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Foot Spa Intervention on Hypertension: A Case Study

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Abstract. Hypertension was the most common disease suffered by the people of Sungai Rangas Ulu Village. One of the management of hypertension was complementary therapy in the form of a foot spa. This study aims to describe the results of nursing care in patients with hypertension through foot spa therapy. It used a case study method on one of the hypertensive patients. The individual was a community of Sungai Rangas Ulu Village chosen at random or accidentally. Individuals were given foot spa therapy, and observed their blood pressure by using a sphygmomanometer every day for six days. The results of the evaluation of foot spa therapy were that blood pressure had decreased. Blood pressure before intervention was 170/100 mmHg; on the last day of the intervention, blood pressure was found to be 141/94 mmHg. Foot spas could provide a sense of relaxation to stimulate vasodilation, lowering blood pressure. Foot spa therapy can be a complementary therapy option for people with hypertension.

Keywords: case study; foot spa; hypertension

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1. Introduction

Hypertension is a condition of high blood pressure for two days with a systolic value of ≥ 140 mmHg and/or a diastolic value of ≥ 90 mmHg. Hypertension is also known as the "*silent killer*." Hypertension sufferers are generally not aware of the dangers of hypertension because they do not have warning signs and symptoms and do not have their blood pressure checked regularly. Hypertension is the leading cause of premature death worldwide because it can increase the risk of heart disease, brain disorders, kidney disease, and other diseases (WHO, 2022).

WHO estimates that 1.2 billion adults aged 30-79 worldwide suffer from hypertension, and most live in low-middle-income countries (WHO, 2022). Data from RISKESDAS in 2018 showed that the prevalence of hypertension in Indonesia increased to 34.11% based on the results of measurements in residents >18 years. South Kalimantan Province is ranked first in the prevalence of hypertension sufferers at 44.13% (RISKESDAS, 2018). In addition, based on the results of a study conducted in Sungai Rangas Ulu Village on 204 residents, it was found that the most common disease suffered was hypertension with a total of 53 residents, followed by diabetes mellitus in 3 residents and stroke in 2 residents.

Several interventions can be made to treat hypertension, such as lifestyle modification, pharmacological treatment, and adherence to antihypertensive treatment. One of which can be done with complementary, alternative, or traditional medicine (Unger et al., 2020). Forms of complementary, alternative or traditional therapy include massage, herbal decoctions, acupuncture, and foot spa (Black and Hawks, 2009). A *foot spa* is a therapy consisting of foot exercises, skin cleansing, and a foot mask. These are nontraumatic and effective in treating related diseases, hypertension like vascular peripheral disease and neuropathy (Stuart et al., 2016). Research conducted by Nurul Manfa'ati in 2019 found that a foot spa performed for 30 minutes could reduce systolic pressure by up to 5 mmHg and diastolic pressure by up to 10 mmHg within three days of intervention. The mechanism of foot spa therapy can reduce blood pressure by sending signals to the nervous system to release endorphins, which can relieve pain and stress, stimulating relaxation and improving blood flow (Manfa'ati, 2019).

Based on the results of a study conducted on May 10, 2022, on Mrs. J, 75 years old, who suffered from hypertension about three months ago, her blood pressure examination results were 170/100 mmHg. She complained that sometimes tingling in the right leg. Mrs. J did not take antihypertensive medication because she feared the drug would damage her kidneys. Mrs. J likes to eat salted fish and coconut milk, and she knows that cucumber is good for lowering blood pressure, so sometimes Mrs. J consumes it by mixing it with coconut milk or just cucumber without adding other spices. Mrs. J also never checked herself into the nearest healthcare facility because she had no health complaints, and no one accompanied her. In addition, if Mrs. J has a

complaint about his health, so Mrs. J will buy and consume drugs purchased at the shop without going to a health service facility or health worker.

Hypertension must be treated with one of the interventions that can be done, such as a foot spa. *Foot spa* is a simple therapy consisting of three stages. These are foot soak, foot reflexology and foot exercise. These steps can be done with simple tools and materials, do not require much money, and can be done at home. This study aims to decrease blood pressure in a person diagnosed with hypertension through foot spa intervention.

2. Research Methods

This study used a case study design through a methodical approach to care nursing comprehensive covering assessment, enforcement of nursing diagnoses, planning, implementation, and evaluation of nursing. Studies case carried out in Sungai Rangas Ulu Village, District West Martapura Regency Banjar, South Kalimantan to Mrs. J with a diagnosis of hypertension. Researchers have obtained permission from patients and families to undertake nursing care. Researchers got patient data through interviews, observations, and physical inspection. The research was conducted from 18 May 2022 to 24 May 2022. The foot spa intervention was carried out once a day for six days. The tools and materials used in the study were SOP for foot spa, small towels, citronella oil Cap Skorpio, Onemed stethoscope, Onemed sphygmomanometer, bucket, warm water, and salt.

3. Research Results

Assessment results were obtained through interviews, observations, and physical inspection. Mrs. J, 75 years old, is a Muslim and a Banjar, so the language used daily at home is the Banjar language. Vital signs examination showed BP: 170/100 mmHg, Temperature: 36.5 0 C, RR: 19x/ minute, SPO2: 99%, N: 72 x/minute. Mrs. J complained that her left leg feels tingling and has suffered from hypertension since three months ago. She is not taking antihypertensive drugs and has never had a health check at the health center because she feels healthy without any complaints. She also feared consuming the drug long-term because she thought it would damage her kidney. The patient said that she would buy medicine at the shop if she were sick. Mrs. J mentioned did not know about his family's illness because there had been no medical examinations in the past. Mrs. J said her husband had died about one year ago due to a stroke and had previously suffered from hypertension. Mrs. J has no allergy to drugs and food, eats 2-3x a day, and likes consuming salty fish and coconut milk food. She knows that cucumber is good for lowering blood pressure, so sometimes Mrs. J consumes it mixed with coconut cream or only cucumber without giving other spices. Mrs. J said there was no limit to food or drink consumption. Researchers arranged the nursing interventions to achieve the outcomes, including teaching foot spas. Before giving the teaching, assessing the client's and the client's family's knowledge is necessary to implement.

Furthermore, the researcher provides a guideline for the foot spa, teaches the client and family, demonstrates the interventions, and evaluates the goal of the programs.

The results of this study are conducted below:

Table 1. Blood Pressure Measurement Results

Date and time	WITA hours	BP before (mmHg)	BP after (mmHg)
Tuesday, 10 May 2022	13.00	**170/100**	-
Wednesday, 18 May 2022	15.00	155/103	154/100
Thursday, 19 May 2022	15.00	155/96	152/92
Friday, May 20, 2022	15.00	165/95	144/90
Saturday, May 21, 2022	15.00	159/95	135/90
Monday, May 23, 2022	15.00	158/90	144/96
Tuesday, 24 May 2022	15.00	152/97	**141/94**

Based on the results of the foot spa intervention performed on Mrs. J for six days, there was a decrease in blood pressure. On the first day, the results of the blood pressure examination were 170/100 mmHg, and on the last day of the intervention, the results of blood pressure measurements were 141/94 mmHg.

4. Research Discussion

Sungai Rangas Ulu village is located on the edge of a river and has a lot of paddy fields and swamps, which are one of the criteria for a wetland area. Residents of Sungai Rangas Ulu Village use wetlands as a source of livelihood and shelter. The livelihoods of the residents of Sungai Rangas Ulu Village are varied, such as farmers, fish farming, traders, processing of salted fish, fishing and so on. The perishable nature of fishery products is one factor that influences the level of public consumption. Fresh fish is easily decomposed. Therefore special treatment is needed so that fishery products are more durable, one of which is salting. Residents of Sungai Rangas Ulu Village are accustomed to consuming and selling fish obtained from the river, some of which are processed beforehand by drying (salty dry fish) and fermented into *wadi fish* for consumption or sale.

The sodium content in 50 grams of salted fish can reach 200-400 mg (WNPG, 2004). Salted fish has high sodium, which causes the water in the body to be retained and causes the volume in the blood circulation to be higher than it should be. As a result, the excess fluid increases the pressure on the walls of the blood vessels. These walls react by thickening and constricting, providing tighter spaces in the blood capillaries and increasing "resistance," which in turn requires higher pressure to move blood to the organs, which can lead to hypertension (Aristi et al., 2020). Meanwhile, coconut milk is a form of saturated fat that can cause hypertension. Excessive fat consumption will increase LDL cholesterol levels and accumulate in the body. Fat deposits caused by cholesterol will stick to blood vessels, eventually forming plaques. The formation of plaque

can cause blockage of blood vessels or atherosclerosis. Blood vessels affected by atherosclerosis will decrease in elasticity, and blood flow throughout the body will be disrupted, which can trigger an increase in blood volume and blood pressure. This is in line with research conducted by Yasril in 2020 that there is a relationship between salt, fat, fiber, and caffeine consumption and hypertension. So people with hypertension need to adopt a healthy diet by minimizing the consumption of salt and coconut milk (Yasril and Rahmadani, 2020). This is a cultural factor related to this village's high blood pressure. It impacts the client's health and those living in the Martapura river.

Based on the results of the foot spa intervention performed on Mrs. J for six days, there was a decrease in blood pressure. On the first day, the results of the blood pressure examination were 170/100 mmHg, and on the last day of the intervention, the results of blood pressure measurements were 141/94 mmHg. These results align with the research conducted by Nurul Manfa'ati in 2019, which found that a foot spa performed for 30 minutes can reduce systolic pressure by up to 5 mmHg and diastolic pressure by up to 10 mmHg within three days of intervention.

The foot spa consists of three stages. These are foot soak, foot reflexology, and foot exercise. Soaking the feet in warm water produces heat energy, dilating and improving blood circulation. It also stimulates the nerves in the feet to activate the parasympathetic nerves, causing changes in blood pressure. This is evidenced by a study conducted by Astutik in 2021, which found that the average blood pressure of the two respondents decreased, systolic blood pressure decreased by 7.21 mmHg, and diastolic decreased by 1.1 mmHg (Astutik and Mariyam, 2021). This aligns with research conducted by Yoshihisa Koike in 2013 by soaking feet in warm water in the elderly. It was found that there was a significant decrease in diastolic blood pressure (P: 0.05) and systolic blood pressure (P: 0.01) (Koike et al., 2018).

Reflexology is a method to reaccelerate blood flow. With massages on the reflex center points, it is hoped that the blood flow will be cut off, and narrowing and blockages in the blood vessels will return to normal. Massage/emphasis on the heart reflex points and *hypertension points* will stimulate nerve impulses to act on the autonomic nervous system, a parasympathetic branch. Massaging/pressing with a regular rhythm on the feet will reflect on the organs concerned. Stimulate the peripheral nerves through the innervation pathways to the central and back nervous systems. Stimulating a decrease in adrenaline hormones will cause vasodilation in the vessels and cause relaxation and peace of mind (Jones, 2018). This is evidenced by the results of research conducted by Amalia in 2016 by giving foot reflexology to the elderly. It was found that the application of foot reflexology was effective in reducing blood pressure in the elderly with hypertension $p < 0.01$ (Amalia, 2016). Applying foot massage with citronella oil can reduce blood pressure in hypertensive patients, with an average decrease in blood pressure of 3-5 mmHg. The chemical composition of the citronella group contains aldehydes and esters. This content is

hypotensive, which can lower blood pressure. The content of aldehydes and esters, which are easily absorbed by water, are hypotensive and can reduce heart rate (Bastos, 2009).

Foot movements performed during foot exercise are the same as a foot massage. Applying pressure and movement on the feet affects hormones, increasing endorphin secretion, which triggers vasodilation of blood vessels and decreases blood pressure, especially brachial systolic. Based on the results of research by Siti Lestari in 2021 by administering diabetic foot exercises to people with type 2 DM showed an average pre-test systolic of 152.57 and pre-test diastolic of 94.43 while post-test systolic 141.10 and post-diastolic test 84.95 (Lestari et al., 2021). Leg exercises relax the body and improve blood circulation. As a result of being moved, smooth blood circulation stimulates blood to deliver more oxygen and nutrients to the body's cells. Besides that, it helps carry more toxins to be removed (Indarti and Palupi, 2018). The decrease in blood pressure occurs because the blood vessels experience dilation and relaxation. Over time, exercise can relax blood vessels so that blood pressure decreases (Yantina and Saputri, 2019).

5. Conclusions and Recommendations

This study concludes that the implementation of nursing performed in Mrs. J through foot spa therapy once a day for six days can lower blood pressure from 170/100 mmHg to 141/94 mmHg. During the provision of foot spa therapy, Mrs. J also said that complaints of tingling feet had decreased. Foot spa therapy provides effectiveness in decreasing blood pressure for patients with hypertension.

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