

ORIGINAL ARTICLE

The Effectiveness of a Formulation of Ginger and Lemongrass Rhizome For Reducing Blood Pressure Through Warm Water Soak Therapy on The Feet

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ABSTRACT

Introduction: Hypertension is a complex health problem and is called a silent killer because it can cause sudden attacks and death. The incidence of hypertension increases with age. The purpose of this study was to analyze the effectiveness of warm water foot soak therapy using ginger rhizome and lemongrass on blood pressure in hypertensive patients. **Methods:** This study used a quasi-experimental design with a one-group pre-post test design approach (using only the experimental group). The sample in this study amounted to 18 respondents selected by purposive sampling. Data were collected through observation sheets and analyzed using the Wilcoxon signed rank test. **Results:** The results showed that from the initial data collection, half of the respondents (9 elderly) experienced moderate hypertension (BP>160 and/or TTD>100 mmHg). Furthermore, each respondent was given warm water foot soak therapy using ginger rhizome and lemongrass for 4 weeks. From the final data collection results, 12 respondents (72.2%) experienced mild hypertension (BP 140-159 mmHg and/or 90-99 mmHg) and a small number of respondents experienced moderate hypertension (BP>160 and/or 100 mmHg) namely 2 respondents (11.1%). The results of the Wilcoxon test obtained a p value of 0.032 α (0.05), so this study concluded that the formulation of ginger and lemongrass rhizomes applied through warm water foot soak therapy is effective in lowering blood pressure in elderly people with hypertension. **Conclusion:** Warm water foot soak therapy with ginger and lemongrass rhizomes can be an alternative non-pharmacological treatment for elderly people with hypertension.

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INTRODUCTION

Hypertension is currently a serious health problem because complications resulting from uncontrolled increases in blood pressure can result in heart disease, stroke, kidney disease, retinopathy, peripheral vascular disease, nerve disorders, and brain disorders. (1).

Hypertension is a disease without clear symptoms (silent disease) because patients do not know they have hypertension or do not know it before checking their blood pressure condition. (2). If hypertension sufferers do not or have not received proper management in controlling their blood pressure, the incidence of non-communicable diseases will increase and health problems in society will become increasingly difficult to overcome. (3). Facts show that there are still many hypertension patients who are not aware that they are suffering from hypertension and take it lightly when they experience several signs and symptoms of hypertension. (4).

Based on data from the World Health Organization (5), An estimated 1.28 billion people worldwide aged 30-79 years suffer from hypertension. The Ministry of Health of the Republic of Indonesia reported that the number of adults in Indonesia suffering from hypertension reached 34.1% of the total population. (6). Of that number, it is known that 8.8% were diagnosed with hypertension and 13.3% of those diagnosed with hypertension did not take medication and 32.3% did not take medication regularly. This shows that most hypertensive patients do not know that they have hypertension so they do not get treatment. (4). The increasing number of hypertension sufferers is indirectly influenced by changes in lifestyle and unhealthy eating patterns. In addition, the behavior of not checking health regularly is also identified as one of the factors causing late detection and treatment of hypertension. (7).

Hypertension patients throughout their lives must be able to accept the disease they suffer from considering that hypertension is a chronic disease. Blood pressure in hypertensive patients can be controlled through two methods, namely pharmacological therapy and non-pharmacological therapy. Pharmacological therapy for hypertension in the elderly involves the use of drugs to lower blood pressure. The choice of drugs and doses must be adjusted to the health condition of the elderly, including factors such as other diseases suffered, drug side effects, and drug interactions. A combination of antihypertensive drugs, such as ACE inhibitors and diuretics, is often used as a method of pharmacological therapy in the elderly with hypertension. However, in the treatment carried out, the elderly often forget or are lazy to take the drugs given because they forget or are tired of taking the drugs so that the tendency that occurs is uncontrolled blood pressure in the elderly with hypertension.

One of the non-pharmacological therapies that can be applied as a companion to pharmacological therapy in the elderly who experience hypertension and at the same time improve the quality of treatment is by utilizing ginger and lemongrass rhizomes. Water therapy is done using warm water mixed with ginger and lemongrass rhizome formulations, can help the elderly in controlling their blood pressure so that it remains in optimal and controlled conditions. In addition, the variety of treatments carried out, makes the elderly not feel bored in undergoing blood pressure control therapy (8).

The aim of this study was to analyze the effect of providing warm water foot soak intervention using ginger and lemongrass rhizomes to reduce blood pressure in elderly people with hypertension.

MATERIAL AND METHODS

The sample in this study involved 18 elderly people with hypertension selected by purposive sampling. This study only involved an experimental group without a control group in the study.

The research criteria used were elderly people aged >60 years, experiencing moderate hypertension (BP>160 and/or DBP>100 mmHg), having no comorbidities that could interfere with the research results, taking antihypertensive medication from a health professional, and willing to participate in research activities. The variable in this study was blood pressure.

Blood pressure data collection was carried out twice, namely before being given therapy and after being given a warm water foot soak therapy. Before respondents were involved in the study, prospective respondents first gave their consent to be involved in the research activities by signing an informed consent form. Furthermore, for respondents who were willing to participate in the research activities, blood pressure measurements were first carried out by trained enumerators using a calibrated tensiometer. Warm water foot soak therapy was carried out by preparing 5 liters of warm water with a temperature of ± 40 °C, which was then put into a plastic bucket. Then, a ginger and lemongrass rhizome formulation (150 grams; 90 grams of ginger rhizome; 60 grams of lemongrass prepared by the researcher) was added to the warm water and stirred until evenly mixed.

The herbs used for therapy in this study were obtained from the Dayang Sumbi Herbal Center in Mojokerto Regency. The fresh herbs were then picked and then subjected to the processes of withering, grinding, oxidation, drying, mixing, and packaging. Each stage of the herbal processing was carried out by certified herbal laboratory personnel. The warm water foot soak therapy session using the ginger and lemongrass rhizome formulation was carried out for 4 weeks, with one therapy session each day. After the intervention had been carried out for 4 weeks, each study participant's blood pressure was measured again.

The results of the blood pressure measurements were then analyzed using the Wilcoxon sign-rank test.

ETHICAL CLEARANCE

This study was approved by Research Ethics Committee, Dian Husada Nursing Academy No. 344-KEPK/VI/DH/2024.

RESULT

Baseline Characteristics

From the research results, it was found that more than half of the respondents in this study were aged 60-74 years, namely 10 respondents (55.6%), more than half were female, namely 10 respondents (55.6%), all respondents did not have comorbidities (100%), and most respondents had normal body weight (BMI between 18.5 and 24.9), namely 12 respondents (66.7%).

Blood pressure changes in elderly with hypertension from two measurements

Based on initial blood pressure measurements, all respondents had moderate hypertension (BP >160 and/or DBP >100 mmHg), with a mean blood pressure of 165.23 mmHg and a standard deviation of 3.62. Subsequently, each study participant received a warm foot soak intervention supplemented with a formulation of ginger rhizome and dried lemongrass for four weeks. During the therapy sessions, each participant was also required to continue taking antihypertensive medication obtained from a healthcare facility and maintain a healthy lifestyle as a method of blood pressure control. After four weeks, the participants' blood pressure was remeasured by an enumerator. From the results of the final blood pressure measurements, it was found that 13 respondents (72.2%) experienced mild hypertension (BP 140-159 mmHg and/or DBP 90-99 mmHg), and 5 respondents (27.8%) experienced moderate hypertension (BP >160 and/or DBP >100 mmHg). From the results of the final data analysis, the average blood pressure was 158.89 mmHg with a standard deviation of 7.39. Based on the results of the comparative test using the Wilcoxon sign rank test, an asymp sig (2-tailed) value of 0.032 < α (0.05) was obtained, so the researcher concluded that the provision of warm water foot soak therapy added with ginger rhizome formulation and dried lemongrass helped the research respondents in controlling their blood pressure to remain in optimal condition.

Table I : Characteristics of research respondents

No	Respondent Characteristics	Number	Percentage
1	Respondent age :		
	- 60-74 years	10	55,6%
	- >74 years	8	44,4%
2	Repondent gender :		
	- Male	8	44,4%
	- Female	10	55,6%
3	Accompanying disease :		
	- No accompanying disease	18	100,0%
	- Has accompanying disease	0	0,0%
4	Respondent's body mass index:		
	- Normal weight (BMI between 18.5 and 24.9)	12	66,7%
	- Overweight (BMI between 25 and 29.9)	6	33,3%

Table II : Changes in blood pressure in respondents before and after intervention: Effectiveness of Ginger and Lemongrass Rhizome Formulation to Lower Blood Pressure Through Warm Water Therapy

No	Respondent Characteristics	Number	Percentage
1	Respondent age :		
	- 60-74 years	10	55,6%
	- >74 years	8	44,4%
2	Repondent gender :		
	- Male	8	44,4%
	- Female	10	55,6%
3	Accompanying disease :		
	- No accompanying disease	18	100,0%
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4	Respondent's body mass index:		
	- Normal weight (BMI between 18.5 and 24.9)	12	66,7%
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DISCUSSION

Based on the results of the Wilcoxon sign rank test, a p value of 0.032 < α (0.05) was obtained, so this study concluded that the application of non-pharmacological therapy of soaking feet in warm water using ginger and lemongrass rhizomes is effective in helping hypertensive patients lower their blood pressure. The results of this study are supported by research conducted by Muzayyana et al, where the results of the study showed a decrease in blood pressure in research respondents who were given a foot soaking intervention using warm water with added ginger and lemongrass rhizomes (9). Ginger rhizome (*Zingiber officinale*) and lemongrass (*Cymbopogon citratus*) are herbal plants that have long been used in traditional medicine. Both contain active compounds that are hypolipidemic, namely able to reduce blood fat levels. In ginger, compounds such as gingerol, shogaol, and zingerone play a role in inhibiting cholesterol synthesis in the liver, as well as increasing lipid metabolism. Meanwhile, lemongrass contains citral, flavonoids, and polyphenols which have similar effects, namely reducing LDL cholesterol and triglycerides and increasing HDL (10). This decrease in lipid levels has a positive impact on blood vessel elasticity and blood pressure, because blood flow becomes smoother and the heart's workload is reduced. In addition, the antioxidant content in ginger rhizome and lemongrass helps reduce oxidative stress which is often associated with hypertension and cardiovascular disease (11).

The method of soaking feet in warm water mixed with ginger rhizome and lemongrass works through a combination of physical and pharmacological effects. Warm water itself causes vasodilation or widening of blood vessels in the periphery (especially the feet), which helps lower blood pressure reflexively. Meanwhile, the active compounds of ginger and lemongrass can be

absorbed through the pores of the skin, and evaporate into aromatherapy that has a relaxing effect on the central nervous system (10). This relaxation helps reduce the activity of the sympathetic nervous system which plays a role in increasing blood pressure. Thus, this method not only provides a local effect on peripheral circulation, but also a systemic effect that lowers blood pressure naturally and holistically. Overall, the combination of ginger rhizome and lemongrass in warm water foot soak therapy is a safe, inexpensive, and effective non-pharmacological approach in helping to control blood pressure, especially for people with mild to moderate hypertension, or as a supportive therapy for patients with medical treatment (12).

The use of non-pharmacological therapy of soaking feet in warm water with added ginger and lemongrass is not solely effective in lowering blood pressure in hypertensive patients. This still requires compliance of hypertensive patients to consume anti-hypertensive drugs obtained from health facilities, carry out stress management, implement a healthy lifestyle, and do physical activity regularly. Without good compliance from hypertensive patients in carrying out advice from health workers, especially in efforts to reduce the risk of recurrence or increase in blood pressure, the provision of non-pharmacological therapy interventions will not produce results according to expectations.

CONCLUSION

The results of the study showed that foot soaking therapy using warm water with added ginger and lemongrass rhizomes can help hypertension sufferers to control their blood pressure.

RESEARCH LIMITATIONS

Some of the limitations faced by the researcher in conducting this research include:

1. The researcher only involved an experimental group in the research without a control group for comparison.
2. The sample size was relatively limited, so the research results cannot be generalized as research that proves that providing a warm foot soak intervention supplemented with a formulation of ginger rhizome and dried lemongrass is effective in helping control blood pressure in elderly people with hypertension.
3. The relatively short duration of the study (4 weeks of therapy sessions) may have resulted in the therapy not producing optimal results.
4. It is possible that the study respondents did not follow the researcher's recommendations for conducting the warm foot soak therapy sessions supplemented with a formulation of ginger rhizome and dried lemongrass.

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The author declares that there is no conflict arising from the research activities and publication of the research article manuscripts carried out

SUGGESTIONS

1. The results of this study can be used as an intervention to help control blood pressure in elderly people with hypertension.
2. Future researchers can develop these results, especially by increasing the sample size.

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