

Case Study: The influence of deep breathing relaxation techniques in reducing blood pressure and pain caused by hypertension

Gusrina Komara Putri^{1*}, Sri Lestari²

1 Lecturer of Politeknik Karya Husada, Jakarta, Indonesia

2 Nursing student of diploma in Nursing of Politeknik Karya Husada, Jakarta, Indonesia

* Corresponding: rina.komara@gmail.com

Abstract

Pain is a body signal to inform pathological condition. In hypertension patients, pain occurred as one of the symptoms of the disease. Hypertension is an increase if systolic and diastolic blood pressure out of normal range. In Indonesia, especially in Kebayoran Lama public health center district, the prevalence of hypertension in the elderly still consider public health issue. This study aims to measure the effect of deep breathing relaxation technique in reducing pain and blood pressure for hypertension patients. This research used a case study design. In this study, researcher in five days measured participants blood pressures and their pain scales. After that, researcher guided participant to do deep breathing relaxation technique five times consecutively, around fifteen minutes. Results pain scale of Mrs. M and Mrs. A that within five days there were slight reducing of pain level. Another finding that there was a trend of decreasing blood pressure of that patient within normal range. It can be concluded that in these two patients deep breathing relaxation techniques could reduce their pain scale and maintaining a healthy blood pressure level of hypertension patients. It is recommended to this research with the more significant sample and using other research variables.

Keywords: hypertension, pain, deep breathing, relaxation technique

1. Introduction

World Health Organization (WHO) found in 2008, almost 40% of adults aged 25 and above had been diagnosed with hypertension, it improves significantly from 600 million in 1980 to 1 billion in 2008 (1). Also, the data concluded that high-income countries have a lower prevalence of hypertension compared with low-income countries such as Indonesia (1). In Jakarta, specifically in Kebayoran Lama public health center it was found that hypertension case increase from 7.53% in 2016 to 10.69% in 2017. Also, the trend of this disease prevalence is growing bigger especially in elderly aged 60-69 years old (2).

Hypertension defines as increasing of systole over 140 mmHg and dystole more than 90mmHg (3,4). Generally, it starts from, mild sick then growing to severe condition. There are two types of hypertension which are primary hypertension which is unknown caused and secondary hypertension that could be identified the etiology (4). The most common symptom of hypertension is the pain.

Pain is an essential symptom to inform malfunction organic or functional in the body. Pain in the head or commonly called headache is unpleasant feeling involve emotional with or without tissue impairment as a symptom from organ malfunction or disease (5). Pain is an unpleasant subjective experience. It measures by the scale, and it can be explained and evaluated by the person who feels it. Pain scale generally divides into acute and chronic pain (6).

In the elderly, pain management differs than younger people. Clinical manifestation of persistent pain is often complex and multifactorial in the older population. Besides that, elderly commonly experience medication-related side effects and have a higher potential for complication and adverse events related to diagnostic and invasive procedures (7). Due to that, relaxation technique could be one of suitable approach in hypertension nursing management of the elderly.

The relaxation technique is a mental and physical relieve from stress and tension. Deep breathing relaxation is the easiest and the most simple of it. It is conducted by slowly taking a deep breath normally (8). The objective of deep breathing relaxation is to improve alveoli ventilation, maintenance gas exchange, avoid lung atelectasis, relaxation of muscle tension, improve cough efficiency, reduce stress physically and emotionally and reduce anxiety (9). Furthermore, the study by Pratiwi (2017) concluded that deep breathing relaxation technique is one of the popular notion-pharmacological techniques to treat pain by regulating the breath (10).

Research conducted by Tawaang, Mulyadi and Palendeng (2013) (11) concluded that breathing relaxation technique could lower the blood pressure in patients with moderately severe hypertension (CI = 95%). Moreover, research conducted by Hartanti, Wardana and Fajar summarized that deep breathing relaxation technique could effectively reduce the blood pressure of hypertension patients (CI = 95%, p-value = 0.001).

In doing a nursing intervention in the community, the family is one of the essential factors should be involved. Friedman (2010) (12) stated that a family is a group that consists of two individuals or more that have a special relationship in term of blood relationship or law legally. Moreover, Friedman (2013) stated that support from family defines as an effort given to others could be in the form of morally and materially to motivate the person in carrying out the activities (13).

Based on initial assessment in the Kebayoran Lama public health center, one of health issue needs more intervention was regarding hypertension in the elderly. This condition could lead to stroke and decrease the elderly quality of life. Furthermore, in two participants of this study, they were complaining of pain in the head that makes them worried it could affect another system in their bodies. These participants want to maintain normal blood pressure without taking too much medication. So one of non-pharmacological approach could be established by exercising the deep breathing relaxation technique.

2. Objectives

There are two main goals in this research. Firstly, it is to measure the effect of deep breathing relaxation technique in reducing pain for hypertension patients. Secondly, it also estimates the effect of deep breathing relaxation technique in reducing blood pressure for hypertension patients.

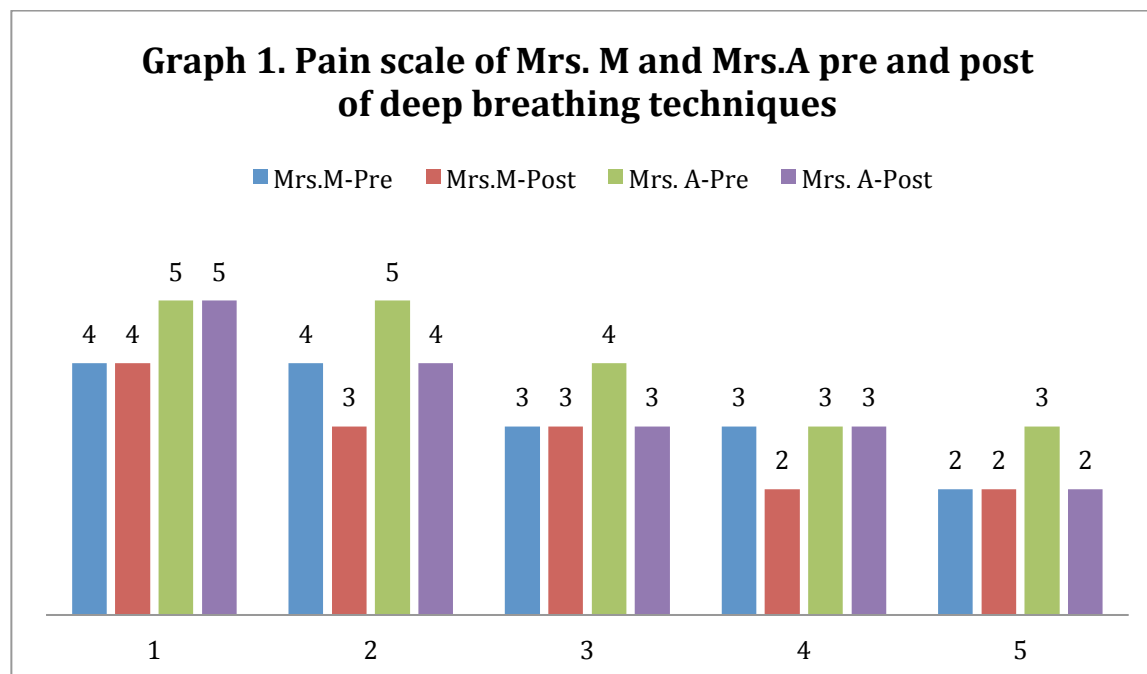
3. Methods

This research used a case study design. There were two patients in this research which were Mrs. M and Mrs. A. Both of them have similar characteristics, namely: female gender, diagnosed with hypertension and aged around 50 years old. A researcher described informed consent, and consequently, it was signed by the participants. Anonymity and confidentiality were ensured during this research. In this study, the researcher in five days measured participants blood pressures and their pain scales. After that, researcher guided participant to do deep breathing relaxation technique five times consecutively, around fifteen minutes.

4. Results

Case 1. Mrs. M (55 years old) complained of a headache and pain especially in the nape of the neck and back of the head region. Pain scale was 4 (out of 10), and it felt like a throbbing pain. Besides that, the patient stated that pain comes and go but sometimes also caused blurred vision. Mrs. M also said that she had been suffered from hypertension for 1.5 years. Besides that, the client stated that she is anxious with her condition because of the hypertension condition. The researcher also observes that client looked sad, confuse and could not explain about the concept of hypertension. In term of family structure, Mrs.M was widowed that lived with six children.

Case 2. Mrs. A (53 years old) stated I feel a headache and dizziness when she caught flu. The pain felt mostly in the head region and it like a circling pain with a scale of 5 (out of 10). The pain comes suddenly. The patient had been diagnosed by hypertension since 13 years ago. Also, the client stated that she regularly consumed drugs therapy (amlodipine), but her condition still not change. Because of that, she becomes worried about her health condition. Patient and family stated that they did not understand the concept of hypertension and therapy management of hypertension patient.



Graph 1 infers pain scale of Mrs. M and Mrs. A. It can be summarized that within five days there were slight reducing of pain level. In the first day, Mrs. M and Mrs.A pain scale were 4 and 5, respectively. Following it, pain scale in the second, third and fourth day were dominantly 3 and 4. Finally, on the fifth day both of patients pain scale was 2.

Table 1. Blood pressure Mrs. M and Mrs. A before and after deep breathing relaxation technique

		Mrs. M		Mrs.A	
		Sistole	Diastole	Sistole	Diastole
I	Pre	160	90	160	90
	Post	160	90	160	90
II	Pre	160	90	160	100
	Post	160	90	160	100
III	Pre	160	100	150	90
	Post	160	100	150	90
IV	Pre	160	90	150	80
	Post	160	100	150	90
V	Pre	150	100	140	90
	Post	150	100	140	80

Graph 1 reflects trends of blood pressure Mrs. M and Mrs.A within five days. In the initial assessment, it can be seen that both patients blood pressure was 160/90 mmHg. Consequently, after regular exercise of deep breathing relaxation technique, it decreased slightly to around 150/90 mmHg. In the last day, blood pressure of Mrs. M was

150/100mmHg whereas Mrs.A was 140/80mmHg. Based on that, it can be concluded that there was the trend of decreasing blood pressure of that patient within normal range.

5. Discussion

Mrs. M aged 55 years old whereas Mrs. A 53 years old. From the initial assessment, it can be classified that both patients were considered elderly with the aged over 50 years old. It is similar with the finding of Pinto (2007) (14) that stated the increase in blood pressure with age is dominantly related to the structural changes in the arteries and especially with large artery stiffness. Also, Gama, Samardi, and Harini (2014) (15) research findings found that elasticity of blood vessel reduces due to the aging process especially blood flow to the brain. Specifically, in Mrs. A, she also has a genetical factor for hypertension disease.

Mrs. A stated that she suffered hypertension because of stress and tired of taking care of her grandchildren. High-stress level increase resistance of vascular prefer and increase cardiac output and stimulate the activity of sympathetic nervous. This condition similar to research by Andria (2013) (16) that suggested there is a significant correlation with the occurrence of hypertension in the elderly with the stress behavior ($p = 0.047$). Moreover, research by Korneliani and Meida (2012) (17) also concluded there was a significant correlation between stress level and incidence of hypertension (CI= 95%; $p=0.0001$). Another research findings stated that systolic blood pressure decreased from pre to post intervention and heart rate was positively associated with self-reported symptoms of stress (18).

In those two participants involved in the study (Mrs.M and Mrs. A), their final blood pressure was 150/100mmHg and 140/80mmHg, respectively. This result paralyze with research of Sentana & Mardiatun (2016) (19) that indicated the influence of technique relaxation to decrease blood pressure of both systolic and diastolic at hypertension patients ($p=0.001$ for group intervention and $p = 0,358$ for group control; blood pressure of diastole $p=0,0065$ for group intervention and $p = 0,44375$ for group control). Furthermore, relaxation technique at clinic test proven could degrade blood pressure 10-15 point (19). In conjunction, these findings considered normal baseline for hypertension patients. Based on James, et al. (2014) (20), it is recommended that the 140/90mmHg for hypertension patient remains reasonable. The relationship between naturally occurring blood pressure and risk is linear down to very low blood pressure, but the benefit of treating to these lower levels with antihypertensive drugs is not established (20).

After five days regular of deep breathing relaxation technique in the last day, blood pressure was 150/100mmHg and 140/80mmHg for Mrs.M and Mrs. A. It decreases 10-20mmHg of their initial assessment blood pressure. It is similar with the study of Putra (2013) (21) that conclude there was a significant difference of blood pressure level within the group did deep breathing (systolic p -value = 0.000 and diastolic p -value =0.000) compared with the control group.

One of specific symptom related to hypertension is a headache and pain in the name of a head. In this research, both Mrs. A and Mrs.M felt this pain whenever they suffered hypertension. This finding similar to the results of Sacco et al. (2013) (22) that concluded that the possibility chronic pain might be associated with the increased risk of hypertension.

Pain in the head could be caused by intracranial or extracranial pain. Pain in the head in hypertension patient classified as intracranial pain which is a migraine that usually resulted from the unusual vascular phenomena. One of theory regarding a headache stated that emotional or prolonged stress would lead to vasospasm reflex to arterial in the head. Theoretically, vasospasm would cause ischemic in some part of the head that symptomized as pain in the head (23). Those finding, paralyzed with the condition of Mrs. A and Mrs.M that stated both of them felt pain the hair like a migraine and circling pain.

One of nonpharmacologic therapy to reduce pain level is by deep breathing technique. It is consist of chest and stomach breathing with a slow rhythm frequency. The benefit of it is to heal the chronic and acute pain constantly (23). The researcher used in pharmacology therapy to control and reduce pain felt by Mrs. A and Mrs. M. This relaxation technique is an independent nursing intervention to reduce pain, improve lung ventilation and increase blood oxygenation. The advantage of skeletal muscle relaxation is to reduce pain by the relaxation of muscle tension (23). Nurses teach the client to do deep breathing by slowly inhale and maximize it lung capacity and the exhale it slowly (21).

Deep breathing relaxation technique could control pain by minimizing the sympathize nervous activity of the autonomous nervous system. Relaxation includes muscle and respiration process. It is easy to do in many places and not required sophisticated equipment. In relaxation technique, it stimulates different regions in the hypothalamus that caused a neurogenic effect in cardiovascular systems such as increase and decrease of arterial pressure and cardiac output. In this relaxation technique, it reduces activity in the sympathetic nervous and lead to the vasodilation of blood vessels and resulted in relaxation condition (19).

In Mrs. M and Mrs.A after they did the deep breathing relaxation technique the pain scale, generally, decrease within a few days. Moreover, the patient also had been taught about this technique and also could support the patient in doing it regularly. This similar to the result Pratiwi (2017) (10) that found that deep breathing relaxation technique could be useful in reducing pain for mother during labor period. Another study also showed a positive effect of relaxation progressive muscle program on decreasing blood pressure and cholestreol level among patients with hypertention (24)

6. Conclusion and Recommendation

To summarize, it can be concluded that in these two patients deep breathing relaxation techniques could give health benefits. Firstly, it could reduce their pain scale. Secondly, it leads to maintaining a healthy blood pressure level of hypertension patients.

In term of a research area, it is recommended to do this research with more significant sample so that the result could be generalized to a bigger population. Also, other factors such as gender, environmental factor, family support could also be measured with different research design so that more variables could be analyzed. In the nursing community practice, it is recommended to involve family members in this research so that the effect of this deep breathing technique could last longer and emphasize.

Acknowledgment

The researcher would like to acknowledge Kebayoran Lama Public Health Center that facilitated this study. It is hoped that these study findings could give some insight into the institution.

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