

Soaking Feet in Warm Water for Hypertension Patient: Case Study

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Abstract: Hypertension or commonly called high blood pressure is an increase in systolic blood pressure above the normal limit, which is more than 140 mmHg and diastolic blood pressure of more than 90 mmHg. Pain is a symptom that arises due to high blood pressure. One of the non-pharmacological therapies that can be used to reduce pain directly and indirectly reduce blood pressure is hydrotherapy. This case study aims to determine the effectiveness of foot soaks using warm water to reduce blood pressure in hypertensive patients. The method used was a descriptive case study on a patient using nursing care from assessment to evaluation. The participant in this study was diagnosed with hypertension sufferers and the blood pressure was measured by a sphygmomanometer. It was found that the client's blood pressure can be overcome by soaking the feet in warm water to lower blood pressure. Provision of hydrotherapy was carried out for 4 days of administration in 1 day 1 time with a duration of 15 minutes to lower blood pressure from 170/100 mmHg drops to 140/90 mmHg. Hydrotherapy can be a non-pharmacologic intervention and an independent therapy from a nurse collaborating with another therapy physician.

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Introduction

The prevalence of hypertension, or high blood pressure, is a significant public health concern both in the United States and globally. In the USA, the prevalence of hypertension in 2017–2018 was estimated to be 49.64%, corresponding to approximately 115 million individuals. The American Heart Association reported that approximately 86 million adults in the United States were affected by hypertension, representing 34% of the adult population (Chobufo et al., 2020; Ostchega et al., 2020). Furthermore, data from the National Health and Nutrition Examination Survey

(NHANES) indicated that the prevalence of hypertension among adults aged 18 and over was 45.4% in 2017–2018, with higher rates among men and increasing with age (Rana et al., 2020). These statistics underscore the widespread impact of hypertension on the population and the need for effective management and control strategies.

Globally, an estimated 26% of the world's population, equivalent to 972 million people, has hypertension, and this prevalence is expected to increase to 29% by 2025. The Centers for Disease Control and Prevention (CDC) also reported that nearly half of adults

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in the United States have hypertension, amounting to 119.9 million individuals (Mills et al., 2017; WHO, 2023). It is noteworthy that hypertension prevalence was found to be higher among non-Hispanic black adults compared to non-Hispanic white or Hispanic adults (Hayes et al., 2022). These findings highlight the widespread nature of hypertension and the need for targeted interventions to address this public health challenge.

The relationship between pain and hypertension is of great interest from both a pathophysiological and clinical perspective. While it is widely recognized that pain can acutely raise blood pressure, the evidence that hypertension is associated with a reduced perception of pain, known as hypoalgesia, is also significant (Sacco et al., 2013). Chronic pain, such as migraines, nerve pain, and lower back pain, can lead to the release of hormones like adrenaline and cortisol, which can increase heart rate and blood pressure, potentially leading to hypertension. Research has found that individuals experiencing chronic low back pain are more likely to have higher systolic and diastolic blood pressures, indicating a clear link between pain and high blood pressure (Koo, 2015; Setyo, 2017; (Nkhata et al., 2015)Puspita et al., 2023; Puspita et al., 2023)

Understanding the link between pain and high blood pressure is crucial for effective management of hypertension. It is important for individuals experiencing chronic pain to seek appropriate diagnosis and treatment from a pain management doctor to help reduce the risk of developing high blood pressure. Managing chronic pain effectively can contribute to controlling blood pressure and reducing the risk of associated complications such as heart attack and stroke. Therefore, addressing chronic pain as a potential contributor to high blood pressure is essential for comprehensive hypertension management (Giummarra et al., 2020; Sacco et al., 2013; WHO, 2023).

Many people only treat hypertension using pharmacological methods such as consuming chemical drugs which have many side effects that are undesirable for sufferers, even though there are quite a few non-pharmacological treatments that are effective in curing hypertension using therapy or consuming natural, affordable, and unlikely herbs. have side effects. Non-pharmacological management of hypertension is highly recommended. Several studies show that non-pharmacological approaches can reduce hypertension, such as hydrotherapy (Rohmah et al., 2014; Verma et al., 2021).

Method

The method was used a descriptive case study using nursing care and a literature review. The patients in this study were stage II (moderate) hypertension

patients who took regular medication. A participant was randomly selected based on the criteria that patients had hypertension with signs and symptoms of dizziness and complained of headaches and when their blood pressure was checked, the results were above systolic pressure 120mmHg and diastolic pressure 80mmHg. The tools that the author uses himself are assisted by a stethoscope, sphygmomanometer, basin, warm water 38-40 degrees Celsius, and a towel. The steps in planning were adapted to guidelines from the Indonesian National Nurses Association (PPNI) organization with the books used, namely SDKI, SLKI, and SIKI to determine nursing diagnoses, nursing goals and objectives, nursing plans and to evaluate the actions given to the client. The intervention carried out involves monitoring the response, pain scale, and factors that aggravate and relieve pain, assessing non-verbal pain responses, and encouraging clients to soak their feet in warm water for 15 minutes with a water temperature of 40 degrees Celsius. This intervention is carried out after the client has consumed the medication for an estimated 2 hours. This intervention carried out in accordance with the Indonesian Nursing Intervention Standards (SIKI) which are evidence-based (EBP) (Tim Pokja SDKI DPP PPNI, 2017; Tim Pokja SIKI DPP PPNI, 2018; Tim Pokja SLKI DPP PPNI, 2022).

The intervention was implemented under the supervision of the nurse who responsible for the patient. The intervention was carried out for 3 days from 29 February 2023 to 01 March 2023 08.00 am to 08.15 WIB. The client was a resident of the Garut Regency Home for the Elderly who suffered from stage II (moderate) hypertension. The client took amlodipine 5 mg once a day regularly. Participants agree that their health data will be published without any identity (anonymous).

Result and Discussion

Hydrotherapy administered in accordance with evidence-based practices to patients produces positive results. In this case, there was a decrease in blood pressure after taking the drug for an estimated 2 hours and *then hydrotherapy was given*, with blood pressure results of 170/100 mmHg to 140/90mmHg after the intervention given for 3 days with an average decrease in blood pressure of 10%.

Table 1. Blood Pressure in *Hydrotherapy*

Date (2023)	Blood pressure (mmHg)	
	Before	After
February 28	170/100	160/100
February 29	160/100	150/100
March 01	150/100	140/90

When conducting case studies in the field, several nursing problems emerged with several signs and symptoms that supported the nursing problems experienced by clients, including acute pain.

When the assessment was carried out, it was discovered that the client had been suffering from hypertension for the past 2 years and the main diagnosis that emerged was chronic pain, characterized by the client complaining of headaches due to the client's high blood pressure. The client took amlodipine 5mg once a day regularly. The author provides an intervention to overcome this problem by soaking the feet in warm water and this intervention is evidence-based or in accordance with evidence-based practice.

This case is in line with a previous study that found a lowering of blood pressure after soaking the patient's feet in warm water. A study by Sudiartawan and Adnyana in 2022 found a difference in blood pressure values before and after treatment by water therapy, both systolic and diastolic (p -value < 0.01). Hartinah et al. (2019) explained that there was a difference in the average systolic and diastolic blood pressure after hydrotherapy intervention for 15 minutes after 5 days (Hartinah et al., 2019; Sudiartawan & Adnyana, 2022).

Hydrotherapy is a non-pharmacological therapy with a treatment method using warm water where heat transfers from warm water to the body, causing dilation of blood vessels which can relieve painful conditions and provide a relaxing effect on the body and can reduce muscle tension. and is a therapeutic method with a low-tech approach that relies on the body's responses to water (Rohmah et al., 2014; Hartinah et al., 2019; Sudiartawan & Adnyana, 2022; Sapartinah et al., 2023).

Conclusion

Hydrotherapy can overcome nursing problems in the form of acute pain in hypertensive patients as evidenced by a decrease in blood pressure.

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