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The Effect Of Foot Soak Therapy Using Warm Water On Reducing Blood Pressure In Hypertension Patients

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ABSTRACT

Hypertension is a condition in which a person will experience an increase in systolic blood pressure above normal ≥140 mmHg and diastolic ≥90 mmHg. Hypertension can be caused by poor diet and lack of physical activity. The purpose of this research was to find out the effect of foot soak therapy using warm water on lowering blood pressure in patients with hypertension in Malendeng Village, Manado City. This research is a pre experiment research with One Group pretest-postest design. The sampling technique is purposive sampling. The samples amounted to 12 people who had previously checked their blood pressure using a sphygmomanometer. Furthermore, the collected data was tested for data normality. The hypothesis was tested with the Wilcoxon to find out the decrease in blood pressure in respondents with a level of significance (α) 0.05. The results showed that the most common gender obtained in the study was female with 9 respondents (75.0%). The conclusion in this research is that there is an effect of foot soak therapy using warm water on reducing systolic and diastolic blood pressure in patients with hypertension p=0.002. This p value is less than the value of α=0.05.

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1. INTRODUCTION

About 22% of people in the world have hypertension. Southeast Asia ranks second with a prevalence of around 25%. The African continent has the highest prevalence, reaching 27%, while the American continent has the lowest prevalence, at 18% (Cheng et al., 2020). The World Health Organization (WHO, 2016) reports that 26.4 percent of people worldwide suffer from hypertension. This figure is expected to increase to 29.2 percent in the following year. According to the 2019 Basic Health Research Report, there are 658,201 hypertension sufferers in Indonesia. 34.11% had hypertension, while 13.33% did not use antihypertensive medication (Ministry of Health of the Republic of Indonesia, 2020).

The use of antihypertensive drugs or a doctor's diagnosis accounts for around 13.5% of the prevalence of hypertension in North Sulawesi. In Indonesia, the prevalence of hypertension is higher due to common causes such as heredity and lifestyle, such as lack of physical activity, consumption of foods high in salt or high in fat, smoking habits, and alcohol consumption (Rikesdas, 2020).

One unique way to lower blood pressure in people with hypertension is to do foot soak therapy in warm water. To prevent more severe hypertension, which can lead to stroke, it is recommended to do so. The method is to soak the ankles for fifteen minutes in warm water with a temperature between 38 and 40 degrees Celsius. This therapy can not only reduce blood pressure but can also relax muscles, widen blood vessels, and improve sleep quality (Harnani, Y., & Axmalia, A, 2018).

Theoretical Study

Hydrotherapy is a technique that uses water to treat various pains, its capabilities and benefits have long been known. Hydrotherapy is a low-tech treatment method that relies on the body's reaction to water. Sensory disorders such as limited range of motion or mobility, fatigue, pain, breathing problems, circulation problems, depression, and heart disease can be treated with this therapy. Immersion in warm water is known as hydrotherapy. This type of physical activity can help people reduce various types of discomfort, such as soaking their feet (Ningrum, 2018).

To relieve pain symptoms, soaking the feet in warm water is heat therapy. It is proven that this therapy reduces pain caused by muscle tension and can also help improve circulation problems. The feet are considered the "second heart" of the human body in ancient Chinese medicine. Warm water foot therapy is carried out at a temperature of 38–40 °C. Utilizing heat can also make muscles more flexible, meaning they are less stiff. As a therapy to lower blood pressure, soaking your feet in warm water is a cheap and easy way (Zerlina, 2018). Hypertension is characterized as having a systolic blood pressure greater than 140 mmHg and a diastolic blood pressure greater than 90 mmHg above normal. Unhealthy eating habits and lack of physical activity can contribute to high blood pressure (Rihiantoro & Widodo 2018).

Dewi, E, U. (2019) in his research stated that soaking the feet in warm water creates hot energy which has a meditative effect, increases blood circulation, and improves blood circulation. Activating the parasympathetic nervous system can change blood pressure. Reducing blood pressure can be achieved by doing hydrotherapy regularly. Soaking the feet in warm water is one method that is often used for hydrotherapy. Scientifically, the body experiences the effects of warm water physiologically. First, the temperature of warm water affects the blood vessels, increasing overall blood flow. Second, the loading component in water can strengthen muscles and ligaments, affecting the body's joints (Padila, 2018).

2. METHOD

This research is a quantitative type , and a pre-experimental design is used. The design chosen is one group pre-test and post-test , the pre-test is carried out first to determine the initial status of the respondent before the intervention. This research involved 123 people from the Malendeng community who suffered from hypertension, 69 men and 54 women. The sampling method used was purposive sampling took 10% of the population, namely 12 people with the inclusion criteria: Hypertension sufferers with blood pressure more than 140/90 mmHg, aged over thirty years and provided a signature on the consent letter and could write and read. The research instrument used a warm water immersion therapy SOP and a blood pressure measurement device.

3. RESULTS AND DISCUSSION

Result

1. Respondent Characteristics

a. Frequency Distribution of Respondents Based on Age

Table 1 Distribution of Respondents Based on Age in Malendeng Ward III in 2023 (n=12)

Age	Lots Respondent	
	Frequency (F)	***Percent (%)***
26-35 Years	4	33.3
36-45 Years	7	58.4
46-55 Years	1	8.3
Total	12	100.0

Primary Data Sources 2023

Table 1 shows that 7 people from the age group 36-45 years answered, giving a percentage of 58.3%. 4 people from the 26-35 year age group answered, giving a percentage of 33.3%. One person from the 46-55 year age group responded, giving a percentage of 8.3%.

b. Frequency Distribution of Respondents Based on Gender

Table 2 Distribution of Respondents Based on Gender in Malendeng Ward III in 2023 (n=12)

Type Sex	Lots Respondent	
	Frequency (F)	***Percent (%)***
Man	3	25.0
Woman	9	75.0
Total	12	100.0

Primary Data Sources 2023

Table 2 above, it can be concluded that 9 of the respondents were women, with a percentage of 75.0%. Meanwhile, 3 of the respondents were men, with a percentage of 25.0%.

c. Frequency Distribution of Respondents Based on Occupation

Table 3 Distribution of Respondents Based on Occupation in Malendeng Ward III in 2023 (n=12)

Work	Lots Respondent	
	Frequency (F)	*Percent (%)*
Self-employed	3	25.0
Trader	4	33.3
Mother House Ladder	5	41.7
Total	12	100.0

Primary Data Sources 2023

Table 3 above, it can be concluded that the majority of people who answered were housewives, namely 5 people, with a percentage of 41.7%. Four people who answered worked as traders, with a percentage of 33.3%, and three people answered as entrepreneurs, with a percentage of 25.0%.

d. Frequency Distribution of Respondents Based on Education Level

Table 4 Distribution of Respondents Based on Education Level in Malendeng Ward III in 2023 (n=12)

Level of education	Lots Respondent	
	Frequency (F)	*Percent (%)*
JUNIOR HIGH SCHOOL	7	58.3
SENIOR HIGH SCHOOL	5	41.7
Total	12	100.0

Primary Data Sources 2023

Table 4 above, it can be concluded that the majority of respondents have a junior high school education level, namely 7 people with a percentage of 58.3%. Meanwhile, there were 5 respondents who had a high school education level, with a percentage of 41.7%.

2. Univariate Analysis

a. Systolic Blood Pressure Frequency Distribution

Table 5 Distribution of Respondents Based on Systolic Blood Pressure Before and After the Foot Soak Therapy with Warm Water to Reduce Blood Pressure in Hypertension Sufferers in Malendeng Subdistrict, Environment III, 2023 (n=12)

Pressure Blood (mmHg)	Intervention Soak your feet in warm water			
	Pre		*Post*	
	n	%	n	%
130-140	0	0	12	100.0
141-150	10	83.2	0	0
151-160	2	16.8	0	0
Total	12	100.0	12	100.0

Source of 2023 Statistical Frequency Data

Table 5 above shows that the systolic blood pressure before treatment was found to be 141-150 mmHg by 10 respondents (83.2%), while the systolic blood pressure after treatment was found to be 130-140 mmHg by 12 respondents (100.0%).

b. Frequency Distribution of Diastolic Blood Pressure

Table 6 Distribution of Respondents Based on Diastolic Blood Pressure Before and After Foot Soak Therapy with Warm Water to Reduce Blood Pressure in Hypertension Sufferers in Malendeng Subdistrict, Environment III, 2023 (n=12)

Pressure Blood (mmHg)	Intervention Soak your feet in warm water			
	Pre		*Post*	
	n	%	n	%
80-90	0	0	12	100.0
91-100	12	100.0	0	0
Total	12	100.0	12	100.0

Source of 2023 Statistical Frequency Data

Table 6 above shows that the highest diastolic blood pressure before treatment was 91-100 mmHg by 12 respondents (100.0%), while the highest diastolic blood pressure was 80-90 mmHg after treatment by 12 respondents (100.0%).

3. Bivariate Analysis

a. Systolic Wilcoxon Test Analysis Results

Wilcoxon Test Analysis Results in Providing Foot Soak Therapy Using Warm Water to Reduce Blood Pressure in Hypertension Sufferers in Malendeng Subdistrict, Manado City 2023 (n=12)

Time	Systolic Blood Pressure				
	n	*Mean*	Std. Deviation	Min-Max	*p-value*
Pre	12	147.50	4,338	142-158	0.002
Post	12	133.67	2,462	130-137	

2023 Wilcoxon Test Data Source

Based on table 5.7 above, the results show that systolic blood pressure before warm water foot soak therapy is average (147.50), with a minimum value (142) and a maximum value (158), with a standard deviation (4,338), but After therapy the systolic blood pressure fell to (133.67), with a minimum value of (130) and a maximum value of (137), with a standard deviation of (2.462) with a *p-value of* 0.002 or <0.05 after being given the foot soak intervention.

b. Wilcoxon Diastolic Test Analysis Results

Wilcoxon Test Analysis in Providing Foot Soak Therapy Using Warm Water to Reduce Blood Pressure in Hypertension Sufferers in Malendeng Subdistrict, Manado City 2023 (n=12)

Time	Diastolic Blood Pressure				
	n	*Mean*	Std. Deviation	Min-Max	*p-value*
Pre	12	97.50	1,168	95-99	0.002
Post	12	80.92	1,084	80-83	

2023 Wilcoxon Test Data Source

Based on table 5.8 above, diastolic blood pressure is the average (97.50), with a minimum value (95) and maximum value (99) with a standard deviation of (1.168), after therapy the diastolic pressure becomes (80.92), with a minimum value (80) and maximum value (83) with standard deviation (1.084)) with a *p-value of* 0.002 or <0.05 after being given the foot soak intervention.

Discussion

This study was conducted in Malendeng Village from 23 June to 3 July 2023. 12 people who met the inclusion criteria were selected using a *purposive sampling method* . This study tries to find out whether soaking feet in warm water can reduce blood pressure in people suffering from hypertension. This research uses a one group pre-test and post-test experimental design. For five minutes before and five minutes after the foot soak, the researcher recorded blood pressure using a digital blood pressure measuring device in the observation sheet. All participants successfully completed the intervention well, and the soaking was carried out for fifteen minutes in warm water. Nobody dropped out .

The results of the analysis show that, as reported by Nazzaruddin, Yati, and Pratiwi (2021), warm water foot soak therapy reduces blood pressure in hypertension sufferers. The theory behind this research is that soaking the feet in warm water can widen blood vessels, improve blood circulation, stimulate the nerves in the feet, and activate the parasympathetic nervous system, which in turn increases blood pressure. Researchers believe that the body's response to heat energy and activity causes changes in blood pressure after treatment for people with hypertension. As a result, this influences the effect of warm water foot soak therapy on blood pressure.

Researchers found that the respondent's age influenced changes in blood pressure. This is especially true for the 36 to 45 year age group. The research results of Nazzaruddin, Yati, and Pratiwi (2021) are in line. Studies show that people over 33 years of age are more likely to have high blood pressure. Additionally, research results suggest that age, gender, and lifestyle may be other risk factors that contribute to the development of hypertension. Researchers suspect that systolic blood pressure increases as a result of changes that occur in the walls of large blood vessels, which narrow and harden with age.

Gender is one of the factors that can cause hypertension. This shows that the majority of respondents in this study were women, and this finding is in line with the findings of Sari and Aisah (2022). Most women have a higher risk of high blood pressure, according to this study. This is due to the possibility of left ventricular atrophy as a result of long-term sustained increased cardiac afterload. This condition becomes more severe with increasing age because the heart muscle's ability to control blood pressure becomes less effective. High blood pressure generally occurs more often in women as they get older. Although this hormone plays an important role in preventing high blood pressure, estrogen secretion tends to decrease in women over 35 years of age. Therefore, women are more susceptible to experiencing high blood pressure. According to researchers *(Falah M, 2019),* women also have a greater risk of experiencing stress because of their tendency to consider problems excessively. Researchers assume that some of the reasons why women over 30 have higher blood pressure are stress, lack of physical activity, use of birth control pills, and being overweight. The effects of the sympathetic nervous system, which influences the hormone adrenaline, which causes blood pressure to rise, is responsible for the influence of stress on hypertension.

Another factor that can cause high blood pressure is a person's job. According to this research, the majority of respondents are housewives. One factor that can cause hypertension is a person's type of work. By reducing vascular resistance and reducing the activity of the sympathetic nervous system and the renin angiotensin system, physical activity can help reduce the risk of hypertension *(Anggara and Prayitno, 2020).* Researchers suggest that people who are less active have a higher risk of heart rate. A high heart rate indicates that the heart is exerting greater pressure on the artery walls when it contracts.

Knowledge about healthy lifestyles to prevent hypertension is greatly influenced by a person's level of education. The results showed that the majority of respondents had junior high school, which is consistent with the research findings of Arafah and Kamriana (2019), which found that lower levels of education were associated with a higher prevalence of hypertension. This may be caused by a lack of knowledge about health and difficulty receiving information or instructions from health professionals, which in turn has an impact on healthier behavior and lifestyle (*Retnaningsih et al, 2021).* Researchers assume that a low level of education is considered to be correlated with a lack of knowledge and awareness of health. Controlling hypertension is difficult for people with hypertension because they usually don't know much about their health.

Foot therapy with warm water can help people with high blood pressure lower their blood pressure. To prevent severe hypertension, which can cause stroke, people with mild hypertension are advised to carry out this preventive therapy. This method involves soaking the ankle for about fifteen minutes in warm water that is between 38 and 40 degrees Celsius. Pedicure therapy with warm water not only helps lower blood pressure, but can also relax muscles, widen blood vessels, and improve sleep quality *(Harnani & Axmalia, 2018).*

4. CONCLUSION

From the results and discussion of this research, it can be concluded that soaking feet in warm water in Malendeng Village for hypertensive patients is very effective in lowering blood pressure. Not much physical activity, such as exercise, can cause a buildup of salt in the blood vessels, which increases blood pressure. Therefore, the more often you soak your feet in warm water, the greater the changes in blood pressure which can help prevent hypertension. It is hoped that the results of this research can be used as a reference and increase nurses' knowledge in providing health services or education to the community using modern methods, namely long-distance communication, so that they can provide nursing care according to community needs without having to go to the hospital.

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