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Slow deep breathing for hypertensives with poor tissue perfusion

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Abstract
Hypertension is blood pressure that exceeds normal limits where systolic blood pressure> 140 mmHg and diastolic blood pressure > 90 mmHg. To overcome this, it is necessary to make non-pharmacological therapy, namely the application of slow deep breathing exercises. This study aims to apply the application of slow deep breathing exercise to decrease blood pressure in patients with hypertension with ineffective brain tissue perfusion. The method used in this research is a case study with a sampling technique that is purposive sampling. The results of this study indicate that the application of slow deep breathing exercises can reduce blood pressure in patients with hypertension with ineffective brain tissue perfusion. Slow deep breathing exercises can lower blood pressure by activating the autonomic nerves so that vasodilation occurs in blood vessels.

Keywords: Hypertension; nursing care; slow deep breathing; community nursing; nursing intervention

Introduction

Hypertension is blood pressure that exceeds normal limits where systolic blood pressure is > 140 mmHg, and diastolic blood pressure is > 90 mmHg (Russo, Santarelli & O'Rourke., 2017). Hypertension is a non-communicable disease that has a high prevalence and is increasing. Hypertension in 2018 reached 30% of the population and is the most significant cause of death at 7.1 million per year (Andri et al., 2018). The World Health Organization states that of the entire population, hypertension causes 7.5 million deaths and 12.8% of all deaths (Sartika et al., 2018). In 2018 the prevalence of hypertension sufferers in Southeast Asia reached 36% including in Indonesia with 34.1% of the population. That data showed an increased compared with the previous data in 2013, which was 25.8%. In addition, hypertension attacks the population of Central Java, 35% of the population (Purwono et al., 2020).

The causes of hypertension are age, gender, genetics, obesity, smoking, and comorbidities such as diabetes mellitus (Singh, Shankar & Singh, 2017). Hypertension is a significant problem because the prevalence continues to increase, and there are still many hypertension patients who have not received or have been treated, but blood pressure cannot reach the target. Furthermore, hypertension is considered a significant problem because of complications that can increase morbidity and mortality. Hypertension that is not treated immediately will cause several complications including heart failure, kidney failure, stroke, and cerebrovascular disease (Berek, 2018). Surprisingly, complications of hypertension cause the death of 9.4% of the world's population (Khanal et al., 2019).

Treatment of hypertension can be done pharmacologically and non-pharmacologically. Pharmacological treatment is a treatment carried out by giving antihypertensive pharmacological drugs. At the same time, non-pharmacological treatment can be done with relaxation, exercise, and therapy. Non-pharmacological relaxation treatments include autogenic relaxation, finger clasp relaxation, deep breathing relaxation, and slow deep breathing. The application of slow deep breathing exercise is an activity to regulate breathing slowly and deeply, whose activities are realized by the perpetrator (Kalaivani, Kumari & Pal, 2019). This exercise can affect the autonomic nerves and cause vasodilation in blood vessels so oxygen to the brain is not blocked. The study is essential as this will help nurses integrate the intervention with the patient. Clinical studies described that deep breathing might reduce blood pressure (Yau & Loke, 2021; Nuckowska et al., 2021). This can overcome the ineffective perfusion of brain tissue. However, none of studies described the case report in evaluating of this intervention. Therefore, the study aimed to evaluate the effectiveness in patient with hypertension. Hopefully, this study will bring a fresher perspective on using complementary therapy in community nursing.

Method

The study used case study method using purposive sampling. Respondents selected were patients aged 55 years with hypertension grade I. Data collection in this study was taken using participatory observation methods, unstructured interviews, along with documentation. Data collection tools are SOP (Standard Operating Procedure) application of slow deep breathing exercises and blood pressure measurement using a manual tension meter and stethoscope. In addition, data was collected through documentation in the form of previous medical history data. This activity is carried out directly by providing slow deep breathing (2 times per day during 21 days). The authors alto conducted interviews and physical examinations. The data were analyzed according to the clinical symptoms of the patient.

Results

The demographic characteristics are Mr. W, a male with 55 years old living in Magelang. The patient works as a farmer, non-smoker patient and almost-never exercise. Patients complained frequent headaches, shoulders feel heavy, and difficult to sleep. However, the patient started to sleep when felt dizziness. The patient said he had hypertension for the past 7 years but had never checked his health regularly. At the time of the assessment, the data obtained were blood pressure 150/90 mmHg, pulse 88x/minute, temperature 36.5°C, and respiration 20x/minute. Based on an assessment, the nursing diagnosis was ineffective brain tissue perfusion. After having the intervention, the result found that slow deep breathing decreases the blood pressure **(Figure 1)**.

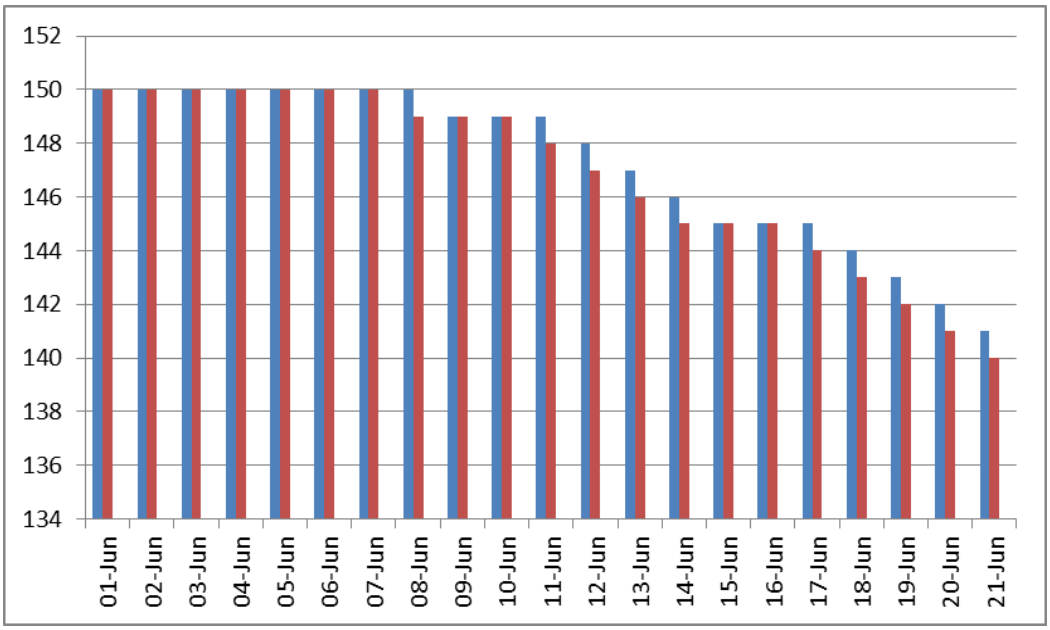

Figure 1. Evaluation of the intervention

Discussion

The general objective of this study was evaluating the effectiveness of slow deep breathing for patient with hypertension. The nursing action plan includes observing the client's blood pressure, instructing the client to reduce excessive activity, recommending not to stress, and teaching the client to make the slow deep breathing exercise application. In the implementation phase, the author measures the client's blood pressure before giving the slow deep breathing exercise application, then retakes the measurement after giving the application. After intervention, patient felt relaxed and comfortable. Evaluation of respondents with nursing problems of ineffective brain tissue perfusion obtained a subjective evaluation of the client, saying he did not feel dizzy. The client described that his body felt relaxed after applying slow deep breathing exercises for 21 days. The objective evaluation found that the client looked relaxed, calm, and comfortable, with blood pressure 140/90 mmHg, pulse 80x/minute, temperature 36.5^{o}C, and respiration 20x/minute. Analysis of the client's hypertension problem is resolved, with the next nursing plan to encourage the client to carry out routine checks at the nearest health service. The graph measuring blood pressure before and after the application of slow deep breathing exercise shows a decrease in blood pressure of 10 mmHg, from 150/90 mmHg to 140/90 mmHg.

During data collection method, the author start with an assessment as the initial stage and the primary basis of the nursing process. The assessment phase begins with data collection, and the formulation of client needs or problems (Rothman, Solinger, Rothman & Finlay, 2012). The data collected includes biological, psychological, social, and spiritual data. The focus that needs to be studied on clients with hypertension is the main complaint, current medical history, previous medical history, family medical history, physiological data, and blood pressure checks (Muntner et al., 2019). Nursing diagnoses that may appear in hypertension clients include decreased cardiac output, impaired sense of comfort, acute pain, activity intolerance, and ineffective brain tissue perfusion. Hypertension can disrupt blood circulation to the brain so that the supply of O2 decreases and can cause problems of ineffective brain tissue perfusion (Alosco et al., 2014).

The implementation of nursing is a series of activities carried out by nurses to help clients from the health status problem they are facing to a better health status. The purpose of this nursing implementation is to assist clients in achieving the goals that have been set, including health promotion, disease prevention, and health recovery. In Mr. W with a nursing diagnosis of ineffective brain tissue perfusion, the implementation carried out was the application of slow deep breathing exercises for 21 consecutive days in the morning and evening. In the implementation phase, the authors measure the client's blood pressure before applying slow deep breathing exercise, then measure the blood pressure again after giving the application. The evaluation results on Mr. W for 21 days, with the diagnosis of ineffective brain tissue perfusion being partially resolved, showed that Mr. W's blood pressure decreased from 150/90 mmHg on the first day to 140/90 mmHg on the last day. This can be concluded that slow deep breathing decreased the blood pressure in patient with hypertension. The intervention can be used by community nursing for complementary therapy.

Conclusion

The application of slow deep breathing exercises can affect the decrease in blood pressure of people with hypertension with ineffective brain tissue perfusion. The mechanism of lowering blood pressure in the application of slow deep breathing exercises can be caused by increased activity of central inhibitory rhythms, which impact sympathetic output. slow deep breathing exercises for 21 consecutive days in the morning and evening can reduce blood pressure by 10 mmHg. Further studies are needed to explore this therapy's benefits in broad populations.

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