

## APPLICATION OF HYDROTHERAPY ON THE BLOOD PRESSURE OF THE ELDERLY WITH HYPERTENSION: CASE STUDY

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### ABSTRACT

Hypertension is a condition when a person has an increase in blood pressure above normal with a systolic pressure above 140 mmHg and a diastolic pressure above 90mmHg. Hypertension is a Silent Killer. Therefore, efforts are needed to reduce blood pressure, namely by non-pharmacological "Hydrotherapy" which can increase capillary permeability so it is very useful for blood pressure reduction therapy. This study aims to apply hydrotherapy to the elderly with hypertension in Gunungpati Central Java. This study employed descriptive method with a case approach to elderly people with hypertension from 3 August to 8 August 2020. The elderly with inclusion criteria: suffering from hypertension, do not take drugs, do not have comorbidities and are willing to become respondents. The instruments used were observation sheets and patient documentation records, thermometer, tension meter, and stethoscope. Hydrotherapy procedures (warm water with a temperature of 37.5-40° C), soaked feet up to 15 cm above the ankles, hydrotherapy was carried out 6 times for 6 consecutive days with a time of 15 minutes in the afternoon at 16.00 WIB. The average blood pressure before intervention was 155-160 mmHg/ 100 mmHg and the blood pressure after intervention was 80-90 mmHg. This study has been shown to be effective in reducing blood pressure in hypertensive elderly with the hydrotherapy method.

Keyword: Elderly, Hypertension, Hydrotherapy

### BACKGROUND

According to data from 2013, the elderly population in Central Java Province increased by 11.10% to 33.36 million people in 2013, and then increased to 4.3 million people in 2017 (12.59%). The number of elderly people in Central Java Province is expected to rise by 2020 (Jateng, 2019). The growing number of elderly people necessitates extra attention, particularly when it comes to geriatric health issues. This is related to the degenerative nature of aging, which includes physical, mental, and psychosocial changes (Azizah, 2011).

One of the most common chronic diseases with a high mortality rate is hypertension (Hamid, 2013). Hypertension is a disease that may affect anyone, and it is also known as the "silent killer" since people rarely experience symptoms when they are suffering from it. Blood pressure can be reduced using both pharmacological and non-pharmacological therapy. Hydrotherapy is one of the non-pharmacological approaches to dealing with low blood pressure. Hydrotherapy has several benefits, including improving/flowing blood circulation, increasing muscular relaxation, nourishing the heart, relaxing muscles, and increasing capillary permeability. This therapy is particularly effective at lowering blood pressure in hypertension patients. The working principle of this hydrotherapy is to use warm water at 40.5-43° C by conduction, where heat passes from warm water to the body, causing blood vessels to dilate and muscle tension to be reduced (Damayanti, 2014).

The purpose of this case study was to determine whether there was an effect of applying hydrotherapy on blood pressure in the elderly with hypertension in Gunungpati, Central Java.

## METHOD

This study is a descriptive case study research conducted from August 3 to August 8, 2020. The research instruments employed in this case study were observation sheets, documentation notes, thermometers, tensimeters and stethoscopes. The results of interviews and blood pressure measurements taken before and after the hydrotherapy intervention (warm water at 37.5–40 C) were used to analyze the data. Hydrotherapy was carried out 6 times for 6 days in a row, for 15 minutes each time, in the afternoon at 16.00 WIB. The research was conducted in Gunungpati. Samples obtained in this study consider the inclusion and exclusion criteria as follows:

1. Inclusion Criteria
  - a. Elderly (aged 60-70)
  - b. Elderly with hypertension
  - c. Elderly without co-morbidities such as heart failure or kidney failure
  - d. Elderly who are willing to be respondents
2. Exclusion Criteria
  - a. Elderly with co-morbidities such as heart failure, kidney failure, etc
  - b. Elderly who consumes drugs
  - c. Elderly who are not willing to be respondents

## RESULTS AND DISCUSSION

The study was conducted on August 3-8, 2020. There were 2 respondents in this study who met the inclusion criteria as examination subjects, namely Mrs. S, who is 68 years old, is Muslim, has no comorbidities such as heart disease, and had hypertension (HT)  $\pm$  6 months ago. The second respondent is Mrs. P, aged 60, is Muslim, works as a housewife (IRT), does not have a history of comorbidities, and suffered from hypertension  $\pm$  4 months ago. Hypertension is common in the elderly, and it is caused by the thickening of artery walls, which results in the accumulation of collagen in the muscle layer, causing the blood vessels to gradually tighten and stiffen, narrowing the circulatory system and raising blood pressure.

Table 1. Blood Pressure Measurement Pre and Post Intervention (n=2)

No.	Blood Pressure Measurement (Pre)	Blood Pressure Measurement (Post)
P1	160/100 mmHg	130/80 mmHg
P2	155/100 mmHg	120/90 mmHg

Table 2. Interview Results Pre and Post Intervention (n=2)

No	Focus Data (Pre)	Focus Data (Post)
P1	<i>"In the past few months, I've often experienced headaches (tension), heart palpitations. I usually prefer to take a rest in order to overcome this problems"...</i>	<i>"I felt less headaches, felt more relaxed and comfortable"...</i>
P2	<i>"I felt headaches, then my neck stiffened and I felt weak, I didn't take any prescription medications"...</i>	<i>"For 6 consecutive days, I did hydrotherapy. It became less painful each day and I felt more relaxed. My neck got no longer stiffened"...</i>

According to the findings of the study, pre and post intervention data between P1 and P2 showed a decrease in blood pressure after 6 days of hydrotherapy. This is in line with a study by (Gito, 2016) titled "The Effect of Warm Water Therapy on Lowering Blood Pressure in the Elderly with Hypertension," which found a decrease in TD systole average of 14,643 mmHg and a diastole average of 5,714 mmHg with a p-value of 0.000 (p-value <  $\alpha$ ). This is supported by Cappuccio's 2004 theory in (Umah, 2014) that a decrease in systolic blood pressure of 6.9 mmHg is the minimum threshold for the success of warm water therapy. Meanwhile, a diastolic blood pressure of 3.5 mmHg is the minimum limit for successful therapy. Blood pressure is affected by a variety of factors, including age, genetics, lifestyle, and obesity. Because the flexibility of blood vessels reduces as people age, they are more susceptible to hypertension (Junaedi, 2013).

This study is also consistent with research conducted by (Hernani, 2017) entitled "Foot Soak Therapy Using Warm Water Effectively Lowers Blood Pressure in the Elderly" which found that warm water foot soak therapy is effective in reducing high blood pressure. This research confirmed the theory of (Umah, 2014), which argues that soaking the feet in warm water improves blood circulation from the energy produced, and that warm water therapy can

relieve stress, anxiety, and make feelings more relaxed, tranquil, and pleasant, resulting in a decrease in heart rate. This is in accordance with Table 1 where Mrs. S initially experienced heart palpitations and became more relaxed and comfortable after the intervention.

Hydrotherapy can lower blood pressure due to the hydrostatic and hydrodynamic effects. The hydrostatic effect is beneficial for strengthening the spine and joints bone. The hydrodynamic effect helps to strengthen muscles and ligaments while also improving blood circulation and respiratory function. As a result of the hydrostatic and hydrodynamic effects, the body carries out movements that are useful in strengthening the muscles, the circulatory system, calming and relaxing, which causes the adrenaline in the body to decrease, the heart rate to decrease, and the muscles of the blood vessel walls to relax, causing the blood pressure to decrease (Hamidin, 2010).

This study is also in line with a study conducted by (Dilianti et al., 2017) titled "Effectiveness of hydrotherapy in reducing blood pressure in the elderly with hypertension at the Al-Islah Nursing Home in Malang" which found that after 6 days of therapy, 2 times a day, hydrotherapy is perceived effective in lowering blood pressure with a p-value of 0.000.

According to research by (Arafah, 2019) entitled "The Effect of Warm Water Foot Soak Therapy on Reducing Blood Pressure in Hypertension in the Work Area of the Pattalassang Health Center, Kab. Takalar", it was found that  $p = 0.000 < \alpha = 0.05$ , indicating that warm water foot soak therapy is effective in lowering blood pressure on hypertension. This study supports the findings of (Hardianti et al., 2018) in their study "Benefits of Immersion Method with Warm Water in Lowering Blood Pressure in Hypertension Patients," which discovered that warm water can lower blood pressure, particularly diastolic pressure. This is explained by the conduction theory, which states that heat transfer from warm water to the body causes blood vessels to dilate and muscle tension to decrease, thereby improving blood circulation.

According to a study conducted by (putra, Candra Syah, n.d.) titled "Effectiveness of Massage and Hydrotherapy on Reducing High Blood Pressure," the majority of the elderly stated that after receiving a foot massage with lavender essential oil, the leg muscles that were previously tense became relaxed, the body became fresher, and headaches were reduced. Meanwhile, blood pressure was objectively reduced, grimaces were reduced, leg muscles were not tense, and nearly 60% of the elderly who received intervention and treatment slept for 30-60 minutes. This finding is also supported by research of (Retnaningsih, 2019) titled "The Effect of Reflexology on the Blood Pressure Reduction," which found that reflexology has an effect on lowering blood pressure. This is confirmed by the theory that reflexology is a massage technique that helps alleviate pain, build endurance, create a sense of relaxation, and relieve stress by massaging certain points on the hands and feet. The benefits of applying reflexology to the feet are the same as those of hydrotherapy, namely, helping in the restoration of body balance, pain relief, increased blood flow, muscle tension release, and stimulation of relaxation and comfort (Retnaningsih, 2019). The calmer a person is, the easier it is to lower blood pressure.

The elderly population continues to grow in parallel with developments in the health sector, which have resulted in longer life expectancies and lower mortality rates. This demographic shift could have ramifications in the realms of health, economics, and social welfare (Dwi Retnaningsih, 2018).

The one-month study by (Kusumawati et al., 2018) entitled "Differences in Blood Pressure Before and After Warm Water Foot Soak Therapy in the Elderly at the Budi Agung Kupang Elderly Social Care Institution", found a significant difference in blood pressure before and after warm water foot soak therapy. According to the research by (Arista Putri, 2016) entitled "The Effectiveness of Foot Soak Therapy Using Warm Water and Elderly Gymnastics Against Blood Pressure in the Social Rehabilitation Unit (Uresos) Pucang Gading Semarang Unit", there was a decrease in systolic and diastolic blood pressure in the intervention group with treatment foot soak with warm water, and elderly exercise was more effective than the control group with solely elderly exercise. The results of the statistical analysis obtained a p-value of 0.004 ( $<0.05$ ) for a decrease in systolic blood pressure and a p-value of 0.018 ( $<0.05$ ) for a decrease in diastolic blood pressure.

## CONCLUSION AND SUGGESTION

The application of hydrotherapy is effective in lowering blood pressure in the elderly with hypertension in Gunungpati. In order for treatment to be successful, various factors must be considered, including age, environment, client's diet, and stress in the elderly.

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