Conference Paper

The Effect of Slow Deep Breathing on Blood Pressure of Hypertension Patients in M. Djamil Hospital Padang 2018

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Abstract

The incidence of hypertension reached 50% of the total population in the world and is expected to increase to 64.01% by 2025. West Sumatra Province has a high incidence of hypertension, one of which is based on data from M. Djamil Hospital Padang, obtained 24,782 people suffering from hypertension in 2016. Handling hypertension with the aim of lowering blood pressure can be done in various ways, one of which is by non-pharmacological therapy, slow deep breathing. The purpose of the study is to determine the effect of slow deep breathing on blood pressure. The type of research was quasi-experiment with two groups, pre-test and post-test. The research was carried out in the Interne Room in M. Djamil Hospital Padang from February to August 2018. The population is all patients with hypertension in the interne room. The sampling technique used was purposive sampling and the number of samples was 28 people with criteria for hypertension samples, aged 40-60 years and not obese. Data processing is carried out computerizedly by processing the data using the Wilcoxon test. The results showed that there was an effect of slow deep breathing on systolic blood pressure in the intervention group with p = 0.01 and diastolic p = 0.02 and there was no effect of slow deep breathing on systolic blood pressure in the control group with p = 0.107 and diastolic p = 0.157.

Keywords: *slow deep breathing*, blood pressure, hypertension

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1. Introduction

Hypertension is one of the main diseases because of the high incidence in the world and its relationship with coronary heart disease as the number one killer disease in the world [1]. Hypertension results in disruption of the blood vessels which results in the supply of oxygen and nutrients carried by the blood being blocked up to the body tissues that need it. Hypertension is often referred to a silent killer, because it is a deadly disease without the symptoms first as a warning to the sufferer [2].

The incidence of hypertension reached 50% of the total world population, while those who were known to receive treatment were only 25% and 12.5% were treated well. WHO in 2012 also stated a comparison of the incidence of male and female hypertension found that men had a greater risk of hypertension compared to women with 26.6% men and 26.1% women. That number will probably increase to 29.2% in 2025. Hypertension has killed 9.4 million people worldwide each year [3].

Indonesia is one of the countries with the most hypertension. There is an increase in the prevalence of hypertension in Indonesia every year. There was an increase in hypertension prevalence from 7.6% in 2007 to 9.5% in 2013 [4].

Hypertension can occur due to an increase in heart rate and volume due to sympathetic nervous system activity [5]. This results in an increase in contractility of heart muscle fibers by selective vasoconstriction in ferrous organs [1]. If this happens continuously, the heart muscle will thicken (hypertrophy) and cause heart function as a pump to be disrupted, a further consequence of the occurrence of brain blood vessel damage, eyes (retinopathy), and kidney failure [6]. Hypertension can be a serious threat if you do not get improper management. If blood pressure in hypertensive patients can be maintained in normal values it will help them in obtaining optimal health, avoiding the risk of complications of cardiovascular disease and improving quality of life.

Treatment of hypertension is done in two ways, namely pharmacologically and non-pharmacologically. In pharmacological way, anti-hypertensive drugs can be use but this pharmacological therapy can cause side effects such as nausea, vomiting, dizziness, tachycardia and dangerous palpitations in the body. Non pharmacological way can be done one of them through slow deep breathing exercise [7].

Slow deep breathing is conscious relaxation to regulate breathing deeply and slowly. Slow deep breathing is done six times per minute for 15 minutes, giving effect to blood pressure through increased baroreceptor sensitivity and decreasing the activity of the sympathetic nervous system.

Slow deep breathing is one of the relaxation methods. During relaxation there is an extension of muscle fibers, decreased nerve impulses to the brain, decreased brain activity and other bodily functions, characteristics of the relaxation response characterized by decreased pulse rate, amount of breathing and decreased blood pressure [8]. The effect of slow deep breathing on changes in blood pressure in patients with hypertension, it was showed that slow deep breathing can reduce blood pressure. The effect of slow deep breathing exercise on blood pressure in hypertensive patients, it was also found that there was an effect of deep breathing therapy on a decrease in blood pressure.

West Sumatra Province has a high incidence of hypertension, this is due to lifestyle or eating patterns that are not controlled by the community. The largest hospital in West Sumatra and also the referral hospital of three provinces that handles hypertension and other cardiovascular cases is RSUP. M. Djamil located in the city of Padang. Based on the initial survey conducted at RSUP. M. Djamil Padang, there was an increase toward the number of hypertension events every year, as many as 15,627 people in 2013 and increased by 24,782 in 2016. Based on interviews conducted on 10 hypertensive patients who were in cardiac hospitalization, 7 people say that they have been suffering from hypertension for more than 3 years and have only been taking medication regularly from doctors only while 3 other people say that besides taking medicine from doctors, patients also have other herbal medicines sold in pharmacies. None of the respondents knew how to do slow deep breathing therapy to control or reduce their blood pressure.

2. Methods and Equipment

2.1. Research methods

This type of research uses Quasi Experiment (Pseudo Experiment) with the design used is the pretest-posttest design, which is by taking measurements before the treatment (pre test experiment treatment) and measurements after treatment (post test). This aims to see the differences between pre and post. This design does not involve a comparison group (control), the effectiveness of the treatment is assessed by comparing the post test and pre test scores.

The implementation of the research process is as follows:

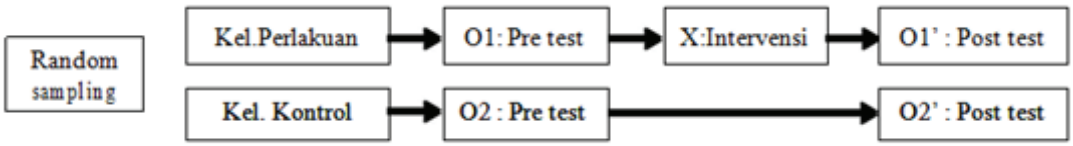

Figure 1: Research Design.

Explanation:

1: Blood pressure measurement includes systolic pressure and diastolic pressure, before slow deep breathing therapy is used as pretest data.

01': Blood pressure measurement includes systolic pressure and diastolic pressure, after slow deep breathing therapy is used as post test data.

X: Treatment (giving slow deep breathing therapy).

02: Blood pressure measurement includes systolic pressure and diastolic pressure, the control group is used as pre-test data.

02': Blood pressure measurements include systolic pressure and diastolic pressure, without intervention is used as post test data.

2.2. Time and place of research

This research has been carried out at RSUP.M.Djamil Padang in the Interne room in March to October 2018.

2.3. Population and sample

2.3.1. Population

The population in this study was all respondents who experienced hypertension, the number of patients who experienced hypertension in the last 1 month in the internal ward was 50 people.

2.3.2. Sample

The sample used in this study was patients who had hypertension with a sample of 28 people, divided into 14 interventions and 14 controls

2.3.3. Sample criteria

1. Inclusion criteria are samples that are included or deserve to be studied, with sample inclusion criteria as follows:
   (a) Willing to be a respondent
   (b) Hypertension
   (c) Age between 40-60 years old
   (d) Not obese
2. Exclusion Criteria

   Exclusion criteria are characteristics of a sample that cannot be included or suitable for research. The exclusion criteria in this study are:
   (a) The patient is unconscious

2.4. Technique sampling

The research sample was taken by purposive sampling, the technique of determining the sample by choosing a sample among the population that was in accordance with the will of the researcher so that the sample could represent the characteristics of the population that had been known before [9].

2.5. Research instrument

The instruments used in this research were Tensimeter mercury, electrocardiogram (EKG), ECG paper, stopwatch, pens, notebooks, observation sheets collected by observation method and glucometer to measure slowdeep breathing in hypertensive patients

2.6. Data collection techniques

Type of Data Collection

1. Primary Data

   Data obtained directly from measurements of blood pressure measurements before and after intervention. Primary data in the study are the results of interviews and observations directly with respondents. Other data that is also obtained directly from the respondent is the identity of the respondent.

2. Secondary data

   Secondary data as supporting data of this study were obtained from patient entry book data and other medical records owned by RSUP internal rooms. M. Djamil Padang.

2.7. Data analysis technique

2.7.1. Editting

After the data were collected, the researcher re-checks the clarity of the data and the balance of data that have been collected, namely the number, name, age, sex, occupation, filling blood pressure before and after being given slow deep breathing exercise. All data collected have been checked, all data are clear from the results of the examination and no errors were found.

2.7.2. Coding

At this stage, the code is given to each data that have been collected on each question in the observation sheet of slow deepbreathing exercises.

2.7.3. Entry

Entering data that have been given a code into the master table and then processing them into a computer program.

2.7.4. Cleaning

The researcher rechecks so that there are no errors and differences between the data that have been collected with the data entered into the master table.

2.8. Data analysis

2.8.1. Univariate analysis

The distribution of mean blood pressure in hypertensive patients includes before and after being given slow deep breathing training

2.8.2. Bivariate analysis

Data is processed computerizedly to determine the effect of independent variables on the dependent variable studied. Before testing the hypothesis the researcher tested the normality for the experimental group.

To determine the type of hypothesis test, the effect of slowdeep breathing on blood pressure in hypertensive patients was carried out by Shapiro Wilk test. If the interpretation of significance (p) <0.05 then the data is normally distributed and the hypothesis test used is parametric test namely paired T test, but if the interpretation value is significant (p) ≥ 0.05 then the data is not normally distributed and hypothesis testing is used is a non-parametric test, the Wilcoxon test.

3. Result

3.1. Univariate analysis

3.1.1. Characteristics of respondents

Characteristics of respondents in this study were hypertensive patients aged between 48-59 years with an average age of 53.5 years.

3.1.2. Known Average systolic and diastolic pressures before administering Slow deep Breathing in the intervention group and control group

Table 1: Average systolic and diastolic pressure before administering Slow deep Breathing in the intervention group.

Slow Deep Breathing	N	Mean	SD	Min-Mak
Average Systolic Pressure	14	154,05	5,419	147 – 163
Average Diastolic Pressure	14	92,86	4,105	83 – 100

Based on Table 3.1, the average systolic pressure before Slow deep Breathing in the intervention group was 154.05 with a standard deviation of 5.419. Low systolic pressure was 147 and the highest was 163. While the average diastolic pressure before administering Slow deep Breathing in the intervention group was 92.86 with a standard deviation of 4.105. Low diastolic pressure 83 and highest 100.

Table 2: Average systolic and diastolic pressure Before giving Slow deep Breathing to the Control group.

Slow Deep Breathing	N	Mean	SD	Min-Mak
Average Systolic Pressure	14	148,10	5,015	140-157
Average Diastolic Pressure	14	89,19	2,567	83-190

Based on Table 3.2, the average systolic pressure before Slow deep Breathing in the control group was 158.33 with a standard deviation of 5.956. Low systolic pressure 150 and highest 170. While the average diastolic pressure before slow deep Breathing administration in the control group was 89.76 with a standard deviation of 4,972. Low diastolic pressure 83 and highest 100

3.1.3. Known Average systolic and diastolic pressures after administration of Slow deep Breathing in the intervention group and control group

Based on table 3.3, the average systolic pressure after Slow deep Breathing in the intervention group was 148.10 with a standard deviation of 5.015. Low systolic pressure

Table 3: Average systolic and diastolic pressure after slow deep breathing in the control group.

Slow Deep Breathing	N	Mean	SD	Minimal-Maksimal
Average Systolic Pressure	14	158,33	5,956	150-170
Average Diastolic Pressure	14	89,76	4,972	83-100

140 and highest 157. While the average diastolic pressure after slow deep breathing administration in the intervention group was 86.19 with a standard deviation of 2.567. Low diastolic pressure 83 and highest 90

Table 4: Known Average Systolic and Diastolic Pressure After Slow Deep Breathing administration in the Intervention group.

Slow Deep Breathing	N	Mean	SD	Minimal-Maksimal
Average Systolic Pressure	14	156,90	6,975	143-170
Average Diastolic Pressure	14	88,81	4,258	83-93

Based on table 3.4, the average systolic pressure after slow deep breathing in the intervention group was 156.90 with a standard deviation of 6.975. Low systolic pressure 143 and highest 170. While the average diastolic pressure after the administration of Slow deep Breathing in the intervention group was 88.81 with Standard Deviation 4,258. Low diastolic pressure 83 and highest 93.

3.2. Bivariate analysis

3.2.1. Differences in average systolic and diastolic pressures before and after administration of Slow deep Breathing in the intervention group and control group

Table 5: The difference in the average systolic and diastolic pressure before and after the administration of Slow deep Breathing in the intervention group.

Slow Deep Breathing	**N**	**Mean**	**Standar-Deviasi**	**Z**	**Sig.**
Average Systolic Pretest	14	154,05	5,419	-3,270	0,001
Post Systolic average	14	148,10	5,015		
Difference		5,95	0,404		
Pretest Diastolic Average	14	92,86	4,105	-3,133	0,002
Average postastolic postest	14	89,19	2,567		
Difference		3,67	1,538		

Based on table 3.5 above it can be seen that the difference in average systolic pressure before and after giving slow deep breathing is 5.95 with a standard deviation of 0.404. Based on the results of the Wilcoxon statistical test p value = 0.001, while the difference in the average diastolic pressure before and after giving slow deep breathing is 3.67 with a standard deviation of 1.538. Based on the results of the Wilcoxon statistical test p value = 0.002. Because p <0.05, it can be concluded that there is a difference in the average systolic and diastolic pressure before and after the administration of Slow deep Breathing in the intervention group

TABLE 6: The difference in the average systolic and diastolic pressure after the administration of Slow deep Breathing in the control group.

Slow Deep Breathing	n	Mean	Standar-Deviasi	Z	Sig.
Average Systolic Pretest	14	158,33	5,956	-1,613	0,107
Post-Systolic average	14	156,90	6,975		
Difference		1,43	-1,019		
Pretest Diastolic Average	14	89,76	4,972	-1.414	0,157
Average postastolic postest	14	88,81	4,258		
Difference		0,95	0,714		

Based on table 5.6 above it can be seen that the difference in average systolic pressure before and after without giving slow deep breathing is 1.43 with a standard deviation of -1.019. Based on the results of the Wilcoxon statistical test p value = 0.107, while the difference in average diastolic pressure before and after without giving a slow deep breathing is 0.97 with a standard deviation of 0.714. Based on the results of Wilcoxon's statistical test, p = 0.157 was obtained. Because p> 0.05, it can be concluded that there is no difference in the average systolic and diastolic pressure before and after the administration of Slow deep Breathing in the control group.

4. Discussion

4.1. Univariate analysis

4.1.1. Average systolic and diastolic pressure before administering Slow Deep Breathing in the intervention group and control group

The average systolic pressure before administering Slow Deep Breathing in the intervention group was 154.05 with a standard deviation of 5.419, while the average diastolic pressure before administering Slow Deep Breathing in the intervention group was 92.86 with a standard deviation of 4.105. The average systolic pressure before the administration of Slow Deep Breathing in the control group was 158.33 with a standard deviation of 5.956, while the average diastolic pressure before administering Slow Deep Breathing in the control group was 89.76 with a standard deviation of 4.972.

This shows that the client's blood pressure before being given good treatment in the intervention and control groups is equally uncontrolled and tends to be high. This is closely related to the workings of the patient's heart which gets heavier and longer, resulting in faster blood pressure. The same is said in theory that blood pressure is influenced by the work of the heart. Heart work that is ineffective and severe will result in high blood pressure rates so that it can be fatal to clients who suffer from hypertension [10].

4.1.2. Average systolic and diastolic pressure after administering of Slow Deep Breathing in the intervention group and in the control group

The average systolic pressure after administering of Slow Deep Breathing in the intervention group was 148.10 with 5.015 Standard Deviation while the average diastolic pressure after administering of Slow Deep Breathing in the intervention group was 86.19 with a standard deviation of 2.567. The average systolic pressure after slow deep breathing in the intervention group was 156.90 with a standard deviation of 6.975 while the average diastolic pressure after administering of Slow Deep Breathing in the intervention group was 88.81 with a standard deviation of 4.258.

The results of this study are the same as the results of another research which said that giving Slow Deep Breathing to clients with hypertension is very good for work and blood pressure rate. This can be seen from the results of the intervention given to the client. Clients who carry out the Slow Deep Breathing action correctly will feel the benefits gradually. Starting from the comfort of the client's breathing to the condition of the body changed to be more relax than before. This study also proved that systolic and diastolic

blood pressure will automatically react when the process of slow deep breathing activities is carried out as well as possible and in accordance with the standards that have been set [11].

The difference in mean systolic pressure before and after the administration of Slow Deep Breathing is 5.95 with a standard deviation of 0.404. Based on the results of the Wilcoxon statistical test p value = 0.001, while the difference in average diastolic pressure before and after Slow Deep Breathing was 3.67 with a standard deviation of 1.538. Based on the results of the Wilcoxon statistical test p value = 0.002. Because p <0.05, it can be concluded that there is a difference in the average systolic and diastolic pressure before and after the administration of Slow Deep Breathing in the intervention group. Furthermore, in the control group also obtained the results of differences in the average systolic pressure before and after without giving Slow Deep Breathing was 1.43 with a standard deviation of -1.019. Based on the results of the Wilcoxon statistical test p value = 0.107, while the difference in mean diastolic pressure before and after without Slow Deep Breathing was 0.97 with a standard deviation of 0.714. Based on the results of Wilcoxon's statistical test, p = 0.157 was obtained. Because p> 0.05, it can be concluded that there is no difference in the average systolic and diastolic pressure before and after the administration of Slow Deep Breathing in the control group. Slow Deep Breathing has an effect on the nervous system and affects blood pressure. Slow Deep Breathing decreases sympathetic nerve activity through an increase in central inhibitory rhytms which will result in a decrease in sympathetic outpust. This decrease resulted in a decrease in the release of epinephrine which is captured by the alpha receptor so that it affects the smooth muscle of blood vessels. Vascular smooth muscle experiences vasodilation which decreases peripheral resistance and causes a decrease in blood pressure. Therefore, exercise Slow Deep Breathing can be used as a non-pharmacological therapy for hypertensive patients who either take drugs or do not take drugs.

5. Conclusion

Based on the results of the research conducted by the researcher, it was concluded:

1. The average systolic pressure before administering the Slow deep Breathing in the intervention group was 154.05 with a standard deviation of 5,419. Low systolic pressure was 147 and the highest was 163. While the average diastolic pressure before administering Slow deep Breathing in the intervention group was 92.86

with a standard deviation of 4.105. Low diastolic pressure was 83 and the highest was 100.

2. Average systolic pressure before administering Slow deep Breathing in the control group was 158.33 with a standard deviation of 5,956. Low systolic pressure was 150 and the highest was 170. While the average diastolic pressure before administering slow deep Breathing in the control group was 89.76 with a standard deviation of 4,972. Low diastolic pressure was 83 and the highest was 100.

3. Average systolic pressure after administering Slow deep Breathing in the intervention group was 148.10 with a standard deviation of 5.015. Low systolic pressure was 140 and the highest was 157. While the average diastolic pressure after administering slow deep breathing in the intervention group was 86.19 with a standard deviation of 2.567. Low diastolic pressure was 83 and the highest was 90.

4. Average systolic pressure after administering of Slow deep Breathing in the intervention group was 156.90 with a standard deviation of 6.975. Low systolic pressure was 143 and the highest was 170. While the average diastolic pressure after administering of Slow deep Breathing in the intervention group was 88.81 with Standard Deviation 4,258. Low diastolic pressure was 83 and the highest was 93.

5. There is a difference in the average systolic pressure before and after administering slow deep breathing is 5.95 with a standard deviation of 0.404 with p = 0.001 while the difference in the average diastolic pressure before and after slow deep breathing is 3.67 with the standard 1.538 deviation with a value of p = 0.002.

6. There is a difference in the average systolic pressure before and after without giving a slow deep breathing amounting to 1.43 with a standard deviation of -1.019 with a value of p = 0.107 while the difference in the average diastolic pressure before and after without giving a slow deep breathing is 0, 97 with a standard deviation of 0.714 with a value of p = 0.157.

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