Foot Soaking Therapy with Warm Water Decrease Blood Pressure of Patients with Hypertension

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Abstract :

Hypertension, or high blood pressure, is a prevalent condition that poses significant risks to cardiovascular health. Non-pharmacological interventions are increasingly being explored to manage and reduce blood pressure levels. One such method is foot soaking therapy using warm water, which has shown promise in promoting relaxation and improving circulation. This study investigates the effects of foot soaking with warm water on the blood pressure levels of patients diagnosed with hypertension. A randomized controlled trial was conducted, involving hypertensive patients who underwent foot soaking sessions in warm water for a specified duration over a period of weeks. Blood pressure measurements were taken before and after each session, and the results were analyzed for any significant changes. The findings indicate that foot soaking with warm water led to a notable reduction in both systolic and diastolic blood pressure, suggesting its potential as a complementary treatment for managing hypertension. This therapy could offer a low-cost, accessible alternative for individuals seeking to reduce their blood pressure and improve overall cardiovascular health, especially in cases where traditional interventions may not be readily available or preferred. Further research is needed to explore the long-term effects and mechanisms behind this therapeutic practice.

Keywords: hypertension, blood pressure, foot soaking therapy, warm water, cardiovascular health, non-pharmacological treatment

1. BACKGROUND

Elderly characterized by decreased of ability to improve or maintain its normal function due to degenerative health problems such as hypertension (Nugroho, 2000). Hypertension is an asymptomatic disorder accompanied by elevated systolic and diastolic blood pressure and is often referred to as "the silent killer" (Potter & Perry, 2005) (G, B, & Izzo, 2003). Raised blood pressure is the biggest single contributor to the global burden of disease and to global mortality. (Poulter, Prabhakaran, & Caulfield, 2015). Hypertension occurring in the elderly is due to changes in the structure and function of the blood vessels (Setyaningsih et al., 2014). Based on data from World Health Organization (WHO), in 2013 the number of uncontrolled hypertension clients increased from 600 million in 1980 to 1 billion in 2008 (World Health Organization, 2013). Data based on Basic Health Research in Indonesia held in 2013 revealed that the prevalence of hypertension was the highest prevalence of degenerative diseases in elderly (based on measurement result at age ≥18 years). East Java is one province with hypertension prevalence is high enough 26.2% (Badan Penelitian dan Pengembangan Kesehatan, 2013). Based on data from the health clinic at a social service in Jember as one district at East Java, Indonesia, the number of elderly who experienced hypertension in July to September 2017 as many as 53 people. Management of hypertension aims to maintain blood pressure in the normal range and improve the health status and quality of life of the elderly. Generally, the management of hypertension is divided into pharmacological and nonpharmacological therapy. However, pharmacological therapy for the elderly has various problems such as dependency effects, elderly disobedience in taking antihypertensive drugs, and side effects that may arise due to drug administration (Aronow & Banach, 2012). Therefore, non pharmacological treatment can be done to support pharmacological treatment (Muttaqin, 2009). Nonpharmacological management such as foot soak therapy is a therapy with warm water to dilate muscle tissue of the blood vessels to make blood circulation smoothly (Solechah, Masi, & Rottie, 2016)

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 Response	
	Frequency (F)	Percent (%)
26-35 Years	4	33.33
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 Of Sex	Lots Response	
	Frequency (F	Percent (%)
Man	3	25
Woman	9	75
Total	12	100

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
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

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

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

Table no **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	97.50	1,168	95-99	0.002
Post	12	80.92	1,084	80-83	

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

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

5.REFERENCES

1) Alimul. (2018). Nursing Research Methods and Data Analysis Techniques . Jakarta: Salemba Medika. Arafah, S., & Kamriana. (2019). The Effect of Soaking Your Feet Using Warm Water on Reducing Blood Pressure in Hypertension in the Working Area of the Pattallassang District Health Center. Takalar. Journal of Nursing Media , vol. 10. No. 2, pages 78-84. (https://journal.poltekkes-mks.ac.id/ojs2/index.php/mediakewarni/article/view/1336 on September 24. At 09.08 WITA).

2) Arikunto. (2018). Research Procedures A Practical Approach . Revised Edition Jakarta: PT. Rineka Cipta.

3) Arora. (2018). 5 Steps to prevent and treat high blood pressure . Jakarta: Bhuana Popular Science. Biswas, T., Islam, SMS, & Islam, A. (2018). Prevention of hypertension in Bangladesh: a review journal of medicine. Semantic Scholar , vol. 7, no. 2, pages 137-144. (https://www.semanticscholar.org/reader/18ed4291641f9cc18588ffe969503f41f50f6d0b . Accessed on September 24 2023. At 08.17 WITA).

4) Cheng, H.-M., Lin, H.-J., Wang, T.-D., & Chen, C.-H. (2020). Asian management of hypertension: Current status, home blood pressure, and specific concerns in Taiwan. The Journal of Clinical Hypertension , vol. 22, no. 3. (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8030078/ . Accessed on September 24 2023. 00.42 WITA).

5) Dewi, E, U. (2019). The Effect of Foot Soak Therapy in Warm Water on Reducing Blood Pressure in Hypertension Sufferers in the Poasia Health Center Working Area, Kendari City. Journal of Scientific Health Diagnosis , vol. 18, no. 2. (https://jurnal.stikesnh.ac.id/index.php/jikd/index . Accessed on September 24 2023. 00.45 WITA).

6) Falah, M. (2019). The relationship between gender and the incidence of hypertension in the community in Tamansari Village, Tasikmalaya City. Journal of Nursing & Midwifery STIKes Mitra Kencana Tasikmalaya , vol. 3, no. 1, 2599-0055, pages 85-94. (https://www.fikes.umtas.ac.id/assets/backend/publikasi/38.pdf . Accessed on 5 August 2023. At 00.28 WITA). Florence. (2018). Results of blood pressure measurements in various positions with an aneroid spygmomanometer in nursing students .

7) Semarang. Gunawan. (2018). Hypertension (High Blood Pressure) , Yogyakarta: Kanisius. Hariawan., & Tatisina. (2020). "Implementation of Family Empowerment and Hypertension Exercise as a Self-Management Effort for Hypertension Sufferers." Sasambo Community Service Journal , vol 1, no. 2. (http://jkp.poltekkes-mataram.ac.id/index.php/PKS/article/view/478. Accessed on 24 September 2023. At 00.36 WITA).

8) Harnani, Y., & Axmalia, A. (2018). Foot Soak Therapy Using Warm Water Effectively Lowers Blood Pressure in the Elderly. Journal of Community Health. Journal of Community Health , vol. 3, no. 4. (https://media.neliti.com/media/publications/275632-soak-feet-warm-water-therapyeffective-t-f707d2b1.pdf. Accessed on 24 September 2023. At 00.32 WITA).

9) Ilkafah. (2018). Differences in Lowering Blood Pressure in the Elderly Anti-Hypertension Medications and Foot Soak Therapy with Warm Water in the Working Area of Public Health Centers Between Tamalanrea Makassar. Panrita Husada Health Journal. Ejournal Unsrat , vol. 5, no. 2. (https://ejournal.unsrat.ac.id/v3/index.php/pharmacon/article/view/12194. Accessed on September 24 2023. 00.29 WITA).

10) Istiqomah. (2018). The Effect of Warm Water Foot Soak Therapy on Blood Pressure Levels in Elderly People with Hypertension in Depok Ambar Ketawang Gamping Hamlet, Yogyakarta. Unisayogya Ejournal , vol. 2, no. 3. (https://ejournal.unisayogya.ac.id/ejournal/index.php/index/search/ . Accessed on September 24 2023. 08.35 WITA). Ministry of Health of the Republic of Indonesia. (2020). Basic Health Research: RISKESDAS 2019. Research and Development of the Indonesian Ministry of Health. Lalage. (2018). Healthy Living With Water Therapy . Yogyakarta: Abata Press.

11) Nazaruddin., Yati, M.., & Pratiwi, D, S. (2021). The Effect of Foot Soak Therapy in Warm Water on Reducing Blood Pressure in Hypertension Sufferers in the Poasia Health Center Working Area, Kendari City. Journal of Scientific Health Diagnosis , vol. 16, no. 2, pages 87-97. (https://jurnal.stikesnh.ac.id/index.php/jikd/article/view/472. Accessed on September 24 2023. 09.02 WITA).

12) Ningrum. (2018). Comparison of Hydrotherapy Massage and Manual Massage Methods for Fatigue Recovery After Lactacid Aerobic Exercise. Journal of Applied Sports Science , vol. 3, no. 1. (https://ejournal.upi.edu/index.php/JTIKOR/article/view/11501/6915. Accessed on September http://ejournal.seaninstitute.or.id/index.php/healt 24 2023. 00.55 WITA).

13) Notoadmodjo. (2018). Health Research Methodology . Jakarta: Rineka Cipta. Nurasiyah, SH (2018) Description of Blood Pressure Based on Body Position in Patients. Nursalam. (2018). Nursing Research Methodology , 4th edition, Jakarta: Salemba Medika. Padila. (2018). Internal Medicine Nursing Care .

14) Yogyakarta: Nuha Medika. Pratiwi., & Tiara. (2019). Epidemiological Description of Hypertension in the Terjun Village, Medan Marelan District, 2019. The University Institutional Repository , vol. 1, no. . (https://repositori.usu.ac.id/handle/123456789/3596. Accessed on September 24 2023. 01.00 WITA). Ranomut Community Health Center. (2023). Highest Non-Communicable Disease Reports . Manado. Suyanto., & Siswanto. (2018). Health and Medical Research Methodology .

15) Yogyakarta: Science Exchange. Syam, N. (2018). The Effect of Warm Water Soaking the Feet and Consuming Cucumber Juice on Hypertension in the Elderly. Thesis. Nursing Study Program, Faculty of Medicine and Health Sciences, UIN Alauddin Makassar, Journal UIN Alauddin , vol. 1, no. 2. (http://repositori.uinalauddin.ac.id/2401/1/Nurhaida%20Syam.pdf. Accessed on September 24 2023. 00.08 WITA). Triyanto. (2018).

16) Integrated Nursing Services for Hypertension Sufferers . Yogyakarta: Graha Ilmu. WHO, 2016. A Global Brief of Hypertension. Silent killer, global public health crisis. Wibowo, D, A., & Purnamasari, L. (2019). The Effect of Warm Water Foot Soaking on Sleep Quality in the Elderly in the Handapherang Community Health Center Working Area, Ciamis Regency, 2019

17) . Galuh Nursing Journal , vol. 1, no. 2. (https://jurnal.unigal.ac.id/index.php/JKG/article/view/2635. Accessed on 23 September 2023. At 11.45 WITA). Zerlina. (2018). Healthy Living With Water Therapy . Yogyakarta: Abata Pres