

ORIGINAL ARTICLE**THE EFFECT OF FOOT MASSAGE THERAPY ON ELDERLY PEOPLE'S BLOOD PRESSURE WITH HYPERTENSION IN WIROGUNAN VILLAGE, YOGYAKARTA CITY**

Pipin Nurhayati*, Lindah Kurniasari

Bachelor of Nursing Program, STIKES Surya Global, Bantul, Special Region of Yogyakarta, Indonesia

*Corresponding author: pipin.nurhayati44@gmail.com**ARTICLE INFO***Article history:**Received: 22 January 2026**Revised: 1 February 2026**Accepted: 6 February 2026**Keywords:**Blood Pressure;**Elderly;**Foot Massage.***ABSTRACT**

Background: Deadly diseases nowadays dominating have turned into non-infectious diseases, such as hypertension. Hypertension is mostly suffered by the elderly due to stress, heredity, salt intake, or lifestyle. If not treated, it will lead to complications such as stroke or kidney failure. The importance of maintaining blood pressure through non-pharmacological therapies, such as foot massage therapy, to optimize pharmacological therapy. **Objective:** The objective of this research is determine the effect of foot massage therapy on blood pressure in elderly people with hypertension. **Method:** A one-group pretest-posttest design was used. The sampling technique used was consecutive, with a sample size of 40 respondents. A twenty-minute foot massage was delivered to the respondent as an intervention, ten minutes to each foot, every morning for seven days. To measure the blood pressure, a digital sphygmomanometer is used. **Results:** The pretest systolic pressure was 152.25 on average, and the diastolic pressure was 92.40 on average. The post-test systolic pressure was 133.35 on average, and the diastolic pressure was 80.25 on average. Data analysis using the Wilcoxon signed-rank test found a p-value of 0.000 ($\alpha < 0.05$). **Conclusion:** Non-pharmacological interventions are as important as supportive therapy for every gold standard of patient health care. Foot massage therapy has an effect on lowering blood pressure in elderly people with hypertension.

BACKGROUND

Basic physiological needs in humans are related to a healthy lifestyle, such as maintaining a healthy and fit body, avoiding various diseases and health disorders. Challenges in the health sector, such as the shift in the phenomenon of infectious diseases, for example, tuberculosis or HIV/AIDS, to non-communicable diseases, especially hypertension (Ansar, Dwinata, & Apriani, M, 2019). Hypertension is suffered by many patients of productive age, and elderly people make up the majority. The aging process brings various problems, one of which is physical changes (Febrianti & Mustakim, 2019). The elderly experience changes in the body system, especially the circulatory system, which is the main cause of death, including hypertension (Hardati & Ahmad, 2017).

Human age rising is directly proportional to blood pressure, which is caused by psychological factors such as stress, heredity, age, high sodium consumption, and poor lifestyle choices. Vascular disease, namely hypertension, has a high risk of death and can cause severe complications such as stroke (62%) and other complications (49%) caused by heart attacks (Ayuchecaria, Khairah, Feteriyani, & Banjarmasin, 2018). Hypertension is a condition in which a person's blood vessels experience an increase in blood pressure, leading to mortality and morbidity (L. Saputra, 2014).

According to a report from the previous research, the number of people with hypertension worldwide is 22% of the total population of 27%. Indonesia ranks first in terms of high blood pressure, with 57.6% of patients visiting primary health facilities complaining of hypertension, and this number is still expected to increase (Siswanto, Widyawati, Wijaya, Salfana, & Karlina, 2020). The number of female patients is higher at 36.85%, compared to 31.34% for male patients. This vascular disease most often affects the elderly, with 24.1 million people or 82.2% of the total elderly population of 29.3 million in Indonesia (Setiawan, Rianto, & Dianto, 2022).

The negative effects of increased blood flow include high heart rate, sleep disturbances, and the onset of other diseases such as stroke. Special measures are required to reduce these negative effects (Arianto, Prastiwi, & Sutriningsih, 2018). Management can be done pharmacologically, such as administering single or combination antihypertensive drugs (Saputra, 2014), and benzodiazepine therapy for anxiety and sleep disorders (Hall, 2023). There are non-pharmacological therapies to treat high blood pressure, one of which is foot massage relaxation therapy (Setiawan & Rahayu, 2021). This relaxation massage technique can lower heart rate by inhibiting the sympathetic nervous system's stress response (Arianto et al., 2018). Additionally, this technique stimulates the parasympathetic nervous system through vasodilation of the muscles, thereby reducing anxiety through improved blood circulation.

Foot massage therapy was soft tissue manipulation by five basic techniques: rubbing, kneading, tapping, scraping, and vibration. The massage is performed on the leg, starting from the MP joint to the leg (Nurlathifah, Cahyani, Nugraha, & Nursiswati, 2022). Foot massage therapy is performed for ten minutes using twelve stages, among others, kneading, rubbing, and rotating the foot. The rubbing motion on the foot increases temperature and activates sympathetic activity, which sends neurotransmitter signals to the brain, providing a sense of

comfort and relaxation (Afianti & Mardhiyah, 2017). The massage movements induce a lymphatic drainage effect, and the blood flow mechanism experiences vasodilation and reduced sympathetic nerve activity for lower blood pressure, while deep massage activates the thalamus to release endorphins and enkephalins, which have a relaxing effect, reduce pain, and improve comfort and sleep quality (Maliya & Andria, 2018).

Based on preliminary study results at the Mergangsan Community Health Center, there were 1,123 elderly people with hypertension in the last three months. The highest number is in Wirogunan Village, about 447 elderly people with hypertension. Based on interviews with 10 elderly people with hypertension at the Mergangsan Community Health Center, 80% of elderly people with hypertension have poor sleep quality, often waking up at night or having difficulty falling asleep at night, and 20% of them have no problems with sleep. All 10 elderly people with hypertension had high blood pressure with systolic pressure of 150-180 mmHg and diastolic pressure of 80-100 mmHg. In addition to difficulty sleeping, the 10 elderly people with hypertension at the Mergangsan Community Health Center complained of frequent dizziness or headaches and neck stiffness. Foot massage therapy has a relaxing effect on patients with cardiovascular disorders such as hypertension, especially hypertensive patients with poor sleep quality. Based on this background, the researcher was interested in investigating the effectiveness of foot massage therapy on blood pressure in hypertensive elderly individuals in Wirogunan Village, Yogyakarta City.

OBJECTIVE

Determined the effect of foot massage therapy on elderly people with hypertension in Wirogunan Village, Yogyakarta City, is the objective of this study.

METHOD

Design, Population and Sample

A one-group pretest-posttest design has been used. The population in this study consisted of all elderly individuals with hypertension in Wirogunan Village, Yogyakarta City, totaling 447 individuals. Sampling was conducted using consecutive sampling, with the following inclusion criteria: ready to become a respondent, grade 1 hypertension, aged 56-65 years, and didn't take an antihypertensive pill (during the study). The exclusion criteria are experiencing complications, sensory and cognitive impairments, with a total of 40 respondents. This research was conducted in Wirogunan Village, Yogyakarta City. The research was conducted from September to November 2025.

Intervention, Instrument and Data Analysis

The researcher conducted a pretest by measuring blood pressure. After that, the researcher ensured that the respondents were relaxed and then performed a 20-minute foot massage intervention on both feet, with a duration of 10 minutes on each foot. The intervention was given in the morning for 1 week, every day. In conducting the intervention, the researcher was assisted by a research assistant. The foot massage therapy was conducted seven times a

week. After 7 days, a post-test was conducted by measuring blood pressure again. The research instrument used in this study was a digital sphygmomanometer to measure blood pressure. The data collected were primary and secondary data. Primary data included age, gender, religion, occupation, education, and smoking history. The independent variable in this study was foot massage therapy, and the dependent variable was blood pressure. The Wilcoxon sign rank test was used for bivariate analysis. This study passed the ethics test at STIKES Surya Global Yogyakarta with No.1.04/KEPK/SSG/IX/2025.

RESULTS

The subjects of this study were elderly people with Grade 1 hypertension in Wirogunan Village, Yogyakarta City. The characteristics of the respondents in this study included gender, religion, occupation, education, and smoking history.

Table 1. Respondent Characteristics (n=40)

Variable	Category	Frequency (f)	Percentage (%)
Gender	Male	143	45,1
	Female	174	54,9
Education	Elementary school	21	52,5
	Junior high school	9	22,5
	High school	10	25,0
Occupation	Unemployed	23	57,5
	Farmer	7	17,5
	Entrepreneur	10	25,0
Smoking history	Smoker	17	42,5
	Non-smoker	23	57,5
Exercise	Once a week	40	100
	Twice a week	0	0
	More than twice a week	0	0
Total		40	100

Based on Table 1 above, it was found that the majority were male (57.5%). Islam was the most common religion, it's about 85%. The number of unemployed respondent were 57.5%. With the most common education level being elementary school, 52.5%. About 57.5% respondents are not smokers, and the majority exercise once a week, 100%.

Table 2. The Effect of Foot Massage Therapy on Blood Pressure in Elderly People with Hypertension in Wirogunan Village, Yogyakarta City (n=40)

Blood Pressure		Min-Max	Mean	Z-Score	Sig.
Systolic	Pre	145-159	152,25	-3.829	0,000
	Post	116-150	133,35		
Diastolic	Pre	90-99	92,40	-3.925	
	Post	73-89	80,25		

Based on Table 2, the blood pressure of the elderly before therapy was administered showed a systolic pressure with a mean value of 152.25 mmHg and a diastolic pressure of 92.40 mmHg. After therapy was administered, the systolic pressure showed a mean value of 133.35 mmHg, and the diastolic pressure showed a mean value of 80.25 mmHg. The Wilcoxon signed-rank test analysis shows that the Systolic Z-score is -3.829, with a p-value of 0.000. The Diastolic Z-score is -3.925, p-value is 0.000. The Diastolic. This indicates that foot massage therapy has an effect on blood pressure in elderly people with hypertension.

DISCUSSION

Blood pressure is the force exerted by blood on each unit area of the blood vessel wall (Hall, 2023). Men often experience symptoms of hypertension in their thirties, while women experience symptoms after menopause, with a higher increase in women than in men (Salsabila, Husain, Prastiwi, & Sulisty, 2023). This is triggered by a decrease in estrogen hormones after menopause, one of whose functions is to control blood flow (Mayasari et al., 2025). Other respondent characteristics that may contribute to blood pressure are physical activity and smoking history. When a person engages in routine daily activities, they can reduce the risk of increased blood pressure and the oxygen in the blood flows smoothly (Hasanudin, Ardiyani, & Perwiraningtyas, 2018).

Previous study found that patients who do not engage in daily physical activity are 3.094 times more likely to experience an increase in blood pressure compared to patients who engage in regular physical activity. Physical activity improves and facilitates circulation in the heart, lungs, and blood vessels, as indicated by decreased lactic acid, reduced risk of atherosclerosis, and increased HDL cholesterol (Sari, 2019). Otherwise, significant relationship between smoking status and the incidence of hypertension has declare, where people with smoking status were at greater risk of hypertension than non-smokers (Imelda, Sjaaf, & Puspita PAF, 2020).

Efforts to overcome high blood pressure in the elderly have been tested in this study, namely by using non-pharmacological foot massage therapy. Foot massage therapy was performed for 3 consecutive days for 15 to 30 minutes. Respondents who were able to perform foot massage therapy on themselves felt that their leg muscles were more flexible, not stiff, comfortable for walking, and some respondents were able to walk in the morning (Ainun, Kristina, & Leini, 2021). Pain in the legs and other parts of the body was reduced, they felt more relaxed, and their blood flow was more stable. Changes were observed after three days of therapy, with a decrease in systolic and diastolic blood pressure from high to within the normal range in study participants with hypertension (Ainun et al., 2021).

Another study in patients who underwent foot massage found significant changes, as evidenced by the results obtained, namely a pretest blood pressure range of 120/70-140/90 and a posttest result of 120/70-130/80. The average change in blood pressure was in the range of 10-20 mmHg from the blood pressure before the foot massage therapy was performed (Saputra & Purnomo, 2021). Foot massage can help the body achieve homeostasis through extrinsic and intrinsic regulation of peripheral blood flow, smooth muscle relaxation,

and arterial vasodilation during foot massage (Setyowati, Husain, & Widodo, 2023). Foot massage produces comfort and hemodynamic balance in patients (Ainun et al., 2021). Foot massage also has effects, including lowering serum epinephrine and cortisol levels. Decreased sympathetic nervous system activity causes peripheral vasodilation, thereby reducing pulse, mean arterial pressure, heart rate, and respiratory rate (Lakshmanan & Amutha, 2019). In addition to affecting MAP and HR, the application of foot massage significantly good cardiac output, which optimizes blood circulation throughout the body (Rosyada & Trihandini, 2013). Lowering average arterial blood pressure and providing patients with a sense of calm.

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CONCLUSION

Based on these study findings, the systolic blood pressure average before foot massage was 152,25 mmHg, with an average diastolic blood pressure of 92,40. The conclusion of this study was that foot massage therapy has an effect on blood pressure in elderly people with hypertension. The Wilcoxon signed-rank test analysis showed $p = 0.000$ ($\alpha < 0.05$).

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