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WARM RED GINGER WATER FOOT SOAKING THERAPY ON BLOOD PRESSURE IN HYPERTENSION PATIENTS

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ABSTRACT

This study aims to determine blood pressure in hypertensive patients using warm red ginger foot bath therapy in the work area of the Jembatan Kecil Community Health Center, Bengkulu City. This study used a quasi-experimental design involving control and intervention groups. The results showed that in the intervention group, the average systolic blood pressure before receiving the warm red ginger foot bath was 146.13 mmHg, and the average systolic blood pressure after receiving the warm red ginger foot bath was 137.67 mmHg. The analysis results for the control group showed that the average systolic blood pressure before was 139.73 mmHg and after was 183.20 mmHg. While the average diastolic blood pressure in the intervention group before the warm red ginger foot bath was 86.40 mmHg, and the average diastolic blood pressure after the warm red ginger foot bath intervention was 79.80 mmHg. In conclusion, the control group showed that the average diastolic blood pressure before the intervention was 81.20 mmHg, and the average after the intervention was 79.73 mmHg. Simultaneously, there was a decrease in systolic and diastolic blood pressure in the intervention group.

Keywords: Warm Red Ginger Water, Hypertensive Patients, Blood Pressure

INTRODUCTION

Hypertension is defined as a condition in which systolic blood pressure exceeds 140 mmHg and diastolic blood pressure exceeds 90 mmHg, based on at least two measurements (Mursudarinah et al., 2021). When blood pressure is above normal, it is known as hypertension or the silent killer, as it can increase the risk of death if systolic blood pressure is above 140 mmHg and diastolic blood pressure exceeds 90 mmHg.

Hypertension, commonly known as high blood pressure, is a serious health condition that significantly increases the risk of heart, brain, kidney, and other diseases. It is a major risk factor for heart attacks, heart failure, and stroke, collectively known as cardiovascular disease (CVD), and contributes to chronic kidney damage. Managing hypertension is crucial to prevent long-term complications and urgent cardiovascular problems. Hypertension is recognized as one of the leading causes of premature death from cardiovascular disease (World Health Organization, 2024).

The prevalence of hypertension is projected to reach 33% by 2023, with two-thirds of this prevalence occurring in low-income and developing countries (WHO, 2023). It is predicted that the prevalence of hypertension will continue to increase, with estimates that by 2025, 29% of the global adult population will have hypertension. Hypertension causes approximately 8 million deaths annually, of which 1.5 million occur in Southeast Asia,

where one-third of the population suffers from hypertension, potentially increasing the burden of healthcare costs (Ambarwati et al., 2021).

In Indonesia, the prevalence of hypertension is recorded at 30.8%. Jakarta has the highest prevalence rate, reaching 121.153 million people, while West Papua has the lowest prevalence rate, with 2,163 people. According to the Basic Health Research (Ministry of Health of the Republic of Indonesia, 2023).

Based on the prevalence of hypertension, Bengkulu Province ranks 26th (28.14%). The prevalence of high blood pressure in Bengkulu Province reached 168,519 cases, or 64%. The highest rate occurred in North Bengkulu Regency with a prevalence of 95%, followed by Rejang Lebong with 91%, Seluma with 83%, Lebong with 82%, Muko-muko with 81%, Kepahiang with 48%, Kaur with 31%, and South Bengkulu with 28%. Meanwhile, Bengkulu City ranks seventh with a prevalence of 41%, and the lowest is Central Bengkulu with 22% (Bengkulu Province Health Research Profile, 2022).

The estimated number of people aged 15 or above with hypertension in 2023 is 50,898. Of this estimated total, 14,812 (40.7%) meet the health service criteria. This service figure represents a 20.6% decrease compared to 2022, when healthcare services for hypertension patients were 40.7%. This data demonstrates that disease patterns in Bengkulu City remained consistent from 2022 to 2023 (Bengkulu Health Office, 2023). The most common illnesses in 2023 were non-communicable diseases, particularly essential hypertension. The Jembatan Kecil Community Health Center recorded the highest number of healthcare services for hypertension patients, with 42,120 (Bengkulu City Health Office, 2023).

Based on a survey conducted on November 6, 2024, data obtained from the Jembatan Kecil Community Health Center showed that in 2022, there were 1,725 hypertension sufferers: 908 men (40.1%) and 1,357 women (59.9%). In 2023, there were 1,999 men (830) and 1,248 women (60.1%). In 2024, from January to December, there were 92 men (30) and 62 women (67.39%).

Non-pharmacological approaches, including lifestyle modifications such as diet, exercise, stress reduction, and mind-body practices like yoga and Tai Chi, have been shown to significantly reduce both systolic and diastolic blood pressure in hypertensive patients. For example, lifestyle intervention combined with Tai Chi reduced systolic blood pressure by about 21.75 mm Hg and diastolic by 13.62 mm Hg, outperforming usual care and other interventions (Chen et al., 2024). Integrated yoga and naturopathy treatments, including hydrotherapy and meditation, also demonstrated significant improvements in blood pressure and cardiovascular parameters, with greater benefits observed in patients not on medication (Deepa et al., 2025). Slow breathing training and pranayama (yogic breathing) have been found to lower blood pressure and heart rate, likely through autonomic nervous system modulation and stress reduction (Chidambaram et al., 2025; Yuenyongchaiwat et al., 2024). Biofeedback and reflexology are additional non-pharmacological therapies that show promise in lowering blood pressure, though evidence quality varies and further research is needed (Muhtarul, 2024; Jenkins et al., 2024). Overall, these natural, non-drug interventions are effective and safe adjuncts for hypertension management, contributing to cardiovascular risk reduction alongside or sometimes independent of pharmacological treatments (Almabruk et al., 2025; Yuar, 2025).

Soaking feet in warm ginger water is a very simple, easy-to-implement, practical, and affordable method that can be done independently at home by those suffering from hypertension. From a scientific perspective, warm water has physiological effects on the

body. First, warm water acts on blood vessels, improving blood circulation. h, stabilizes blood flow and heart function, while the load factor in water can strengthen muscles and ligaments, which impact the body's joints (Effendy & Sari, 2021). Ginger, on the other hand, is rich in cations and anions such as calcium, magnesium, and phosphorus, which contribute to bone growth, muscle contraction, and nerve conduction. The minerals contained in ginger are useful for treating contracted muscles, controlling hypertension, overcoming muscle weakness, and relieving spasms. Furthermore, ginger also contains high levels of potassium, which plays an important role in regulating blood pressure and heart rhythm (Nadia, 2020).

RESEARCH METHOD

This study employed a quasi-experimental pre-post study involving a control group whose blood pressure was only measured without receiving foot soak therapy, and an intervention group. The goal was to determine the effects of the treatment. The specific characteristics of this experiment relate to the treatment or intervention. The variables identified in this study consist of independent and dependent variables.

RESULTS

Univariate Analysis Results

Respondent Characteristics

Age

Table. 1
Frequency Distribution of Age

VariabeI	N	Intervention	N	Control
Age	15		15	
Mean		53,33		50,07
Sd.Deviation		6,640		7,156
Min		40		40
Max		60		60
CI *for mean* 95%		49,66-57,01		46,10-50,07

Based on the table above, the average age of respondents in the intervention group was 53.33 years. The average age of respondents in the control group was 50.07 years, with a Standard Deviation of 7.156 years.

Gender

Tabel. 2
Frequency Distribution of Gender

Variabel	Intervention		Control	
	N	%	N	%
Male	3	20,0	4	26,7
Female	12	80,0	11	73,3

Based on the table above, gender in the intervention group was 80.0% female and in the control group 73.3%.

Education

Table. 3
Frequency Distribution of Education

Variabel	Intervention		Control	
Education	N	%	N	%
SD	6	40,0%	5	33,3%
SMP	4	26,7%	6	40,0%
SMA	5	33,3%	4	26,7%

The majority of respondents in the intervention group had an elementary school education (40.0%), and in the control group, a junior high school education (40.0%).

Occupation

Table. 4
Distribution of Occupation

Variable	Intervention		Control	
Occupation	N	%	N	%
Housewife	5	33,3%	6	40,0%
Trader	4	26,7%	2	13,3%
Self-employed	2	13,3%	5	33,3%
Unemployed	4	26,7%	2	13,3%

The majority of respondents in the intervention group were housewives (33.3%), and the majority in the control group were housewives (40.0%).

Characteristics of Respondents' Systolic and Diastolic Blood Pressure in the Intervention and Control Groups

Table. 5
Distribution of Respondents' Mean Systolic BP
before and after Intervention

Variable	Mean	SD	Min	Max	CI
Intervention					
Pre-Systolic Blood Pressure	146,13	7,434	130	157	142,02-150,25
Post-Systolic Blood Pressure	137,67	10,349	112	157	131,94-143,40
Control					
Pre-Systolic BP	139,73	7,869	129	159	135,38-144,09
Post-Systolic BP	138,20	7,867	129	159	133,84-142,56

The analysis results for the intervention group showed that the average systolic blood pressure before receiving the warm red ginger foot soak was 146.13 mmHg, and the average systolic blood pressure after receiving the warm red ginger foot soak was 137.67 mmHg. The analysis results for the control group showed that the average systolic blood pressure before was 139.73 mmHg and after was 183.20 mmHg.

Table. 6
Distribution of Respondents' Mean Diastolic Blood Pressure
before and after Intervention

Variable	Mean	SD	Min	Max	Cl
Intervention					
Pre-Diastolic Blood Pressure	86,40	7,735	73	97	82,12-90,68
Post-Diastolic Blood Pressure	79,80	8,126	62	92	73,30-84,30
Control					
Pre-Diastolic Blood Pressure	79,20	5,609	70	87	76,09-82,31
Post-Diastolic Blood Pressure	77,73	5,509	70	87	74,68-80,78

The analysis results showed that the average diastolic blood pressure in the intervention group before the warm red ginger foot soak was 86.40. mmHg, the average diastolic blood pressure after the warm red ginger foot soak intervention was 79.80 mmHg. The analysis results in the control group showed that the average diastolic blood pressure before was 81.20 mmHg, and the average after was 79.73 mmHg.

DISCUSSION

Univariate Analysis

Respondent Characteristics

Age

Age significantly influences blood pressure and the risk of hypertension, with the likelihood of high blood pressure increasing as people grow older due to structural and functional changes in the cardiovascular system. Systolic blood pressure (SBP) risk rises continuously from around age 35 to 79, while diastolic blood pressure (DBP) risk increases early but declines after age 50-65, with men showing a linear increase in SBP risk and women a nonlinear pattern (Cheng et al., 2022). Older adults often experience increased blood pressure variability linked to arterial stiffness, autonomic dysfunction, and molecular aging processes such as inflammation and oxidative damage, which contribute to hypertension development (Bencivenga et al., 2022). The age at which hypertension begins also matters: earlier onset (before age 40) is associated with higher risks of cardiovascular disease and mortality compared to onset at older ages, emphasizing the importance of early detection and management (Mak et al., 2025). Biological aging markers, including DNA methylation profiles, correlate with both prevalent and incident hypertension, suggesting that physiological aging processes underlie increased hypertension risk (Kresovich et al., 2023). Overall, age is a primary risk factor for hypertension, with changes in vascular structure, biological aging, and cumulative blood pressure exposure driving increased prevalence and cardiovascular complications in older populations (Mak et al., 2025; Cheng et al., 2022).

Gender

Women are more likely to experience hypertension than men. This is influenced by the presence of the hormone estrogen, which tends to make them more susceptible to stress due to frequent overthinking.

The increased risk of hypertension in women after menopause is primarily related to hormonal changes, particularly decreased estrogen that impact vascular function such as endothelial dysfunction and increased arterial stiffness (Fontaine et al., 2025; Li et al., 2024). Although follicle-stimulating hormone (FSH) levels increase postmenopause, studies have shown no significant association between FSH levels and the risk of

hypertension or high blood pressure longitudinally (Tehrani et al., 2025). However, higher levels of sex hormone-binding globulin (SHBG) are associated with a lower risk of hypertension and reduced blood pressure, suggesting a protective role for sex hormones in blood pressure regulation (Watz et al., 2023).

Education

Judging from the frequency distribution of respondents based on their education level among hypertension sufferers at the Jembatan Kecil Community Health Center in Bengkulu City, the average education level of respondents in the intervention group was elementary school (40.0%), and in the control group, junior high school (40.0%). In a study by Fahriah et al., (2021), education level not only impacts a person's knowledge level but also their ability to process various information.

This is consistent with a study by Yuwono et al., (2018) which explained that the majority of respondents, 23 (65.7%) out of 35 respondents, were elementary school graduates. This is due to the limited economic resources of the surrounding community, which significantly impact health. Low educational levels among respondents were found to significantly influence their hypertension, as a lack of health knowledge leads to ineffective thinking in responding to and managing health problems.

Occupation

The results of a study conducted on 30 respondents showed that, in general, the frequency distribution of respondents based on occupation of respondents with hypertension at the Jembatan Kecil Community Health Center in Bengkulu City showed that the average occupation of respondents in the intervention group was housewife (33.3%) and in the control group (40.0%). Working as a housewife appears to be associated with a higher risk of hypertension, especially in the elderly. A study in Jatimulyo Village found that 70% of elderly people with hypertension were housewives, indicating a high prevalence in this group (Rosa et al., 2023). is still limited, the high physical and psychosocial workload of housework may be a risk factor for hypertension. In addition, factors such as physical activity and smoking behavior also play a role in the risk of hypertension in workers (Andini & Siregar, 2024). Therefore, housewife work, which often involves heavy workloads and stress, may be an important risk factor for hypertension, especially in elderly women (Andini & Siregar, 2024; Rosa et al., 2023).

Characteristics of Systolic and Diastolic Blood Pressure of Warm Red Ginger Foot Soaks on Blood Pressure in Hypertension Patients in the Intervention and Control Groups

A gradual reduction in hypertension can reduce the risk of hypertension in respondents. One way to reduce hypertension is by adopting a healthy lifestyle, which includes a balanced diet, regular exercise, stress management, regular blood pressure checks, maintaining an ideal body weight, limiting salt intake, avoiding smoking, and avoiding fatty foods. Soaking feet in warm water mixed with red ginger has been shown to be effective in lowering blood pressure in people with hypertension, especially the elderly. This therapy works by dilating blood vessels, increasing capillary permeability, and providing a relaxing and warming effect that helps lower blood pressure (Salis et al., 2024; Sari et al., 2023; Mutmainnah et al., 2023). Studies show that after several days of foot soak therapy with warm red ginger water, there is a significant decrease in systolic and diastolic blood pressure, as well as a reduction in anxiety that often accompanies

hypertension in the elderly (Pengesti et al., 2025; Nugraheni & Soleman, 2024). The water temperature used ranges from 37 to 48°C, which is optimal for stimulating blood circulation and muscle relaxation 48. In addition, this therapy also provides a feeling of comfort and reduces muscle tension, which contributes to lowering blood pressure (Ali et al., 2023; Hidayat et al., 2022).

CONCLUSION

The average systolic and diastolic blood pressure of hypertensive patients in the intervention group before receiving warm red ginger foot soak therapy was 146.13/86.40 mmHg. In the control group, the average systolic and diastolic blood pressure of hypertensive patients before the first measurement was 139.73/81.20 mmHg.

The average systolic and diastolic blood pressure of hypertensive patients in the intervention group after therapy was 137.67/79.80 mmHg. In the control group, it was 138.20/79.73 mmHg.

SUGGESTION

For the Jembatan Kecil Community Health Center, BengkuIu City

The Community Health Center can educate the public about the benefits and method of providing foot soak therapy with warm red ginger water to reduce blood pressure in hypertensive patients.

For Other Researchers

Future research can include longer days to ensure more effective results from foot soak therapy with warm red ginger water.

For Hypertension Sufferers

Those with hypertension are encouraged to seek non-pharmacological treatment to help lower their blood pressure.

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