



Reduce Blood Pressure Values Of Hypertension Patients Using Slow Deep Breathing

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ABSTRACT

This study aimed to determine the effect of slow deep breathing techniques on blood pressure values in hypertensive patients. This research is a Pre-Experimental Design with One Group Pretest-Posttest. The sampling technique used is non-probability sampling, purposive sampling with a research sample of 22 respondents. Univariate results obtained an average respondent of 60 years, with the majority gender 21 respondents (95.4%). Bivariate results showed that the p-value of the statistical test using the Wilcoxon test was known that the p-value was 0.000 (<0.05). In conclusion, slow deep breathing techniques affect blood pressure values in hypertensive patients at Puskesmas 23 Ilir Palembang in 2022.

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1. INTRODUCTION

World Health Organization (WHO) data for 2015 shows that around 1.3 billion people worldwide have hypertension, meaning that 1 out of 3 people worldwide are diagnosed with hypertension. The number of people with hypertension continues to increase every year ^[1]. WHO in 2018 stated that Indonesia was included in the top 100 rankings with deaths from hypertension of 14.41%, while the prevalence of hypertension in Indonesia based on data from Riskesdas in 2013 was 25.8%, which percentage increased in 2018 to 25.8. % ^[5].

Based on the prevalence profile of the South Sumatra Health Service (2019). It was found that the number of hypertension sufferers in 2018 aged > 15 years in South Sumatra Province was 5,572,379 people. Palembang City contributed the highest number of 1,130,254 people with hypertension. At the same time, the city of Pagaralam has the lowest number of hypertension sufferers (94,153 people). Of 5,572,379 hypertension sufferers, only 137,299 patients received standard health services (2.5%).

The incidence of hypertension increases with the increasing age group. Hypertension prevention based on measurement results in residents aged 55-64 years 55.2%. There is a significant increase in the prevalence of hypertension in patients over 60 years of age. Physiologically, the higher a person's age, the greater the risk of hypertension ^[3]. In general, hypertension is measured twice at five-minute intervals under adequate rest. Systolic blood pressure increases by more than 140mmHg, and diastolic blood pressure increases by more than 90mmHg ^[4].

This disease can be a severe threat if left untreated, and uncontrolled blood pressure will result in stroke, myocardial infarction, kidney failure, encephalopathy, and spasms of blood vessel constriction. This can lead to reduced blood and oxygen supply to the tissues, resulting in microinfarctions in the tissues. Severe complications of hypertension are death due to obstruction and rupture of the brain's blood vessels ^[5].

This chronic condition occurs because the blood pressure on the artery walls increases. An increase in systolic blood pressure of more than 140 mmHg and diastolic blood pressure of more than 90 mmHg on two measurements

with an interval of five minutes in a somewhat rested/peaceful state. Hypertension puts the heart and arteries under abnormal tension. Excessive pressure gradually puts on the body's organs which are nourished by the blood supply. The result is blood vessels in the brain can burst and cause a stroke. Or the kidney's ability to filter is impaired. The heart must work harder to pump blood to compensate for the increased blood pressure in the arteries ^[6].

Management of hypertension can be done in two ways, pharmacologically and non-pharmacologically. Pharmacologically antihypertensive drugs can be used, but this can cause side effects such as nausea, vomiting, dizziness, tachycardia, and palpitations which are harmful to the body. While non-pharmacological methods can be carried out, one of which is breathing relaxation with the slow deep breathing technique, an intervention to reduce blood pressure and symptoms a person feels to deal with various situations using the slow deep breathing technique ^[7].

Slow deep breathing (deep breathing) is a technique of doing deep breathing, slow breathing (holding inspiration to the maximum), and how to exhale slowly ^[8]. The slow deep breathing technique can affect blood pressure values because of the long exhalation than the slow deep breathing exercise method causes intrathoracic pressure in the lungs to increase during inspiration, thereby increasing oxygen levels in the tissues. Chemoreceptor reflexes, which are abundant in the carotid, and aortic bodies and, to a lesser extent, in the thoracic cavities and lungs, become activated. It then carries nerve signals to the respiratory center in the medulla oblongata. So the work activity of the parasympathetic nerves and reduce the work activity of the sympathetic nerves will cause decreased blood pressure ^[9].

Supporting research on this topic shows the average systolic blood pressure of respondents in the intervention group before slow deep breathing was 151.33 mmHg and 96.00 mmHg diastolic. After being given the procedure, the systolic blood pressure was 136.00 mmHg and 85.33 mmHg diastolic, with a significant systolic (p-value) value of 0.000 and diastolic (p-value) of 0.000 ^[6]. Another research on 28 respondents with hypertension at the Denpasar Health Center found that giving slow deep breathing therapy significantly reduces systolic and diastolic blood pressure in patients with a value of $p = 0.000 (<0.001)$ ^[7]. The research results are also in line with the research. The results obtained for blood pressure with a p value = 0.000, meaning that at alpha 5% there is a significant difference between the average blood pressure in hypertensive patients before and after deep breathing technique therapy, namely H_0 is rejected and H_a is accepted. means deep breathing techniques to reduce blood pressure in hypertensive patients ^[8].

Based on the initial data collection at the Puskesmas on May 16, 2022, there were 143 confirmed patients in the last three months, and a preliminary study conducted by researchers interviewing five patients suffering from hypertension who visited the Puskesmas said they never had and did not know how to do the slow technique. Deep breathing to control blood pressure

From the description above, it is necessary to research the effect of slow deep breathing on blood pressure values in hypertension patients at Puskesmas 23 Ilir Palembang.

2. RESEARCH METHOD

This study used a quantitative method with a Pre Experiment research design with a Group Pretest Posttest research design. In the trial activities that do not use a control group, this design is carried out by comparing the pre-test and post-test results in the group being tested ^[12]. The population in this study was 143 patients according to the expected inclusion and exclusion criteria. The research sample was taken using a purposive sampling technique where the sample size of the population of this study, which made the sample, with the condition that the population was > 100 people so that a total sample of 22 respondents was obtained. Slow deep breathing is carried out once a day for three consecutive days ^[13]. The duration of each exercise is 20-30 minutes. I am collecting data in this study using a questionnaire. The research instrument has been tested for validity and reliability with the results of the validity of each question item > 0.05 and the reliability value of 0.793 > 0.6 so that this questionnaire can be declared valid and reliable. Data analysis includes univariate and bivariate. The test used is the Wilcoxon test with 0.05.

Figure 1. Research design

Pre-test	Intervention	Post-test
O ₁	X	O ₂

**3. RESULTS AND ANALYSIS****3.1 RESULTS****3.1.1 Univariate Analysis****a. Distribution of Age and Gender Characteristics of Slow Deep Breathing Therapy in Hypertension Patients at Puskesmas 23 Ilir Palembang in 2022**

Table.1
Distribution of Age and Gender Characteristics of Slow Deep Breathing Therapy in Hypertension Patients at Puskesmas 23 Ilir Palembang in 2022

No.	Variable	Frequency	Percentage (%)
1.	Age		
	30-45 year	6	27,3%
	45-60 year	8	36,4 %
	>60 year	8	36,4%
2.	Gender		
	Man	1	4,5%
	Women	21	95,5 %

Based on table 4.1 above, it is known that the age of hypertensive patients is more aged 45-60 years, with as many as eight respondents (36.4%) also, the same as the number of ages > 60 years are as many as eight respondents (36.4%). It is known that most hypertension sufferers are female, with as many as 21 respondents (95.5%).

b. Distribution of Blood Pressure Before Slow Deep Breathing Therapy In Hypertension Patients at Puskesmas 23 Ilir Palembang in 2022

Table. 2
Distribution of Blood Pressure Before Slow Deep Breathing Therapy in Hypertension Patients at Puskesmas 23 Ilir Palembang in 2022

Hypertension Patient's Blood Pressure	Median	Min-Max	SD
Systolic Blood Pressure Before intervention	148,00	140-162	7,327
Diastolic Blood Pressure Before intervention	90,50	80-110	9,369

Based on table 2 above, blood pressure in hypertensive patients before slow deep breathing technique therapy is known as the median systolic blood pressure before 148.00 mmHg with a standard deviation of 7.327. In comparison, the median diastolic blood pressure before slow deep breathing technique therapy is 90 .50 mmHg with a normal deviation value of 9.369.

c. Distribution of Blood Pressure After Slow Deep Breathing Therapy In Hypertension Patients at Puskesmas 23 Ilir Palembang in 2022

Table. 3
Distribution of Blood Pressure After Slow Deep Breathing Therapy In Hypertension Patients at Puskesmas 23 Ilir Palembang in 2022

Hypertension Patient's Blood Pressure	Median	Min-Max	SD
Systolic Blood Pressure After intervention	145,50	135-160	7,344
Diastolic Blood Pressure After intervention	90,00	80-100	7,035

Based on the table. 3 above blood pressure in hypertensive patients after slow deep breathing technique therapy, it is known that the median systolic blood pressure is 145.50 mmHg with a standard deviation value of 7.344. In contrast, the median diastolic blood pressure after the slow deep breathing technique is 90.00 mmHg with a value standard deviation of 7.035.

3.1.2. Bivariate Analysis

a. The Effect of Slow Deep Breathing Therapy on Blood Pressure Before and After in Hypertension Patients at Puskesmas 23 Ilir Palembang in 2022

Table. 4
The Effect of Slow Deep Breathing Therapy on Blood Pressure Before and After in Hypertension Patients at Puskesmas 23 Ilir Palembang in 2022

	Hypertension Patient's Blood Pressure	Median	SD	Min-Max	P.Value
Posttest	Systolic	145,50	7,344	135-160	0,000
	Diastolic	90,00	7,035	80-100	

Based on Table 4 above, the effect of slow deep breathing on blood pressure values using the slow deep breathing technique shows that the median systolic blood pressure is 145.50 mmHg with a standard deviation of 7.344, while the median diastolic blood pressure is 90.50 with a standard deviation of 7.035. The results of statistical tests using the Wilcoxon test show that the p-value of the systolic and diastolic p values is 0.000 (<0.05).

3.2 DISCUSSION

3.2.1 Univariate Analysis

a. Distribution of Age and Gender Characteristics of Slow Deep Breathing Therapy in Hypertension Patients at Puskesmas 23 Ilir Palembang in 2022

The results of the study from the distribution of age and gender characteristics of hypertensive patients with hypertension were more aged 45-60 years, as many as eight respondents (36.4%) also the same as the number of ages > 60 years was as many as eight respondents (36.4%). It is known that most hypertension patients are female, with as many as 21 respondents (95.5%).

The results of these studies are in line with this research that which that the average age is 64 years. The older a person is, the higher their blood pressure, so older people tend to have a higher blood pressure than younger people ^[2]

The results of this study are in line with the statement of other studies that most of the sexes in this study were women, which shows that more female respondents than male respondents experienced hypertension because the incidence of hypertension is related to gender. The hormone estrogen can cause this in women. This hormone is obtained by women during menstruation every month and is continuously renewed. However, if a woman experiences menopause, the hormone estrogen will decrease, and the risk of hypertension will increase ^[11].

Based on the theory and research results above, the researchers assume that age and gender are closely related to hypertension, which is higher in women experiencing menopause. Levels of the hormone estrogen influence hypertension. These hormones will decrease when women enter old age (menopause), so women become more susceptible to hypertension.

b. Distribution of Blood Pressure Before Slow Deep Breathing Therapy In Hypertension Patients at Puskesmas 23 Ilir Palembang in 2022

The study's results from the distribution of blood pressure in hypertensive patients before slow deep breathing technique therapy showed that the median systolic pressure before the slow deep breathing technique was 148.00 mmHg with a standard deviation value of 7.327. In comparison, the median diastolic blood pressure before slow deep breathing technique therapy was 90.50 mmHg with a standard deviation of 9.369.

Slow deep breathing can be given to hypertensive patients. The advantages of this relaxation therapy are that it can be done independently at home, is relatively easy to do, does not require a long time for treatment, and reduces the impact of pharmacological therapy for hypertension patients. This treatment can be done six times per minute for 15 minutes to impact blood pressure by increasing baroreceptor sensitivity and reducing sympathetic nerve activity in hypertensive patients ^[10].



The average blood pressure before the slow deep breathing technique was 165.67 mmHg systolic and 94.73 mmHg diastolic with the lowest systolic value of 159 mmHg and 80 mmHg diastolic. The highest systolic value was 178 mmHg the highest diastolic value was 112 mmHg [7].

Based on the theory and research results above, the researcher assumes that there has been no change in blood pressure values because the slow deep breathing technique has not been performed on the respondents who will be studied. So there has been no significant change in the respondents.

c. Distribution of Blood Pressure After Slow Deep Breathing Therapy In Hypertension Patients at Puskesmas 23 Ilir Palembang in 2022

The research results from the distribution of blood pressure in hypertensive patients after slow deep breathing technique therapy showed that the median systolic blood pressure was 145.50 mmHg with a standard deviation of 7.344. The median diastolic blood pressure after the slow deep breathing technique was 90.00 mmHg, with a standard deviation of 7.035.

Deep and slow breathing during the slow deep breathing technique will improve oxygen saturation and increase oxygen consumption in the body. An increase in the amount of oxygen in the body will stimulate the emergence of nitrite oxidation. Nitrite oxidation will also affect blood vessels to become more elastic, causing vasodilation in blood vessels to lower blood pressure [10].

The results of this study are in line with the statement of other studies that the average blood pressure after the slow deep breathing technique was 151.33 mmHg systolic and 88.00 mmHg diastolic with the lowest systolic value of 150 mmHg and 75 mmHg diastolic. The highest systolic value was 175 mmHg the highest diastolic value was 100 mmHg [9].

Based on the theory and research results above, the researchers assume that there is a decrease in blood pressure values in hypertensive patients after the slow deep breathing technique is carried out. This indicates a change in blood pressure before and after the slow deep breathing technique is given. Therefore the researchers advise respondents to perform the slow deep breathing technique 3-4 times a week for 15 minutes to reduce blood pressure values.

3.2.2. Bivariate Analysis

a. The Effect of Slow Deep Breathing Therapy on Blood Pressure Before and After in Hypertension Patients at Puskesmas 23 Ilir Palembang in 2022

The effect of slow deep breathing on blood pressure values using slow deep breathing technique is that the median systolic blood pressure is 145.50 mmHg with a standard deviation of 7.344, while the median diastolic blood pressure is 90.50 with a standard deviation of 7.035. The results of statistical tests using the Wilcoxon test show that the p-value of the systolic and diastolic p-value is 0.000 (<0.05).

The mechanism for reducing blood pressure in slow deep breathing exercises is due to the increased activity of central inhibitory rhythms, which impact sympathetic output. A decrease in sympathetic output will cause a reduction in the production of the hormone epinephrine, which is captured by alpha receptors so that it will affect the smooth muscles of the blood vessels resulting in vasodilation, vasodilation in the blood vessels will reduce peripheral resistance, which also causes blood pressure to fall [11].

The results of this study are in line with the statement of other studies that effect of slow deep breathing exercise on blood pressure values in hypertensive patients, showing that slow deep breathing exercise has a significant impact on the intensity of systolic and diastolic blood pressure in hypertensive patients. with a p-value of 0.000 [8]

Based on the research results and theory, the researchers assume that there are changes before and after the slow deep breathing technique is carried out in hypertensive patients where there are significant changes in the decrease in blood pressure values so that the slow deep breathing technique needs to be applied because it can help reduce hypertension.

4. CONCLUSION

Berdasarkan uraian hasil penelitian dan pembahasan tentang Reduce Blood Pressure Values Of Hypertention Patients Using Slow Deep Breathing di Puskesmas 23 Ilir Palembang dapat disimpulkan hal-hal sebagai berikut :

- Distribution of age and sex characteristics, it is known that the age of hypertensive patients is more aged 45-60 years as many as 8 respondents (36.4%) also the same as the number of ages > 60 years, as eight respondents (36.4%). As for gender, It is known that the majority of hypertensive patients are female, with as many as 21 respondents (95.5%).
- The distribution of blood pressure in hypertensive patients before slow deep breathing technique therapy is known that the median systolic blood pressure before the slow deep breathing technique was 148.00 mmHg with a

- standard deviation value of 7.327, while the median diastolic blood pressure before slow deep breathing technique therapy was 90.50 mmHg with normal deviation value of 9.369
- c. The distribution of blood pressure in hypertensive patients after slow deep breathing technique therapy is known that the median systolic blood pressure after 145.50 mmHg with a standard deviation value of 7.344 while the median diastolic blood pressure after slow deep breathing technique is 90.00 mmHg with a typical value deviation 7.035.
 - d. There is an effect of slow deep breathing therapy on blood pressure values in hypertensive patients at Puskesmas 23 Ilir Palembang in 2022. The results of statistical tests using the Wilcoxon test show systolic and diastolic blood pressure after obtaining a p-value of 0.000 (<0.05).

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