

Original Article

CONTROLLED HYPERTENSION: THE EFFICACY OF PAPAYA JUICE IN LOWERING HIGH BLOOD PRESSURE IN THE ELDERLY

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ABSTRACT

Background. Reducing blood pressure in the elderly can be achieved through the utilization of alternative treatments, one of which is papaya juice. Hypertension in the elderly is highly perilous and can lead to fatal consequences. This research aimed to investigate the efficacy of papaya juice consumption in lowering blood pressure among the elderly population. **Research Method.** This research employed a Quasi-Experimental design with a Pretest-Posttest Control Group Design. The population studied consisted of all hypertensive patients at the Mojolangu Community Health Center. Sampling was conducted using a purposive sampling technique, with a total of 30 respondents – 15 assigned to the control group and 15 to the intervention group. Data collection utilized measurement tools including a Sphygmomanometer, stethoscope, and observation sheets. Data analysis was performed using Wilcoxon and Mann-Whitney tests. **Findings.** "The results of the study using the Wilcoxon test revealed that the systolic blood pressure had a p-value of 0.000 (<0.05), and for diastolic blood pressure in the intervention group, a p-value of 0.000 (<0.05) was obtained. This indicates that papaya juice is effective in assisting with blood pressure reduction. Further assessment of the difference in systolic and diastolic blood pressure reduction was conducted through the Mann-Whitney test, yielding a p-value of 0.049, indicating a significant difference. **Conclusion.** Papaya mengkal juice is highly effective and can be considered a viable alternative non-pharmacological therapy option to aid in lowering blood pressure in elderly individuals with hypertension.

Keywords: Hypertension, Unripe Papaya Juice, Non-pharmacological.

BACKGROUND

Blood pressure that exceeds normal levels makes it difficult for blood to flow, increasing pressure against the walls of the arteries and adding strain to the heart. This can result in damage to blood vessels, leading to complications [1]. The World Health Organization (WHO) states that in 2019, there were 1 billion hypertensive individuals globally, with two-thirds of them residing in developing countries. The reported daily increase rate is 26%, totaling 972 million. It is predicted that by 2025, worldwide hypertension figures will be alarming, with an estimated 29% increase [2].

In Indonesia, the prevalence of hypertension is the highest among nations. In 2013, it reached 25.8%, and by 2018, there was an increase to 34.1%. These figures were obtained

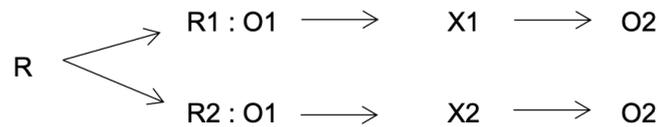
through blood pressure measurements in individuals aged over 18 years [3]. According to the Indonesian Ministry of Health in 2019, hypertension, often referred to as the "Silent Killer," affects approximately 70 million people in Indonesia, constituting around 28% of the population. Regrettably, only about 24% of individuals with hypertension have successfully managed to control their blood pressure [4]. In 2013, in the East Java region, the prevalence of high blood pressure experienced a significant increase, reaching approximately 26.4%. By 2018, the prevalence of hypertension cases continued to rise, reaching 36.32%. The estimated number of individuals aged ≥ 15 years with hypertension in the East Java Province was around 11,008,334, with a male proportion of 48.83% and a female proportion of 51.17% [4]. Especially in the Malang region, the prevalence of hypertension is quite high, reaching 41.8%. This elevation contributes to an increase in mortality and morbidity rates [3,4].

Lowering blood pressure in the elderly can be achieved through the use of alternative treatments, one of which is Unripe or Mengkal papaya juice. Papaya contains minerals, with a potassium content of 257 mg/100 g and sodium at only 3 mg/100 g [5]. Unripe papaya has been proven to reduce the workload of the heart and can lower blood pressure is caused by the diuretic properties found in papaya, while the papain enzyme functions to break down particles that stick to the walls of arteriosclerotic blood vessels due to plaque caused by exposure to free radicals [6–10]. Based on this discussion, the researcher aimed to determine the effectiveness of consuming papaya juice in lowering blood pressure in the elderly.

RESEARCH METHOD

This research utilized a Quasi-Experimental design with a Pretest-Posttest Control Group Design, an experiment conducted on two groups: the intervention group and the control group. The study aimed to analyze the effectiveness of consuming Mengkal papaya juice in reducing blood pressure by comparing the initial blood pressure measurements (pre-test) with the final blood pressure measurements (post-test). In this study, the population comprised 30 respondents. The sample size consisted of 15 respondents for the intervention group and an additional 15 respondents for the control group. The independent variable investigated was the consumption of mengkal papaya juice, operationalized using a Standard Operating Procedure (SOP). The dependent variable studied was blood pressure, measured through observation sheets, a sphygmomanometer, and a stethoscope for data collection.

During data collection, the researcher explained the procedures and obtained informed consent from the respondents. Subsequently, blood pressure measurements were taken on the first day before the intervention and on the last day after the intervention. These measurements were conducted directly at the respondents' homes. The study obtained approval from the health department with the reference number 072/182/35.73.402/2023.



The sampling technique employed in this study is purposive sampling. Based on the researcher's calculations, a sample size of $n = 30$ was determined for the research.

O1	XO2	Wilcoxon Signed Rank Test
O3	CO4	Wilcoxon Signed Rank Test
O1	O3	Mann-Whitney U-Test
O2	O4	Mann-Whitney U-test
X	C	Mann-Whitney U-test
ΔX	ΔC	Mann-Whitney U-test

Explanation:

- O1 : Blood pressure examination before Mengkal papaya juice administration (Pretest intervention group)
- X : Treatment, administration of Mengkal papaya juice
- O2 : Blood pressure examination after Mengkal papaya juice administration (Posttest intervention group)
- O3 : Blood pressure examination (Pretest control group)
- C : No treatment was administered
- O4 : Blood pressure examination (Pretest control group)
- ΔX : Mean difference in systolic blood pressure
- ΔC : Mean difference in diastolic blood pressure

FINDINGS

A. Comparison of blood pressure between pretest and posttest in the intervention group as well as the control group

Systolic blood pressure in the intervention group showed a pretest value of 148 mmHg and a posttest value of 138 mmHg. Subsequent data analysis using the Wilcoxon test yielded a p-value of 0.000 (<0.05) with a mean difference of 10 mmHg, indicating a significant reduction in systolic blood pressure in the intervention group after the

administration of papaya mengkal juice. For diastolic blood pressure, the average pretest and posttest values in the intervention group were 90 mmHg and 80 mmHg, respectively. Data analysis using the Wilcoxon test resulted in a p-value of 0.000 (<0.05) with a mean difference of 10 mmHg, signifying a significant decrease in diastolic blood pressure in the intervention group after the administration of papaya mengkal juice.

Table 1. Results of Pretest and Posttest Blood Pressure Analysis

Variable	Papaya Mengkal Juice Intervention value (n=15)			p-value	Control (n=15)			p-
	Pretest	Postest.	Δ		Pretest	Postest.	Δ	
Systolic Blood Pressure	148 ± 7.74	138.± 7.74	10	0.000	148.33± 7.23	144± 7.60	4.33	0.000
Diastolic Blood Pressure	90± 6.54	80± 6.54	10	0.000	92.66± 4.16	88.33± 4.49	4.33	0.003

The average systolic blood pressure in the control group showed pretest and posttest values of 148.33 mmHg and 144 mmHg, respectively. Data analysis using the Wilcoxon test resulted in a p-value of 0.000 (<0.05) with a mean difference of 4.33 mmHg, indicating a significant decrease in systolic blood pressure in the control group. For diastolic blood pressure, the average pretest and posttest values in the control group were 92.66 mmHg and 88.33 mmHg, respectively. Data analysis using the Wilcoxon test resulted in a p-value of 0.003 (<0.05) with a mean difference of 4.33 mmHg, signifying a significant decrease in diastolic blood pressure in the control group.

B. Comparison by examining the differences in blood pressure changes between pretest and posttest in both the intervention and control groups.

Table 2. Results of Blood Pressure Differences in the Intervention Group and Control Group

Variabel	Group	Papaya mengkal Juice Intervention value (n=15)	Control (n=15)	p-value
Systolic Blood Pressure	Pretest	148±7.74	148.33±7.23	0.844
Diastolic Blood Pressure	Pretest	90±6.54	92.66±4.16	0.192
Systolic Blood Pressure	Posttest	138±7.74	144±7.60	0.049
Diastolic Blood Pressure	Posttest	80±6.54	88.33±4.49	0.001

The pretest systolic blood pressure for the intervention group was 148 mmHg, and for the control group, it was 148.33 mmHg. Subsequent data analysis using the Mann-Whitney

test resulted in a p-value of 0.844 (>0.05), indicating no significant difference in pretest systolic blood pressure between the intervention and control groups. For pretest diastolic blood pressure, the intervention group had an average of 90 mmHg, while the control group had an average of 92.66 mmHg. Data analysis using the Mann-Whitney test yielded a p-value of 0.192 (>0.05), signifying no difference in pretest diastolic blood pressure between the intervention and control groups.

The average posttest systolic blood pressure for the intervention group was 138 mmHg, and for the control group, it was 144 mmHg. Subsequent data analysis using the Mann-Whitney test resulted in a p-value of 0.049 (<0.05), indicating a significant difference in post-test systolic blood pressure between the intervention and control groups. For posttest diastolic blood pressure, the intervention group had an average of 80 mmHg, while the control group had an average of 88.33 mmHg. Data analysis using the Mann-Whitney test yielded a p-value of 0.001 (<0.05), signifying a significant difference in posttest diastolic blood pressure between the intervention and control groups.

C. Average Blood Pressure Difference Results between Pretest and Posttest in the Intervention Group and Control Group.

Table 3. Mean Difference in Blood Pressure Between the Intervention Group and Control Group

Variable	Group		<i>p</i> -value
	Average Difference Papaya mengkal Intervensi juice (n=15)	Average Difference Control (n=15)	
Difference In Systolic Blood Pressure	10 mmHg	4.33 mmHg	0.049
Difference In Diastolic Blood Pressure	10 mmHg	4.33 mmHg	0.001

The mean difference in systolic blood pressure between the intervention and control groups was 10 mmHg and 4.33 mmHg, respectively. Subsequent data analysis using the Mann-Whitney test resulted in a p-value of 0.049 (<0.05), indicating a significant difference in the mean difference in systolic blood pressure between the intervention and control groups. For diastolic blood pressure, the mean difference between the intervention group and the control group was 10 mmHg and 4.33 mmHg, respectively. Data analysis using the Mann-Whitney test yielded a p-value of 0.001 (<0.05), signifying a significant difference in the mean difference in diastolic blood pressure between the intervention and control groups.

DISCUSSIONS

Systolic blood pressure in the intervention group had a pretest mean of 148 mmHg before the administration of Mengkal papaya juice, while the posttest mean was 138 mmHg after the administration, resulting in a mean difference of 10 mmHg. Diastolic blood pressure in the intervention group had a pretest mean of 90 mmHg before the administration of Mengkal papaya juice, and the posttest mean was 80 mmHg after the administration, resulting in a mean difference of 10 mmHg. This aligns with other research indicating a decrease in blood pressure before and after the administration of Mengkal papaya juice, with a mean difference in systolic blood pressure of 18.00 ± 10.14 mmHg ($p = 0.000$) and a mean difference in diastolic blood pressure of 11.00 ± 8.28 mmHg ($p = 0.000$) [11,12]. In conclusion, the administration of Mengkal papaya juice is effective in reducing blood pressure in hypertensive patients.

The pretest mean systolic blood pressure in the control group was 148.33 mmHg, while the posttest mean systolic blood pressure in the control group was 144 mmHg, resulting in a mean difference of 4.33 mmHg. The pretest mean diastolic blood pressure in the control group was 92.66 mmHg, and the posttest mean diastolic blood pressure in the control group was 88.33 mmHg, resulting in a mean difference of 4.33 mmHg.

The difference in the mean difference of blood pressure between pretest and posttest in both the intervention and control groups among hypertensive patients in the Mojolangu Community Health Center area shows that the mean difference in systolic and diastolic blood pressure for the intervention group, which received Mengkal papaya juice, was 10 and 10, respectively. Meanwhile, the mean difference in systolic and diastolic blood pressure for the control group, which did not receive mengkal papaya juice, was 4.33 and 4.33, respectively.

Based on the test on the difference in systolic and diastolic blood pressure between the intervention and control groups, the results indicate a significant difference in the mean difference in systolic blood pressure between the intervention and control groups with a p-value of 0.049 (<0.05), as observed in the Mann-Whitney test. Similarly, the diastolic blood pressure yielded a p-value of 0.001 (<0.05), signifying a significant difference in the mean difference in diastolic blood pressure between the intervention and control groups. The average blood pressure of the respondents before and after the intervention showed a mean difference of 18/11 mmHg with p-values of 0.000 for both systolic and diastolic, indicating a significant decrease in both systolic and diastolic blood pressure [13–15].

CONCLUSION

The researcher's analysis indicates a significant difference between the intervention and control groups after being given Mengkal papaya juice for 7 days. Therefore, during the posttest, blood pressure decreased in hypertensive elderly individuals in the Mojolangu Community Health Center area. The study concludes that Mengkal papaya juice is highly effective and can be considered as an alternative non-pharmacological therapy option to help lower blood pressure in hypertensive elderly individuals.

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