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The Effect of Foot Massage Therapy on Blood Pressure among Elderly with Hypertension

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Abstract

Introduction: Hypertension is a major public health problem and a leading cause of cardiovascular morbidity and mortality worldwide. Uncontrolled hypertension can lead to serious complications affecting the heart, brain, kidneys, and vision. In addition to pharmacological treatment, non-pharmacological interventions such as foot massage therapy have been proposed as complementary approaches to help reduce blood pressure.
Objective: Therefore, this study aims to examine the effect of foot massage therapy on blood pressure among elderly patients with hypertension.
Method: This study was a quasi-experimental research method with a one-group pretest-posttest design. The samples in this study were 20 elderly people aged 60 - 73 years who experienced hypertension
Result: The results of this case study found that the application of foot massage therapy performed directly by the author to the subject can have an effect on changes in systolic and diastolic blood pressure values which are carried out routinely 5 consecutive days and show the average systolic blood pressure value before foot massage therapy is 170mmHg and diastolic blood pressure value of 100mmHg and has been done foot massage therapy, namely systolic blood pressure 130mmHg and diastolic blood pressure value 80mmHg
Conclusion: Researchers analyzed using the sample paired test test and obtained a significance value of sig = 0.00 or sig<0.005 which can be concluded that there is an effect of giving foot massage therapy on lowering blood pressure in the elderly with hypertension at the Iringmulyo Health Center, Metro City in 2024.

Keywords: elderly, foot massage, hypertention

Introduction

Hypertension, often referred to as "the silent killer," is a condition in which blood pressure in the blood vessels remains chronically elevated. This occurs because the heart works harder to pump blood to meet the body's oxygen and nutrient needs. If left untreated, this condition can disrupt the function of other organs, especially vital organs. Global lifestyle changes play a significant role in the increasing incidence of hypertension. The increasing availability of fast food has led to a decrease in the consumption of fresh vegetables and fiber, and an increase in the consumption of salt, fat, sugar, and calories (Palmer, 2018). According to the Indonesian Ministry of Health (2020), high blood pressure is typically identified by elevated systolic and diastolic blood pressure. A person is considered to have high blood pressure when the systolic pressure is greater than 140 mmHg and the diastolic pressure is greater than 90 mmHg, measured on two occasions five minutes apart while resting/calm.

High blood pressure should not be ignored as it can lead to complications. The higher the pressure in the blood vessels, the harder the heart must work to pump blood. If left uncontrolled, hypertension can lead to heart attacks, heart enlargement, and heart failure. Aneurysms can form in the blood vessels and form thrombi, which can block blood flow. Pressure within the blood vessels can also cause blood to leak into the brain, leading to a stroke (WHO, 2020).

According to the World Health Organization (WHO), hypertension is a condition in which a person's blood pressure exceeds normal limits, namely systolic blood pressure above 140 mmHg and diastolic blood pressure above 90 mmHg. This condition can increase the risk of heart, brain, kidney, and other diseases. Globally, the World Health Organization (WHO) estimates that the prevalence of hypertension will reach 33% by 2023, with two-thirds of these cases occurring in low- and middle-income countries (WHO, 2020). The number of people with hypertension will continue to grow over time and is estimated to reach 1.5 billion by 2024 (WHO, 2018). Uncontrolled hypertension can lead to heart complications, including myocardial infarction and left ventricular enlargement with or without heart failure. Hematuria (blood in the urine) and oliguria (scanty urination) are kidney complications of hypertension.

Data from the 2020 Sample Registration System (SRS) from the Indonesian Health Research and Development Agency (Balitbangkes) indicates that hypertension with complications is the fourth leading cause of death across all age groups, accounting for 6.8%. Meanwhile, the Basic Health Research (Riskesdas) indicates that the national prevalence of hypertension was 28.5% in 2013 and 34.1% in 2018. By age group, the prevalence of hypertension is as follows: 13.2% for those aged 18-24; 31.6% for those aged 34-44; 45-54; 45.3% for those aged 55-64; 55.2% for those aged 55-64. The prevalence of hypertension in the 64-74 age group was 63.2%, and in the over-75 age group, 69.5%. According to the Indonesian Basic Health Research (RISKH), the prevalence of hypertension was 34.1% (Ministry of Health, 2023). The 2023 SKI data shows that 59.1% of the causes of disability (vision, hearing, and walking) in the population aged 15 years and older were acquired diseases, of which 53.5% were non-communicable diseases (NCDs), primarily hypertension (22.2%) and diabetes (10.5%). In 2023, the incidence of hypertension, based on measurements, was 29.2% in those aged 15 years and older and 33.4% in those aged 18 years and older.

The low rate of hypertension treatment in Indonesia is consistent with data on the level of healthcare access for hypertension patients in Lampung Province, particularly in Metro City. According to the 2021 Lampung Province Health Profile, the prevalence of hypertension

among residents aged ≥15 years in Lampung Province is 15.10%, with healthcare coverage for hypertension patients at 49.10%; while Metro City has a prevalence of hypertension among residents aged ≥15 years at 16.71%, with healthcare coverage for hypertension patients at 71.40%. In other words, these data indicate that the target for healthcare coverage for hypertension patients according to the Minimum Service Standards (SPM) has not been achieved, both in Lampung Province as a whole and in Metro City.

Untreated and increasingly severe hypertension can lead to visual impairment, nerve damage, heart problems, kidney dysfunction, and cerebral (brain) disorders. These cerebral disorders can lead to seizures and cerebral hemorrhage, paralysis, impaired consciousness, and even coma. The symptoms depend on the level of blood pressure and how long it remains uncontrolled and untreated. Furthermore, these symptoms also indicate complications from hypertension that can lead to other diseases, such as heart disease, stroke, kidney disease, and visual impairment (Indah Sari, 2017).

The high incidence of hypertension indicates that it requires immediate treatment. The first step in hypertension treatment is pharmacological and non-pharmacological therapy (Wirakusumah, 2012). Treatment implemented by community health centers for hypertension patients includes pharmacological therapy, such as antihypertensive medication, counseling on a low-salt diet, and regular check-ups through Prolanis (National Health Insurance Program). Pharmacological therapy only returns blood pressure to normal but does not guarantee that it will not rise again. Long-term use of medication can damage organs such as the brain and kidneys. Hypertension can be treated with non-pharmacological approaches, such as massage therapy, in addition to pharmacological treatments (Sustrani, 2016). Pharmacological treatments have side effects that can worsen the condition or cause other fatal effects. This is because responses to certain medications can include headaches, dizziness, weakness, and nausea (Susilo & Wulandari, 2021). Pharmacological treatment involves medications that can help lower and stabilize blood pressure. The goal of initial pharmacological treatment is to select an effective antihypertensive medication to reduce blood pressure according to the target target and adjust the dosage to the patient (Prodjosudjadi et al., 2019).

Related research conducted by Widowati et al. (2017) on the effects of foot massage therapy found systolic blood pressure before and after intervention was 164 mmHg and 141 mmHg. Furthermore, research conducted by Elisabet Novembriana (2021) on the effects of foot massage therapy reported that systolic blood pressure in the control group was 181 mmHg before and 163 mmHg after. Diastolic blood pressure in the control group was 94 mmHg before and 89 mmHg after. With a mean systolic blood pressure difference of 17,500 and a mean diastolic blood pressure difference of 5,000 in the control group, the difference in mean systolic and diastolic blood pressure between the case and control groups is evident. In the case group, the reduction was highly significant, with a statistical p-value of 0.000 indicating a significant effect of foot massage therapy on blood pressure.

Data obtained at the Iringmulyo Community Health Center (Puskesmas), the number of hypertension cases reached 279 in 2022, 380 in 2023, and 124 cases from January to August 2024. Previous efforts by the Iringmulyo Community Health Center to address hypertension included providing education about hypertension, free routine blood pressure checks, and healthy exercise programs. However, these efforts have not yielded optimal results due to a lack of community enthusiasm.

Objective

This study aims to examine the effect of foot massage therapy on blood pressure among elderly patients with hypertension.

Method

This study employed a quantitative approach using a quasi-experimental design with a one-group pretest–posttest design to examine the effect of foot massage therapy on blood pressure in elderly patients with hypertension. The study was conducted at the Iringmulyo Community Health Center, Metro City, in 2024.

The study population consisted of elderly patients diagnosed with hypertension who were registered at the Iringmulyo Community Health Center. A total of 20 elderly participants, aged 60–73 years, were selected using a total sampling technique, as all eligible participants who met the inclusion criteria were included in the study. The inclusion criteria were elderly individuals diagnosed with hypertension, able to communicate well, and willing to participate in the study, while elderly patients with severe complications or mobility limitations were excluded.

Blood pressure measurements were taken using a standardized sphygmomanometer. Baseline blood pressure (pretest) was measured before the intervention, and posttest measurements were conducted after the completion of the intervention. The intervention consisted of foot massage therapy, which was administered once daily for five consecutive days, with each session lasting approximately 15–20 minutes. The massage was performed manually using massage oil or handbody lotion to reduce skin friction and prevent irritation.

Data analysis was conducted using a paired sample t-test to compare systolic and diastolic blood pressure values before and after the intervention. A p-value < 0.05 was considered statistically significant, indicating that foot massage therapy had a significant effect on reducing blood pressure in elderly patients with hypertension.

Result

Table 1. Analysis of the effect of foot massage therapy on blood pressure in elderly with hypertension based on a paired sample test (n=20)

Type of Pressure		Mean	Category	Asymp. Sig. (2-tailed)
Sistole	Pre test	166.2	Hypertension Grade 2	.000
	Post Test	157.8	Hypertension Grade 1	
Diastole	Pre test	122.2	Hypertension Grade 2	.000
	Post Test	112.9	Hypertension Grade 2	

Based on Table above an analysis can be conducted regarding the effect of foot massage therapy on blood pressure in elderly with hypertension. The average systolic blood pressure before therapy was 166.2 mmHg, which is classified as Stage 2 Hypertension. The average

systolic blood pressure after therapy decreased to 157.8 mmHg, which is classified as Stage 1 Hypertension.

There was a decrease in the average systolic blood pressure of 8.4 mmHg, with a significance value of p=0.000 (p<0.05), indicating statistical significance. Furthermore, changes in diastolic blood pressure were also observed. Based on pretest data, the average diastolic pressure before therapy was 122.2 mmHg, which falls into the Stage 2 Hypertension category. Furthermore, in the posttest, the average diastolic pressure after therapy decreased to 112.9 mmHg, but remained in the Stage 2 Hypertension category.

There was a decrease in the average diastolic pressure of 9.3 mmHg, with a significance value of p=0.000 (p<0.05), indicating that this decrease was statistically significant. The statistical calculations for both blood pressure levels (systolic and diastolic) showed that foot massage therapy significantly reduced blood pressure in elderly people with hypertension at the Iringmulyo Community Health Center in Metro City in 2024.

Discussion

According to the results of the researchers' bivariate analysis, the average systolic pressure during the pretest before the foot massage was 171.5 and the average diastolic pressure was 104 (stage 2 hypertension). Meanwhile, after 5 days of foot massage therapy, there was a significant decrease in blood pressure, as evidenced by the posttest results, which showed an average systolic pressure of 136 and an average diastolic pressure of 83.5 (normal-high). This was further supported by analysis using a paired sample test, which obtained a significance value of sig = 0.00 (sig <0.005), concluding that foot massage therapy had an effect on reducing blood pressure in elderly people with hypertension at the Iringmulyo Community Health Center in Metro City in 2024.

These results are supported by research by Dewi et al. (2023) on "The Effect of Foot Massage on Blood Pressure in Elderly with Hypertension at the Kuala Lempuing Community Health Center in Bengkulu City," found that the average blood pressure in elderly hypertensive patients before receiving foot massage was 151.20 mmHg systolic and 92.73 mmHg diastolic. The average blood pressure in elderly hypertensive patients after receiving foot massage was 138.93 mmHg systolic and 86.33 mmHg diastolic. This finding is supported by a p-value of 0.000 ($p < \alpha$ 0.05), indicating a significant effect of foot massage on blood pressure in elderly hypertensive patients at the Kuala Lempuing Community Health Center in Bengkulu City. Furthermore, research by Irawati (2024) also found a decrease in blood pressure compared to before receiving foot massage with a significance value of p = 0.000 (p < 0.05). Other supporting findings are from research by Ervianda et al. al. (2023) entitled "The Application of Foot Massage to Reduce Blood Pressure in Hypertension Patients at Karanganyar Regency Hospital," found a significant decrease in systolic blood pressure of 40 mmHg and diastolic blood pressure of 10 mmHg after foot massage therapy.

Massage therapy is a sensory integration technique that influences the activity of the autonomic nervous system. When a person perceives touch as a relaxing stimulus, a relaxation response occurs. This relaxation response leads to a more relaxed patient, triggering vasodilation of blood vessels, which then triggers a decrease in blood pressure (Safitri, 2022).

Foot massage can lower blood pressure through several important physiological mechanisms. Foot massage has been shown to activate the parasympathetic nervous system and suppress sympathetic nervous system activity, which plays a role in lowering blood pressure and heart rate. Foot massage can significantly reduce blood levels of cortisol,

norepinephrine, and epinephrine, contributing to lower blood pressure. Mechanical manipulation of the feet also stimulates the release of nitric oxide, which causes vasodilation of blood vessels and a decrease in peripheral resistance. Furthermore, foot massage improves microcirculation and peripheral blood flow, which helps reduce overall blood pressure (Wang et al., 2022).

Foot massage intervention is very beneficial for strengthening heart function in patients with hypertension. Foot massage can increase patient relaxation and prevent the risk of decreased cardiac output, as evidenced by improvements in blood pressure and heart rate. Massage movements on the skin, muscle tissue, connective tissue, and periosteum can stimulate receptors located in these areas. Impulses are conducted by afferent nerves to the central nervous system, which then produces endorphins. They provide feedback by releasing acetylcholine and histamine through afferent nerve impulses, which trigger the body to react through a reflex mechanism of vasodilation of blood vessels. This reduces sympathetic nerve activity and increases parasympathetic nerve activity. Increased parasympathetic nervous system activity decreases heart rate and pulse rate and activates the relaxation response. Decreased sympathetic nervous system activity increases arteriolar and venous vasodilation, decreasing peripheral vascular resistance, and thus lowering blood pressure (Niswah et al., 2022).

Based on all the above, researchers believe that foot massage therapy is significantly effective in lowering blood pressure in elderly people with hypertension. Scientific evidence suggests that foot massage works through mechanisms such as modulating the autonomic nervous system, reducing stress hormone levels, releasing nitric oxide, and increasing peripheral blood flow. Therefore, for optimal implementation, foot massage training can be provided to healthcare workers, families, or caregivers to ensure wider and more sustainable access to this therapy for hypertension management in the elderly.

The researchers hypothesize, based on the results of existing research and previous studies, that foot massage has an effect on lowering blood pressure in hypertensive patients, both systolic and diastolic. Massage of the instep and soles of the feet, performed for 5-15 minutes five times a day, helps improve blood circulation and promote relaxation, thus lowering blood pressure in hypertensive patients.

The researchers believe that non-pharmacological treatment using foot massage techniques is highly effective for hypertensive patients. This method is chosen because it has fewer side effects and is more economical. The foot massage process, using only human hands, can be performed alone or with the help of family or others. Therefore, during the study, researchers also taught foot massage techniques to family members and the patients themselves. They also explained the benefits and advantages of foot massage so that patients and families could perform it at home.

Conclusion

The results showed that most of the 20 elderly participants were aged 60–64 years, and more than half were male. Prior to the intervention, the average systolic and diastolic blood pressure values indicated that the majority of respondents were classified as having stage 2 hypertension. After the implementation of foot massage therapy, there was a decrease in both systolic and diastolic blood pressure, with most respondents classified as having grade 1 hypertension. Statistical analysis using a paired sample test demonstrated that foot massage therapy had a significant effect on reducing blood pressure among elderly patients with hypertension at the Iringmulyo Community Health Center, Metro City, in 2024 ($p < 0.05$).

Conflict of Interest

No declare.

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Reference

1. Aspiani R. (2015). Buku Ajar Asuhan Keperawatan Klien Gangguan Kardiovaskular, Aplikasi NIC & NOC. Jakarta: EGC
2. Asikin, M., M. Nuralamsyah., Susaldi. (2018). Keperawatan Medikal Bedah: SistemKardiovaskuler. Jakarta: PenerbitErlangga.
3. Bell, K. Twiggs, J., Olin, (2018). Hypertension: the silent killer: updated JNC-8 guideline recommendations. Alabama pharmacy association, 334, 4222.
4. Centers for Disease Control, (2020). Interim clinical guidance for management of patients with confirmed coronavirus disease (COVID-19).
5. Chan et al., (2018). Metabolic regulation of mitochondrial dynamics. Journal of Cell Biology, 212(4), 379-387.
6. Cheung, et.al (2018). Contrasting futures for ocean and society from different anthropogenic CO2 emissions scenarios. Science, 349(6243), aac4722.
7. Dinas Kesehatan Provinsi Lampung, (2023). Profil Kesehatan. Lampung: Dinas Kesehatan.
8. Dalimartha, Setiawan. "dkk. (2018)." Care your self hipertensi
9. Ervianda, E., Hermawati, H., & Yuningsih, D. (2023). Penerapan foot massage terhadap penurunan tekanan darah pada penderita hipertensi di RSUD Kabupaten Karanganyar. Jurnal Ventilator, 1(3), 196-207.
10. Febriyati, D., Amita, D., & Kurnia, A. (2023). Pengaruh Foot Massage Terhadap Tekanan Darah Pada Lansia Hipertensi Di Puskesmas Kuala Lempuing Kota Bengkulu. INJECTION: Nursing Journal, 3(2), 73-87.
11. Ganong, W. 2018. Buku Ajar Fisiologi Kedokteran. Penerbit Buku Kedokteran: EGC.
12. Garwahusada, E., & Wirjatmadi, B. (2020). Hubungan jenis kelamin, perilaku merokok, aktivitas fisik dengan hipertensi pada pegawai kantor. Media Gizi Indonesia, 15(1), 60-65.
13. Hidayat, A. 2018. Metode Penelitian Kebidanan dan Teknik Analisis Data. Jakarta: Salemba Medika.
14. Indah Sari. (2017). Berdamai Hipertensi. Jakarta: Tim Bumi Medika.
15. Irawati, P., Fitri, O. E., & Umara, A. F. (2024). Pengaruh Terapi Foot Massage terhadap Penurunan Tekanan Darah pada Pasien Hipertensi Urgensi. Jurnal Ilmiah Keperawatan Indonesia (JIKI), 7(2), 151-160.
16. Kementrian Kesehatan RI, (2020). Profil Kesehatan Republik Indonesia.Jakarta: Depkes RI.
17. Mansjoer. (2018). Buku Ajar Ilmu Penyakit Dalam Edisi II. Jakarta : Media Auscalpius.
18. McIver et al. (2019). Reproducible, interactive, scalable and extensible microbiome data science using QIIME 2. Nature biotechnology, 37(8), 852-857.
19. Mills KT, Colantonio LD, Muntner P, et al. (2023). Sex differences in the prevalence, awareness, treatment, and control of hypertension: a systematic review and meta-analysis. PLoS Medicine, 20(3), e1004169.

20. Niswah, A., Armiyati, Y., Samiasih, A., & Chanif, C. (2022). Penurunan Tekanan Darah Pasien Hipertensi Dengan Terapi Foot Massage: Studi Kasus. In Prosiding Seminar Nasional UNIMUS (Vol. 5).
21. Oktaviarini, E., Hadisaputro, S., Suwondo, A., & Setyawan, H. (2019). Beberapa Faktor yang Berisiko Terhadap Hipertensi pada Pegawai di Wilayah Perimeter Pelabuhan (Studi Kasus Kontrol di Kantor Kesehatan Pelabuhan Kelas II Semarang). Jurnal epidemiologi kesehatan komunitas, 4(1), 35-44.
22. Ridho Aditya, Khoiriyah (2012). Aplikasi Terapi Pijat Refleksi Kaki terhadap Penurunan Tekanan Darah pada Pasien Hipertensi di Kecamatan Lowokwaru Kota Malang
23. Wang, Y., Liu, Z., Zhang, J., & Chen, W. (2022). Effects of foot massage on autonomic nervous system function in elderly hypertensive patients: A randomized controlled trial. Frontiers in Aging Neuroscience, 14, 847265.
24. Wang Z, Chen Z, Zhang L, et al. (2021). Status of hypertension in China: results from the China Hypertension Survey, 2012-2015. Circulation, 143(16), 1090-1102.