pekanbaru

Work	Frequency	Presentation
Laborer	1	5,6%
Teacher	1	5,6%
Farmer	1	5,6%
Civil Servant	1	5,6%
Housewife	10	55,5%
Self-Employed	4	22,1%
Total	18	100%

Source: Primary Data Analysis 2025

Based on the data in Table 4.3, it shows that more than half of the respondents, 10 (55.5%), are housewives.

Long-term hypertension

Table 4. Frequency Distribution of Respondents Based on Duration of Hypertension in the Work Area Rejosari Community Health Center, Pekanbaru

Long-term hypertension	Frequency	Presentation
1 year	4	22,2%
2 years	8	44,5%
3 years	6	33,3%
Total	18	100%

Source: Primary Data Analysis 2025

Based on the data in Table 4.4, it shows that almost half of the respondents suffered from hypertension for 2 years, namely 8 respondents (44.5%).

Average value

Table 5. Average Blood Pressure Values Before and After Chayote Juice Administration in the Rejosari Community Health Center Work Area, Pekanbaru

blood pressure	N	Mean	Min	Max	SD
Pre-Test Systolic	18	150,56	140	167	7.823
Post-Test Systolic	18	130,06	121	137	5.823
Pre-Test Diastolic	18	86,67	70	98	8.513

Post-Test Diastolic	18	78,50	59	95	9.031
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Source: Primary Data Analysis 2025

Based on the data in Table 4.5, the mean systolic blood pressure of 18 respondents was 150.56 mmHg, while the mean after was 130.06 mmHg. The minimum systolic blood pressure before was 140 mmHg and the minimum after was 121 mmHg. For diastolic blood pressure, the mean before was 86.67 mmHg, while the mean after was 78.50 mmHg. The minimum diastolic blood pressure before was 70 mmHg and the minimum after was 59 mmHg

DISCUSSION

Univariate Analysis

Characteristics of Respondents

Age

Based on the research results, the frequency distribution of 18 respondents showed that the majority of respondents were in the early elderly age group, namely 46-55 years old, representing 10 individuals (55.6%). The results showed an increase in the incidence of hypertension with age.

Age is one of the main factors influencing hypertension due to natural changes in the body, including the heart, blood vessels, and hormones. As we age, the cardiovascular system declines, which can lead to an increased incidence of hypertension. As we age, artery walls thicken due to the accumulation of collagen in the muscle layer, causing the blood vessels to gradually narrow and stiffen.

The results of this study align with research conducted by Aristotle (2018) on 30 respondents at the Emergency Center Unit of Khadijah Islamic Hospital, Palembang. Among the older respondents (60.0%), 18 were suffering from hypertension, while among the younger respondents (40.0%).

Researchers believe that age is a significant factor in the incidence of hypertension, with the risk increasing directly with age. This is based on the finding that the majority of respondents (55.6%) were in the early elderly category (46-55 years old).

Gender

Based on the results of the gender analysis of 18 respondents, the analysis results showed that the majority of respondents were women, with 12 respondents (66.7%). This finding aligns with research conducted by Sahlan Zamaa et al., 2022, which also found a higher prevalence of hypertension in women, with 29 respondents (72.5%).

Blood pressure is influenced by gender. This is in line with (Adilla & Eka Mustika, 2023), which showed a significant association between gender and the incidence of hypertension in patients at PKU Muhammadiyah Bantul General Hospital. This study aligns with (Oktavia et al., 2021), which also found a relationship between gender and the incidence of hypertension in the Alalak Selatan Community Health Center, Banjarmasin City.

Gender is a contributing factor to increased blood pressure. This is because women experiencing menopause experience a decrease in estrogen levels. Premenopausal women are protected by the hormone estrogen, which plays a role in increasing High Density Lipoprotein (HDL) levels, a protective factor against atherosclerosis, which causes blood vessels to stiffen and lead to increased blood pressure (Podunge, 2020).

Researchers assume that gender significantly influences the incidence of hypertension, with a higher prevalence in women. This assumption is based on research findings showing that the

majority of respondents with hypertension were women (66.7%). Researchers also assume that hormonal factors, particularly decreased estrogen levels in menopausal women, play a significant role in increasing the risk of hypertension.

Work

Based on the results of a study conducted on 18 respondents in the Rejosari Community Health Center (Puskesmas) in Pekanbaru, the majority of respondents were housewives (10 people) (55.5%). This study aligns with the research by Maulida et al. (2024), which found that the majority of respondents were housewives, with a similar frequency of 19 people (50%). The high prevalence of housewives experiencing hypertension is related to their daily activities, such as cooking, sweeping, mopping, and washing, which can cause them to forget about exercise, which can lead to stress. Stress affects sympathetic nerve activity, which leads to increased blood pressure. Increased blood pressure caused by stress or mental tension, characterized by feelings of anger, resentment, depression, confusion, anxiety, and palpitations, stimulates the adrenal glands to release adrenaline, which in turn stimulates a faster and stronger heartbeat (Sinaga et al., 2022).

The cause of hypertension in housewives is their lack of exercise due to their busy schedules of caring for children and the home, resulting in little physical activity. Furthermore, hypertension can also be caused by stress related to an unstable family economy, which can trigger hypertension. Work is crucial for economic development because a good job can meet one's living needs (Sari et al., 2024).

Researchers assume that being a housewife (IRT), even if not formally employed, carries a heavy workload with various household responsibilities. A busy daily routine such as cooking, cleaning, and caring for the family without sufficient rest can lead to physical and mental fatigue. This condition, coupled with a lack of structured exercise and potential family economic pressures, can increase the risk of chronic stress in housewives. This ongoing stress triggers the release of stress hormones that affect the cardiovascular system, contributing to increased blood pressure and the development of hypertension.

Long-term hypertension

The research results showed that the most frequent duration of hypertension among respondents was 2 years, at 8 (44.5%). This study aligns with research conducted by Susilowati, S.E., (2022), who found that 55 respondents (61.6%) had suffered from hypertension for 1-3 years.

Long-term hypertension can lead to various complications. This can trigger increased blood pressure, which increases with age. Structural and functional changes in the peripheral vascular system are responsible for changes in blood pressure that occur in old age. In addition to age, an unhealthy diet is also a trigger for increased hypertension (Cheristina & Ramli, 2021).

According to researchers, the duration of hypertension is an important factor to consider because the longer a person suffers from hypertension without adequate treatment, the higher the risk of developing complications. Vascular aging that occurs with age, coupled with structural and functional changes in the peripheral vascular system, contributes to a progressive increase in blood pressure.

Average Value of Blood Pressure Before and After being given chayote juice

The results of the systolic blood pressure study showed that the mean before was 150.56 mmHg, while the mean after was 130.06 mmHg. The minimum systolic blood pressure before

was 140 mmHg and the minimum after was 121 mmHg. The diastolic blood pressure data showed that the mean before was 86.67 mmHg, while the mean after was 78.50 mmHg. The minimum diastolic blood pressure before was 70 mmHg and the minimum after was 59 mmHg. This research aligns with research conducted by (Armaita et al., 2022) in the Marunggi Community Health Center in Pariaman City. They found that before the intervention, the average blood pressure of hypertensive patients was still high, with an average value of 149.4 mmHg, the lowest blood pressure being 140 mmHg and the highest blood pressure being 159 mmHg. After the intervention, the average blood pressure of hypertensive patients began to decrease, with an average value of 120.5 mmHg, a lowest blood pressure of 100 mmHg, and a highest blood pressure of 140 mmHg.

According to the researchers' assumptions, the average blood pressure decreased after the intervention, indicating that chayote juice can help lower blood pressure in people with hypertension.

Bivariate Analysis

Based on the statistical analysis of the data described above, it can be seen that chayote juice has an effect on blood pressure in hypertensive patients. This was confirmed through statistical testing using a dependent paired t-test. The results showed that the average systolic blood pressure pre-test was 150.56 mmHg and the post-test was 130.06 mmHg. Meanwhile, the average diastolic blood pressure pre-test was 86.67 mmHg and the post-test was 78.50 mmHg. The statistical test for blood pressure showed a p-value of $0.000 < 0.05$, therefore, hypothesis H_0 was rejected and H_a was accepted, indicating a difference in the effect of chayote juice on blood pressure in hypertensive patients in the Rejosari Community Health Center, Pekanbaru. This research aligns with research conducted by Yanti & Indah (2018) entitled "The Effect of Chayote (Sechium edule) Juice on Blood Pressure in Hypertension Patients." The results showed an average reduction in systolic blood pressure of 15,500 mmHg and diastolic blood pressure of 9,000 mmHg, with a p-value of 0.000 after administration of chayote juice.

Chayote is also rich in potassium. Potassium is useful for controlling blood pressure, as a therapy for high blood pressure, and clearing carbon dioxide from the blood. Potassium is also beneficial for stimulating muscle and nerve function. High potassium levels facilitate oxygen delivery to the brain and help maintain fluid balance, thus making the body feel more refreshed. People with high blood pressure are advised to consume chayote regularly (Desiyana et al., 2020).

According to the researchers' assumptions, the effect of chayote juice on lowering blood pressure in hypertensive patients is due to its high potassium content, which binds sodium, allowing it to be excreted through sweat and other excretory channels. By reducing sodium in the blood, the volume of fluid in the blood also decreases, resulting in a decrease in blood pressure. This was evident in 18 respondents who experienced a decrease in both systolic and diastolic blood pressure after being given one bottle of almond (250 ml) of chayote juice daily for 7 days.

CONCLUSION

The results showed that the majority of respondents were in the early elderly group (46-55 years old), amounting to 10 people (55.6%). In terms of gender, more than half of the respondents were women, amounting to 12 people (66.7%). Based on occupation, the majority of respondents were housewives (10 people (55.5%). Meanwhile, in terms of duration of hypertension, almost half of the respondents, amounting to 8 people (44.5%), had suffered from

hypertension for at least two years. These respondent characteristics provide a demographic overview of the hypertension sufferers who were the subjects of the study in the Rejosari Community Health Center, Pekanbaru.

The results of the systolic blood pressure study obtained data that the mean before was 150.56 mmHg, while the mean after was 130.06 mmHg and the minimum value of systolic blood pressure before was 140 mmHg and the minimum value after was 121 mmHg. on diastolic blood pressure, the data obtained were that the mean before was 86.67 mmHg, while the mean after was 78.50 mmHg and the minimum value of diastolic blood pressure before was 70 mmHg and the minimum value after was 59 mmHg.

The results of the study showed that the average value of systolic and diastolic blood pressure before giving chayote juice had a p value of 0.00, which means <0.05 . While the systolic and diastolic blood pressure after giving chayote juice was 0.00, which means <0.05 . The results of the statistical test for blood pressure showed a p value = 0.000 <0.05 , so the Ho hypothesis was rejected and Ha was accepted, which means there was a difference in the effect of chayote juice on blood pressure in hypertensive patients in the Rejosari Pekanbaru Community Health Center Working Area.

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