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Case Study On The Application Of The Brisk Walking Exercise Technique For Reducing Blood Pressure In Hypertensive Patients

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ABSTRACT

Hypertension is one of the chronic diseases with a very high prevalence worldwide, influenced by various factors such as environment, genetics, lifestyle, and the use of certain medications like birth control pills. Increased blood pressure in hypertensive patients has a significant impact on the risk of serious cardiovascular complications such as heart disease, heart failure, stroke, and kidney failure. Blood pressure control can be achieved thru self-management, which includes medication adherence, healthy lifestyle changes such as regular physical activity, and a low-sodium diet. One effective physical activity for lowering blood pressure in hypertensive patients is brisk walking. Based on this, this study aims to determine the effect of the brisk walking exercise technique on lowering blood pressure in hypertensive patients at RSD dr. A. Dadi Tjokrodipo Bandar Lampung. The method used by the researcher in this study is descriptive with a case study approach. The measuring instrument in this study used a sphygmomanometer, and the brisk walking exercise technique was applied according to the SOP. The research findings indicate a decrease in blood pressure among hypertensive patients after performing brisk walking exercise daily for eight days. The brisk walking exercise technique can lower blood pressure in hypertensive patients at RSD dr A. Dadi Tjokrodipo Bandar Lampung.

Keywords : Brisk Walking Exercise, Hypertension, Blood Pressure.

INTRODUCTION

Background

Hypertension is a long-term medical condition in which blood pressure is abnormally elevated and persistently above the standard limits, namely a systolic blood pressure of ≥130 mmHg and/or a diastolic blood pressure of ≥80 mmHg (Ramadhani et all, 2025). Hypertension is a major risk factor for various serious diseases such as heart disease, stroke, and kidney damage. This condition is often asymptomatic, and if left untreated, it can lead to serious health complications (Wulandari dkk., 2023). Furthermore, according to the *World Health Organization*, (2025) hypertension is a condition that significantly increases the risk of cardiovascular disease and othercomplications.

According to data from the (*World Health Organization*, 2025), approximately 1.13 billion people worldwide suffer from hypertension, which is 1 in 3 people. This number is projected to increase to 1.5 billion by 2025, with 9.4 million annual deaths due to hypertension and its complications. In developing countries, it is estimatedto increase by approximately 80%, from 639 millioncases in 2000 to 1.15 billion cases in 2025 (Lukito, 2023.). Furthermore, in Indonesia, the prevalence of hypertension also increased from 25.8% in 2013 to 34.1% in 2018, with the highest rates in Bangka

Belitung and South Kalimantan, making it a leading cause of non-communicable diseases and death. The prevalence of hypertension in Lampung itself is still in a high percentage range, at 29.94% (Kementerian Kesehatan Republik Indonesia., 2018).

Hypertension is one of the chronic diseases with a very high prevalence worldwide, influenced by various factors such as environment, genetics, lifestyle, and the use of certain medications like birth control pills (Lukito, 2023). This condition is also influenced by stress, lack ofphysical activity, and the consumption of high – salt and low potassium foods. Hypertension has a significant impact on cardiovascular health, including increasing the risk of heart failure, myocardial infarction, and stroke (Rivo Aditya & Mustofa, 2023).

Increased blood pressure in hypertensive patients has a significant impact on the risk of serious cardiovascular complications such as heart disease, heart failure, stroke, and kidney failure. Consistently high blood pressure causes damage to blood vessel walls and vital organs, worsening morbidity and increasing mortality rates (Rivo Aditya & Mustofa, 2023). Therefore, blood pressure control is crucial to prevent these complications and improve the quality of life for hypertensive patients (Lukito, 2023)

Blood pressure control can be achieved thru self-management, which includes medication adherence, healthy lifestyle changes such as regular physical activity, and a low - sodium diet (Theofani Rantetondok et al., 2024). Studies show that patients who are able to self-manage well tend to have better-controlled blood pressure compared to those who are less disciplined (Lakoro et al., 2022). Physical activity also plays a role in lowering blood pressure by training the heart and blood vessels to work more efficiently, thus reducing the pressure load on the arterial walls (Manungkalit et al., 2024).

One effective physical activity for lowering blood pressure in hypertensive patients is brisk walking (Selli et al., 2020). Brisk walking is a light to moderate aerobic exercise that involves walking faster than usual, helping to increase heart rate and blood circulation. Research shows that regular brisk walking for 15-30 minutes in several sessions per week can significantly lower systolic and diastolic blood pressure in hypertensive patients, making it a recommended non- pharmacological method for controlling blood pressure and reducing the risk of cardiovascular disease (Julistyanissa & Chanif, 2022)

The advantages of brisk walking for hypertensive patients include its ease of execution without the need for special equipment, low risk of injury, and additional benefits such as improved muscle function, blood circulation, and stimulation of endorphin release, which can have a relaxing effect (Riama, A et el., 2024). The way brisk walking exercise works is by reducing peripheral resistance thru muscle contractions during physical activity. This fast walking movement increases blood flow by up to 30 times because the precise rhythm opens capillaries 10-100 times wider, resulting in blood vessel dilation (Widiani, 2024). This process shortens the diffusion distance of oxygen and metabolic substances to the cells, increasing oxygen supply to the tissues and supporting optimal cell function. This activity also contributes to weight management and improves the body's metabolism, which overall helps stabilize blood pressure and reducethe risk of hypertensive complications. Therefore, brisk walking is apractical and effective exercise option for hypertensive patients who want to maintain the health of their heart and blood vessels (Simanjuntak & Purba, 2025)

Although various studies show that brisk walking can significantly lower blood pressure in hypertensive patients, some patients still experience symptoms such as dizziness, palpitations, and sleep disturbances (Indah Permata Sari et al., 2024). Based on this, this therapy should be combined with medical treatment, a low – salt and cholesterol diet, quitting smoking, and stress management for optimal results. Given the high incidence of hypertension in Indonesia, further researchis needed to comprehensively evaluate the effectiveness of brisk walking techniques in controlling blood pressurein hypertensive patients (Sari et al., 2021).

Based on this, this study aims to determine the effect of the brisk walking exercise technique on lowering blood pressure in hypertensive patients at RSD dr. A. Dadi Tjokrodipo Bandar Lampung, with the research statement: "Case Study on the Application of the Brisk Walking Exercise Technique for Lowering Blood Pressure in Hypertensive Patients."

RESEARCH METHODS

The method used by the researcher in this study is descriptive with a case study approach. The subjects in this study were hypertensive patients at RSD dr. A. Dadi Tjokrodipo, meeting the inclusion and exclusion criteria, totaling 2 people. The inclusion criteria for this study were patients with systolic blood pressure of 140-159 mmHg and diastolic blood pressure of 90-00 mmHg, as well as patients with

signs of decreased cardiac output. Furthermore, the exclusion criteria for the study are patients experiencing a decrease in consciousness. The measuring instrument in this study used a sphygmomanometer, and the brisk walking exercise technique was applied according to the SOP. The intervention was carried out using a nursing care approach that included assessment, diagnosis, intervention, implementation, and evaluation. This research uses structured interviews, observation, and outcome measurement methods. Subjects were selected thru purposive sampling based on predetermined criteria. Before implementation, informed consent was obtained from respondents who signed a form indicating their willingness to participate in the study.

RESULTS

The results of this study present the characteristics, health history, nursing diagnoses, interventions, implementation, and evaluation of the application of the brisk walking exercise technique.

Table 1. Respondent Characteristics

Client Identity	Respondent 1	Respondent 2
Name	Mrs. N	Mrs. E
Age	62 years old	62 years old
Religion	Islam	Islam
Gender	Female	Female
Highest Education	Junior High School	High School
Occupation	Retailer	Homemaker
Medical Diagnosis	Hypertension	Hypertension

Based on Table 1, the characteristics of the respondents show that there are 2 research respondents. Respondents 1 and 2 are both 62 years old, female, and diagnosed with hypertension. The highest level of education for respondent 1 is junior high school, and for respondent 2, it is senior high school. Furthermore, the occupations of the respondents are merchant for respondent 1 and homemaker for respondent 2.

Table 2. Health History

Health History	Mrs. N.	Mrs. E.
Reason for Hospital Admission	The client arrived at Dr. A Dadi Tjokrodipo Regional General Hospital in Bandar Lampung on August 25, 2021, at 06:00 with the complaint of a severe headache in the neck. The client reported a history of past health conditions. Current Patient Condition: The client's heart was racing, sometimes coughing, and having difficulty sleeping. Upon assessment, the client's blood pressure was found to be 150/90 mmHg.	The client arrived at the Regional General Hospital Dr. A Dadi Tjokrodipo Bandar Lampung on August 25, 2021, at 08:10 with complaints of severe headache in the neck, feeling a rapid or pounding heartbeat, coughing, difficulty sleeping, and nausea. Upon assessment, the client's blood pressure was found to be 145/90 mmHg.
Main Complaint	Headache	Headache
Current Health History	The client feels a headache and heaviness in the neck, finds it difficult to perform activities due to dizziness, reports occasional coughing, often sleeps at nite, and is also concerned about their financial situation during this pandemic. Currently, the client is receiving captopril 25 mg medication therapy twice a day.	The client complains of a headache and a heavy feeling in the neck. The client states that since the headache started, they have also felt nauseous. The client rarely consumes vegetables because it is a family habit at home that they do not like vegetables. The client's usual pattern is to drink coffee twice a day. The client feels their heart is racing. Currently, the client is receiving medication therapy

		with captopril 25 mg 2x1.
Previous Medical History	The client stated they have been suffering from hypertension for 5 years.	The client stated that their blood pressure has been elevated for the past 3 years.

Nursing Diagnosis

Based on the data found by researchers from the results of the assessment and analysis according to the diagnostic formulation, the nursing diagnosis for respondents 1 and 2 can be formulated as: risk for decreased cardiac output related to changes in heart rhythm (palpitations/ fluttering) and changes in contractility (paroxysmal/ coughing).

Implementation

Mrs. N and Mrs. E consumed blood pressure medication administered by the staff of Dr. A Dadi Tjokrodipo Regional General Hospital in Bandar Lampung at 10:00 AM. The researcher provided brisk walking exercise techniques to Mrs. N 3 hours before she took the medication, and to Mrs. E 2 hours before she took the medication. The reason for this is so that the client is not under the influence of medication during the research. The brisk walking exercise technique was given to respondent 1 (Mrs.N) on August 26, 2021, at 06:00 WIB, and to respondent 2 (Mrs. E) on September 26, 2021, at 07:30 WIB. This was done for 2 weeks with 4 routine sessions, 2 days of rest, and then continued the following day. The reason is that at that time, the respondents were not under the influence of medication and it did not interfere with their activities. Before performing the brisk walking exercise technique, the respondents were first measured for blood pressure. The next step was to perform the brisk walking exercise technique according to the SOP.

Evaluation

The results of the blood pressure measurement evaluation before and after the brisk walking technique was applied in the study are shown in the following table:

Table 3. Results of Blood Pressure Measurements Before Brisk Walking Exercise Technique

Respondent	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Average systolic	Average diastolic
1	150/100 mmHg	140/100 mmHg	140/80 mmHg	140/90 mmHg	140/80 mmHg	140/90 mmHg	140/90 mmHg	130/80 mmHg	140 mmHg	90 mmHg
2	150/90 mmHg	150/90 mmHg	140/100 mmHg	140/90 mmHg	140/10 mmHg	140/60 mmHg	140/100 mmHg	140/90 mmHg	142,5 mmHg	90 mmHg

The results of blood pressure measurements using a sphygmomanometer before the brisk walking exercise technique was applied can be seen in Table 4.2. On the first day, the first client before the application in the morning had a blood pressure of 150/100 mmHg, on the second day 140/100 mmHg, on the third day 140/80, on the fourth day 140/90 mmHg, on the fifth day 140/90 mmHg, on the sixth day the client's blood pressure before the therapy was applied was 140/90 mmHg, on the seventh day 140/90 mmHg, and on the eighth day 130/80 mmHg. Then, for the second client, on the first day the blood pressure was 150/90 mmHg, on the second day 150/90 mmHg, on the third day 140/100 mmHg, on the fourth day 140/90 mmHg, on the fifth day 140/100 mmHg, on the sixth day 140/60 mmHg. On the seventh day 140/100 mmHg, and on the eighth day 140/90 mmHg.

Table 4. Results of Blood Pressure Measurements After Brisk Walking ExerciseTechnique

Respondent	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Average systolic	Average diastolic
1	140/80 mmHg	140/80 mmHg	130/80 mmHg	130/90 mmHg	130/80 mmHg	130/90 mmHg	130/90 mmHg	130/80 mmHg	132,5 mmHg	83,7 mmHg
2	160/90 mmHg	130/90 mmHg	130/90 mmHg	130/80 mmHg	130/80 mmHg	130/80 mmHg	130/80 mmHg	120/80 mmHg	130 mmHg	83,7 mmHg

The results of blood pressure measurements using a sphygmomanometer after the brisk walking exercise technique was implemented can be seen in Figure 4.3, which shows a decrease in blood pressure. The study was conducted once a day for eight days. On

the first day, Mrs. N's blood pressure decreased to 140/80 mmHg. On the second day, her blood pressure decreased to 140/80 mmHg. On the third day, her blood pressure decreased to 130/80 mmHg. On the fourth day, the client's blood pressure was 130/90 mmHg. On the fifth day, it was 130/80 mmHg. On the sixth day, the client's blood pressure was 130/90 mmHg. On the seventh day, it was 130/90 mmHg. On the eighth day, it was 130/80 mmHg. On the first day, the second patient, Mrs. E, experienced a decrease in blood pressure to 140/90 mmHg. On the second day, the client's blood pressure increased before the intervention and decreased to 130/90 mmHg after the intervention. On the third day, the client's blood pressure was 130/90 mmHg. On the fourth and fifth days, the client's blood pressure was 130/80 mmHg, and on the sixth day, the client's blood pressure was 130/80 mmHg. On the seventh day, it was 130/80 mmHg, and on the eighth.

Further, in Table 4.5, respondent 1 (Mrs. N) had an average blood pressure before the brisk walking exercise technique was applied, with systolic blood pressure of 140 mmHg and diastolic blood pressure of 90 mmHg. The blood pressure measurement results after the brisk walking exercise technique was applied were systolic blood pressure of 132.5 mmHg and diastolic blood pressure of 83.7 mmHg, with an average blood pressure reduction difference of 7.3 mmHg for systolic and 6.5 mmHg for diastolic. The blood pressure measurement results for respondent 2 (Mrs. E) showed an average blood pressure before the brisk walking exercise technique was applied, with systolic blood pressure of 142.5 mmHg and diastolic blood pressure of 90 mmHg. The blood pressure measurement results after the brisk walking exercise technique was applied were systolic blood pressure of 130 mmHg and diastolic blood pressure of 83.7 mmHg, with an average blood pressure reduction difference of 12.5 mmHg for systolic and 6.3 mmHg for diastolic.

Table 4.5 Average Blood Pressure Before and After Brisk Walking Exercise Technique

Respondents	Average Pre-Intervention BP		Average Post-Intervention BP		AverageDifference in Average BP Before and AfterIntervention	
	Sistolik	Diastolik	Sistolik	Diastolik	Sistolik	Diastolik
1	140 mmHg	90 mmHg	132,5 mmHg	83,7 mmHg	7,5 mmHg	6,5 mmHg
2	142,5 mmHg	90 mmHg	130 mmHg	83,7 mmHg	12,5 mmHg	6,3 mmHg

Discussion

Respondent Characteristics

This study involved two respondents with interesting demographic and clinical characteristics for analysis in the context ofhypertension. Both respondents were 62 - year - old women with a medical diagnosis of hypertension, but they had different educational and occupational backgrounds.

Age and Gender

The prevalence of hypertension significantly increaseswith age. In individuals aged 60 and over, the cardiovascular system undergoes structural and functional changes that make them more susceptible to hypertension. These changes include progressive arterial stiffness, decreased elasticity of large blood vessels, and altered baroreceptor response (Kim, 2021). At the age of 62, both respondents were in the elderly age group, which is at high risk for the development and complications of hypertension. The natural aging process impacts both systolic and diastolic blood pressure, although diastolic pressure tends to stabilize or decrease after the age of 60. (Weber, 2020).

Gender differences also play a role in hypertension patterns. Before menopause, men generally have a higher prevalence of hypertension than women. However, after menopause (which typically occurs around the age of 50), the prevalence of hypertension in women tends to increase dramatically and can even exceed that of men in older age groups (Wu, 2022). The decline in estrogen hormone after menopause is associated with an increased risk of hypertension because estrogen has a protective effect on the cardiovascular system (Mahajan, 2023). With both respondents being female and 62 years old, it is very likely they have gone thru menopause, which contributes to their risk of hypertension.

Education Level

The respondents' education levels show significant differences: respondent 1 has a junior high school education, while respondent 2 has a high school education. Education level is a strong indicator of socioeconomic status and is often correlated with health literacy and access to information. Lower education levels are often associated with lower health literacy, which is an individual's ability to obtain, process, and understand basic health

information and services needed to make appropriate health decisions. (Berkman, 2021). Respondents with a junior high school education may face greater challenges in understanding complex information about hypertension management, such as the importance of a low-salt diet, medication adherence, and regular blood pressure monitoring. Low health literacy can hinder the adoption of healthy behaviors and the success of hypertension treatment. (Guo, 2023)

Respondents with a high school education generally have better health literacy compared to those with a middle school education. This can facilitate a better understanding of their medical condition, treatment instructions, and the importance of a healthy lifestyle. Higher education levels are also often associated with a better ability to seek health information from various sources and critically evaluate it, although this does not always guaranty optimal health practices (Deng, 2022).

Changes in Blood Pressure Before and After Implementing the Brisk Walking Exercise Technique

The results of the eight-day observation showed that brisk walking exercise was effective in lowering blood pressure in Mrs. N and Mrs. E. Mrs. N's blood pressure decreased from 140/80 mmHg on the first day to stabilizing at 130/80-90 mmHg after the third day. Meanwhile, Mrs. E experienced a more progressive decrease, starting from 140/90 mmHg on the first day and reaching optimal blood pressure of 120/80 mmHg on the eighth day, although there was a temporary increase before exercise on the second day. These two cases confirm that the fast track is an effective non-pharmacological intervention for managing and stabilizing blood pressure in hypertensive patients in a short amount of time.

Hypertension is a multifactorial condition involving complex dysregulation of the cardiovascular system. Brisk walking exercise, as a form of easily accessible moderate-intensity physical activity, has been proven to be a highly effective non-pharmacological intervention for lowering and controlling blood pressure. The antihypertensive effect of brisk walking is mediated by a series of interconnected pathophysiological changes in the body. One of the central mechanisms for lowering blood pressure due to exercise or physical activity is thru improved vascular endothelial function. Endothelial cells lining the inner part of blood vessels are responsible for producing nitric oxide (NO). NO is an important signaling molecule that triggers the relaxation of vascular smooth muscle, causing vasodilation (widening of blood vessels) and a decrease in peripheral resistance, which ultimately lowers blood pressure (Ashraf, 2023).

Brisk walking exercise done regularly can increase friction/shear stress on blood vessel walls. This shear stress is a strong stimulus for the endothelium to increase the expression and activity of the endothelial nitric oxide synthase (eNOS) enzyme, which produces more NO. (Sugawara, 2021). This increase in NO bioavailability not only enhances vasodilation but also improves arterial elasticity and reduces vascular stiffness, which are characteristic features of hypertension and aging. (Fagard, 2020)

Furthermore, hypertension is often associated with increased sympathetic nervous system (SNS) activity and decreased parasympathetic activity. Excessive SNS activity leads to vasoconstriction, increased heart rate, and increased cardiac output, all of which contribute to high blood pressure (Li, 2021). Physical exercise, including brisk walking, consistently demonstrates the ability to modulate this autonomic balance. Regular exercise can lower sympathetic tone activity and increase parasympathetic tone activity. This shift results in a decrease in systemic vascular resistance, a reduction in resting heart rate, and more efficient myocardial contractility, which collectively contribute to lower blood pressure (Whelton, 2020).

Brisk walking exercise also has an effect on weight loss. Although the weight loss effect may not be immediately visible in the short term, consistent brisk walking exercise over the long term contributes to a reduction in body fat mass (Fagard, 2020). Excessive adipose (fat) tissue, especially visceral fat, is metabolically active and produces adipokines (hormones) that can affect blood pressure, such as leptin and resistin, which contribute to increased blood pressure. Weight loss thru exercise improves the adipokine profile and reduces the pro-inflammatory and pro-hypertensive effects of adipose tissue. This gradually supports blood pressure reduction and control (Whelton, 2020).

The results of this study support the recommendation that brisk walking exercise is an effective and safe intervention to help lower and manage blood pressure in hypertensive patients. The observation of blood pressure reduction occurring within a relatively short time (8 days) indicates that the effects of brisk walking exercise can be seen in the near future, although longer consistency and duration will provide more sustainable benefits. The blood pressure fluctuations observed over several days (e.g., on Mrs. N's 4th,

6th, and 7th days) are normal and need to be monitored, but the overall downward trend remains positive.

CONCLUSION

The brisk walking exercise technique can lower blood pressure in hypertensive patients at RSD dr. A. Dadi Tjokrodipo Bandar Lampung. Brisk walking exercise, as a form of easily accessible moderate - intensity physical activity, has been proven to be a highly effective non-pharmacological intervention for lowering and controlling blood pressure. The anti hypertensive effect of brisk walking is mediated by a series of interconnected pathophysiological changes in the body.

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