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Soursop (*Annona Muricata Linn*) Leaf Decoction as an Adjunctive Therapy for Lowering Blood Pressure in Hypertensive Women of Reproductive Age: A Quasi-Experimental Study

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ABSTRACT

Hypertension is one of the non-communicable diseases often referred to as a "silent killer". In women of reproductive age, it is commonly caused by unhealthy lifestyle behaviors and hormonal imbalances. Hypertension can be managed through non-pharmacological therapies. One such therapy is consuming a decoction of soursop leaves. The intervention provided was an adjunct therapy to pharmacological treatment. This study aimed to investigate the effect of soursop leaf decoction on blood pressure among women of reproductive age with hypertension in the working area of Martapura 1 Health Center. A quantitative quasi-experimental method was used with a pre-test and post-test repeated measures design. The study involved 40 respondents selected through purposive sampling. Data were analyzed using the Wilcoxon test. The results showed a significant effect of soursop leaf decoction on both systolic and diastolic blood pressure, with a p-value of 0.000 ($p < 0.005$). These findings suggest that soursop leaf decoction effectively lowers blood pressure in hypertension women of reproductive age in the working area of Martapura 1 Health Center. This therapy is expected to serve as a potential alternative treatment for managing blood pressure in women of reproductive age with hypertension.

ABSTRAK

Hipertensi merupakan salah satu penyakit tidak menular yang biasa disebut sebagai "silent killer". Penyebab hipertensi pada wanita usia subur yaitu faktor perilaku kesehatan dan hormonal yang tidak seimbang. Hipertensi dapat diatasi menggunakan terapi nonfarmakologi. Terapi nonfarmakologi yang diberikan ialah rebusan daun sirsak. Intervensi yang diberikan merupakan terapi pendamping terhadap terapi farmakologi. Tujuan penelitian ini untuk mengetahui pengaruh rebusan daun sirsak terhadap tekanan darah pada wanita usia subur penderita hipertensi di wilayah kerja Puskesmas Martapura 1. Penelitian ini menggunakan desain kuantitatif quasi eksperimen pre- dan post-test design, metode repeated measures. Sampel 40 responden menggunakan purposive sampling. Analisis menggunakan uji Wilcoxon. Terdapat pengaruh rebusan daun sirsak terhadap tekanan darah sistol dan diastol dengan p-value 0.000 dimana p-value < 0.005 bahwa adanya pengaruh rebusan daun sirsak terhadap penurunan tekanan darah pada wanita usia subur penderita hipertensi di wilayah kerja Puskesmas Martapura 1. Terapi ini diharapkan dapat menjadi alternatif bagi wanita usia subur penderita hipertensi dalam menurunkan tekanan darah.

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Introduction

Hypertension is one of the non-communicable diseases often referred to as a "silent killer". Persistently elevated blood pressure on repeated measurements is a condition commonly referred to as hypertension. Common symptoms include neck pain, dizziness, and dilation of small blood vessels. Inadequate management of hypertension may lead to complications such as heart failure, stroke, aneurysm, ocular disorders, kidney disease, and metabolic syndrome (Ningrum et al., 2024).

Hypertension is a leading cause of premature mortality worldwide. It occurs when the pressure within the blood vessels is persistently elevated, defined as 140/90 mmHg or higher (*World Health Organization*, 2023). While hypertension is often associated with older adults, it also affects women of reproductive age. Women of reproductive age are those who are still within their reproductive period (from the onset of menarche until the cessation of menstruation), regardless of marital status, and who have the potential to conceive (Maring et al., 2022). In this population, hypertension may result from unhealthy lifestyle behaviors as well as hormonal imbalances.

According to the World Health Organization (WHO), an estimated 1,28 billion adults aged 30-79 years worldwide are living with hypertension, with approximately two-thirds residing in low- and middle-income countries. This highlights hypertension as a global health concern and a serious challenge for countries with limited resources. Among these cases, 46% of individuals are unaware that they have hypertension, and only about 42% have been diagnosed and are receiving treatment (WHO, 2023). Regionally, the highest prevalence is reported in Africa at 27%, while the lowest is in the Americas at 18% (WHO, 2023). In the United States, between August 2021 and August 2023, the prevalence of hypertension among adults aged ≥18 years reached 47,7%, with a higher rate in men (50,8%) than in women (44,6%) (Fryar et al., 2024). In Indonesia, the prevalence is 30,8% among adults aged ≥18 years, with a higher proportion in women (36,9%) compared to men (31,34%) (Indonesian Health Survey, 2023).

According to the 2024 South Kalimantan Provincial Health Profile, there were 1.209.294 recorded cases of hypertension in the province in 2023. The condition was more prevalent among women, with 620.619 cases, compared to 588.675 cases in men. In Banjar Regency, the 2023 Banjar Regency Health Profile reported 38.626 cases of hypertension, with only a slight difference between men 19.361 cases and women 19.265 cases. In the service area of Martapura 1 Public Health Center, there were 506 recorded visits by women with hypertension in the past three months. A preliminary study conducted through interviews with ten hypertensive women in the Martapura 1 Public Health Center area revealed that none of them had prior knowledge of, or had ever consumed, soursop leaf decoction as an alternative approach to lowering blood pressure.

Hypertension can lead to serious health complications such as heart failure, stroke, aneurysm, ocular disorders, kidney disease, and metabolic syndrome, and may even result in death if not properly treated or controlled. Management of hypertension can be achieved through pharmacological and non-pharmacological approaches. The pharmacological approach involves the administration of antihypertensive medications, while the non-pharmacological approach includes alternative strategies such as engaging in regular exercise, maintaining a healthy diet, reducing salt intake, and using herbal remedies with blood pressure lowering properties, such as soursop (Annona muricata Linn) leaves (Andri et al., 2022). Soursop leaves contain several bioactive compounds, including monotetrahydrofuran acetogenins (active compounds with cytotoxic properties) such as anomuricin A and B, giganterosin A, annonacin-10-one, muricatosin A and B, goniothalamicin, and potassium ions. They also contain calcium, phosphorus, carbohydrates, vitamins A, B, and C, tannins, phytosterols, calcium oxalate, the alkaloid muricine, and antioxidants, which can prevent free radical damage, dilate and relax blood vessels, and ultimately lower blood pressure (Risty et al., 2019).

Based on the study by Andri et al. (2022) entitled The Use of Soursop Leaf Decoction in Reducing Blood Pressure among Hypertensive Patients, there was a notable decrease in both systolic and diastolic blood pressure before and after the administration of soursop leaf decoction among hypertensive patients in the service area of Lingkar Barat Public Health Center, Bengkulu City (Andri et al., 2022). Similarly, findings from a study by Supriyadi et al. (2023) entitled The Effect of Consuming Soursop (Annona muricata Linn)

Leaf Decoction on Blood Pressure in Elderly Patients with Hypertension in Miangas Village, Talaud Islands Regency, North Sulawesi Province, demonstrated that the consumption of soursop leaf decoction significantly affected blood pressure in the elderly. Furthermore, after consuming the decoction, the majority of elderly respondents achieved normal blood pressure levels in the service area of Miangas Public Health Center, Talaud Islands Regency, North Sulawesi Province (Supriyadi et al., 2023).

Based on the aforementioned background, the researcher is interested in investigating The Effect of Soursop Leaf Decoction on Blood Pressure in Women of Reproductive Age with Hypertension in the Service Area of Martapura 1 Public Health Center. Therefore, this study aims to test the hypothesis that incorporating soursop leaf decoction into the standard antihypertensive regimen is more effective in reducing blood pressure among women of reproductive age with hypertension compared to the use of the standard regimen alone.

Research Methodology

Research Design

The research design employed in this study is a quantitative approach using a quasi-experimental pre- and post-test design with a control group, applying the repeated measures method. The study involved two groups: a control group and an intervention group. In the intervention group, respondents were given a soursop leaf decoction prepared using the same ingredients, processing method, and dosage 150 ml for all respondents without variation. The decoction was prepared by boiling 10 grams of soursop leaves in 300 ml of water for 15 minutes at 100°C until the volume was reduced to 150 ml. The liquid was then filtered and served warm. The intervention was administered once daily in the afternoon for five consecutive days. This intervention did not interfere with the respondents prescribed treatment regimen, and they continued taking amlodipine as prescribed by a physician, similar to the control group. The control group respondents consumed only the prescribed amlodipine for blood pressure reduction. Data collection was conducted by visiting respondents' homes after obtaining informed consent. Blood pressure was measured five minutes before the intervention to obtain pre-test data, and again 30 minutes after the intervention to obtain post-test data. Blood pressure measurements were performed using a sphygmomanometer and stethoscope for five consecutive days for each respondent.

Research Location and Period

This study was conducted in the working area of Martapura 1 Public Health Center in May 2025. The research was carried out over five consecutive days, with daily pre- and post-intervention data collection.

Population and Sample

The study population comprised 137 women of reproductive age with hypertension residing in the working area of Martapura 1 Public Health Center. A total of 40 respondents were selected as the research sample, divided equally into two groups: 20 respondents in the intervention (treatment) group and 20 respondents in the control group. The sampling technique employed in this study was purposive sampling, a method based on specific criteria predetermined by the researcher. Two categories of sampling criteria were applied: inclusion and exclusion. The inclusion criteria were women of reproductive age diagnosed with stage 1 or stage 2 hypertension within the working area of Martapura 1 Public Health Center, who were willing to respondent in the study and signed an informed consent form. The exclusion criteria were women of reproductive age with hypertension who had comorbid complications, were unavailable at the time of data collection, or were not residing in the working area of Martapura 1 Public Health Center.

Research Instruments

The instruments used in this study included an observation sheet, a recording sheet, a sphygmomanometer, a stethoscope, a measuring cup, a drinking glass, and a digital scale.

Data Analysis

This study employed univariate analysis to describe respondents' characteristics and the mean blood pressure,

as well as bivariate analysis to assess the effect of soursop leaf decoction on blood pressure. Data were analyzed using SPSS version 16 with the Wilcoxon test as the statistical method. The collected research data underwent several processing stages, including editing, coding, data entry, cleaning, scoring, and tabulating.

Etichal Consideration

This research underwent a series of ethical reviews and was approved by the Health Research Ethics Committee of STIKes Intan Martapura prior to its implementation. The committee issued an ethical clearance certificate for the study on March 17, 2025, under the reference number 019/KE/YBIP/-SI/III/2025. Data collection was conducted only after obtaining informed consent, which was signed by each respondent.

Result

A descriptive analysis of the respondents' demographic and clinical characteristics was conducted to ensure homogeneity between the two groups. These characteristics, including age, education, occupation, and duration of hypertension, are summarized in Table 1.

Table 1. Characteristics of Respondents in the Intervention and Control Groups.

Characteristic	Intervention Group		Control Group		Total
	f	%	f	%	
Age					
35-39 Years Old	2	10	1	5	3 (7,5%)
40-44 Years Old	5	25	8	40	13 (32,5%)
45-49 Years Old	13	65	11	55	24 (60%)
Education					
Elementary School	11	55	6	30	17 (42,5%)
Junior High School	6	30	13	65	19 (47,5%)
Senior High School	2	10	1	5	3 (7,5%)
Bachelor's Degree	1	5	0	0	1 (2,5%)
Occupation					
Housewife	17	85	16	80	33 (82,5%)
Private Employee	3	15	4	20	7 (17,5%)
Duration of Hypertension					
< 5 Years	7	35	11	55	18 (45%)
> 5 Years	13	65	9	45	22 (55%)

Primary Data, Mei 2025

Based on Table 1, the majority of respondents women of reproductive age with hypertension were aged 45-49 years old, totaling 24 participants (60%). The most common highest education level was junior high school, with 19 participants (47,5%). The majority of respondents' occupation was housewife, totaling 33 participants (82,5%), and most had been suffering from hypertension for more than 5 years, with 22 participants (55%).

Table 2. Mean Blood Pressure Values of Respondents in the Intervention and Control Groups

Group		Mean Blood Pressure Reduction					
		Pre	Day 1	Day 2	Day 3	Day 4	Day 5
Intervention Group (Soursop Leaf Decoction)	**Systol**	152.80	142.00	140.80	141.20	137.30	133.40
	Diastol	95.95	92.15	89.65	89.70	89.50	88.00
Control Group (Antihypertensive Medication)	**Systol**	155.85	154.75	153.90	152.70	149.25	146.90
	Diastol	95.30	94.40	94.60	92.50	90.85	91.55

Primary Data, Mei 2025

Based on Table 2, in the intervention group, the mean blood pressure showed a decrease in both systolic and diastolic values from before the intervention on the first day until after the intervention on the second day. On the third day, blood

pressure increased following the intervention, while on the fourth and fifth days, it decreased again. In the control group, systolic blood pressure decreased from before the intervention on the first day until after the intervention on the fifth day. Diastolic blood pressure decreased from before the intervention on the first day until after the intervention on the first day, continued to decrease from the second to the fourth day, and on the fifth day, there was an increase in the number of respondents with normal blood pressure.

Table 3 Effect of Soursop Leaf Decoction on Blood Pressure in Women of Reproductive Age with Hypertension in the Service Area of Martapura 1 Public Health Center

Variable	*P-Value*
Soursop Leaf Decoction on Systolic Blood Pressure in Hypertensive Patients	0.000
Soursop Leaf Decoction on Diastolic Blood Pressure in Hypertensive Patients	0.000
Antihypertensive Medication on Systolic Blood Pressure in Hypertensive Patients	0.000
Antihypertensive Medication on Diastolic Blood Pressure in Hypertensive Patients	0.002

Primary Data, Mei 2025

Based on Table 3, the Wilcoxon test results indicated that soursop leaf decoction had a significant effect on systolic blood pressure with *p-value* 0.000 and diastolic blood pressure with *p-value* 0.000. Similarly, antihypertensive medication also significantly affected systolic blood pressure with *p-value* 0.000 and diastolic blood pressure with *p-value* 0.002.

Table 4 Comparison Results Between the Intervention and Control Groups

Rank				
Post	**Group**	**N**	**Mean Rank**	**Sum of Rank**
***Post* Sistol**	Intervention	20	10.70	214.00
	Control	20	30.30	606.00
	Total	40		
***Post* Diastol**	Intervention	20	15.25	305.00
	Control	20	25.75	515.00
	Total	40		

Test Statistics		
	***Post* Sistol**	***Post* Diastol**
Mann-Whitney U	4.000	95.000
Wilcoxon W	214.000	305.000
Z	-5.349	-2.994
Asymp. Sig. (2-tailed)	.000	.003
Exact Sig. [2*(1-tailed Sig.)]	.000	.004

Primary Data, Mei 2025

Based on Table 4, the Mann-Whitney test results indicated a significant difference in systolic blood pressure with *Asymp. Sig.* 0.000 and diastolic blood pressure with *Asymp. Sig.* 0.003 between the intervention and control groups.

Discussion

Characteristics of Respondents in the Intervention and Control Groups

The data on respondents' characteristics based on age show that the majority of hypertensive participants in this study were aged 45-49 years old. This is in line with the findings of Maring et al. (2022), which indicate that hypertension tends to increase after the age of 40 due to the higher blood pressure required to pump blood to the brain and other vital organs. At the same time, vascular elasticity declines after the age of 40, leading to increased blood pressure (Maring et al., 2022). The researchers assume that at this age, the condition of the blood vessel walls experiences reduced elasticity, resulting in elevated blood pressure with advancing age. This is also associated with degenerative diseases that occur due to declining organ function as one Ages. Consistent

with the theory proposed by Zubaidah et al. (2021), hypertension is caused by degenerative factors that develop in individuals as they age due to decreased organ function (Zubaidah et al., 2021).

Many studies report that the majority of hypertensive patients are over 50 years old, however, women of reproductive age with hypertension are the primary focus of this study. According to Novendy et al. (2022), several risk factors contribute to hypertension in women of reproductive age, including a family history of hypertension, high sodium intake, frequent consumption of fast food, infrequent fruit consumption, and poor nutritional status (Novendy et al., 2022). In women entering their forties or the pre-menopausal period, estrogen levels decline, reducing the body's protective mechanisms against disease. This leads to vascular stiffening and endothelial cell damage, which contribute to elevated blood pressure. In addition to hormonal issues, stress is also a significant factor that increases the susceptibility of women to hypertension (Sukmawaty, 2022).

The data on respondents' educational background indicate that the majority of participants had a junior high school education. This aligns with the findings of Mustaqimah et al. (2021), which suggest that the level of education shapes individuals' perceptual and decision-making patterns. Higher education levels influence individuals' ability to make informed decisions regarding their own health, compared to those with lower educational attainment (Mustaqimah et al., 2021).

The researchers assume that education significantly influences the learning process; the more an individual learns, the easier it becomes to acquire information from others or through mass media. The greater the access to information, the broader the knowledge about health, particularly hypertension. Knowledge is closely related to educational level, as individuals with higher education are expected to have a more comprehensive understanding of hypertension. This is supported by the theory proposed by Raziansyah & Sayuti (2022), which states that most respondents with lower educational attainment did not understand hypertension (Raziansyah & Sayuti, 2022). However, it should be emphasized that a lack of formal education does not necessarily equate to a lack of knowledge. Both formal and non-formal education can enhance knowledge. This perspective contrasts with the findings of Dhirisma & Moerdhanti (2022), which indicate no significant relationship between educational level and public knowledge of hypertension (Dhirisma & Moerdhanti, 2022). Higher education does not guarantee the quality of knowledge, as information can also be acquired through external encouragement or personal initiative to seek it.

The data on respondents' occupational characteristics indicate that the majority of hypertensive women of reproductive age in this study were housewives. This aligns with the findings of Wulandari et al. (2023), which report a significant relationship between physical activity and the incidence of hypertension (Wulandari et al., 2023). Physical activity can help reduce hypertension through various means, such as cycling, walking, exercising, or engaging in movements that expend energy and burn fat in the body's metabolism. Additionally, physical activity can be performed collectively within the community. Many housewives believe that taking care of children, cooking, sweeping, and performing other household tasks consumes most of their time, leaving little opportunity for other activities such as exercise. Throughout their life cycle, individuals continuously experience work-related stress. This can be influenced by the responsibilities of being a housewife, which involve meeting all household needs from waking up to going to bed, thereby increasing their risk of developing hypertension (Raziansyah & Sayuti, 2022).

For housewives, elevated blood pressure can be caused by several factors, such as economic challenges and household demands, which may trigger stress. Stress is a significant factor that can induce hypertension. The relationship between stress and hypertension is closely linked to increased sympathetic nervous system activity, which can cause unpredictable elevations in blood pressure (Zubaidah et al., 2021). It is recommended that exercise be performed for at least 30 minutes per day in a proper and effective manner, allowing the heart to pump blood efficiently and maintaining blood pressure within normal limits. This aligns with the findings of Nasution et al. (2024), which indicate a significant relationship between the level of physical activity and the incidence of hypertension. Physical activity, in this context, refers to engaging in sufficient exercise amid daily work routines. Regular exercise has been shown to reduce stress levels, improve mental health, and positively influence blood pressure regulation (Nasution et al., 2024).

Duration of Hypertension

The data on respondents' characteristics based on the duration of hypertension indicate that the majority of respondents had been living with hypertension for more than five years. This finding aligns with the study by Weo et al. (2022), which reported a relationship between the duration of hypertension and anxiety experienced by hypertensive patients concerning the need for continuous blood pressure monitoring, including lifestyle and dietary habits (Weo et al., 2022). The prolonged duration of hypertension is often caused by unhealthy lifestyles and irregular dietary patterns, resulting in persistent high blood pressure. Additionally, the length of time living with hypertension can influence patients' knowledge about the condition and contribute to anxiety. According to Sukmawaty (2021), one of the most important risk factors affecting the incidence of hypertension is lifestyle (Sukmawaty, 2021). Modern lifestyles often involve insufficient physical activity, excessive consumption of alcohol and coffee, smoking, and prolonged stress. This is consistent with the findings of Simon & Alfiah (2022), which showed that most respondents had experienced hypertension for more than five years. Hypertension at the time of initial diagnosis is closely linked to its underlying risk factors (Simon & Alfiah, 2022). Individuals with a higher number of risk factors are more likely to develop hypertension earlier compared to those without such risk factors.

Mean Blood Pressure Values of Respondents in the Intervention and Control Groups

The intervention group experienced a mean reduction in systolic blood pressure of 19,4 mmHg (from 152,80 to 133,40), whereas the control group experienced a reduction of 8,95 mmHg (from 155,85 to 146,90). This indicates a significant decrease in blood pressure, both systolic and diastolic. On the third day, there was an increase in blood pressure compared to the previous day, with systolic pressure rising from 140,80 mmHg to 141,20 mmHg and diastolic pressure from 89,65 mmHg to 89,70 mmHg.

This is in line with the study by Telova et al. (2024), which reported changes in blood pressure among menopausal women after administration of soursop leaf decoction (Telova et al., 2024). The researcher assumes that soursop leaf decoction can help reduce blood pressure in hypertensive women of reproductive age, based on observations over five consecutive days, which showed a significant reduction in both systolic and diastolic blood pressure. Although there was a slight increase in blood pressure on the third day, overall, blood pressure continued to decrease until the fifth day for both systolic and diastolic measurements. The compounds present in soursop leaves play an important role in this process by facilitating blood flow and increasing vascular elasticity, thereby normalizing blood pressure.

The data on the average blood pressure reduction in the control group, which received antihypertensive medication, show a decrease in blood pressure, although it was less efficient compared to the intervention group. On the fifth day, systolic blood pressure decreased from 155,85 mmHg to 146,90 mmHg, and diastolic blood pressure decreased from 95,30 mmHg to 91,55 mmHg. Although the control group exhibited a relatively smaller reduction, changes in blood pressure over time were still observed.

This is in line with the study by Husnatika et al. (2023), which reported a significant relationship between the administration of amlodipine and captopril and blood pressure conditions (Husnatika et al., 2023). Amlodipine is one of the first-line antihypertensive drugs for patients with hypertension based on JNC VIII and is recommended by the Indonesian Cardiovascular Society (PERKI) in 2015 as well as the Indonesian Hypertension Society (PERHI) in 2019 (Sayyidah et al., 2020). The researchers assume that antihypertensive drugs such as amlodipine have an effect in lowering blood pressure in hypertensive patients, although the reduction is not as pronounced as in the intervention group receiving soursop leaf decoction. While blood pressure reduction was observed in the control group, it tended to be smaller and less significant. This occurs because individual responses to antihypertensive drugs can vary depending on the patient's condition and duration of drug use.

Effect of Soursop Leaf Decoction on Blood Pressure in Women of Reproductive Age with Hypertension in the Service Area of Martapura 1 Public Health Center

The Wilcoxon test results in the intervention group using soursop leaf decoction indicated an effect of the decoction on systolic blood pressure $p < 0.000$ and diastolic blood pressure $p < 0.000$, with *p-values* < 0.005 this demonstrates that soursop leaf decoction has a significant effect in reducing blood pressure among reproductive aged women with hypertension in the working area of Martapura 1 Community Health Center. This result is supported by a comparative analysis using the Mann-Whitney test results indicated a significant difference in systolic blood pressure with *Asymp. Sig.* 0.000 and diastolic blood pressure with *Asymp. Sig.* 0.003 between the intervention and control groups. Potassium ions found in the extracellular fluid of soursop leaves can lower blood pressure by relaxing the heart and slowing heart rate. Potassium ions also help maintain the body's fluid balance with sodium, inhibit renin secretion, actively participate in arteriolar vasodilation, and reduce endogenous vasoconstrictive responses (Yulianto, 2019). This is consistent with the study by Andri et al. (2022), which reported reductions in systolic and diastolic blood pressure before and after administration of soursop leaf decoction in hypertensive patients within the working area of Lingkar Barat Community Health Center, Bengkulu City (Andri et al., 2022).

The study by Telova et al. (2024) also reported changes in blood pressure among menopausal women after administration of soursop leaf decoction, as assessed using the Wilcoxon test, with a *p-value* of 0.000 (Telova et al., 2024). According to Saputra & Sukanty (2024), GC-MS analysis of soursop leaves using ethanol as a solvent identified several compounds, including Trans-Caryophyllene, also known as beta-caryophyllene. Numerous scientific studies have demonstrated that trans-caryophyllene possesses anti-inflammatory, analgesic, and antioxidant properties (Saputra & Sukanty, 2024). Trans-caryophyllene also exerts positive effects on the cardiovascular system, being effective in vasorelaxation of blood vessels, which is beneficial for the treatment of hypertension and other cardiovascular diseases (Youssef et al., 2019). The researchers assume that hypertension can be managed through non-pharmacological therapy, such as soursop leaf decoction, as a complementary approach to ongoing pharmacological treatment.

The Wilcoxon test results in the control group receiving antihypertensive medication also showed an effect on systolic blood pressure *p value* 0.000 and diastolic blood pressure *p value* 0.002. Several factors influence the effectiveness of antihypertensive medication in lowering blood pressure, including irregular exercise, unhealthy diet, and lifestyle habits. If these factors are not managed alongside medication adherence, blood pressure may not improve. This finding contrasts with the study by Nufus et al. (2024), which reported no significant relationship between adherence to antihypertensive medication and blood pressure among hypertensive patients at Kimia Farma 937 Raya Pharmacy, Bogor (Nufus et al., 2024).

The researchers assume that combining soursop leaf decoction with antihypertensive medication would provide maximal benefits in reducing blood pressure in hypertensive patients without causing toxicity. This is supported by the study of Saputri et al. (2022), titled Acute Toxicity of the Combination of Captopril and Soursop Leaf Decoction in Wistar Rats, which found that the combination of captopril (25-150 mg/day in humans before conversion to animal doses) and soursop leaf decoction (300 ml/day in humans before conversion to animal doses) did not cause mortality in the test animals within 24 hours and during a 7-day observation period in each experimental group. Therefore, the use of captopril combined with soursop leaf decoction does not induce acute toxicity in the test animals (Saputri et al., 2022).

The antihypertensive medication used in this study was amlodipine. Amlodipine functions by inhibiting calcium ions through slow-acting channels in the cell membrane. It is considered an ideal drug because it can lower blood pressure, reduce the risk of severe organ damage caused by hypertension, and decrease the likelihood of cardiovascular events. Due to its long duration of action, amlodipine only needs to be administered once daily (Khusna, 2021). Potassium ions in the extracellular fluid of soursop leaves can relax the heart and slow heart rate, thereby reducing blood pressure (Rahmawati et al., 2024).

Study Limitations

The limitations of this study include the use of purposive sampling and a relatively small sample size (n = 40),

which may restrict the generalizability of the findings to the broader population of reproductive aged women with hypertension. The intervention period of five days is relatively short, and the long-term effects and sustainability of blood pressure reduction remain unknown. The absence of a placebo control for the decoction means that placebo effects cannot be entirely ruled out. Additionally, the researchers could not control factors influencing participants' blood pressure during the study, such as cultural dietary habits involving high sodium intake. These factors may have affected the actual impact of soursop leaf decoction on blood pressure in reproductive aged women with hypertension.

Conclusion

Based on the results of the study, which involved observations over five consecutive days of 20 respondents in the intervention group and 20 respondents in the control group, it can be concluded that soursop leaf decoction has an effect on both systolic and diastolic blood pressure, with a *p-value* of 0.000 ($p < 0.005$). This indicates that soursop leaf decoction significantly contributes to reducing blood pressure in reproductive aged women with hypertension in the working area of Martapura 1 Community Health Center. This therapy is expected to serve as an alternative for reproductive aged women with hypertension to help lower blood pressure while continuing their prescribed antihypertensive medication.

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Conflict of Interest

The researchers affirm that there is no conflict of interest in this study. The processes of data collection and data analysis were conducted independently and objectively by the researchers, without any influence or intervention from external parties that could affect the study's results.

Credit of Author Statement

Fir'ad Setya Nugraha: Conceptualization, Project Administration, Software, Data Curation, Writing Original Draft. **Martini Nur Sukmawaty:** First Advisor, Validation, Curation. **Iis Pusparina:** Second Advisor, Methodology, Formal Analysis. **Raziansyah:** Examiner.

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