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The Effect of Feet Reflection Massage on Blood Pressure in Hypertension Patients at Community Health Centers II Petang

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ABSTRACT

Complications of hypertension cause various health problems such as kidney damage, heart attack, stroke, and Alzheimer's. One of the non-pharmacological treatments to avoid the long-term effects of hypertension is foot reflexology therapy. Foot reflexology therapy is a therapy that suppresses the zones and nerve points on the right and left soles of the feet. This study aims to determine the effect of foot reflexology on blood pressure in patients with hypertension. This type of research is a Quasi Experiment with a Non-Equivalent Control Group Design. The population in this study was all 102 people with hypertension in Pelaga village. The sample selection used was purposive sampling with a total of 36 people. Foot reflexology intervention is given 3 times a week for 20 minutes. The average systolic blood pressure before being given foot reflexology is 160.44 mmHg and diastolic blood pressure is 93.06 mmHg, after being given foot reflexology systolic blood pressure is 140.83 mmHg, and the average diastolic blood pressure is 82.67 mmHg. The average difference in blood pressure before and after the foot reflexology was 10.39 mmHg. The results of the analysis used Mann-Whitney analysis. The p-value of 0.000 ($p<0.05$), so it can be concluded that there is an effect of foot reflexology on blood pressure in hypertension sufferers in Community Health Center II Petang. Foot reflexology is important to be given to hypertensive patients to reduce the impact of increasing blood pressure.

Keywords: hypertension; therapy; foot reflection massage

INTRODUCTION

Non-communicable diseases are one of the leading causes of death and physical dysfunction worldwide, especially in the heart and blood vessel diseases. Hypertension includes non-communicable diseases characterized by increased systolic and diastolic blood pressure of more than 140 mmHg and or 90 mmHg. Most hypertension does not show any early symptoms (Amanda & Martini, 2018). According to 2018 World Health Organization (WHO) data, about 1.13 billion people worldwide suffer from hypertension, and only 36.8% take medication. Complications of hypertension account for 9.4 million deaths worldwide. The prevalence of hypertension in Indonesia is 80.8%, the highest number of cases of hypertension in North Sulawesi and Bali is ranked ninth (Riskesdas, 2018). Bali Provincial Health Profile in 2019 stated that hypertension ranked third in the pattern of the top 10 diseases with the highest distribution in Denpasar, Badung, and Tabanan (Profil Kesehatan Provinsi Bali, 2019). The number of hypertension according to data on health center visits in Badung regency in 2016, amounted to 5,130 people; in 2017, it was 6,697 people; in 2018, it was 62,534 people, and in 2019 it was 99,557 people (Dinkes Kabupaten Badung, 2019).

Death occurs due to the impact of hypertension and other diseases initiated by hypertension, including kidney damage, heart attack, stroke, glaucoma, erectile dysfunction, dementia, and Alzheimer's. Hypertension is one of the leading preventable causes of premature death and disability worldwide (Bui et al., 2019). The management of hypertension can be in the form of pharmacological and nonpharmacological management. Pharmacological therapy can be carried out using high-blood pressure drugs. High blood pressure drugs do not eliminate hypertension but control blood pressure to remain stable. While nonpharmacological therapy can be done by applying a healthy lifestyle such as a healthy diet, adequate sleep needs, a relaxed and relaxed mind, avoiding caffeine, cigarettes, alcohol, and stress, and doing regular physical activity (exercise) (Efiyanti, 2020). Physical activity can be combined with several complementary therapies such as reflexology, yoga, cupping, and others.

One of the complementary therapies that can be given to people with hypertension is foot reflexology. Foot reflexology is a method of massaging certain points on the foot area. Basic techniques used in foot reflexology include

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thumb radio wave technology, hand-toe rotation technology, and push-holding technology. Reflexology provides stimulation in the form of pressure on the nerves of the human body; stimulation is received by nerve receptors and altered by the body, which is then passed to the spinal cord, parts of the brain, and muscles (Lukman et al., 2020). Based on research conducted by (Awaludin, 2018) on the effect of light massage on blood reduction in people with hypertension in Banyumas regency stated that light massage influences the decline of systolic and diastole blood pressure in people with hypertension.

Based on a preliminary study interview in September 2021 in Pelaga village, the working area of puskesmas Sore II, of 10 hypertensive patients, six people said they only took antihypertensive drugs, 4 people said that the drug was only taken when feeling pain in the neck. The ten patients said it was very rare to exercise and never performed foot reflexology massage therapy. The study aimed to identify systole and diastole's blood pressure before and after being given foot reflexology therapy, analyze changes in the blood pressure of systole and diastole, and analyze the effect of foot reflexology therapy on blood pressure in people with hypertension.

METHOD

The research design used is quantitative with the Quasi Experiment (Pre-Post Test Design) method using the Non-Equivalent Control Group Design research design approach. This research was carried out in Pelaga Village of UPTD Puskesmas Sore II Working Area. The population in this study is all hypertensive people in Pelaga Village, as many as 102 people. The sampling technique used in this study is nonprobability sampling type purposive sampling, and obtained a sample of 36 people with primary hypertension. The simple random sampling method separates the treatment group from the control group using even and odd lotteries. even number for the treatment group and an odd number for the control group. The data collection instruments used in the study included foot reflexology guidelines and blood pressure measurement sheets. The tools used for foot reflexology are mattresses, water, wet wipes, alcohol, massage aids (triangular wood), dry wipes, olive oil, body lotion, and calibrated sphygmomanometer. Data analysis consists of univariate and bivariate analyses using the Wilcoxon and Mann-Whitney tests.

RESULT

Table 1. Distribution of Respondent Characteristic Frequency by Age and Gender

Characteristics	Intervention Group		Control Group	
	Frequency	Percentage	Frequency	Percentage
Age				
17-25 years	1	5.6	3	16.7
26-35 years	1	5.6	1	5.6
36-45 years	2	11.0	2	11.0
46-55 years	7	38.9	5	27.8
56-65 years	7	38.9	7	38.9
Gender				
Male	7	38.9	7	38.9
Female	11	61.1	11	61.1

Based on table 1, it was found that in the treatment group most respondents were 7 people (38.9%) aged 46-55 years and 56-65 years and in the control group as many as 7 people (38.9%) aged 56-65 years. Based on gender, in the treatment and control group as many as 11 respondents (61.1%) were female.

Table 2. Blood Pressure Distribution Before Foot Reflexology Intervention in Hypertensive Patients

Group	Blood pressure	N	Mean	Min-Max
Intervention	Systole	18	160.44	150-180
	Diastole	18	93.06	88-104
Control	Systole	18	166.28	154-190
	Diastole	18	92.44	88-104

Based on table 2 obtained in the treatment group, the average systole blood pressure before being given foot reflexology was 160.44 mmHg and the average diastole blood pressure was 93.06 mmHg, in the control group the average systole blood pressure was 166.28 mmHg and the average diastole blood pressure was 92.44 mmHg.

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Table 3. Blood Pressure Distribution After Foot Reflexology Intervention in Hypertensive Patients

Group	Blood pressure	N	Mean	Min-Max
Intervention	Systole	18	140.83	130-160
	Diastole	18	82.67	78-90
Control	Systole	18	165.89	150-188
	Diastole	18	91.50	85-100

Based on table 3, in the treatment group, the average systole blood pressure after being given foot reflexology was 140.83 mmHg, and the average diastole blood pressure was 82.67 mmHg; in the control group the average systole blood pressure was 165.89 mmHg, and the average diastole blood pressure was 91.50 mmHg.

Table 4. Analysis of Blood Pressure Changes in Systole and Diastole Before and After Foot Reflexology Intervention in Hypertensive Patients

Group	Blood pressure	N	Mean	Difference Mean	p-value
Intervention	Systole (pre)	18	160.44	19.61	0.000
	Systole (post)	18	140.83		
Intervention	Diastole (pre)	18	93.06	10.39	0.000
	Diastole (post)	18	82.67		
Control	Systole (pre)	18	166.28	0.39	0.479
	Systole (post)	18	165.89		
Control	Diastole (pre)	18	92.44	0.94	0.122
	Diastole (post)	18	91.50		

Based on the interpretation of table 4, the results of bivariate analysis using the paired t-test in the treatment group obtained a p-value on systole and diastole blood pressure of 0.000 ($p<0.05$), then H_0 rejected means that there is a difference in blood pressure before and after being given foot reflexology. In the control group, using Wilcoxon test analysis obtained a p-value of 0.479 (systolic) and a p-value of 0.122 (diastolic), the value of $p>\alpha$ (0.05). There is no p-value of 0.479 (systolic) and p-value of 0.122 (diastolic), the value of $p>\alpha$ (0.05). There is no p-value of 0.479 (systolic) and p-value of 0.122 (diastolic), the p-value>α (0.05), then H_0 has rejected means that there is a difference in blood pressure before and after being given foot reflexology—significant differences in blood pressure in the control group.

Table 5. Effects of Foot Reflexology on Hypertensive Patients

Blood Pressure	Mann-Whitney
	p-value
Systole	0.000
Diastole	0.000

The results of the bivariate analysis using the Mann-Whitney test obtained a value of $p=0.000$ ($\alpha<0.05$), then H_0 rejected means there is an effect of foot reflexology on blood pressure in hypertensive patients in the Community Health Center II Petang.

DISCUSSION

The results of the study before being given foot reflexology in the treatment group obtained an average systole blood pressure of 160.44 mmHg and diastole blood pressure of 93.06 mmHg, average systole blood pressure in the control group of 166.28 mmHg and diastole blood pressure of 92.44 mmHg. The results of this study are in accordance with the study (Barelli et al., 2018) that obtained an average result of systole blood pressure before treatment of 159.10 mmHg and an average diastole blood pressure result of 98.40 mmHg. Age is a risk factor for hypertension that cannot be modified, in this study the majority of the age range of respondents aged 56-65 years and female. Hypertension increases with age. Age increases cause physiological changes in the body such as the thickening of the uterine wall due to the buildup of collagen substances in the muscle layer so that blood vessels narrow and become stiff starting at

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45 years (Triyanto, 2014). In addition to age, gender also affects the increase in blood pressure; hypertension in Indonesia is greater in women (8.6%) than in men (5.8%).

Blood pressure after being given foot reflexology in the treatment group averaged systolic blood pressure was 140.83 mmHg and the average blood pressure diastole was 82.67 mmHg, in the control group, without being given the intervention of the average systolic blood pressure of 165.89 mmHg and the average blood pressure of diastole 91.50 mmHg. The average difference in systolic blood pressure in the treatment group was 19.61 mmHg, and in diastolic blood pressure was 10.39 mmHg. Foot reflexology is one of the non-pharmacological therapies that can lower blood pressure. The benefits of foot reflexology for people with hypertension are that it can provide relaxation stimuli that can facilitate blood flow and body fluids in parts of the body associated with the nerve points of the massaged foot. Smooth blood circulation will provide a relaxing effect, so the body experiences a balanced condition (Umamah & Paraswati, 2019). This study's results align with research by (Barelli et al., 2018), namely a decrease in blood pressure after being given a back period of 145.10 mmHg and 89.80 mmHg. When performing reflexology on the leg muscles, the pressure on this muscle can relax tension gradually, so it can help facilitate blood flow to the heart. Massage on the soles of the feet stimulates and restores the body's balance system to lower blood pressure. One way to lower blood pressure is with foot reflexology therapy because if foot massage is done regularly, it can lower levels of the stress hormone cortisol lowering sources of depression and anxiety so that blood pressure will continue to fall; body functions will improve (Nasrullah, 2018).

The results of the Wilcoxon test analysis in the treatment group obtained a p-value = 0.000 means that there is a difference in blood pressure before and after being given foot reflexology massage in people with hypertension in Pelaga Village UPTD Working Area Puskesmas Sore II. There was an average difference in systolic and diastolic blood pressure in the treatment group after the intervention. The average systolic blood pressure before being treated at 160.44 mmHg decreased to 140.83 mmHg after receiving foot reflexology. Diastole blood pressure also decreased with the average diastole blood pressure before the treatment of 93.06 mmHg decreased to 82.67 mmHg after treatment. While in the control group, there was no significant difference in systolic and diastolic blood pressure because it was not given any intervention but only took antihypertensive drugs.

Foot reflexology affects the decline in blood pressure of people with hypertension occurs because the ten zones extending from the tip of the head to the toe that all the inside of the ten zones are connected and contained in the soles of the feet so that when pressed on the zones and nerve points on the soles of the right and left feet make the body comfortable and relaxed so that blood pressure can be controlled with minor side effects. Blood vessels will improve, which will provide a relaxing effect on stiff muscles and the result of vasodilation in the blood vessels will lower both systolic and diastolic blood pressure.

The hypothesis test results obtained p-value=0.000 (<0.05), meaning Foot Reflexology affects Blood Pressure in People with Hypertension in UPTD Puskesmas Sore II. The results of this study are also in line with the study (Umamah & Paraswati, 2019), entitled The Effect of Foot Reflexology Therapy With Manual Methods On Blood Pressure In People With Hypertension In The East Karangrejo Region Wonokromo that there is an influence of Manual Foot Reflexology Massage on blood pressure reduction in people with hypertension with a value of p-value = 0.001. Researchers argue that the drop in blood pressure occurs because foot reflexology is to provide a relaxing effect on the body and makes blood vessels that initially undergo vasoconstriction become dilation. This relaxation is produced by tactile stimulation found in body tissues. Reflexology decreases the production of the hormone cortisol by increasing the secretion of corticotropin from the HPA axis. When the body relaxes, serotonin which plays a role in physiological changes in the body to mutate capillary and arteriole blood vessels is removed from the brain so that the microcirculation of blood vessels will improve, which will provide a relaxing effect on stiff muscles and the result of vasodilation in blood vessels will lower blood pressure stably (Mayssara, 2018).

CONCLUSION

The average systolic blood pressure before being given foot reflexology in the treatment group was 160.44 mmHg, and diastolic blood pressure was 93.06 mmHg; in the control group, the average systolic blood pressure was 166.28 mmHg, and the average blood pressure was diastolic blood is 92.44 mmHg. The average systolic blood pressure after being given foot reflexology was 140.83 mmHg, and the average diastolic blood pressure was 82.67 mmHg; in the control group, the average systolic blood pressure was 165.89 mmHg, and the average blood pressure was diastolic blood pressure was 91.50 mmHg. The results of the bivariate analysis using the paired t-test showed a p-value of 0.000 ($p < 0.05$), then H0 was rejected, meaning there was a difference in blood pressure before and after foot reflexology was given. The results of the bivariate analysis using the Mann-Whitney test obtained p value = 0.000 ($\alpha < 0.05$), then H0 is

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rejected, meaning that there is an effect of foot reflexology on blood pressure in hypertension sufferers in Pelaga Village, UPTD Public Health Center Petang II.

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