THE COMPLEMENTARY THERAPY USED FOR HYPERTENSION: A SYSTEMATIC REVIEW

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Abstract

***Introduction*:** *Hypertension is the most dominant risk factor for cardiovascular disease, which is the most frequent cause of deaths all over the world. Patients' hypertension requires nonpharmacological interventions as an integral part of case management. Complementary and alternative medicine are recognized and accepted in several countries, also could be recommended for lowering blood pressure. The aim of this study is to explore the most popular method of CAM used for hypertension.*

Method: *This study was conducted by searching online databases between 2012 - 2022, using PRISMA 2020 to find specific articles. The PICOT framework that be used: adult with hypertension, complementary use, blood pressure. Articles were sourced from Elsevier, Plos One, NIH, Lancet, BMC, Sage, Springer, Wiley, Lippincott, and Garuda. The researcher obtained 23 articles for final review, with inclusion criteria for people with hypertension that use CAM as a therapy to prevent elevated blood pressure.*

Result: *10 articles were RCT, 7 articles were cross sectional, 4 articles were experiments, 1 article was cohort, and 1 article was mixed method. The result showed that the CAM was effective in lowering blood pressure. People with hypertension most often used herbal medicine, acupuncture, massage, acupressure, yoga, meditation, tai chi, reflexology, guided imagery, and aromatherapy oil (in sequentially).*

Conclusion: *Perception/belief, lack of information, experience and culture affect people's behavior in choosing medical drugs over CAM. Therefore, health care should promote CAM and provide patients with non-pharmacological intervention.*

Keywords: *complementary, therapy, hypertension, blood, pressure*

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INTRODUCTION

Hypertension is a serious medical condition that can increase the risk of heart, brain, kidney, and other diseases. Hypertension can be managed by reducing modifiable risk factors including unhealthy diets (excessive salt consumption, a diet high in saturated fat and trans fats, low intake of fruits and vegetables), physical inactivity, consumption of tobacco and alcohol, and being overweight or obese. People with hypertension should be reducing and managing mental stress, regularly checking blood pressure and consulting with health professionals, treating high blood pressure, and managing other medical conditions (Verma et al., 2021).

Previous studies show that there were many antihypertensive medications and lifestyle changes are proven to reduce blood pressure (Brook et al., 2013); lifestyle modification is the first-line intervention in treatment (Herrod et al., 2017). Herbal medicine could be one of the hypertension treatments (Mohamad Roni Alfaqih & Mei Fitria Kurniati, 2021). Proper management of hypertension may require both pharmacological and non-pharmacological interventions. Non-pharmacological interventions help reduce the daily dose of antihypertensive medication and/or delay the progression from prehypertension to hypertension stage (Herrod et al., 2017; Verma et al., 2021).

Complementary and alternative medicine has often been used to treat musculoskeletal pain, colds, chest congestion, depression, anxiety, muscles, rigidity. Complementary and alternative medicine is famous for many reasons. Management of biochemical and physical signs of disease is not one and only target of the CAM physician, but also considers the mental, social, emotional, and nutritional circumstances in which the disease occurs. The benefit of mind-body and body-dependent interventional techniques is ataractic and relieve stress (Iqbal BEMS & Hct, 2022).

Complementary and alternative medicine can be integrated into general medicine for hypertension by considering opinions and practices. It is important for healthcare professionals to ask patients about their intention of CAM methods to plan their treatment effectively (Gökçe & Gürdoğan, 2019). CAM therapies can be used in combination with conventional antihypertensive drugs to achieve optimal blood pressure control (Guerrero-García & Rubio-Guerra, 2018). Fixed-dose combination therapy, which combines multiple active agents in a single formulation, has been proven to be effective in lowering blood pressure and improving patient compliance (Wan et al., 2014). Integrating CAM into general medicine for hypertension can provide a more holistic and individualized approach to patient care, enhancing overall health and well-being (Nimbalkar, 2014).

The aim of this study is to explore the most popular method of CAM used for hypertension.

MATERIALS AND METHODS

Study Design and Search Strategy

The systematic review design was reviewed from eligible full-text articles. Comprehensive search was conducted in ten electronic databases, including Wiley, Elsevier, BCM, Sage, Plos One, NIH, LLW, Lancet, Springer, and Garuda. Publications that have become references from the last ten years, namely 2012 to 2022 and full-text articles in English. When searching for journals or filtering the articles, researchers

used keywords and the Boolean operator (AND). The keywords used in this systematic review were "Complementary", "Hypertension", "Non-Pharmacology", "Blood Pressure", "CAM".

Search strategy and Selection criteria

The journal search process was carried out from 2012 to 2022. The search for articles using keywords was limited by inclusion and exclusion criteria. The inclusion criteria in this systematic review were (1) People (adult) with hypertension that use CAM as a therapy to prevent elevated blood pressure (2) The study have been published in English language; reported past 10 years. The exclusion criteria were (1) a book chapter (2) summarizes data (3) the letters to the Editor (4) a qualitative study and (5) treatment of hypertension used in animal models.

The data obtained were then selected one by one by the researcher to determine the suitability of the desired article and to remove duplicate articles or those that did not meet the criteria. After getting the articles that match the research, the articles were analyzed one by one and grouped to get the results. The next step was the step to discuss the point based on the selection results.

Data collection

A total of 648 articles were identified. After screening, there were 460 articles that did not meet the criteria; and 41 articles removed. The next step was a depth assessment of the chosen 147 articles; 138 articles as a candidate abstract and 115 articles were rejected. Finally, there were 23 articles included in synthesis.

RESULTS

By following the search strategy and paying attention to the inclusion and exclusion criteria, 23 full-text articles were obtained and deserved to be analyzed. Research study analysis of title, author, study design, population, therapy, and results of study.

Ten articles were RCT, seven articles were cross sectional, four articles were experiments, one article was cohort, and one article was mixed method. These articles describe several alternative treatments in the form of complementary therapies that can be used as treatment by hypertensive patients.

The articles discussed the treatment of hypertension by means of acupuncture, acupressure, aromatherapy, exercise, herbs, massage, meditation, relaxation, and Tai Chi. Most of the articles discuss the use of herbs as a treatment for hypertension. The studies conduct in several countries, consist of Uganda, Thailand, China, Indonesia, Jamaica, and Switzerland.

Table 1. Type of CAM used for hypertension.

Type of CAM	Frequency
Herbal	6
Acupuncture	4
Massage	4
Acupressure	3
Energy therapies (Meditation, Yoga, Tai Chi, Spiritual healing, Deep breathing, Exercise training)	6
Total	23

DISCUSSION

Herbs

Herbal medicine is one of the most used complementary and alternative medicine for hypertension, such as Garlic (Amalia & Luukmanto, 2021) and Ginger (Olayemi et al., 2015).

The study found that, in the garlic capsule group was found the average MAP decreased from week 0 to week 4 by 21 mmHg, after consuming garlic capsules at a dose of 1500 mg/day (Amalia & Luukmanto, 2021). Garlic have been effective in treating hypertension and CVD. However, it was not regulated or supervised carefully, and it use could lead to serious complications or interactions with its combination with traditional medicines (Chrysant & Chrysant, 2017).

Ginger was advantageous for hypertensive patients (Olayemi et al., 2015). In a study conducted in Western Jamaica, herbal medicine (Ginger, Noni Juice, Neem tree) was found to be the most common CAM method used by hypertensive patients (Adeniyi et al., 2021). Another study found that plant-based treatments for hypertension are very common among low and middle-income countries (Kifle et al., 2021b).

Alternative medicine using herbs is considered effective for hypertension (Nuwaha & Musinguzi, 2013). Herbs are quite safe and effective in inducing moderate reductions in BP either single dose or in combination with current antihypertensive drugs. However, it is important to note that the effects of herbal remedies can vary depending on the preparation, dosage, and individual factors, and some may interact with prescription medications (Chrysant & Chrysant, 2017).

Reasons for using alternative medicine include fear of modern medicine, their previous good experience in consumption (Nuwaha & Musinguzi, 2013), age, gender, residence, education, income, complications, duration of hypertension, also family history (Kifle et al., 2021b). In Western Jamaica, the study found that factors such as self-reported knowledge of complementary and alternative medicine (CAM), the beliefs about CAM were significantly associated with its use among patients (Owusu et al., 2020).

The Chinese herbal formula not only stabilizing blood pressure (BP) but also improving clinical symptoms and quality of life, reversing hypertension-related risk factors, and protecting target organs to increase chances of long-term survival (Xiong et al., 2013).

Acupuncture

Acupuncture methods have been found to effectively control blood pressure (Li et al., 2019). Acupuncture parameters, such as acupuncture modalities, selection of acupuncture points, as well as frequency and duration of treatment sessions, can contribute to optimal acupuncture outcomes for the treatment of hypertension (Lu et al., 2015).

Acupuncture has the potential to lower blood pressure in patients with hypertension by activating various pathways in the body (Fan et al., 2020). It was found that the mechanism of acupuncture lowers blood pressure related to the regulation of renin-angiotensin-aldosterone system, vascular endothelium, oxidative stress, and neuroendocrine system (Li et al., 2019).

Acupuncture significantly reduced systolic blood pressure (Wang et al., 2013). Acupuncture at LR3 and KI3 has a control effect on essential hypertension and targets cerebral regions involved in blood pressure regulation (Zhang et al., 2021). Study in Japan, show that acupuncture treatment reduced arterial blood pressure in patients with mild hypertension (Kimura et al., 2021). On the other hand, several articles reported that treatment with acupuncture had little effect on lowering blood pressure in patients with mild hypertension (Jacqueline Phillips, 2020; Silva et al., 2020; Zhang et al., 2021).

Massage

Foot and back massage have been found to be effective in reducing blood pressure and improving sleep quality in females with essential hypertension (Suryaningsih et al., 2022). In a randomized controlled study, females with essential hypertension received six sessions of foot and back massage twice weekly for three weeks, showed a reduction in blood pressure values and anxiety after the massage sessions (Arslan et al., 2021). Another study found that massage (tactile massage) resulted in short-term reductions in blood pressure, heart rate, and blood glucose in women with primary insomnia (Sjöling et al., 2012).

Massage therapy is effective in controlling blood pressure. The effects on blood pressure last for at least 72 hours. Findings of the study indicated that massage therapy was a safe, effective, applicable, and cost-effective intervention in controlling BP of the pre-hypertension (Givi, 2013).

Acupressure

Acupressure is effective for managing hypertension-related symptoms. It was significantly different from the control group after adjusting for confounding factors, including gender, age, and drug use (Biçer et al., 2021). Further, acupressure therapy can reduce systolic and diastolic blood pressure in patients with hypertension and is a simple non-invasive technique that nurses can perform independently (Zubaidah et al., 2021).

The mechanism of acupressure for hypertension is to accelerate blood-flow circulation and reduce blood pressure (Dermawan et al., 2019). Acupuncture activates brain regions to alleviate autonomic response. Acupuncture activates pathways in the afferent, central, and efferent pathways to inhibit high blood pressure(Fan et al., 2020). Acupressure on the Taichong acupoint can lower BP in hypertensive patients and may be included in the nursing care plan for hypertension, however, additional studies are needed to determine the optimal dosage, frequency, and long-term effects of this therapy (Lin et al., 2016).

The other complementary

The Other complementary therapies included Tai Chi, exercise, meditation, and relaxation.

Tai Chi exercise improves blood pressure and quality of life in patients with hypertension (Pan et al., 2021). Tai Chi protects the cardiovascular system in middle age (Wen & Su, 2021). Tai Chi may lower sympathetic tone and increase parasympathetic tone, resulting in changes in the autonomic nervous system and reducing blood pressure. Study in Korean medical practice shows that Tai Chi as non-medication approaches that could be used to treat hypertension (Lee et al., 2020).

Meditation, deep breathing, and relaxation have been found to reduce hypertension through various mechanisms. These practices can exert beneficial effects on autonomic tone and reflexes, leading to a decrease in blood pressure acutely and after long-term practice (Citra Wisuda et al., 2022). Meditation may reduce hypertension through effects on autonomic tone, autonomic reflexes, the mind-heart connection, and the anti-inflammatory reflex (Olex et al., 2013). Deep breathing relaxation decreases blood pressure in people with hypertension (Fitriyah et al., 2019).

CAM should not be used as a substitute conventional medical treatments for hypertension. Rather, it can be used as a complementary approach to conventional

treatments to help manage blood pressure and improve overall health. It is also important to consult with a healthcare provider before using any CAM therapies to ensure safety and effectiveness. Complementary therapy is integrated with modern therapy affecting harmony individual from the aspect of biological, psychological, and spiritual.

CONCLUSION

Complementary medicine can be used as an alternative option for the treatment of hypertension. Hypertensive patients can choose several ways such as herbs, acupuncture, massage, acupressure, aromatherapy, exercise, meditation, relaxation, and Tai Chi to lower or control blood pressure. However, experiences, culture, Perception/belief, and lack of information affect people's behavior in choosing medical drugs over Complementary and Alternative Medication. Therefore, health care should promote CAM and provide patients with non-pharmacological intervention as an integral part of case management in hypertension.

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Conflict of Interest

No Potential Conflict of interest was reported by the author(s)

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Appendices 1. Article selection of CAM used for hypertension.

No	Title Author	Study Design	Population	Therapy	Result
1.	A Randomized Trial of Tai Chi on Preventing Hypertension and Hyperlipidemia in Middle-Aged and Elderly Patients (Wen & Su, 2021)	Randomized controlled trial	n = 66 patients with hypertension and hyperlipidemia	Tai Chi	- Wu-style Tai Chi group showed significant improvement in primary outcomes - Wu-style Tai Chi had better effect on hypertension and hyperlipidemia compared to simplified Tai Chi
2.	Acupuncture at LR3 and KI3 shows a control effect on essential hypertension and targeted action on cerebral regions related to blood pressure regulation (Zhang et al., 2021)	Random. The single-blind; LFF analysis	n = 29 subjects	Acupuncture at LR3 and KI3	- Acupuncture at LR3 and KI3 shows control effect on essential hypertension. - Acupuncture has targeted action on cerebral regions related to blood pressure regulation.
3.	Acupuncture for essential hypertension (Wang et al., 2013)	The randomized controlled trials (RCTs)	n = 35 randomized trials (involving 2539 patients)	Acupuncture	- Acupuncture significantly reduced SBP (systolic blood pressure) - Methodological flaws limit the conclusions on efficacy
4.	Acupuncture for patients with mild hypertension: A randomized controlled trial (Zheng et al., 2019)	Single- blind, sham-controlled, randomized trial	n = 428 patients with systolic blood pressure (SBP) from 140 to 159 mm Hg and/or with diastolic blood pressure (DBP) from 90 to 99 mm Hg.	Acupuncture	- Acupuncture had a small effect size on the reduction of blood pressure in patients with mild hypertension. - Acupuncture was superior to sham acupuncture and waiting-list control at week 9.
5.	Clinical outcomes in hypertensive or diabetes patients who concomitantly use complementary medicines in Lagos, Nigeria (Olayemi et al., 2015)	Cross-sectional study design	n = 500 patients with a diagnosis of diabetes mellitus or hypertension or diabetic hypertensive.	Herbal	- 64% of subjects have used complementary medicines - Ginger is the commonly used complementary medicine
6.	Complementary medicine uses in US adults with hypertension: A nationally representative survey (Kohl-Heckl et al., 2022)	Cross-Sectional Analysis	n = 26,742 data	Meditation (spiritual meditation, yoga, mindfulness meditation, relaxation, mantra meditation, guided	- 22.7% of participants reported having arterial hypertension - Participants with hypertension were less likely to use complementary medicine therapies

No	Title Author	Study Design	Population	Therapy	Result
				imagery, tai chi, and qi gong)	
7.	Complementary and alternative medicine use and its associated factors among hypertensive patients in Debre Tabor General Hospital, Ethiopia (Kifle et al., 2021a)	Cross-sectional study	n = 450 hypertensive patients	Herbal, Exercise, Holy water	- 67.8% of hypertensive patients used complementary and alternative medicine (CAM) - Factors associated with CAM use: female gender, age over 45, rural residence, higher education, high income, presence of complications, duration of hypertension over 5 years, and family history of hypertension.
8.	Deep Breathing Relaxation for Decreasing Blood Pressure in People with Hypertension (Fitriyah et al., n.d.)	Pre-Experimental One Group Pretest-Post-test design	n = 30 People	Deep breathing relaxation	- Deep breathing relaxation decreases blood pressure in people with hypertension. - Most respondents experienced a decrease in blood pressure after deep breath relaxation, with some still categorized as hypertension stage 2.
9.	Effectiveness of Acupressure on the Taichong Acupoint in Lowering Blood Pressure in Patients with Hypertension: A Randomized Clinical Trial (Lin et al., 2016)	Randomized controlled trial	n = 80 (40:40)	Acupressure on the Taichong Acupoint	- Acupressure on Taichong acupoint lowers blood pressure. - Further studies needed to determine optimal dosage and long-term effects
10.	Effects of a single bout of power exercise training on ambulatory blood pressure in older adults with hypertension: A randomized controlled crossover study (Schimitt et al., 2020)	Randomized controlled clinical trial with crossover design	n = 46 (23:23)	Power exercise training (PT)	- Office systolic/diastolic BP decreased after power exercise training - Hypotensive effect not sustained under ambulatory conditions
11.	Effects of acupuncture on obstructive sleep apnea severity, blood pressure control and quality of life in patients with hypertension: A randomized controlled trial (Silva et al., 2020)	Case control, double-blinded study.	n = 44 patients	Acupuncture	There were no differences daytime or nocturnal BP between the acupuncture and sham-acupuncture groups ($p > .05$)

No	Title Author	Study Design	Population	Therapy	Result
12.	Factors associated with the use of complementary and alternative therapies among patients with hypertension and type 2 diabetes mellitus in Western Jamaica: a cross-sectional study (Owusu et al., 2020)	Cross-sectional study using an investigator-administered questionnaire	n = 311 hypertension; n = 130 DM	Herbal, Relaxation technique and Spiritual healing	- 79% of participants with hypertension reported using complementary and alternative medicine. - 65% of participants with type 2 diabetes mellitus reported using complementary and alternative medicine
13.	Herbs Used for the Treatment of Hypertension and their Mechanism of Action (Chrysant & Chrysant, 2017)	Randomized controlled trial	n = 40 Patient Hypertension	Herbal	- Herbs have been effective in treating cardiovascular disease and hypertension. - There is scientific evidence supporting the use of herbs.
14.	Impact of classic massage on blood pressure in patients with clinically diagnosed hypertension (Walaszek, 2015)	Experimental	n = 10 women aged 60-68	Massage	- Blood pressure values decreased over the course of the study. - Diastolic blood pressure was lower than the norm.
15.	Prevalence, determinants, and outcomes of traditional, complementary, and alternative medicine use for hypertension among low-income households in Malaysia and the Philippines (Palileo-Villanueva et al., 2022)	Cross-sectional data analysis	n = 946 adults with hypertension	Natural and biologically-based products; Manipulative and body-based systems; Energy therapies; non-medical, non-herbal	- Prevalence of TCAM use for hypertension higher in Philippines - TCAM use not strongly associated with hypertension management outcomes
16.	Randomized Control Trial Complementary Therapy Garlic (Allium Savum Linn) Capsules in Hypertension Patients (Amalia & Luukmanto, 2021)	Randomized Controlled Trial (RCT)	n = 60 (30:30)	Herbal	There is a significant difference between the MAP value before and after administration of garlic capsules.
17.	The Effect of Acupressure on Blood Pressure Level and Pulse Rate in Individuals with Essential Hypertension (Biçer et al., 2021)	Randomized control trial	n = 91 people including 47 in the intervention group and 44 placebo group	Acupressure	- Acupressure on Neiguan acupuncture point regulates blood pressure. - Effective for management of hypertension-related symptoms
18.	The Effectiveness of Acupressure Therapy in Lowering Blood Pressure in Patients with Hypertension (Zubaidah et al., 2021)	Pre-experimental design	n = 15 people	Acupressure	- Acupressure therapy resulted in a decrease in blood pressure. - The effect of acupressure therapy was significant.

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19.	The effects of tactile massage (TM) on blood pressure, heart rate and blood glucose in a sample of women suffering from primary insomnia (Sjöling et al., 2012)	Eexperimental prospective design	n = 10 Women	Massage	- Short-term reduction in blood pressure, heart rate, and blood glucose - No long-term effects observed for the studied variables
20.	The influence of foot and back massage on blood pressure and sleep quality in females with essentials hypertension: a randomized controlled study (Arslan et al., 2021)	Randomized controlled study	n = 90 patients 60 were in intervention group (foot and back massage group) and 30 in control group	Massage	- Foot and back massage reduced blood pressure. - Foot and back massage improved sleep quality.
21.	The use of complementary and alternative medicine among hypertensive and type 2 diabetic patients in Western Jamaica: A mixed methods study (Adeniyi et al., 2021)	A mixed method	n = 60; adults (≥18 years of age)	Herbal	- 98% of participants reported using alternative treatments - 73-80% felt that herbal medicines controlled their conditions
22.	Use of alternative medicine for hypertension in Buikwe and Mukono districts of Uganda: a cross sectional study (Nuwaha & Musinguzi, 2013)	Cross sectional survey	n = 258 people with hypertension	Herbal	- 56.2% of people with hypertension had used alternative medicine - 28.6% were currently using alternative medicine alone or in combination with modern medicine - Alternative medicine is effective for hypertension
23.	Use of Complementary and Alternate Medicine in Women with Heart Disease, Hypertension and Diabetes (Sibbritt et al., 2015)	Cohort	n = 9,748	Massage	- Women with hypertension and diabetes are less likely to use complementary and alternative medicine (CAM) - Use of CAM by women with heart disease, hypertension, and/or diabetes is lower compared to other chronic illness groups