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THE EFFECT OF A COMBINATION OF SLOW DEEP BREATHING AND MUSIC THERAPY ON REDUCING BLOOD PRESSURE IN THE ELDERLY WITH HYPERTENSION : CASE REPORT

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ABSTRACT

Introduction: Hypertension is an abnormal increase in blood pressure that can cause persistent symptoms in target organs. Uncontrolled hypertension can lead to complications such as heart disease, kidney failure, and stroke. Nonpharmacological therapies that can be done to reduce blood pressure are slow deep breathing and music therapy. **Purpose**: To determine the effect of a combination of slow deep breathing therapy and music therapy on lowering blood pressure in the elderly with hypertension. **Methods**: The research design used a case study method by providing slow deep breathing and music therapy interventions for 7 days to 2 case study subjects who experienced hypertension. Data collection using observation sheets and standard operating procedures (SOP) slow deep breathing and music therapy. Blood pressure measurement tools use a digital Sphygmomanometer and data analysis using descriptive analysis. **Discussion**: The implementation results showed that after the combination of slow deep breathing therapy and music therapy for 7 days there was a decrease in blood pressure in both case study subjects. The decrease in blood pressure in case study subject I on the first day after therapy was 198/103 mmHg and after 7 days of therapy it became 178/101 mmHg. In case study subject II, on the first day of intervention, blood pressure was 163/97 mmHg and after intervention for 7 days it became 152/95 mmHg. **Conclusion:** Combination therapy of slow deep breathing and music therapy can reduce blood pressure in elderly people suffering from hypertension.

Keywords: Blood pressure, hypertension, music therapy, slow deep breathing

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INTRODUCTION

Hypertension is a worldwide public health problem due to the high number of serious complications and is the leading cause of premature death worldwide. Hypertension in the elderly can be seen from an increase in systolic blood pressure of at least 140 mmHg or diastolic pressure of at least 90 mmHg (Mohammed Nawi et al. 2021). Based on the Framingham Study data, the risk of developing hypertension in individuals aged 55 to 65 years is >90%. This situation shows that the increasing number of elderly people ultimately leads to an increase in the population with hypertension (Benetos, Petrovic & Strandberg, 2019).

Based on the 2017 May Measurement Month (MMM) data, it is stated that in Indonesia, 34.5% of respondents with hypertension suffer from uncontrolled hypertension, while 20% are newly diagnosed with hypertension. This figure is almost the same as the national figure of 34.1% with the proportion of sufferers being mostly women (32.9%) while men (28.7%) (Wang et al. 2021). According to Riskesdas in 2018, the prevalence of hypertension in Central Java province reached 37.57% (89,648 people).

Complications of hypertension can be prevented by pharmacological and non-pharmacological management. Most international guidelines recommend 5 groups

of drugs to treat hypertension, namely using thiaze diuretics, calcium channel blockers, angiotensin converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARB), and beta blockers (BB) (Benetos, Petrovic & Strandberg, 2019). Meanwhile, non-pharmacological therapy can use complementary therapies such as Progressive Muscle Relaxation (ROP), hypnotherapy, lavender aromatherapy, music therapy, and slow deep breathing (Putri & Amalia, 2021). Slow deep breathing is one type of relaxation for people with hypertension that functions to regulate deep and slow breathing which can improve physical and mental health (Pakaya & Putri Nento, 2023). In addition, music therapy has an influence on the limbic system which plays a role in changing mood which results in changes in functional parameters, namely blood pressure and pulse rate which are mediated by the autonomic nervous system (Wexberg et al. 2021).

The results of research conducted by Genisa, Yuliza & Gunardi, 2023 show that there is an effect of classical music therapy and slow deep breathing in reducing blood pressure in hypertensive patients in RW 002 Samba Danum Village, Central Kalimantan Central Katingan District with a p-value = 0.000 < α 0.05. The therapy is given for 1 week consecutively, with 15 minutes of music therapy and 10 minutes of slow deep breathing therapy. Therefore, researchers are interested in providing a combination of slow deep breathing and music therapy to reduce blood pressure in the elderly.

METHOD

The design of this scientific paper uses a case study design. The subjects used were 2 case study subjects with hypertension who were given slow deep breathing and music therapy interventions for 7 days in accordance with predetermined inclusion and exclusion criteria. The inclusion criteria used are elderly aged ≥60 years, either male or female, have blood pressure ≥140/90 mmHg at the time of blood pressure measurement, are able to communicate and have good hearing and are willing to become respondents. The exclusion criteria in this study were not willing to become research respondents.

Before the intervention began, case study subjects were given an understanding of the purpose and benefits of slow deep breathing therapy and music therapy. After the respondent is willing to become a case study subject, then the case study subject is asked to sign the consent form that has been prepared by the researcher. The case study subject was given an understanding that the results of this research did not display the name of the case study subject in the report or publication manuscript.

Data analysis in this study used descriptive analysis by analyzing changes in blood pressure before and after therapy presented in graphical form. Data collection tools use Standard Operating Procedures (SOP) Slow deep breathing and music therapy. Blood pressure measurements were taken before and after therapy using a digital sphygmomanometer. Data collection was carried out for 25 minutes with 5 minutes used for blood pressure checks before therapy, 15 minutes of slow deep breathing therapy and music therapy and 5 minutes used for blood pressure checks after therapy.

The steps of slow deep breathing therapy and music therapy are carried out by creating a calm and comfortable environment, positioning the patient in a relaxed position, preparing a digital sphygmomanometer, measuring blood pressure before therapy, recording blood pressure results on an observation sheet, asking the patient to place one hand on the chest and one hand on the stomach, ask the patient to close their eyes, play relaxation music and set the volume to 50-60 dB (medium volume), encourage the patient to inhale through the nose for 4 seconds with the mouth closed by feeling the relaxation music, ask the patient to exhale slowly for 8 seconds through the mouth and repeat for 15 minutes. After 15 minutes, switch off the music and ask the patient to open their eyes. Next, take blood pressure measurements after the therapy and record the results on the observation sheet.

RESULT

Case study subject I is 74 years old, the last education is elementary school with a body weight of 60 kg, height 155 cm with a BMI of 25 (ideal weight). Based on the assessment on 23 October 2023, it was found that the client

had previously performed cataract surgery on both eyes 2 years ago. Currently the respondent complains of sudden dizziness and disappears after resting. Complaints of dizziness are felt throughout the head with a duration of ± 10 minutes. Subject I said he had ≥10 years of high blood pressure but the patient was reluctant to have regular blood pressure checks so that his blood pressure was not controlled. Both of the respondent's parents have a history of suffering from hypertension. In addition, the respondent has a smoking habit that has lasted ≥45 years and every day the patient usually smokes ± 2 cigarettes / day. The client has a habit of drinking ± 3 cups of coffee / day and likes to eat salted fish. The client received drug therapy Amlodipine 10 mg taken 1x1 a day. BP at the time of assessment: 208/108 mmHg, HR: 77 x/min, and RR: 20 x/min.

The subject of case study II was 69 years old, the last education was elementary school with a body weight of 50 kg and a height of 154 cm with a BMI of 21.1 (ideal weight). Based on the assessment on 7 November 2023, the respondent's previous medical history was admitted to the hospital in April 2023 with a diagnosis of heart disease. The patient has a history of diabetes mellitus since 2018 and hypertension since 2017. Complaints that the respondent currently feels are nape pain, left chest pain like stabbing on a scale of 5, easily tired, and surprised. In addition, when there are things that push the respondent's chest immediately flutters. Based on the radiological examination on 14 April 2023, it was found that the patient's heart was enlarged in the left ventricle, elongated aorta, and atherosclerosis. The client said he did not have a history of hypertension, DM, and heart disease from his parents. The client said that before knowing that he had hypertension, the patient had a habit of smoking and drinking coffee added with 1 brown sugar. Coffee consumption per day can reach 3 times. In addition, the client often eats salted fish, fried foods, and coconut milk.

The client is currently receiving oral medications, including Clopidrogen (1x75 mg), Lansoprazole (1x30 mg), Candesartan (1x16 mg), Miniaspi (1x80 mg), Bisoprolol (1x2.5 mg), Acarbose (1x50 mg), Metformin (3x1) and Amlodipine (1x10 mg). The client said he rarely took Amlodipine because there were already many drugs that had to be taken so the client only took antihypertensive drugs 1 week before chronic disease management Programmed. Clients routinely take treatment to the hospital every 1 month to a cardiologist. The client's TTV at the time of assessment, BP: 151/82 mmHg, H%: 55 x/min, and RR: 20 x/min. The pulse was weak.

Nursing diagnosis for subject I and II based on the assessment that has been done is a decrease in cardiac output associated with afterload changes. The nursing goal to be achieved is that after taking nursing action for 7x24 hours the patient's cardiac output increases with blood pressure outcome criteria 2 (moderately deteriorating) to 3 (moderately improving).

Intervention in both case study subjects is to monitor vital signs by monitoring blood pressure through a combination of slow deep breathing therapy and music therapy to lower blood pressure. Implementation in case study subject I was carried out on 23-29 October 2023. While the subject of case study II was carried out on 7-13 November 2023.

DISCUSSION

1. Characteristics of respondents

Based on the characteristics of respondents including age, gender, family history, and dietary patterns, it was found that the subjects in the case study were both aged ≥60 years who were more dominant in experiencing hypertension. Several studies have proven that as age increases, blood pressure will also increase (Azizah, Hasanah & Tri Pakarti, 2022). Ageing affects the baroreceptors involved in blood pressure regulation as well as arterial flexibility. This condition is influenced by a decrease in the elasticity of the blood vessel wall which is decreasing. The high rate of hypertension with age is caused by changes in the structure of large blood vessels, causing blood vessels to narrow and blood vessel walls to become stiff, resulting in an increase in systolic blood (Purnomo et al. 2020).

In terms of gender characteristics, case study subject I was male and case study subject II was female. Theory states that men are more at risk of developing hypertension in middle age while women are more at risk of

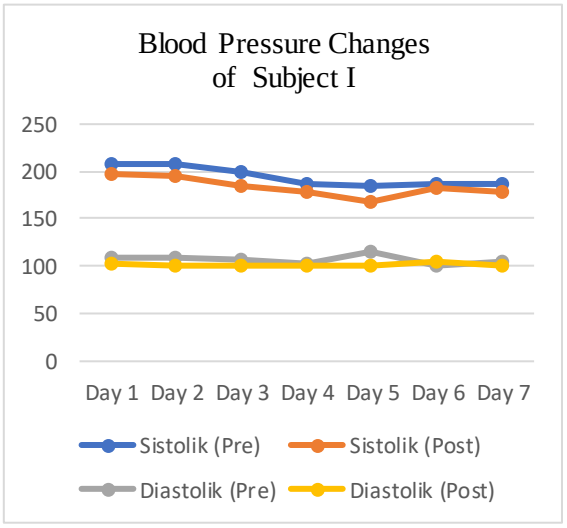
developing hypertension when entering old age (Azizah, Hasanah & Tri Pakarti, 2022). In productive age women have estrogen and progesterone hormones that function as protection of vascular tone. The reduction of both hormones will worsen the blood pressure condition of hypertensive patients, causing blood pressure to increase (Arisandi & Hartiti, 2022).

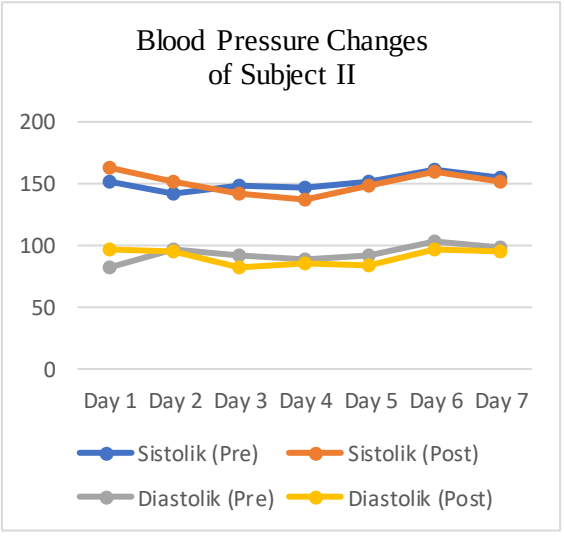
Case study subject I has a family history of hypertension, namely from both parents. This is in accordance with the theory that genetic factors have twice the risk of developing hypertension compared to individuals who do not have a family history of hypertension (Azizah, Hasanah & Tri Pakarti, 2022). Individuals with a family history of hypertension have a greater chance of developing primary hypertension. This occurs because of the inheritance of traits through genes, however, there are other external factors that influence individuals to experience hypertension such as an unhealthy lifestyle (Septiawan, Permana & Yuniarti, 2022).

Both case study subjects have poor dietary patterns such as consuming foods high in salt, eating fried foods and coconut milk. This is in accordance with research by Arisandi & Hartiti, 2022, which states that the level of knowledge can affect a person's response in responding to situations related to hypertension diet. Considering that the two subjects of this research case study are with the last education of elementary school, it shows that the level of education can affect the ability to choose healthy living habits. In addition, a lack of information and knowledge about hypertension diet patterns can result in uncontrolled blood pressure.

The case study subject currently still has a smoking habit of ±2 cigarettes/day while the case study II subject currently does not smoke, but previously had a history of smoking ±2 cigarettes/day. This habit can increase the risk of hypertension because the nicotine content in cigarettes causes calcification of blood vessel walls. Nicotine and carbon dioxide in cigarettes can damage arterial endothelial cells, reduce the elasticity of blood vessels so that blood vessels become stiff and blood pressure increases (Purnomo et al. 2020).

2. Changes in Blood Pressure Before and After Intervention





Based on this graph, it shows that the blood pressure of case study subject I has decreased after being given slow deep breathing therapy and music therapy for 7 days. Systolic blood pressure on the first day was 198 mmHg and after being given therapy for 7 days the blood pressure of subject I decreased to 178 mmHg with a decrease of 20 mmHg. While the diastolic pressure on day 1 was originally 108 to 104 mmHg with a decrease of 4 mmHg.

Meanwhile, case study subject II did not experience a consistent decrease in blood pressure because he had experienced symptoms of heart disease, namely left ventricular heart enlargement (cardiomegaly). On the first day, Subject II

experienced an increase in blood pressure from 151/82 mmHg before intervention to 163/97 mmHg. The second day, before therapy 142/97 mmHg and after therapy 151/94 mmHg. The increase in blood pressure occurred because during the provision of therapy, subject II felt tense and was the first to try therapy to lower blood pressure. After giving therapy on the third day until the seventh day, blood pressure decreased because subject II felt comfortable, calm, and began to get used to the therapy given. The results of therapy for 7 days showed that the systolic blood pressure on the first day was originally 163 to 152 with a decrease of 11 mmHg. While the diastolic pressure was originally 97 to 95 mmHg with a decrease of 2 mmHg.

When given slow deep breathing therapy and music therapy, there were not many adverse events reported. From the first day to the seventh day, case study subject I said he did not experience complaints of tightness and dizziness during therapy. Case study subject I felt calmer, more comfortable, and did not complain of dizziness after slow deep breathing therapy and music therapy. Meanwhile, case study subject II said that on the first day of therapy the patient felt tense and took too deep breaths so that the patient felt shortness of breath in the 8th minute. This can be seen in the blood pressure before therapy which is 151/82 mmHg and after therapy it is 163/97 mmHg. On the second day, Subject II began to feel comfortable and began to follow the directions of the researcher when taking and exhaling. Furthermore, on the third to seventh day the client said he did not experience any complaints and felt more comfortable, calm, and relieved so that there was a decrease in blood pressure after therapy. This condition is in accordance with the research of Varvogli and Darviri, 2011 in Mahundingan et al. 2023, states that when the body is in a state of relaxation, it will cause feelings of comfort, calm, and reduce anxiety so that it can reduce blood pressure.

3. The Effect of Combination of Slow Deep Breathing and Music Therapy on Blood Pressure Reduction

The combination of Slow deep breathing and music therapy can reduce blood pressure in patients with hypertension. In accordance with research conducted by Ping et al. 2018 with slow deep breathing interventions and music therapy can reduce systolic and diastolic blood pressure in patients with hypertension. However, the decrease can be seen in case study subject I with primary hypertension while case study subject II with secondary hypertension because it has experienced symptoms of coronary heart disease or heart failure, namely left ventricular heart enlargement (cardiomegaly). This is in accordance with the research of Khoiriyati, K.T. & Wulandari, 2015 that patients with primary hypertension, their blood pressure is easy to control because the provision of therapy focuses on the main mechanism of blood pressure reduction, namely by complex control of the nervous and hormonal systems that are interrelated in their effects on cardiac output and peripheral vascular resistance. The use of appropriate therapy in patients with hypertension will more easily reduce blood pressure without affecting other target organs.

In both subjects there was a decrease in systolic pressure after therapy, this was influenced by psychological conditions because when the body relaxes, it feels calmer and systolic pressure will drop. In addition, systolic pressure is influenced by systemic and pulmonary circulation so the emphasis is on regulation during relaxation. Breathing control can reduce the pulse rate and lower systolic blood pressure. In contrast, diastolic blood pressure is related to coronary circulation. Diastolic blood pressure does not decrease significantly during therapy because atherosclerosis of the coronary arteries can affect diastolic pressure (Khoiriyati, K.T. & Wulandari, 2015). In accordance with this study that both subjects experienced a slight decrease in diastolic pressure.

Slow deep breathing can cause a decrease in sympathetic output so that it can reduce the production of epinephrine hormones captured by alpha so that it affects the smooth muscles of the blood vessels to cause vasodilation. Vasodilation in blood vessels will reduce peripheral resistance to cause blood pressure to decrease. Slow deep breathing done 6 to 10 times in 1 minute if done regularly will stimulate the release of

endorphin hormones that make the body relax. In addition, the release of hormones can stimulate endorphin by stimulating the parasympathetic nervous system to be more active than the sympathetic nervous system which can affect the work of baroreceptors and result in vasodilation in blood vessels and decreased heart rate which can reduce blood pressure (Septiawan, Permana & Yuniarti, 2022). Based on the results of research by Sumartini & Miranti, 2019, it shows that slow deep breathing relaxation if done correctly will have an effect on lowering blood pressure in the elderly.

Music can lower blood pressure because when individuals listen to music it will produce a stimulus sent by neurons of the Reticular Activating System (RAS). The stimulus will be transformed by specific nuclei from the thalamus through the cerebral cortex area, limbic system, corpus collosum as well as the autonomic nervous system area and neuroendocrine system. Music can stimulate the sympathetic and parasympathetic systems to produce a relaxation response. Music stimulates the hypothalamus so that it will cause a calmer feeling which affects the production of endocrine, cortisol, and catecholamine the mechanism of lowering blood pressure (Aulia, Inayati & Immawati, 2023).

Supporting factors in the combined intervention of slow deep breathing and music therapy are that the case study subjects feel happy to do this therapy because it is easy to do and does not require costs. In addition, this therapy can lower blood pressure and reduce complaints felt by case study subjects. Both case subjects said that the case subjects became more aware of how to lower blood pressure other than by taking blood pressure lowering medication.

CONCLUSION

Based on the provision of slow deep breathing interventions and music therapy given to the two case study subjects, it is known that there is a decrease in blood pressure after being given therapy for 7 days. With these results, it can be concluded that slow deep breathing therapy and music therapy can reduce blood pressure in elderly people with hypertension.

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