

Research Article

The Effect of Warm Ginger Water Foot Bath on Blood Pressure Reduction in Hypertensive Elderly at Sialang Baru

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Hypertension is a degenerative disease, a disease that occurs due to aging, and lower's the body's organs productivity. The aim of this research is to know the effect of warm ginger water foot bath on blood pressure reduction in hypertensive elderly at Sialang Baru. The research design used is pre-experimental with pre and post-test designs. The technique of sampling purposive was performed on 20 respondents. The instrument was in observation form. The research results were obtained from the respondent's average blood pressure before and after giving ginger warm water foot bath (systolic blood pressure 165.50 mmhg becomes 158,55 mmHg and diastolic 98.05 mmHg becomes 90,15 mmHg). The results of the study paired sample analysis showed p -value $<0,005$, which means a warm ginger water foot bath is effective for lowering blood pressure hypertension in the elderly at Sialang Baru. It is recommended that the puskesmas can provide counseling and information to patients suffering from hypertension to do warm ginger water foot bath as herbal medicine for hypertension.

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1. INTRODUCTION

Data from the World Health Organization in 2018 shows that 1 billion people in the world suffer from hypertension and it is estimated that there are 7.5 million deaths or about 12.8% of all deaths caused by hypertension. According to the American Heart Association (AHA), about 1 in 3 adults suffer from this disease. It is even estimated that it will continue to increase by 7.2% or around 83.5 million people in 2030 (Langini, 2021)^[1]. The prevalence of hypertension in 2018 showed a significant increase from 2013 which was 34.1% in the population aged 18 years and over. The prevalence of hypertension in the elderly age group has increased quite high.^[1]

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Hypertension ranks first in the health problems of the elderly in Indonesia (Langin, 2021)^[1]. The results of the data obtained from the Health Office of Riau Province, Siak City in (2021) health services for patients with hypertension were 66,904 cases consisting of 34,569 men and 32,335 women. The results of data obtained from the Health Office of Siak City in (2021), data on hypertension is the highest disease. Of about 14 health centers in Siak City, the highest hypertension case data was in the Mempura Siak Health Center, which was 110.23 cases (overall data). (Siak City Health Office, 2021).^[2]

Two treatments can be given to patients with hypertension, namely pharmacological and non-pharmacological treatments. Pharmacology such as being given anti-hypertensive drugs while non-pharmacology can be done with physical activity, exercise, and complementary therapies, one of which is soaking feet in warm red ginger water (Haripuddin et al., 2021).^[3] Soak feet can be combined with herbal ingredients such as species of ginger (yellow ginger), ginger elephant (ginger rhino), and ginger red (ginger sunti) but the ginger that is widely used for medicine is red because red ginger contains essential oils that contain essential oils. higher than other ginger. Soaking the feet with red ginger decoction can have the effect of increasing blood circulation and increasing muscle relaxation in the body. Red ginger has the most significant benefits when compared to other types of ginger. Gingerol compounds show to have hypotensive activity. The content of gingerol comes from non-volatile oil. This content is what makes the sensation of a warm feeling on the skin when used topically (Sani & Fitriyani, 2021)^[4]. Andi's research (2019)^[5] was conducted at the Melati Integrated Health Center, Talang Betutu Village, Palembang, this study found the effect of soaking red ginger feet in reducing blood pressure. Hijriyani et al (2018)^[6] research conducted in Dunglepu Village, Giritontro, Wonogiri, this study found a decrease in blood pressure in the two respondents, Mrs. S hypertension stage 1 become pre-hypertension and Mrs. Y stage 2 becomes stage 1. And then research Khayati (2021)^[7] conducted in Banyumeneng Village, Mraggen District, Demak Regency, this study found a decrease in blood pressure values in the elderly after soaking feet in a red ginger stew.

A preliminary study conducted by researchers on February 25, 2022, in Sialang Baru Village, obtained data from interviews with patients who had hypertension and performed complementary therapy with traditional medicine, the results were 11 people, 2 people said they rarely did a physical activity, 3 people said smoked, as many as 1 person said he did not routinely visit the puskesmas for health checks or blood pressure checks, as many as 2 people said they used ginger plants for hypertension drugs and as many as 3 people said they regularly consume traditional medicines from the puskesmas.

2. RESEARCH METHOD

This study used a *pre-experimental design*. The type of design that will be used is *one group pretest-posttest*. This study did not involve a comparison group (control) but only the treatment group.

The time of study was carried out in April-June 2022. The population in this study was 460 respondents.

This study uses a sample collection method with purposive sampling, namely taking samples that match the inclusion criteria from the total population of 20 people with inclusion criteria, namely a). elderly who suffer from hypertension with a systolic blood pressure of 140-190 mmHg and/or diastolic blood pressure of 90-110 mmHg, b). willing to be a respondent, c). age 60 years and over, d). able to communicate well and e). not taking antihypertensive drugs.

3. RESEARCH RESULTS

TABLE 1: Frequency Distribution by Age, Gender, Ethnicity and Occupation of Respondents in Sialang Baru Village (n=20).

Respondent characteristics	Experimental group	
	Frequency (Respondent)	Percentage (%)
Age		
Elderly (60–74 years)	20	100
Middle age (45–59 years)	0	0
Old age (75–90 years)	0	0
Old age (>90 years)	0	0
Gender		
Male	5	25
Female	15	75
Education		
Elementary school	12	60
Junior high school	5	25
Senior high school	3	15

Based on the table. 1, it can be seen that the majority of respondents' age ranges from 60-74 years old as many as 20 people (100%). There are more women than men with 15 women (75%). The majority of respondents have elementary education with a total of 12 people (60%). The majority of respondents are housewives with a total of 12 people (60%).

TABLE 2: Frequency Distribution of Respondents Based on Blood Pressure in the Warm Water Foot Soak Intervention Group.

Blood pressure	Before intervention		After intervention		N
	Average pressure	blood	Average pressure	blood	
Systolic	165.50		158.55		20
Diastolic	98.05		90.15		

Based on the table. 2, it can be seen that the mean value of systolic blood pressure before the intervention was 165.50 and decreased after the intervention, namely the mean value of 158.55. Meanwhile, the mean value of diastolic blood pressure before the intervention was 98.05 and decreased to 90.15.

TABLE 3: Distribution and Effect of Lowering Blood Pressure in the Intervention Group and after being given a foot bath with warm red ginger in Sialang Baru Village in 2022.

Variable	N	Mean	Std deviation	Std error	P-value
Systolic	20	6.950	7.112	1.590	0.000
Diastolic	20	7.900	7.847	1.755	

Based on the table. 3 The results of the statistical test show that the difference in the mean systolic blood pressure was 6.950 while the diastolic blood pressure is 7.900 with the *Paired sample t-test* obtained *p-value* <0.005, this means that there is an effect of giving warm red ginger foot soaks to the elderly with hypertension in the Sialang Baru village.

4. DISCUSSION

4.1. Characteristics of Respondents

The results of this study were 20 respondents based on age, namely, age 60-74 years as many as 20 people (100%). With old age, the large arteries lose flexibility and become stiffer thus blood is forced to pass through the blood vessels that are narrower than usual and increasing blood pressure.

Age has a risk factor for hypertension. Elderly people are very at risk of developing hypertension, the higher a person's age tends to be, the higher their blood pressure, older people tend to have a high blood pressure than younger people. This age-related condition is a by-product of arteriosclerosis wear and tear of the major arteries, particularly the aorta, and a result of reduced flexibility. The hardening of these arteries

makes the arteries stiffer, and the arteries and the aorta lose their adaptability (Sani & Fitriyani, 2021).

Researchers assume that this is because as a person ages, there is a decrease in the ability of the body's organs, including the cardiovascular system, in this case, the heart and blood vessels. Blood vessels become narrower and blood vessel wall stiffness occurs, causing blood pressure to increase.

From the processing of the frequency distribution by gender, it was found that most of the respondents were female, namely, 15 people (75%) and male sex as many as 5 people (25%). The results of research by Silfiyan & Khayati, (2021) state that the majority of respondents with hypertension were female, as many as 18 respondents (90%). This condition is caused by a decrease in the hormone estrogen when women enter the menopause stage. When the amount of this hormone decreases, the organs in the female body lose their ability to become uncontrollable and the atrial vessels become tense and even harden. In addition, when the estrogen content is depleted, there will be damage to endothelial cells which will trigger plaque in the blood and at the same time stimulate an increase in blood pressure.

This is because women have entered menopause which will gradually lack the hormone estrogen which has a role in increasing levels of High-Density Lipoprotein (HDL) and serves to protect blood vessels from damage this is the reason why women are more susceptible to hypertension than men. This is following the facts in the field where older women experience hypertension because most of them have experienced menopause (Immawanti et al., 2021).

Researchers assume that the female sex is a factor causing high blood pressure because many women have experienced menopause and in this study, many elderly women who are over 60 years old suffer from hypertension.

The level of education is more in respondents with elementary education, namely 12 people (60%), compared to junior high school, which is 5 people (25%), high school, which is 3 people (15%), research results Lumowa, (2020) said the level of education can affect a person's ability and knowledge in implementing healthy living behavior, especially hypertension. The higher the level of education, the higher a person's ability to maintain a healthy lifestyle, respondents with higher education will easily absorb information and will have better knowledge than respondents with low education.

Hafidz et al., (2021) states that education influences a person's ability to obtain and use health information. Education influences a person's understanding of the importance of healthy lifestyle choices. Decision-making about health problems is influenced by a person's level of education. The lower a person's education, the less likely he is to use

healthcare facilities. Individuals with higher education and working in the formal sector have greater access to health information, are more involved in determining attitudes, and are more independent in nursing actions.

The researcher assumes that the level of education can affect the occurrence of hypertension because the level of education affects a person's ability to obtain information, if someone has a high education, it tends to that person will be more alert and maintain a healthy lifestyle because of the amount of information he/she gets. People who have a higher education level tend to have more adherence to taking medication and checking themselves into health services.

Based on the type of work, more respondents are Housewives as many as 12 people (60%), compared to entrepreneurs as many as 3 people (15%), and self-employed as many as 1 person (5%), Research results Sapwal et al., (2021) states if the socioeconomic status is low, the flow of high blood pressure becomes higher, while socioeconomic status is closely related to the type of work, because the type of work is not only a factor that is closely related to socio-economic conditions such as education level. The level of education is related to the health information obtained so it can affect their health status.

The researcher assumes that hypertension can occur because of the workload and demands of life that can affect the burden of the mind which can eventually trigger an increase in blood pressure.

The results of the research that have been carried out obtained hypertension data in 20 respondents as the experimental group, the average value of hypertension at the prettiest average posttest with the intervention of soaking the feet in warm red ginger water decreased by an average of 158.55.

The study was conducted in the experimental group by being given a foot bath of warm red ginger water carried out for a week within 1 x a day with a duration of 15 minutes. The data above shows that the average respondent before being given treatment experienced blood pressure above 140-190 mmHg. Then after being given a foot bath in warm water, red ginger experienced a decrease in blood pressure. The use of foot soaks using warm water produces heat energy which dilates blood vessels and improves blood circulation and also stimulates the nerves in the legs to activate the parasympathetic nerves, causing changes in blood pressure (Nurpratiwi et al., 2021).

This research is in line with Astutik & Mariyam, (2021) the application of foot soak using warm water that has been carried out on both hypertension responses results in a decrease in blood pressure, before and after foot soak therapy for 3 days, with the result 160/100 mmHg to 130 /90 mmHg and 170/90 mmHg to 130/90 mmHg. Based on

the two cases, the average blood pressure of the two respondents decreased, systolic blood pressure decreased by 7.21 mmHg and diastolic blood pressure decreased by 1.1 mmHg. The results of this study are in line with Yusuf & Nur'aina, (2021). The results showed that there was a difference in blood pressure before and after doing warm water bath therapy. This can also be seen from the statistical test results of the paired sample T-test of P value = 0.000 < real level ($\alpha = 0.05$). Similarly, what happened in warm water soaking therapy when red ginger was added with statistical test results paired sample T test P value = 0.000 < significant level ($\alpha = 0.05$). However, what is more, effective is the red ginger warm water immersion therapy where the mean difference value = 12.00 systolic blood pressure, and the mean difference = 12.668 diastolic blood pressure, while for the warm water immersion therapy the mean difference = 10.00 for systolic blood pressure, and the mean difference = 11.00 for diastolic blood pressure.

According to the researchers' assumptions, the elderly are more at risk of developing hypertension because this is due to a decrease in physiology in the body such as natural changes in the heart, blood vessels, and hormones thus most people have hypertension when they are 50-60 years old and when they are >65 years old, women are more at risk of developing hypertension. hypertension because blood pressure in women continues to increase after menopause, this is due to the presence of the hormone estrogen.

4.2. The Effect of Red Ginger Warm Water Foot Soak on Blood Pressure Reduction in Elderly Hypertension

Research conducted in Sialang Baru Village found that there was an effect of red ginger warm water foot soak in lowering blood pressure, before and after the red ginger warm water foot soak there was a systolic blood pressure of 165.50 mmHg to 158.55 mmHg, while the diastolic value before and after was 98.05 to 90.15 mmHg. It is known through the paired sample t-test which shows p-value = 0.000 or p-value <0.005. This means that there is an average effect of a significant decrease in blood pressure before and after being given a foot bath of warm red ginger in the elderly with hypertension.

The results of this study are in line with the research conducted by Sani & Fitriyani (2021) conducted at the Ngudi Rahayu Posyandu RT 01/RW 14, Bolon, Colomadu, Karanganyar that hypertension sufferers come from the elderly group aged 60-74 years totaling 23 respondents or equal to (54.7%). This is related to structural and functional changes in the vascular system of the elderly. These changes are in the form of loss of elasticity of connective tissue and decreased relaxation of smooth muscles which will

be the cause of decreased distension and stretchability of blood vessels. The results of this study are in line with research conducted by Harnani & Axmalia, (2017) which was conducted on elderly respondents showing that based on the Wilcoxon statistical test, a p-value = 0.001 was obtained which indicates that there is an effect of foot soak therapy with warm water on lowering blood pressure.

Soak the feet with boiled red ginger water is one technique to lower blood pressure by soaking the feet in warm water containing boiled red ginger. Soaking the feet in warm water with red ginger produces a hot/warm effect that can cause liquids, solids, and gases to expand in all directions and increase chemical reactions. In the tissue, metabolism will occur along with increased exchange between body chemicals and body fluids. Heat/warmth has a biological function that causes blood vessels to widen, so that blood circulation increases. Physiologically, the body's response to heat is to dilate blood vessels and relax muscles thus it can increase circulation which will affect blood pressure (Hafidz et al., 2021).

Red ginger is a plant with red rhizomes and is smaller in size than white/yellow ginger (rhinoceros ginger). Red ginger also usually can only be harvested when it is old, while ordinary ginger can be enjoyed when it is young or old. When red ginger is ripe or old, this plant contains more essential oils than ordinary ginger. This type of ginger has a high volatile oil content and the hottest taste, making it suitable for pharmaceutical and herbal ingredients. The benefits of red ginger for health are many because it has been widely used as traditional medicine as well, red ginger contains various health benefits, one of which is to lower blood pressure (Nurrokhman et al., 2022).

The researcher assumes that the red ginger foot bath has many health benefits, especially in controlling blood pressure and treating hypertension because the content contained in ginger is Flavonoid, Saponin, and Non-Flavonoid Phenol compounds which have properties to lower blood pressure. In the description above, it is concluded that there is a significant effect when soaking the feet in warm red ginger water can reduce blood pressure in the elderly with hypertension in the experimental group.

5. CONCLUSION

1. The majority of respondents' gender, namely women as many as 15 people (75%), while the majority aged 60-74 years were 20 people (100%), and the majority of occupations were household workers as many as 12 people (60%), and the majority of education was elementary school, namely 12 people (60%),

2. Respondents had blood pressure before and after soaking the feet in warm red ginger water, it was known that the average systolic blood pressure was 165.50 mmHg to 158.55 mmHg and the diastolic blood pressure was 98.05 mmHg to 90.15 mmHg.

3. There is an effect of soaking the feet in warm red ginger on the decrease in blood pressure, p-value = 0.000 or p-value <0.005. In elderly hypertension in Sialang Baru Village.

6. SUGGESTION

It is recommended for respondents increase their knowledge in choosing herbal medicines or alternative medicines to lower blood pressure in hypertensive patients, such as routinely doing foot baths in warm red ginger to lower blood pressure in hypertensive patients. Thus the Public Health Center can provide counseling and information to patients who suffer from hypertension to routinely do a foot soak in warm red ginger water as alternative medicine or herbal medicine for hypertension. For further researchers who want to research the effect of soaking feet in the warm water of red ginger, the results of this study can be used as a reference to be able to conduct further research on foot soaks in the warm water of other red ginger, for example, modified by aromatherapy.

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