

## Trends and Issues in the Use of Garlic as A Natural Treatment for Lowering Blood Pressure in Hypertension Sufferers: Literature Review

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### ABSTRACT

**Introduction:** Hypertension, or high blood pressure, is a global health problem whose prevalence continues to increase from year to year. The World Health Organization (WHO) reports that hypertension is one of the leading causes of death from cardiovascular disease worldwide. According to WHO data, approximately 1.28 billion adults aged 30–79 years suffer from hypertension globally. One natural ingredient that has attracted attention in the treatment of hypertension is garlic (*Allium sativum*). Thus, this paper aims to examine the effectiveness of garlic as a blood pressure-lowering drug in patients with hypertension and its underlying mechanism of action.

**Methods:** A comprehensive review of relevant studies was conducted, analyzing findings related to hypertension management, barriers to treatment, and the role of healthcare professionals and complementary therapies in improving patient compliance. This study used search engines and databases.

**Result:** The analyzed research findings consistently demonstrate that garlic has significant potential in lowering blood pressure among individuals with hypertension.

**Conclusion:** Garlic (*Allium sativum* Linn.) has proven to be significantly effective in reducing blood pressure among hypertensive patients in various preparations such as extracts, decoctions, and infusions, primarily through the action of allicin as a vasodilator, antioxidant, and anti-inflammatory agent.

**keywords:** complementary therapy; garlic (*Allium sativum*); hypertension; treatment; trends and issues.

### INTRODUCTION

Hypertension, or high blood pressure, is a global health problem whose prevalence continues to increase from year to year. The World Health Organization (WHO) reports that hypertension is one of the leading causes of death from cardiovascular disease worldwide. According to WHO data, approximately 1.28 billion adults aged 30–79 years suffer from hypertension globally. In many developing countries, including Indonesia, the prevalence of hypertension is very high. Based on the latest 2023 National Basic Health Research Survey (RISKESDAS), the prevalence of hypertension in Indonesia was 29.2%, a figure considered high. This illustrates the widespread and serious burden of this disease, often referred to as the “silent killer.” Hypertension frequently shows no clear symptoms in its early stages, but over time it can lead to serious complications such as stroke, heart failure, and kidney disease (Marhabatsar & Sijid, 2024; Kadir, 2020; Haidar, 2023).

Treatment for hypertension generally involves pharmacological therapy, such as antihypertensive drugs from the ACE inhibitor, beta blocker, diuretic, and other classes. Although effective, the use of these drugs is often accompanied by unwanted side effects and long-term dependence. Therefore, more and more research is focusing on alternative or complementary approaches, including the use of natural ingredients as adjunctive therapy. (Silvia & Siti 2022) (Rahmadini, Safitri, dkk 2023).

One natural ingredient that has attracted attention in the treatment of hypertension is garlic (*Allium sativum*). Garlic has long been used in traditional medicine due to its active compounds, such as allicin,

which have vasodilatory and anticoagulant effects, as well as the ability to lower cholesterol and blood pressure levels. Several studies show that regular consumption of garlic can help lower systolic and diastolic blood pressure, especially in patients with mild to moderate hypertension. Seeing this potential, it is important to explore further the role of garlic as a natural therapeutic agent in helping to control blood pressure. Thus, this paper aims to examine the effectiveness of garlic as a blood pressure-lowering drug in patients with hypertension and its underlying mechanism of action. (Mahadewi & Yowani 2023) (Angraini & Sari 2023) (Mangngi 2022) (Sunarno & Syarif 2023).

**METHODS**

A comprehensive review of relevant studies was conducted, analyzing findings related to hypertension management, barriers to treatment, and the role of healthcare professionals and complementary therapies in improving patient compliance. This study used search engines and databases such as Google Scholar, DOAJ, and PubMed with the keywords: hypertension; treatment; complementary therapy; garlic (*Allium sativum*); trends and issues. In addition, this literature review applied a publication time limit, where only articles published within the last five years were included. This time restriction was intended to ensure that the evidence reviewed reflects the most recent scientific developments, current trends, and contemporary issues regarding the use of garlic as a natural therapy for lowering blood pressure.

**RESULTS**

The analyzed research findings consistently demonstrate that garlic has significant potential in lowering blood pressure among individuals with hypertension. The summary of article analyses is presented in Table 1.

Table 1. Article analysis

No	Title and Author, Years	Population and Sampel	Method	Result
1.	“The Effect of Garlic Extract ( <i>Allium sativum</i> Linn) on Reducing Blood Pressure in Elderly with Hypertension in the Working Area of UPTD Puskesmas Peureulak, East Aceh Regency”  Nanda Desreza, Erawati, Syarifah Masthura (2023).	15 respondents.	Quasi-experiment with One Group Pretest–Posttest approach.	The study showed that before the intervention of giving garlic extract ( <i>Allium sativum</i> Linn), all respondents (15 people) were in the hypertension category. After the intervention, there was a significant change in blood pressure. Most respondents, namely 8 people (53.3%), experienced a decrease in blood pressure and were in the normal category after the intervention.
2.	“The Effect of Consuming Garlic on Reducing Blood Pressure in Hypertensive Patients”  Siska Sakti Angraini, Vino Rika Nofia, Honesty Diana Morika, Putri Minas Sari (2023).	16 respondents	Quasi-experiment with Two Group Post-Test Design.	Analysis using an independent t-test showed a p-value of 0.000 for systolic blood pressure and 0.000 for diastolic blood pressure. This indicates that garlic consumption can significantly reduce blood pressure in hypertensive patients.
3.	“The Effect of Garlic Decoction ( <i>Allium sativum</i> ) on Blood Pressure in Hypertensive Patients”	36 respondents	Quasi experiment with non-equivalent pre-	The mean blood pressure in the intervention group before being given garlic decoction was 176.61 mmHg, while after the intervention

	Sindy Melinda and Rosalina (2022).		test post-test control group design	it became 168.39 mmHg. Meanwhile, the mean blood pressure in the control group before intervention was 174.83 mmHg and after the intervention it became 174.42 mmHg.
4.	“The Effect of Garlic Drink on Reducing Hypertension Blood Pressure at Telaga Health Center, Bengkulu City, 2022”  Ruadya Tuzzarah Dewi, Des Metasari, Murwati (2022).	15 respondents.	Quasi-experiment with One Group Pretest–Posttest approach.	Before the intervention, the mean systolic blood pressure was 150 mmHg, while after the intervention it dropped to 121.33 mmHg. For diastolic blood pressure, the mean before the intervention was 91.33 mmHg, and after the intervention it dropped to 80.33 mmHg.
5.	“The Effect of Garlic Infusion on Blood Pressure in Hypertensive Patients in Lembang Kadundung, Masanda Subdistrict, Tana Toraja Regency, 2022”  Yahya Handayani, Agustina Palamba, Deva (2022).	10 respondents	Quasi-eksperiment with one group pre-test dan post test.	The study showed that after garlic infusion therapy, 40% of respondents experienced normalization of blood pressure, while 30% were classified as pre-hypertension, 20% remained in hypertension stage 1, and 10% in hypertension stage 2.
6.	“Garlic Decoction and Deep Breathing Relaxation Therapy in Reducing Blood Pressure in Elderly with Hypertension”  Pauzan Efendi, Erni Buston, Herza Jumarta, Noni Buston (2023).	36 respondents	Quasi experiment with pre-test post-test control group design	There was a significant difference in the reduction of blood pressure between the intervention group that received garlic decoction combined with deep breathing relaxation therapy and the control group that only received deep breathing relaxation therapy. The mean reduction in systolic blood pressure in the intervention group was 11.61 mmHg, while in the control group it was 3.05 mmHg.

**DISCUSSION**

Hypertension is one of the major global health problems that has received serious attention from various stakeholders at both national and international levels. According to the World Health Organization (WHO, 2021), hypertension affects more than 1.2 billion people worldwide, with higher prevalence in developing countries due to lifestyle changes, dietary patterns, and low health awareness. Hypertension is often referred to as the “silent killer” because it frequently presents no symptoms at an early stage, yet can lead to severe complications such as coronary heart disease, stroke, and chronic kidney failure if not properly managed. Therefore, hypertension management strategies include both pharmacological and non-pharmacological approaches. One non-pharmacological intervention that has been increasingly studied is the use of herbal remedies, particularly garlic (*Allium sativum* Linn).

Findings from the reviewed documents consistently indicate that garlic has significant potential in reducing blood pressure among hypertensive patients. Research conducted by Desreza, Erawati, and Masthura (2023) demonstrated that administering garlic extract to 15 elderly hypertensive patients in East Aceh resulted in a significant reduction in blood pressure, with 53.3% of respondents achieving normalized blood pressure. These findings are consistent with Angraini et al. (2023), who employed a

two-group post-test design and reported a p-value < 0.001 for both systolic and diastolic blood pressure, confirming the effectiveness of garlic consumption as an antihypertensive intervention.

Similarly, Melinda and Rosalina (2022), using a non-equivalent control group design with 36 respondents, found that the intervention group experienced an average reduction in systolic blood pressure of 8.22 mmHg, while the control group showed almost no change. This underscores the direct effect of garlic decoction on lowering blood pressure. Another study by Dewi, Metasari, and Murwati (2022) in Bengkulu further reinforced this evidence, showing that garlic drink consumption significantly lowered average systolic blood pressure from 150 mmHg to 121.33 mmHg. Likewise, research by Handayani, Palamba, and Deva (2022) in Tana Toraja revealed that after consuming garlic infusion, 40% of respondents achieved blood pressure normalization.

More interestingly, a study by Efendi et al. (2023) combined garlic decoction with deep-breathing relaxation therapy. Their findings showed a mean systolic blood pressure reduction of 11.61 mmHg in the intervention group, compared to only 3.05 mmHg in the control group. This suggests that combining herbal interventions with relaxation techniques can provide a synergistic effect in blood pressure control.

From a physiological standpoint, the antihypertensive effect of garlic is associated with its active compound, allicin. Allicin is formed when garlic is crushed or chopped, and functions as a natural vasodilator by enhancing the release of nitric oxide (NO) in the vascular endothelium. NO promotes the relaxation of vascular smooth muscles, thereby reducing peripheral resistance and lowering blood pressure (Ried & Fakler, 2021). Moreover, garlic possesses antioxidant properties that reduce oxidative stress, as well as antiplatelet effects that inhibit platelet aggregation, thus contributing to the reduction of cardiovascular complications (Sun et al., 2021).

Recent scientific evidence from meta-analyses also supports the effectiveness of garlic. For instance, Sun, Zhou, Wang, and Chen (2021) found that garlic supplementation reduced systolic blood pressure by an average of 8–10 mmHg in hypertensive patients. Another meta-analysis by Dima et al. (2022) confirmed that garlic consumption in various forms (extracts, capsules, or decoctions) significantly lowered both systolic and diastolic blood pressure, particularly in individuals with uncontrolled hypertension.

However, it is important to note that most studies conducted in Indonesia have utilized quasi-experimental designs with relatively small sample sizes (10–36 participants). This limits the generalizability of their findings. Therefore, randomized controlled trials (RCTs) with larger sample sizes are necessary to ensure the validity of results and to determine the optimal safe and effective dosage of garlic for long-term use. Additionally, variations in preparation methods (extracts, decoctions, or infusions) may affect allicin content, making it essential for further studies to compare the effectiveness of different garlic preparations.

From a practical perspective, these findings carry significant implications for nursing practice and public health. Garlic can serve as an easily accessible, affordable, and relatively safe complementary therapy, particularly for rural populations or elderly individuals with limited financial capacity to purchase chemical antihypertensive drugs. Healthcare professionals can educate communities on the proper use of garlic as an adjunct to pharmacological therapy. However, garlic consumption should not completely replace prescribed antihypertensive medications in patients with severe conditions, but rather be used as an additional therapy to enhance treatment effectiveness.

In conclusion, both local and international evidence consistently indicates that garlic is a promising herbal remedy for hypertension management. Although further large-scale and comprehensive research is still required, garlic has proven to be a viable complementary therapy option in preventing and controlling cardiovascular diseases.

## CONCLUSIONS

Garlic (*Allium sativum* Linn) has proven to be significantly effective in reducing blood pressure among hypertensive patients in various preparations such as extracts, decoctions, and infusions, primarily through the action of allicin as a vasodilator, antioxidant, and anti-inflammatory agent. Research consistently shows that garlic consumption meaningfully lowers systolic and diastolic pressure and can serve as an accessible, relatively safe complementary therapy. Nevertheless, further large-scale rando.

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