

# Herbal Medicine in Elderly with Hypertension

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**Abstract:** The researcher previously described various age-related cardiovascular changes, including decreased heart rates, reduced oxygen extraction, stiffening of the arteries, vasoconstriction, elevated systolic blood pressure, thickening of the heart muscle, decreased diastolic filling rate, alterations in rhythmic rate, and prolongation of the action potential. Various prescription medications, non-prescription substances, and herbal supplements have the potential to impact blood pressure and complicate the management of hypertension in persons undergoing treatment. Approximately 70-80% of the global population depends on traditional herbal medicine as their main source of primary healthcare. The purpose of this study was to ascertain the prevalence of herbal medication utilization among elderly individuals with hypertension, as well as to identify the most frequently employed herbs in this population. The prevalence of hypertension in the older population in this study exceeded the national average, since they utilized herbal medicine at different intervals and durations. The prevalence of herbal medicine in this study was more than that observed in a study conducted in black South African communities, but lower than the prevalence reported in the study conducted in India.

## 1 INTRODUCTION

Hypertension, medically referred to as HTN, is a prevalent condition that impacts a significant number of individuals, causing elevated blood pressure levels. High blood pressure is defined as having a blood pressure equal to or more than 140/90 mmHg (millimeters of mercury). There are around 970 million individuals globally who suffer hypertension. By 2025, it is projected that 1.56 billion adults would be afflicted with it. (Saseen JJ, 2014). The overall rate is comparable among males and females but differs according to age. Blood pressure readings rise with advancing age, and hypertension is highly prevalent among the older population. Among those aged 65 years or older, women are more susceptible to high blood pressure compared to men. A higher prevalence of hypertension is observed among African Americans, with 47% of women and 43% of men being affected. The prevalence of obesity in Caucasians is 31% in women and 33% in men, while in Mexican

Americans it is 29% in women and 30% in men. The lifetime probability of developing hypertension (HTN) among those aged 55 and above with normal blood pressure (BP) is 90%. The etiology of high blood pressure remains undetermined for the vast majority of people. This is classified as main or essential hypertension. Secondary hypertension, diagnosed as such due to a specific etiology, affects a minority of people. The prevalence of primary hypertension is observed in more than 90% of people with high blood pressure. (Saseen JJ, 2014). Essential hypertension is not curable, however it can be managed with effective treatment, which may include lifestyle modifications and medications. The development of primary HTN may be significantly influenced by genetic factors. Chronic hypertension typically progresses gradually over an extended period of time. (Olin and Pharm, 2018). The latest guidelines for controlling high blood pressure suggest that those aged 60 and above should have more lenient blood pressure targets ( $\geq 150/90$

mmHg) compared to those below this age. (Post Hospers et al., 2015)

The researcher previously described various age-related changes to the cardiovascular system, including a decrease in heart rates, reduced oxygen extraction, stiffening of the arteries, vasoconstriction, elevated systolic blood pressure, thickening of the heart muscle, decreased diastolic filling rate, altered rhythmic rates, and prolonged action potential. The autonomic nerve system (ANS) undergoes structural and functional changes that are intimately linked to the process of aging. Alterations were detected in the autonomic nerves and ganglia. Significant alterations were also observed in the recordings obtained from sympathetic nerves of skeletal muscle. Researchers suggested that the process of aging may increase the baseline nor-epinephrine level and decrease heart rate variability. The process of aging leads to the stiffening of arteries and the thickness of their walls, which in turn impacts the structure and function of the heart. It is widely recognized that systolic blood pressure tends to increase with age. Hypertrophy is the result of the enlargement of cardiac myocytes, which occurs when more sarcomeres are added. Furthermore, the quantity of myocyte myocardium decreases and all heart components get stiffer as age increases. (Nabil Alama, 2017)

It is recommended to treat high blood pressure in older persons ( $\geq 65$  years old) who live in the community and are not in a healthcare facility. The treatment should be considered if their average systolic blood pressure is equal to or higher than 130 mm Hg, with a target systolic blood pressure of less than 130 mm Hg. When making judgments about how aggressively to lower

blood pressure and which medications to use, it is reasonable to include clinical judgment, patient preference, and a team-based approach to assessing risk for older adults ( $\geq 65$  years old) with hypertension, several other health conditions, and a limited life expectancy. Lowering blood pressure is a realistic approach to avoid cognitive decline and dementia. (Whelton PK, Carey RM, Aronow WS, 2018)

The management of blood pressure is often challenging, resulting in just 30% of individuals on medication achieving optimal control of their blood pressure. (Pourjabali et al., 2017). BP is regulated by several means, including nitric oxide (NO), brain mechanisms, and renal-endocrine systems. Various antihypertensive medications, including diuretics,  $\beta$ -blockers, calcium-channel blockers, and renin-angiotensin system inhibitors such as angiotensin-converting enzyme inhibitors and angiotensin II receptor blockers, are employed either individually or in conjunction to manage this condition. However, antihypertensive medications are associated with many side effects such as impaired kidney function, persistent cough, and Angioedema, among other adverse reactions. Therefore, herbal medicine serves as an alternative for managing hypertension. (Landazuri, Chamorro and Cortes, 2017). Various plants are utilized in folklore or traditional medicine. (Upurety et al., 2012)

Various prescription medications, non-prescription substances, and herbal supplements have the potential to impact blood pressure and complicate the management of hypertension in persons undergoing treatment. (Lenfant et al., 2003). Approximately 70-80% of individuals globally depend on traditional herbal

medicine as their main source of basic healthcare. (Upreti et al., 2012). Approximately 95% of drugs in India are derived from plant-based formulations using ancient methods such as Unani, Ayurveda, Homeopathy, and Siddha. These formulations heavily rely on plants that are gathered from the wild. Herbal medicine enjoys a strong reputation in emerging nations such as India and China, gaining popularity among both urban and rural populations due to its safety, effectiveness, and cost. Approximately 8,000 plant species have been documented for their ethnomedicinal significance. Indigenous traditional medicine, based on traditional knowledge, has been instrumental in the development of innovative healthcare solutions derived from plants. (S. Balamurugan, S. Vijayakumar, S. Prabhu, 2018)

This is utilized for the control of hypertension. Some interventions possess clinical evidence, while others possess scientific evidence regarding their mechanism of action. However, there are some interventions that lack such evidence. However, it is indisputable that there exists an abundant and limitless supply of these plants that necessitate thorough investigation. (Landazuri, Chamorro and Cortes, 2017). A total of 42 medicinal plants, such as sage, barberry, eastern grapes, yarrow, hawthorn, rhubarb, sheng, olive, buckwheat, spring chamomile, milk thistle, jujube, strawberry, Ziziphus, indole, garlic, fennel, and almonds, have been suggested for the treatment of hypertension. (Pourjabali et al., 2017). The purpose of this screening is to identify the different types of herbs that are often utilized by the elderly in the Gisikdrono community.

## 2 METHOD

We conducted a descriptive observational research. The study was carried out at RW 1, Gisikdrono Urban Communities, West Semarang district, in the year 2017. A total of fifty-four elderly individuals were officially enrolled at the Gisikdrono Elderly Integrated Health Post. The samples were collected using the purposive sampling technique. We identified 39 elderly individuals who satisfied the specified inclusion criteria (being 60 years of age or older) and exclusion criteria (lack of dementia, ability to talk, and ability to communicate). The collection of primary data involved conducting interviews with older individuals and performing physical inspections. The researcher adhered to the ethical norm of informed consent. The concept of informed consent encompasses the principles of anonymity, secrecy, truthfulness, and the avoidance of harm. The ethical clearance of the Faculty of Medicine, Diponegoro University, with the reference number No.22/EC/FK-RSDK/I/2017, has been authorized by the Research Ethics Committee.

The patient's blood pressure was measured bilaterally on the right brachial artery using a standard mercury sphygmomanometer while in a seated position, after a 5-minute period of rest.. (Tamosiunas et al., 2019). If a blood pressure reading over 140/90 mm Hg was observed, a third reading was obtained after a duration of 30 minutes. The blood pressure measurement selected was the lowest among the three recorded values. (Khane, Surdi and Bhatkar, 2011).

### 3 RESULT

We recruited a total of 15 elderly participants, accounting for 38% of the sample, who were between the ages of 60 and 64. Additionally, there were 8 elderly individuals, representing 21% of the sample, who were between the ages of 65 and 69. Furthermore, there were 4 elders, comprising 10% of the sample, who were between the ages of 70 and 74. Moreover, there were 9 elders, accounting for 23% of the sample, who were between the ages of 75 and 79. Lastly, there were 3 older adults, making up 8% of the sample, who were above the age of 80. The average age of all participants was 69.5 years. We encountered a total of 30 female elders, which accounts for 77% of the participants. Additionally, we identified 9 male participants, constituting 23% of the total. The indicators of Indonesia's general health status have significantly improved, as seen by the increase in life expectancy from 66.3 years in 2000 to 69.1 years in 2015. (World Health Organization, 2020). There is a 90% likelihood that the life expectancy at birth for South Korean women in 2030 will exceed 86.7 years, which is now the greatest international life expectancy recorded in 2012. Additionally, there is a 57% chance that it will surpass 90 years.. (Kontis *et al.*, 2017).

We acquired a total of 9 individuals (23%) who were elderly and had either hypertension or a prior medical record of complaints. Conversely, 30 participants (77%) had no previous history of hypertension. We acquired 28 old individuals, which accounts for 72% of the total, who exhibited blood pressure levels that above the usual range. Additionally, we observed 11 elderly individuals, constituting

28% of the total, who displayed blood pressure within the normal range. Blood pressure was measured in the first month and found to have an average reading of 132/83 mmHg. Following thorough self-assessment and professional advice, during the fifth month, we had a mean blood pressure reading of 127/82 mmHg. According to JNC 7, blood pressure (BP) should be classified into four categories: normal, raised, stage 1 hypertension, or stage 2 hypertension. (Lenfant *et al.*, 2003)

Elderly blood pressure distribution as per the guidelines of the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7). In the initial month, 15.4% of elderly individuals had normal blood pressure (BP), 48.7% had prehypertension, 23% had stage 1 hypertension, and 12.8% had stage 2 hypertension. By the fifth month, the percentages changed to 12.8% for normal BP, 64.1% for prehypertension, 15.4% for stage 1 hypertension, and 7.7% for stage 2 hypertension.

Hypertension was the predominant ailment (57.6%) observed among the senior population in Indonesia. (Sekplin A.S. Sekeon and , Angela F.C. Kalesaran, 2017) The study revealed a greater prevalence of hypertension (72%) compared to the declared national prevalence of hypertension based on primary health research in 2013 (25.8%). The prevalence of hypertension among the majority was greater than the provincial prevalence reported by the Ministry of Health in 2014, which was 27.1%. In 2016, the Riskesdas survey reported a prevalence of 8.7%. (Ajeng Tias Endarti, 2016). However, it is nearly equivalent to the prior study conducted in Ponorogo, which reported a

68% similarity. (Cholik Harun Rosjidi , Laily Isro'in, 2017)

Raggi documented that the incidence of hypertension among the senior population was 23.1% in three European nations.. (Raggi *et al.*, 2016) The prevalence of hypertension in Sri Lanka was 30.6%, and it had a substantial association with the quality of life among the senior population. (Rathnayake and Siop, 2015) Hypertension is a prevalent and significant conventional risk factor for cardiovascular disease and stroke worldwide.(Sekplin A.S. Sekeon and , Angela F.C. Kalesaran, 2017) . Out of the participants, we obtained 10 individuals (26%) who had seniors in their family with a history of hypertension, while 29 participants (74%) had no such family history. The prevalence of hypertension among senior individuals with a positive family history is 26%, which is much lower compared to the previous study conducted in China, where the prevalence was 67.5%. Additionally, individuals with a positive family history had higher blood pressure values. Multiple researchers have discovered that genetic factors significantly contribute to the development of hypertension. Individuals who have a genetic predisposition to hypertension due to their family history are at a significantly increased risk of developing this condition, with a 2 to 4-fold higher likelihood. (Liu *et al.*, 2015). Another study discovered a positive correlation between the prevalence of hypertension and the number of affected families. Furthermore, it was observed that mothers with hypertension had a greater impact than fathers, and the presence of hypertension in first-degree relatives was associated with an increased risk of developing hypertension, particularly

in second-degree relatives. (Tryjanowski, Sparks and Kosicki, 2006)

**Table 1. Herbal use as hypertension**

<b>Herbal name (Indonesian )</b>	<b>Latin name</b>
Tawon Liar	<i>Apis Dorsata</i>
Jinten Biru	<i>Plectranthus Amboinicus</i>
Sinshe Prostakur	<i>Serenoa Repens Fructus</i>
Cabe Puyang	<i>Piper Retrofractum</i>
Brotowali	<i>Tinospora Cordifolia</i>
Kunir Asam	<i>Curcuma Longa Linn. Syn. Curcuma Domestica Val.</i>
Belimbing Manis Mentimun Seledri	<i>Averrhoa Carambola, Cucumis Sativus, Apium Graveolens</i>
Godong Imbo	<i>Melia Azedarachta</i>
Minyak Zaitun	<i>Olea Europaea</i>
Belimbing Wuluh	<i>Averrhoa Bilimbi</i>
Susu Kedelai	<i>Glycine Max</i>
Temulawak	<i>Curcuma Zanthorrhiza</i>

The table displays herbal remedies that are used as supplemental treatments to doctor-prescribed medications. The elderly consumed these herbal supplements either once, twice, or thrice a day, or occasionally at irregular intervals. Over a year, a significant proportion of senior individuals, over 25%, concurrently use prescription medicines and herbal medicine without disclosing this information to their doctor.

Herb-drug interaction was frequently overlooked by healthcare providers until recently. The majority of well-trained physicians have insufficient understanding regarding herbal medicine and its potential for medication interactions. Patients may fail to disclose their concurrent usage of herbal medicine to their doctor. (Meshesha *et al.*, 2020). This study was conducted to ascertain the incidence of herbal medicine utilization and identify the frequently employed herbs among older individuals with hypertension. The rate of herbal medication usage was greater than that observed in a study conducted in black South African communities, where 21% of individuals used herbal medicine for hypertension treatment. However, it was lower compared to a study conducted in India, which revealed that 63.9% of hypertensive patients used herbal medicine. (Hughes *et al.*, 2013)

#### 4 CONCLUSIONS

The prevalence of hypertension among the elderly in this study exceeded the national average, as they utilized herbal medicine at different intervals and durations. The prevalence of herbal medicine in this study was more than that observed in a study conducted in black South African communities, but lower than the prevalence reported in the study conducted in India. Additional investigation is required to ascertain the specific compound responsible for reducing blood pressure.

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