

Impact of Soursop Leaf Decoction on Blood Pressure in Individuals with Hypertension: A Systematic Literature Review

Dela Gita Rosalina¹, Tsaniya Nurazizah¹, Ghina Nurziah Naurah¹,
Dedi Supriadi¹, Elis Novianti¹, Jajuk Kusumawaty¹

¹Department of Nursing, STIKes Muhammadiyah Ciamis, Jawa Barat, Indonesia

Correspondence author: Jajuk Kusumawaty

Email: jajukkusumawaty@stikesmucis.ac.id

Address: Jln. KH. Ahmad Dahlan No. 20 Ciamis, Jawa Barat, Indonesia Telp. 082240935050

DOI: <https://doi.org/10.56359/gj.v6i1.530>



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

ABSTRACT

Introduction: Hypertension remains a leading global health concern, significantly increasing the risk of cardiovascular morbidity and mortality. Interest in natural therapies has grown, including the use of *Annona muricata* (soursop) leaf decoction, which is hypothesized to exert antihypertensive effects through its bioactive compounds.

Objective: This systematic review aims to evaluate the efficacy of *Annona muricata* leaf decoction in reducing blood pressure among individuals with hypertension.

Methods: A comprehensive literature search was conducted across four databases—PubMed, ProQuest, Garuda, and JSTOR—for studies published between 2021 and 2025. Inclusion criteria focused on studies involving hypertensive individuals treated with soursop leaf decoction, with outcomes measured using manual or digital sphygmomanometers. The selection process adhered to PRISMA guidelines. Data extraction and quality appraisal were independently performed by two to three reviewers using the CASP checklist. Extracted data included study characteristics, intervention details, duration, frequency, and delivery methods.

Results: A total of 16 studies involving 322 participants were included. Findings consistently demonstrated that soursop leaf decoction significantly reduced both systolic and diastolic blood pressure. The observed antihypertensive effects are attributed to flavonoids and potassium, which contribute to vasodilation. The most effective regimen was consumption twice daily over a 7–8 week period.

Conclusion: *Annona muricata* leaf decoction shows promising potential as an adjunctive, non-pharmacological intervention for managing hypertension. It offers a cost-effective and accessible alternative, especially in low-resource settings. Nonetheless, further clinical trials are needed to determine standardized dosages and assess interactions with conventional antihypertensive medications.

Keywords: blood pressure, hypertension, soursop leaf

Introduction

Hypertension, or high blood pressure, is a major global health concern that significantly contributes to morbidity and mortality across various populations. According to the World Health Organization, hypertension is a leading risk factor for cardiovascular diseases such as coronary artery disease, heart failure, stroke, and chronic kidney disease (Setiawan et al., 2018). This condition is often referred to as a “silent killer” because it frequently presents without noticeable symptoms in its early stages, leading to late diagnosis and increasing the risk of severe complications (Swastini, 2021).

Without proper management, hypertension can progressively damage blood vessels and vital organs, raising the likelihood of heart attacks, strokes, and sudden death. Early detection, consistent blood pressure monitoring, lifestyle modifications, and adherence to prescribed medical therapies are essential in reducing these risks (Setiawan et al., 2018). Public awareness of modifiable risk factors—such as excessive salt consumption, lack of physical activity, obesity, and chronic stress—is also critical in the prevention and control of hypertension (Darfiani & Monika, 2021).

In Indonesia, the prevalence of hypertension continues to rise, in part due to rapid societal modernization and the adoption of unhealthy lifestyles. Dietary patterns rich in sodium, saturated fats, and processed foods are major contributors to this trend (Swastini, 2021). Moreover, decreased physical activity, increased psychosocial stress, and harmful behaviors such as smoking and alcohol consumption further worsen the condition (Mulianingsih et al., 2021). According to data from the National Basic Health Research (*Riskesdas*), many cases remain undiagnosed due to limited awareness and infrequent blood pressure screenings. Even among those diagnosed, poor adherence to treatment regimens leads to increased risks of complications such as myocardial infarction, stroke, renal failure, and reduced quality of life.

These issues highlight the urgent need for comprehensive interventions to manage hypertension in Indonesia. Strategies should include nationwide health education, increased access to screening and treatment services, and public policies that encourage healthier lifestyles. The collaborative involvement of governments, healthcare providers, and communities is crucial in fostering an environment conducive to hypertension prevention and control.

Pharmacological management typically involves the use of antihypertensive agents such as diuretics, beta-blockers, angiotensin-converting enzyme (ACE) inhibitors, and calcium channel blockers, which aim to lower blood pressure and reduce complications (Swastini, 2021). However, long-term use of these medications may lead to adverse effects such as dizziness, fatigue, electrolyte imbalances, and renal dysfunction (Sanrang et al., 2024). Some patients may also develop resistance to certain drugs, necessitating more complex treatment regimens.

Consequently, many patients are turning to natural alternatives believed to offer fewer side effects. Traditional medicinal plants have been used for centuries and are gaining renewed interest for their potential in lowering blood pressure. Examples include celery (*Apium graveolens*), bay leaves (*Syzygium polyanthum*), *Phyllanthus niruri*, *Andrographis paniculata*, and garlic (*Allium sativum*), all of which contain bioactive compounds known to dilate blood vessels, reduce cholesterol, and regulate sodium levels (Swastini, 2021).

In addition to herbal remedies, natural hypertension management also involves lifestyle changes such as increasing dietary fiber and potassium intake, reducing salt consumption,

engaging in regular physical activity, and practicing stress-reduction techniques like yoga and meditation (Darfiani & Monika, 2021). A balanced combination of natural and medical therapies may help patients maintain stable blood pressure with minimal risk. However, medical consultation is essential before initiating herbal treatments to ensure safety and avoid potential drug interactions.

One such medicinal plant is the soursop (*Annona muricata*), whose leaves have been traditionally used in tropical regions for therapeutic purposes. These leaves are rich in active compounds including alkaloids, flavonoids, tannins, saponins, and acetogenins, which are known for their pharmacological effects (Retnaningsih & Amalia, 2024). The antihypertensive properties of *Annona muricata* are attributed to its ability to act as a vasodilator, reduce oxidative stress, and inhibit angiotensin-converting enzyme (ACE), mimicking the action of conventional ACE inhibitors (Harnita et al., 2023).

Traditionally, soursop leaf tea is consumed by boiling a few leaves in water for 15–20 minutes and drinking it regularly. While this herbal remedy offers promising benefits, excessive intake may be harmful due to the potential cytotoxic effects of acetogenins (Febrianti & Niah, 2018). Therefore, proper dosage and consultation with healthcare professionals are strongly recommended to ensure safety, particularly for individuals already undergoing antihypertensive treatment (Robert et al., 2022).

Objective

This study aims to evaluate the effect of soursop leaf (*Annona muricata*) decoction on blood pressure in individuals with hypertension.

Method

Study design

This systematic literature review adheres to the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement.

Search strategy

The search strategy covered the period from January 1, 2021, to December 31, 2025, and included various databases such as PubMed, ProQuest, Garuda, and JSTOR. The search was limited to the last five years to ensure that researchers included the most recent and relevant information on the specific topic. Research and developments in a scientific field can change and evolve over time, making it crucial to consider the latest literature for a comprehensive understanding. Additionally, restricting the search timeframe to the last five years aimed to help researchers manage the number of studies they needed to evaluate and synthesize.

The search utilized Medical Subject Headings (MeSH) terms and keywords in advanced search engines, as detailed in the appendix (Supplementary File 1). This search was conducted independently by two authors of this article (TN, GNN) who systematically searched the previously referenced electronic databases.

Tabel 1. MeSH term on search strategy phase

Source	Link	Keywords	Num
Pubmed	https://tinyurl.com/bddzaz24	soursop[MeSH Terms]	224
ProQuest	https://tinyurl.com/mrxzdjmx	soursop AND (blood AND pressure) AND hypertension	77
Garuda	https://tinyurl.com/nsky4amu	Soursop AND Blood Pressure AND Hypertension	3
JSTOR	https://tinyurl.com/cnaxk2fn	((Soursop) AND (Hypertension))	28
Total			332

Inclusion criteria

Participant

The participants included in this study were individuals with hypertension. There were no restrictions based on gender, religion, or race

Intervention

Soursop leaf (*Annona muricata*) decoction is an herbal drink made by boiling soursop leaves (*Annona muricata*) in water. This beverage has long been used in traditional medicine due to its active compounds that offer various potential health benefits. In the healthcare field, soursop leaf decoction is recognized as a natural remedy containing bioactive compounds such as acetogenins, flavonoids, and alkaloids. These compounds are claimed to have antioxidant, anti-inflammatory, and antimicrobial effects, which may help in the treatment of various diseases, including cancer, hypertension, diabetes, and digestive disorders.

To prepare soursop leaf decoction (*Annona muricata*), start by selecting 5–10 fresh or dried soursop leaves and wash them thoroughly to remove dirt or foreign substances. Next, bring 3–4 cups of water to a boil and add the cleaned soursop leaves. Allow the mixture to simmer until the water reduces to approximately 2 cups. Once done, strain the decoction and let it cool until warm enough to drink. For optimal benefits, consume 1–2 times a day as needed.

Control

Eligible controls were required to receive standard care, usual care, or a placebo.

Outcomes

We included studies that measured blood pressure using various instruments, such as blood pressure monitors or sphygmomanometers.

Study design

We included randomized controlled trials (RCTs), quasi-experimental studies, pre-experimental studies, and case studies to assess the effects of soursop leaf (*Annona muricata*) decoction. Studies based on descriptive research, literature reviews, systematic reviews, and opinion articles were excluded. Only studies written in English and Indonesian were included.

Exclusion criteria

Studies not published in English or Indonesian were excluded. Individuals under the age of 12, as well as families with chronic diseases or mental disorders in individuals over 65 years old, were not included in this study. Articles focusing on single-author essays, editorials, Letters to the Editor, correspondence, narrative reviews, mapping reviews, literature reviews, systematic reviews, conference abstracts, book chapters, and opinion articles were excluded from this analysis.

Study selection and data extraction

Two authors (DGR, DS) independently reviewed all titles and abstracts based on the previously described study design. If a consensus between the two authors could not be reached, a senior researcher (DS, JK) made the final decision regarding the inclusion of the questioned article. Three other authors (TN, GNN, EN) independently extracted data from each study included in the dataset. The selected study reports for inclusion contained information on authorship, year, country, design, sample size, interventions, instruments, results, and findings.

Assessment of risk of bias

Three researchers (DGR, TN, DS) independently conducted quality assessments of the included studies. Differences in assessments were discussed collectively, and if further clarification or resolution was needed, they consulted with senior researchers (DS, JK). This rigorous process ensured that the quality evaluation was conducted strictly and in accordance with scientific standards.

CASP evaluation

Three researchers (DGR, TN, DS) independently conducted quality assessments of the included studies. Differences in assessments were discussed collectively, and if further clarification or resolution was needed, they consulted with senior researchers (DS, JK). This rigorous process ensured that the quality evaluation was conducted strictly and in accordance with scientific standards.

Result

Study selection

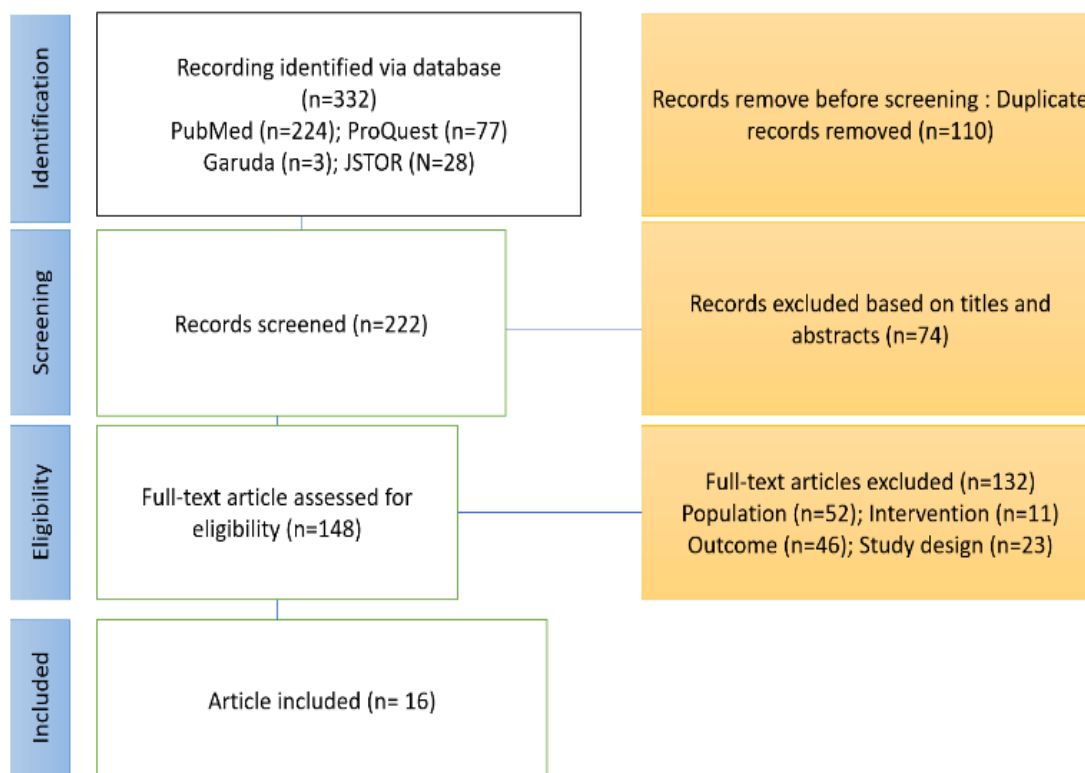


Figure 1. Screening process flowchart by PRISMA

From the initial database search, a total of 332 articles were identified. After removing 110 duplicates, approximately 222 articles remained for evaluation in the next phase. Two researchers, DGR and GNN, independently conducted further screening based on titles and abstracts, reducing the selection to 148 articles. Subsequently, a full-text review was conducted, resulting in 16 articles that met the inclusion and exclusion criteria. Detailed information can be found in Figure 1.

Study characteristics

Tabel 2. Characteristic of Intervention

Author	Intervension, Facilitator, Setting	Numbe rs of Session	Duratio n	Method or Media	Topic
Yano & Keswara (2021) Indonesia	The intervention consisted of an educational session using leaflets and a demonstration of the preparation of soursop leaf decoction. The facilitators of this intervention were the researchers. This setting was conducted with hypertensive clients in the coastal area of West Lampung.	Once a day	1 week	Conducted using leaflets and a demonstration of the preparation of soursop (<i>Annona muricata</i>) leaf decoction.	Not experien ced
Andri et al. (2022) Indonesia	This study was conducted by a research team.	Not experie nced	Not experie nced	Not experienced	Not experien ced
Lorenza et al. (2023) Indonesia	This study was conducted by a research team in Baros Subdistrict, within the working area of Baros Community Health Center, Sukabumi City.	Not experie nced	Not experie nced	Not experienced	Not experien ced
Dianto et al. (2023) Indonesia	This study was conducted by a research team in Punggelan District, Banjarnegara Regency.	Once a day	1 week	Not experienced	Not experien ced
Ayunita et al. (2023) Indonesia	The administration of soursop leaf extract (<i>Annona muricata L</i>) to reduce blood pressure in hypertensive patients. The principal investigator and research team are from Mandala Waluya University and the Ministry of Health Polytechnic, Kendari, Indonesia. The study was conducted in the working area of Katobu Community Health Center, Muna Regency, Southeast Sulawesi, Indonesia.	Not experie nced	Not experie nced	Not experienced	Not experien ced
Ningrum et al. (2024) Indonesia	The intervention in this study involved administering soursop leaf decoction to two subjects with hypertension. The facilitators of this study were the researchers and the team involved in providing nursing care, which included educating the subjects and their families about the benefits of soursop leaf decoction and providing support throughout the intervention process.	Twice a day	1 week	Soursop (<i>Annona muricata</i>) leaf are boiled with 300ml of water and 10 grams of soursop (<i>Annona muricata</i>) leaf for 15 minutes over low heat until 150ml remains.	Not experien ced

	The study setting was in RW05, Kangkung Village, Mranggen District, Demak Regency.				
Siagian et al. (2024) Indonesia	The intervention involved the consumption of soursop leaf tea. The facilitators of this study were the research team from the Department of Public Health, Universitas Prima Indonesia. The study setting was at Ajijulu Village Community Health Center, Tigapanah District, Tanah Karo Regency, North Sumatra Province, Indonesia.	Once a day	2 week	The procedure for making soursop (<i>Annona muricata</i>) leaf tea includes selection of leaves, cleaning, cutting, drying, and boiling.	Not experienced
Purnama et al. (2024) Indonesia	This study involved a combination of pharmacological and herbal therapy along with patient education. Pharmacological therapy included the administration of Amlodipine 10 mg per day, while herbal therapy involved the consumption of soursop leaf decoction three times a week. Additionally, patients and their families received education on hypertension management and the importance of medication adherence. The intervention was facilitated by a medical team consisting of doctors who prescribed medication and healthcare professionals who provided education on treatment and a healthy lifestyle. The study was conducted at Puskesmas X, where hypertensive and obese patients received care.	Three times a week	Three times a week	Amlodipine 10 mg is taken orally once daily as part of pharmacological therapy. Herbal therapy involves consuming soursop leaf decoction, prepared by boiling the leaves, three times a week. Patients and their families receive direct education on hypertension management and the importance of treatment adherence.	Not experienced
Kurniawan & Dianto (2024) Indonesia	This study involved the administration of soursop leaf decoction as herbal therapy for hypertensive patients, along with education on hypertension management and the benefits of soursop leaves. The intervention was facilitated by the medical team at the Sawangan Village Elderly Health Post, including healthcare workers who provided both therapy and education. The study took place at the Sawangan Village Elderly Health Post, Punggelan District, Banjarnegara Regency.	Once a day	12 weeks	Patients consume soursop (<i>Annona muricata</i>) leaf decoction, prepared by boiling and straining the leaves, once daily for 12 weeks. They and their families receive direct counseling on its benefits and effective hypertension management.	Not experienced
Damayanti et al. (2024) Indonesia	This study involved the administration of soursop leaf decoction, where patients consumed the decoction for seven days as a therapy to lower blood	Twice a day	1 week	Prepare 8 clean soursop (<i>Annona muricata</i>) leaf and 2 glasses of	Not experienced

	pressure. The intervention was facilitated by the medical team at Yosomulyo Community Health Center, including nurses and healthcare professionals who provided both therapy and education to patients. The study was conducted at Yosomulyo Community Health Center, Metro City, where elderly individuals with hypertension reside.			water. Boil 1 glass of water with the leaves until it reaches a rolling boil, then strain the decoction.	
Mardiono et al. (2024) Indonesia	This study involved the administration of soursop leaf decoction, where patients consumed the decoction as a therapy to lower blood pressure. The intervention was facilitated by healthcare professionals from the Faculty of Midwifery and Nursing, Universitas Kader Bangsa, who conducted observations, measured blood pressure, and provided education to patients. The study was conducted at Harapan Kita Elderly Social Care Center in Palembang.	Twice a day	8 weeks	Prepare 20 grams of clean soursop (<i>Annona muricata</i>) leaf and 400 cc of water. Boil the leaves with the water until it reaches a rolling boil, then strain the decoction until 200 cc remains. Consume 200 cc of the decoction in the morning after breakfast and another 200 cc in the evening.	Not experienced
Novitasari et al. (2024) Indonesia	This study involved the administration of herbal tea, using a combination of bay leaves and soursop leaves as a functional beverage for hypertensive patients. The brewing process was conducted at different temperatures and durations to achieve optimal sensory quality and antioxidant activity. The intervention was facilitated by researchers and trained panelists from Politeknik Kesehatan Kemenkes Malang, who conducted sensory quality testing and antioxidant activity analysis of the herbal tea. The study was conducted at the Food Science Laboratory and Organoleptic Laboratory at Politeknik Kesehatan Malang, as well as the Nutrition Department Laboratory at the Faculty of Public Health, Universitas Airlangga, for antioxidant activity analysis.	Not experienced	Not experienced	Not experienced	Not experienced
Telova et al. (2024) Indonesia	This study involved the administration of soursop leaf decoction (<i>Annona muricata</i> Linn) to menopausal women with hypertension for one week to	Once a day	1 week	Boil soursop (<i>Annona muricata</i>) leaf in water. The	Not experienced

	assess its effect on blood pressure reduction. The intervention was facilitated by researchers from Institut Kesehatan Medistra Lubuk Pakam and Universitas Bengkulu, who conducted the study. The study was conducted at Klinik Pratama Berkah Medica in Pantai Labu District.			amount of water and leaves can be adjusted, but it should be sufficient to produce a decoction suitable for consumption.	
Nopriani & Azhari (2024) Indonesia	This study involved the administration of soursop leaf decoction (<i>Annona muricata</i> Linn) to hypertensive respondents as a non-pharmacological therapy to assess its effect on blood pressure. The intervention was facilitated by researchers from the Bachelor's Degree in Nursing Program at STIKES Mitra Adiguna Palembang, who conducted the study. The study was conducted at Air Sugihan Community Health Center, Jalur 27.	Twice a day	1 week	Boil soursop (<i>Annona muricata</i>) leaf in enough water to produce two glasses of decoction.	Not experienced
Rahmawati et al. (2024) Indonesia	This study involved the administration of soursop leaf decoction (<i>Annona muricata</i>) to elderly respondents with hypertension over a specific period to assess its effect on blood pressure reduction. The intervention was facilitated by researchers from Universitas Indonesia Maju, who conducted the study. The study was carried out in Sukawangi Village, Warungkondang District, Cianjur Regency.	Twice a day	1 week	Boil soursop (<i>Annona muricata</i>) leaf in a sufficient amount of water to produce two glasses of decoction.	Not experienced
Sari et al. (2025) Indonesia	The intervention was facilitated by researchers from the Nursing Study Program at STIKes Husada Jombang, who conducted the study. The study was carried out at the Elderly Posyandu in Simongagrok Village, Dawarblandong District, Mojokerto Regency.	Twice a day	1 week	Boil soursop (<i>Annona muricata</i>) leaf in hot water to make tea.	Not experienced

The table summarizes various interventions conducted in Indonesia that utilized soursop (*Annona muricata*) leaf decoction or tea as a complementary approach for managing hypertension. Most studies involved the daily or twice-daily administration of the decoction over a period ranging from one week to twelve weeks. The intervention was typically facilitated by researchers, healthcare professionals, or local medical teams in community-based settings such as health centers, elderly care posts, and village clinics. While some studies included educational components—such as leaflets, demonstrations, or direct counseling—others focused solely on the herbal treatment. In some cases, soursop therapy was combined with conventional pharmacological treatments like Amlodipine.

The preparation methods were generally consistent across studies, involving boiling fresh or dried soursop leaves in water and consuming the resulting decoction. However, several studies lacked detailed descriptions of the intervention, frequency, or educational topics, making them harder to replicate or evaluate. Despite this, the overall trend suggests that soursop leaf decoction is widely accepted as a practical, low-cost intervention for hypertension. The variation in duration, dosage, and implementation highlights the need for standardized protocols in future research to ensure consistency, effectiveness, and broader applicability.

Table 3. Data Extraction

Author, year, country	Design (Sample size)	Intervention (Case)	Instrument (outcomes)	Findings
Yano et al. (2021) Indonesia	Quasi Experiment 2 Responden	Soursop (<i>Annona muricata</i>) Leaf Decoction (Hypertension)	Sphymano for blood pressure	This study found that soursop (<i>Annona muricata</i>) leaf decoction is an effective, affordable, simple, and safe non-pharmacological therapy for lowering blood pressure in hypertensive patients after seven days of consumption.
Andri et al. (2022) Indonesia	Quasi Experiment 30 Responden	Soursop (<i>Annona muricata</i>) Leaf Decoction (Hypertension)	Sphymano for blood pressure	There was a decrease in systolic and diastolic blood pressure before and after the intervention of boiled soursop (<i>Annona muricata</i>) leaf water in hypertensive patients at Lingkar Barat Community Health Center, Bengkulu City.
Lorenza et al. (2023) Indonesia	Quasi Experiment 16 Responden	Soursop (<i>Annona muricata</i>) Leaf Decoction (Hypertension)	Sphymano for blood pressure	This study found that soursop (<i>Annona muricata</i>) leaf decoction has a significant effect in lowering blood pressure in elderly hypertensive patients.
Dianto et al. (2023) Indonesia	Quasi Experiment 20 Responden	Soursop (<i>Annona muricata</i>) Leaf Decoction (Hypertension)	Sphymano for blood pressure	Both betel leaf and soursop (<i>Annona muricata</i>) leaf decoctions are effective in lowering blood pressure in elderly patients with hypertension, with a systolic p-value of $0.005 < 0.05$ and a diastolic p-value of $0.000 < 0.05$. Therefore, both can be considered as alternative therapies at the Sawangan Elderly Health Center.
Ayunita et al. (2023) Indonesia	Quasi Experiment 49 Responden	Soursop (<i>Annona muricata</i>) Leaf Decoction (Hypertension)	Sphymano for blood pressure	There is a significant effect of soursop (<i>Annona muricata</i>) leaf extract on reducing blood pressure in hypertensive patients in the working area of Katobu Health Center, Muna Regency.

Ningrum et al. (2024) Indonesia	Case Report 2 Responden	Soursop (<i>Annona muricata</i>) Leaf Decoction (Hypertension)	Sphymano for blood pressure	Administering soursop (<i>Annona muricata</i>) leaf decoction twice daily for seven days is effective in lowering blood pressure in elderly patients with hypertension, with an average systolic reduction of 9.92 mmHg and a diastolic reduction of 3.55 mmHg.
Siagian et al. (2024) Indonesia	Quasi Experiment 30 Responden	Soursop (<i>Annona muricata</i>) Leaf Decoction (Hypertension)	Sphymano for blood pressure	Consuming soursop (<i>Annona muricata</i>) leaf tea can lower both systolic and diastolic blood pressure, indicating that this local herbal remedy has potential benefits for individuals diagnosed with hypertension. Successful pharmacological control of hypertension should be supported by a healthy lifestyle.
Purnama et al. (2024) Indonesia	Quasi Experiment -	Soursop (<i>Annona muricata</i>) Leaf Decoction (Hypertension)	Sphymano for blood pressure	This study shows that the combination of Amlodipine and soursop (<i>Annona muricata</i>) leaf decoction is effective in lowering blood pressure in hypertensive patients with obesity. Regular consumption of soursop leaves can serve as a non-pharmacological adjunct therapy to help control blood pressure. Risk factors such as age, smoking, and diet should still be considered to prevent complications.
Kurniawan & Dianto (2024) Indonesia	Quasi Experiment 20 Responden	Soursop (<i>Annona muricata</i>) Leaf Decoction (Hypertension)	Sphymano for blood pressure	Before the soursop leaf decoction therapy, the blood pressure of elderly hypertensive patients at the Sawangan Posyandu was 169.10/96.50 mmHg (Stage 2 hypertension). After the therapy in May 2023, it decreased to 142.20/82.20 mmHg, with a systolic p-value of 0.005 and a diastolic p-value of 0.000 (<0.05), proving the effectiveness of soursop leaf decoction in lowering blood pressure.
Damayanti et al. (2024) Indonesia	Kuantitatif Pre-eksperimental 41 Responden	Soursop (<i>Annona muricata</i>) Leaf Decoction (Hypertension)	Sphymano for blood pressure	Soursop (<i>Annona muricata</i>) leaf decoction therapy is effective in lowering blood pressure in hypertensive patients at Yosomulyo Health Center, Metro City, with a systolic reduction of 26.4% and a diastolic reduction of 13.5%, demonstrating significant results in blood pressure control.

Mardiono et al. (2024) Indonesia	Pre-eksperiment 33 Responden	Soursop (<i>Annona muricata</i>) Leaf Decoction (Hypertension)	Sphymano for blood pressure	Soursop (<i>Annona muricata</i>) leaf decoction reduced systolic blood pressure from 165.8 to 152.6 and diastolic blood pressure from 105 to 98, with statistically significant results ($p < 0.05$). This indicates a positive effect on hypertensive patients at Harapan Kita Elderly Social Care Center.
Telova et al. (2024) Indonesia	Quasi Experiment 15 Responden	Soursop (<i>Annona muricata</i>) Leaf Decoction (Hypertension)	Sphymano for blood pressure	Based on the Wilcoxon test results, a p -value of 0.000 was obtained, indicating $p < (\alpha = 0.05)$. This demonstrates a significant change in blood pressure among menopausal women after consuming soursop (<i>Annona muricata</i>) leaf decoction.
Nopriani & Azhari (2024) Indonesia	Pre-eksperiment 32 Responden	Soursop (<i>Annona muricata</i>) Leaf Decoction (Hypertension)	Sphymano for blood pressure	Soursop (<i>Annona muricata</i>) leaf decoction lowers blood pressure and can serve as a supportive non-pharmacological therapy for hypertension. Its consumption has been proven effective in reducing blood pressure in hypertensive patients, with its bioactive compounds contributing to the natural mechanism of blood pressure reduction. Therefore, this therapy can complement non-pharmacological hypertension management.
Novitasari et al. (2024) Indonesia	RCT -	Soursop (<i>Annona muricata</i>) Leaf Decoction (Hypertension)	Sphymano for blood pressure	The temperature and duration of brewing bay leaf and soursop (<i>Annona muricata</i>) leaf herbal tea did not significantly affect sensory quality. However, brewing at 85°C for 5 minutes enhanced antioxidant activity, with an IC50 value of 69.8 ppm, indicating strong antioxidant properties. The best treatment (P3) under these conditions produced a yellowish-brown color, a preferred herbal aroma, and a slightly bitter taste.
Rahmawati et al. (2024) Indonesia	Quasi Experiment 17 Responden	Soursop (<i>Annona muricata</i>) Leaf Decoction (Hypertension)	Sphymano for blood pressure	This study proves that soursop leaf decoction is effective in lowering blood pressure in elderly hypertensive patients, with MAP decreasing from 124.09 mmHg to 95.24 mmHg within 7 days ($p < 0.001$). The flavonoids and potassium in soursop leaves help dilate blood vessels, making it a supportive non-pharmacological therapy for hypertension.

Sari et al. (2025) Indonesia	Pre-eksperiment 15 Responden	Soursop (<i>Annona muricata</i>) Leaf Decoction (Hypertension)	Sphymo for blood pressure	The administration of soursop (<i>Annona muricata</i>) leaf tea is expected to serve as a self-care therapy for nurses in providing non-pharmacological treatment to reduce MAP values in elderly patients with hypertension.
---------------------------------	---------------------------------	--	---------------------------	---

The table presents a summary of research studies conducted in Indonesia on the use of soursop (*Annona muricata*) leaf decoction or tea as a non-pharmacological intervention for hypertension. Most of the studies used a quasi-experimental or pre-experimental design, with sample sizes ranging from 2 to 49 respondents. The intervention involved administering soursop leaf decoction, often measured using a sphygmomanometer (sphymo) to monitor blood pressure outcomes. Results consistently showed that the decoction was effective in lowering both systolic and diastolic blood pressure. Several studies reported statistically significant reductions ($p < 0.05$), while others detailed the average decrease in mmHg. These findings support the efficacy of soursop leaf as a simple, affordable, and accessible herbal remedy for hypertensive patients.

In addition to clinical outcomes, a few studies explored other aspects such as combining soursop therapy with pharmacological treatment (e.g., Amlodipine) or optimizing preparation methods for antioxidant benefits. Notably, Novitasari et al. (2024) evaluated the sensory and antioxidant properties of the herbal tea, showing that optimal brewing enhanced its health benefits. Despite methodological variations, including differences in study design, dosage, and duration, the findings across studies are consistent—highlighting soursop leaf decoction’s potential as an effective complementary therapy in hypertension management. This highlights the need for further research using standardized protocols and larger sample sizes to validate and optimize its therapeutic application.

Tabel 4. CASP Checklist for The Quality of Studies

Author/Year	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Yano & Keswara (2021)	Y	Y	N	Y	N	Y	Y	Y	Y	Y
Andri et al (2022)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Lorenza et al (2023)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Dianto et al (2023)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Ayunita et al (2023)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Ningrum et al (2024)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Siagian et al (2024)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Purnama et al (2024)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Kurniawan & Dianto (2024)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Damayanti et al (2024)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Mardiono et al (2024)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Novitasari et al (2024)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Telova et al (2024)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Nopirani & Azhari et al (2024)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Ramawati et al (2024)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Sari et al (2024)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y

The quality appraisal table shows the evaluation of 16 studies based on ten criteria (Q1–Q10). All studies scored “Yes” (Y) for most criteria, indicating generally good methodological quality. However, Q5 consistently received a “No” (N) across all studies. This pattern suggests a systematic methodological limitation related to the fifth criterion, which likely involves blinding, control group use, or randomization—common challenges in quasi-experimental or pre-experimental designs.

Despite this, the studies still demonstrated strong adherence to other quality aspects, including clear objectives (Q1), appropriate methodology (Q2), and relevant outcome measures (Q4, Q6–Q10). This consistency across most domains enhances the reliability of the findings and supports the conclusion that soursop leaf decoction is effective in lowering blood pressure.

Discussion

Several studies have evaluated the efficacy of *Annona muricata* (soursop) leaf decoction in reducing blood pressure using various instruments and intervention protocols. Research conducted by Yano and Keswara (2021), Lorenza et al. (2023), and Rahmawati et al. (2024) demonstrated significant reductions in systolic and diastolic blood pressure following a seven-day or longer intervention. These measurements were obtained using validated tools such as sphygmomanometers and structured monitoring forms. Similarly, Ayunita et al. (2023), Siagian et al. (2024), and Sari et al. (2024) confirmed the effectiveness of soursop leaf decoction and tea in lowering mean arterial pressure (MAP) and sustaining long-term blood pressure control in hypertensive individuals.

Comparative studies, such as those by Dianto et al. (2023) and Kurniawan and Dianto (2024), explored the efficacy of soursop leaf in relation to other herbal therapies using sphygmomanometer readings and adherence assessment tools. Additional investigations by Mardiono et al. (2024) and Novitasari et al. (2024) included biochemical analyses to evaluate antioxidant activity as an indicator of therapeutic impact. Overall, these findings suggest that soursop leaf decoction and tea are promising non-pharmacological interventions for hypertension, particularly among elderly individuals and those with comorbid conditions such as obesity.

The methods of administration across studies varied, though decoctions were the most commonly used form. Typically, 5–7 soursop leaves were boiled in water for 10–15 minutes to yield 150–200 ml of decoction, which was consumed one to three times daily for 7–14 days (Yano and Keswara, 2021; Lorenza et al., 2023; Ayunita et al., 2023). Some studies used capsule-based extracts, such as the 500 mg soursop leaf extract administered once daily by Ayunita et al. (2023). Herbal tea preparations were also examined, as in the studies by Novitasari et al. (2024) and Sari et al. (2024), wherein dried soursop leaves were steeped in hot water before consumption. These varying formulations aimed to assess the consistency of antihypertensive outcomes across traditional and processed forms.

Phytochemical analyses have identified a wide range of bioactive compounds in *Annona muricata* leaves, which are believed to contribute to their antihypertensive effects. Swastini et al. (2021) reported the presence of mono-tetrahydrofuran acetogenins, potassium, calcium, phosphorus, carbohydrates, vitamin A, vitamin C, flavonoids, tannins, phytosterols, and alkaloids. Potassium, in particular, plays a crucial role in regulating blood pressure by promoting vasodilation and enhancing sodium excretion. The flavonoid and vitamin C content

supports endothelial function and provides antioxidant protection against oxidative stress, which is a known contributor to vascular dysfunction in hypertension (Yano and Keswara, 2021; Lorenza et al., 2023; Ayunita et al., 2023; Novitasari et al., 2024).

Several studies have emphasized the role of these compounds in improving vascular elasticity and reducing peripheral vascular resistance. Ayunita et al. (2023) and Novitasari et al. (2024) documented strong antioxidant activity attributed to flavonoids, polyphenols, and phytosterols. Furthermore, Telova et al. (2024) and Rahmawati et al. (2024) highlighted the involvement of acetogenins in inhibiting vasoconstriction and promoting vasodilation, thereby contributing to blood pressure reduction.

Beyond antihypertensive properties, soursop leaves have also demonstrated potential in lowering uric acid levels, suggesting broader cardiovascular benefits. Patra et al. (2023) proposed that the flavonoids and tannins in soursop leaf decoction inhibit xanthine oxidase, the enzyme responsible for uric acid synthesis, while simultaneously exerting diuretic effects that enhance uric acid excretion. These mechanisms collectively support soursop's role as a multi-target phytotherapy in the management of metabolic syndromes (Yano and Keswara, 2021; Lorenza et al., 2023; Rahmawati et al., 2024).

In the context of diabetes mellitus, Darfiani and Morika (2021) noted that *Annona muricata* may also contribute to blood glucose regulation by improving insulin sensitivity, reducing intestinal glucose absorption, and lowering insulin resistance. However, they caution that its use should complement—not replace—standard pharmacological therapies due to the lack of large-scale clinical trials confirming its efficacy and safety in human populations.

The clinical implications of these findings suggest that *Annona muricata* leaf decoction could serve as an effective, safe, and affordable complementary therapy for managing hypertension. Its regular use may reduce dependence on conventional antihypertensive medications, thereby minimizing associated adverse effects such as dizziness, fatigue, or electrolyte imbalance. Moreover, the accessibility and low cost of soursop-based preparations could improve patient adherence and long-term blood pressure control.

Given the promising therapeutic outcomes, these results may encourage regulatory bodies to standardize and support the development of scientifically validated herbal formulations based on *Annona muricata*. Healthcare professionals, including physicians and pharmacists, should be educated about the potential benefits and limitations of soursop leaf therapy to ensure appropriate integration with existing treatment regimens without compromising patient safety or therapeutic efficacy.

Conclusion

Soursop (*Annona muricata*) leaf decoction and tea present promising complementary therapies for managing hypertension, particularly in populations vulnerable to side effects of chemical medications. The integration of soursop leaf therapy may enhance blood pressure control and improve patient adherence due to its accessibility and lower adverse effect profile. Nonetheless, further long-term clinical studies are necessary to establish optimal dosing protocols and to evaluate potential impacts on other organ systems. In parallel, public education initiatives should be intensified to promote awareness and proper usage of soursop leaf as a safe and effective adjunct in hypertension management.

Acknowledgement

Not applicable.

Authors' contribution

Each author contributed equally in all the parts of the research. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

Conflict of interest

The researchers stated that there is no conflict of interest related to the implementation and publication of the results of this research. The entire research process, from planning, data collection, analysis, to report preparation, was carried out independently without any influence or pressure from any third party. A commitment to research ethics is upheld throughout the research process, ensuring transparency, accuracy and honesty in reporting results. Respondents' participation was voluntary with informed consent, and their confidentiality and privacy were maintained in accordance with applicable research ethics standards. With this statement, researchers hope that the research results can be trusted and used as a valid reference for the development of science and health practices related to ethnomedicine and reproductive health.

Ethical consideration

Not applicable.

Funding

This research was funded by the Research and Community Service Institute of STIKes Muhammadiyah Ciamis under contract number 004/LPPM/F/2024.

References

1. Andri, P. S. A. (2022). *Penggunaan rebusan daun sirsak terhadap penurunan tekanan darah penderita hipertensi*. <https://doi.org/10.31539/jks.v6i1.4169>
2. Ayunita, D., Supodo, T., & Akbar Torontju, S. (2023). Giving soursop leaf extract (*Annona muricata* L) to lower blood pressure for patients with hypertension. *Waluya The International Science of Health Journal*, 2(2), 59–64. <https://doi.org/10.54883/28292278.v2i2.79>
3. Carey, R. M., Moran, A. E., & Whelton, P. K. (2022). Treatment of hypertension: A review. *JAMA*. <https://doi.org/10.1001/jama.2022.19590>
4. Darfiani, P., Morika, H. D., Studi Sarjana Keperawatan, & Syedza Saintika. (2021). Daun sirsak menurunkan kadar gula darah pasien diabetes mellitus, 6(1), 2021–113. <https://doi.org/10.22216/jen.v6i1.5587>
5. Damayati, G. M., et al. (2024). *Pengaruh air rebusan daun sirsak terhadap tekanan darah pada lansia di Puskesmas Yosomulyo Kota Metro*.
6. Febrianti, D. R., Niah, R., Farmasi, A., & Banjarmasin, I. (n.d.). Analisis kandungan flavonoid dan aktivitas antihiperurisemia ekstrak etanol daun sirsak (*Annona muricata* L.) pada mencit jantan secara *in vivo*.
7. Harnita, N., et al. (2023). Karakterisasi metabolit sekunder ekstrak N-Heksana dari daun sirsak (*Annona muricata* L.). Retrieved from <https://utilityprojectsolution.org/ejournal/index.php/JuKSIT>

8. Kurniawan, W. E., Dianto, W., & Fakultas Kesehatan. (n.d.). *Pengaruh rebusan daun sirsak terhadap penurunan tekanan darah pada lansia hipertensi*. Retrieved from <http://jurnal.globalhealthsciencegroup.com/index.php/JPPP>
9. Lorenza, P. E., Hadiyanto, H., & Alamsyah, M. S. (n.d.). Pengaruh air rebusan daun sirsak terhadap tekanan darah penderita hipertensi pada lansia di Kelurahan Baros Wilayah Kerja Puskesmas Baros Kota Sukabumi.
10. Ma, B., Sanrang, R., & Santi, I. (2024). Studi etnofarmasi tumbuhan obat yang berkhasiat sebagai antihipertensi di Kelurahan Galung, Kecamatan Liliraja, Kabupaten Soppeng. *Makassar Natural Product Journal*, 2(2), 2024–153. Retrieved from <https://journal.farmasi.umi.ac.id/index.php/mnpj>
11. Melliya Sari, G., Puspita, E., Agustin, E., & Rustanti, E. (2025). The effect of giving soursop leaf tea on the reduction of MAP (Mean Arterial Pressure) value in the elderly hypertension sufferers. *Prima Wiyata Health*, 6(1), 9–14. <https://doi.org/10.36720/pwh.v6i1.79>
12. Mulianingsih, N., Respati, B., Endarti, D., & Widayanti, A. W. (2021). Biaya langsung dan tidak langsung pada penyakit hipertensi: Narrative review. *Jurnal Sains Medika*. <https://doi.org/10.33084/jsm.vxix.xxx>
13. Ningrum, P. C., Rachmawati, A., Rejeki, S., & Khayati, N. (2024). Penurunan tekanan darah pada lansia dengan hipertensi menggunakan rebusan daun sirsak. *Ners Muda*, 5(1), 73. <https://doi.org/10.26714/nm.v5i1.13620>
14. Nopriani, Y., Azhari, I., & Studi Sarjana Keperawatan STIKES Mitra Adiguna Palembang. (2024). Pengaruh konsumsi rebusan daun sirsak (*Annona muricata* Linn) terhadap tekanan darah pada penderita hipertensi di wilayah kerja Puskesmas Air Sugihan Jalur 27, 5(2).
15. Novitasari, T. (2024). Pengaruh suhu dan lama penyeduhan teh herbal celup daun salam dan daun sirsak terhadap kualitas sensori dan aktivitas antioksidan sebagai minuman fungsional penderita hipertensi. *Nutriture Journal*, 3(3), 145. <https://doi.org/10.31290/nj.v3i3.4246>
16. Pemberian Rebusan Daun Sirsak Terhadap Penderita Hipertensi Di Panti Sosial Lanjut Usia Sasono Mardiono, Saputra, A. U., Febriansyah, R., Kebidanan dan Keperawatan, F., & Kader Bangsa, U. (2024). The effect of giving soursop leaf decoction to hypertension patients at the elderly social home. *Lentera Perawat*.
17. Purnama, I. D., Makmun, A., & Wijaya, F. (2024). Case report: Hypertension accompanied by obesity with herbal consumption of soursop leaf boiling. *Journal La Medihealtico*, 5(3), 516–523. <https://doi.org/10.37899/journallamedihealtico.v5i3.1343>
18. Rahmawati, I., Arum, I., & Satiti, D. (2024). Hubungan pola asuh orang tua terhadap kejadian diabetes pada anak usia sekolah. *Lentera Ilmu Kesehatan*.
19. Rahmawati, I., G. S., S., & Kamillah, S. (2024). Pengaruh rebusan air daun sirsak (*Annona muricata*) terhadap penurunan tekanan darah pada lansia penderita hipertensi di wilayah Desa Sukawangi Kecamatan Warungkondang Kabupaten Cianjur tahun 2023. *Jurnal Ventilator*, 2(3), 108–126. <https://doi.org/10.59680/ventilator.v2i3.1307>
20. Retnaningsih, D., & Amalia, R. (2022). Penerapan mengkonsumsi air rebusan daun sirsak terhadap penurunan kadar asam urat pada lansia: Case study. *Jurnal Manajemen Asuhan Keperawatan*, 6(2), 1–5.

21. Setiawan, H., Suhanda, S., Rosliati, E., Firmansyah, A., & Fitriani, A. (2018). Promosi kesehatan pencegahan hipertensi sejak dini. *ABDIMAS: Jurnal Pengabdian Masyarakat*, 1(2), 41–45.
22. Swastini, N. (2021). Efektivitas daun sirsak (*Annona muricata* Linn) terhadap penurunan tekanan darah pada hipertensi. *Jurnal Ilmiah Kesehatan Sandi Husada*, 10(2), 413–415. <https://doi.org/10.35816/jiskh.v10i2.618>
23. Telova, Y., Simarmata, P. C., & Damayanti. (2024). The effect of drinking sirsak leaves (*Annona muricata* Linn) on reducing blood pressure in menopause women with hypertension. *Jurnal Kebidanan Kestra (JKK)*, 6(2), 127–131. <https://doi.org/10.35451/jkk.v6i2.1858>
24. Yano, L., & Keswara, U. R. (2021). Pemberian air rebusan daun sirsak untuk menurunkan tekanan darah pada klien hipertensi di Pesisir Barat Lampung. *Jurnal Kreativitas Pengabdian Kepada Masyarakat (PKM)*, 4(5), 1216–1220. <https://doi.org/10.33024/jkpm.v4i5.2875>