



The Effect of Slow Deep Breathing Exercise on the Blood Pressure of Elderly People with Hypertension at the Working Area of the Public Health Centre Air Tawar Padang

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ABSTRACT: Hypertension is often found in elderly, it is a major factor causing stroke and heart disease. The number of people with hypertension continues to increase every year, it is estimated that by 2025 there will be 1.5 million people affected by hypertension in the world. The purpose of study was to determine the effect of slow deep breathing exercise on changes in blood pressure in the elderly in Public Health Center Air Tawar. This research is a Quotion Experiment with one group pre-post design. The research was conducted in Public Health Center Air Tawar, Padang from January to June 2022. The population were 80 elderly with hypertension, with a sample of 20 people obtained from the slovin formula. Data analysis used the Wilcoxon test with Signed Rank Test. The type of data was secondary obtained from the Air Tawar Public Health Center and Primary from questionnaires. The results showed that the average of systolic blood pressure before intervention was 149/100 mmHg. The average after the intervention decreased to 140/92mmHg. The effect of the slow deep breathing exercise was proven by the significant value of blood pressure before intervention and after intervention was 0.001. The conclusion shown, there was a significant influence of slow deep breathing exercise on changes in blood pressure of the elderly. The changes in blood pressure obtained were still in the category of hypertension, it is hoped that respondents will consume low-salt diet, drug consumption and utilizing the services of health workers can make slow deep breathing exercise as one of the blood pressure control techniques.

KEYWORDS: Blood Pressure, Elderly, Hypertension, Public Health Center, Slow Deep Breathing Exercise.

INTRODUCTION

The elderly is the final stage of the development of the human life cycle, where the elderly according to Law No. 13 of 1998 concerning the Welfare of the Elderly, the elderly is someone who has reached the age of more than 60 years, Hypertension is often found in the elderly and is the main factor causing stroke and heart disease in the elderly. Hypertension can be defined as a condition where a systolic pressure increases more than 140mmHg and or diastolic pressure more than 90mmHg caused by disorders in blood vessels that cause obstruction of oxygen and nutrient supply to body tissues that need it. The risk factors that cause hypertension are genetic factors, family history, hypercholesterol, diabetes, a relaxed lifestyle, obesity, drinking habits, stress, and food with high sodium (Setiyorini E, Wulandari NA. 2018).

The prevalence of hypertension in Indonesia based on data from Riskesdas in 2018 tends to increase rapidly. The prevalence of hypertension in 2018 based on doctor's diagnosis was 31.7%, based on drug consumption 25.8% and based on measurements on Riskesdas as much as 34.11%. The proportion of people with hypertension in urban area is greater than in rural area. In 2018 the proportion of hypertension in urban area was 34.3% and 33.7% in rural area (Infodatin, 2018)

The prevalence of hypertension in West Sumatra based on data from Riskesdas is 25.16% of the national prevalence of 34.1%. The incidence of hypertension in West Sumatra is more prevalent in the elderly with age group with 55-65 years old as much as 20.10%, with age group 65-74 years as much as 27.41%, and 32.55% In the age group of 75 years and over (Riskesdas, 2018).

The city of Padang has a prevalence of hypertension as much as 21.7%. There are 23 public health centers in Padang, 3 of them have the highest number of hypertension, the public health center of Air Tawar has 2,209 cases of hypertension, followed by LubukKilangan health center with 1,621 cases, and followed by the public health center of Pauh with a prevalence of 1,512 cases of hypertension (Padang City Health Office, 2020).

The slow deep breathing exercise is a relaxation exercise that can be done in people with hypertension. It can affect a person's physiological state. It is one of the self-management techniques based on how the sympathetic and parasympathetic nervous systems



works. When the slow deep breathing exercise is being done, so oxygen (O₂) that is inhaled will enter the cells, in the cells aerobic metabolism occurs where aerobic metabolism will produce energy, which can produce endorphin hormones, endorphins can cause muscles to relax including the heart muscle. As the heart muscle relaxes, the cardiac workload decreases, the pressure of systole and diastole will also decrease (Sinatra ST, Houston MC, 2015).

Research conducted by Wisnatul, Kurniawati, and Dewi (2021) on the influence of the slow deep breathing to blood pressure in hypertension in the working area of the Tigo Baleh Bukittinggi public health Center, that slow deep breathing therapy can affect blood pressure in hypertension, and the slow deep breathing therapy can also provide a sense of comfort, so it will reduce blood pressure in hypertension people. Another study conducted by Sumartini and Miranti (2019) on the effect of the slow deep breathing on the blood pressure of elderly people at the public Health Center of Ubung, Lombok, that slow deep breathing can have an influence on changes in blood pressure in the intervention group (Wisnatul I, Kurniawati D, Dewi TO, 2021) dan (Sumartini NP, M.I, 2019).

The survey conducted by researchers at the public Health Center of Air Tawar, in January 2022 found as many as 80 elderly people with hypertension. Of the 80 elderly people with hypertension divides into , as many as 65 elderly people with uncontrolled hypertension and 15 elderly people with controlled hypertension. Interviews done on 6 elderly people, all people said that they did not know the ways to control hypertension. They do not know how to control hypertension due to the insufficiency of information. The researcher also asked officers public health center, they said that they have done the gymnastics programs and also education about diet in people with hypertension. Before conducting interviews with respondents, researchers first measured respondents' blood pressure with a sphygmomanometer, and asked respondents for complaints. Based on the phenomenon and data above, researchers conducted a study on "The Effect of Slow Deep Breathing Exercise on Changes in Blood Pressure in the Elderly people With Hypertension

METHODS

This study used a pre-experimental research design using a one-group pre-post test design. The study was conducted from January to June 2022. Data collection is carried out from May 30th to June 4th, 2022. The population in this study were elderly people with hypertension in the working area of Air Tawar public health center, amounted to 20 people. In this study using Purposive sampling. The types of data and data collection techniques in this research are primary data obtained from questionnaires and secondary data obtained from public health center of Air Tawar. Data analyzed with univariate in form of frequency distribution, and bivariate in form of Wilcoxon test (CI 95%).

RESULTS

Table 1. Average of Systolic and Diastolic Blood Pressure Before intervention (Slow Deep Breathing Exercise) in the Working Area of Air Tawar Public Health Center

Variable	F	Min-Max	Mean	SD	95% CI Mean
Systolic Blood Pressure	20	140-160	148.50	6.708	145.36-151.64
Diastolic Blood Pressure	20	90-110	100.00	6.489	96.96-103.04

Based on table 1, it is known that the average of systolic and diastolic blood pressure of the elderly people before intervention (slow deep breathing exercise) was 149/100 mmHg, with a standard deviation of 6,708 at the systolic mean and a diastolic standard deviation of 6,489

Table 2. Average of Systolic and Diastolic Blood Pressure After intervention (Slow Deep Breathing Exercise) in the Working Area of Air Tawar Public Health Centre

Variable	F	Min-Max	Mean	SD	95% CI Mean
Systolic Blood Pressure	20	130-160	140.00	9.177	135.71-140.00
Diastolic Blood Pressure	20	80-100	92.00	7.678	88.41-95.50



Based on table 4.10, it is known that the average of blood pressure was 140/92 mmHg with a standard deviation of systolic blood pressure is 9,177 and a standard deviation of diastolic blood pressure is 7,678

Table 3. The Effect of Slow Deep Breathing Exercise on Changes in Blood Pressure in Hypertensive Elderly people in the Working Area of Air Tawar Public Health Centers

Variable	n	SD	95%CI Mean	p-value
Blood Pressure Pre-Intervention	20	6,708	145.36-151.64 96.96-103.04	0.001
Blood Pressure Post-Intervention	20	9,177	135.71-140.00 88.41-95.50	

Based on the table above, the p-value of 0.001 ($<\alpha 0.005$) was obtained. This shows the effect of slow deep breathing exercise on changes in blood pressure in the elderly people with hypertension in the working area of Air Tawar Public Health Center.

DISCUSSION

The respondents in this study were mostly female. Blood pressure in each person is different. Blood pressure is affected by gender, age, diet, smoking, uncontrolled diabetes, exercise and occupation 49. The average of woman will experience a risk of increased blood pressure after menopause. Women who have not yet menopause are protected by the hormone estrogen which plays a role in increasing high density lipoprotein (HDL) levels. Low HDL cholesterol levels and high LDL cholesterol (low density lipoprotein) affects the occurrence of atherosclerosis processes (Triningtyas DA,M,2018).

This study is in line with research conducted by Widharti, Widyawati&Fitrianur on factors related to blood pressure during the Covid-19 pandemic, the relationship between sex and blood pressure with chi-square p-value results of $0.002 < 0.05$. The elderly people in this study are the elderly (60-74 years) and old (74-90 years) categories. Age is one of the factors that affect hypertension or high blood pressure, the older a person is greater risk of developing hypertension. Related to the incidence of hypertension where the occurrence of some physiological changes resulting from an increase of peripheral resistance and sympathetic activity. In addition, at the age of over 45 years the arterial wall will thicken due to the accumulation of collagen in the muscle layer, so that the blood vessels will gradually narrow and also become stiff, high blood attacks appear around the age of 40 years but can also occur at a young age (Widiharti W, Widiyawati W, Fitrianur WL,2020)

This study is in line with research conducted by Maulia, M, Hengky& Muin2021 which shows that there is a significant relationship between age and the incidence of hypertension, where patients who have age more than 40 years, will have a risk of 2,956 times experiencing blood pressure compared to the age of 18-40 years. One of the respondents in this study was a smoker, where high blood pressure can occur due to smoking. The content of harmful substances contained in cigarettes such as nicotine and carbon dioxide can damage the endothel of arterial blood vessels and the elasticity of blood vessels will decrease so that blood pressure increases (La Ode Alifariki SKNMK,2021)

This study is almost in conjunction with the research conducted by Arlianti, Muhaimin& Anwar in 2019 on the influence of activities and smoking behavior on hypertension in the elderly at the Tomini Health Center, Parigi Regency, with the results that there is an influence of sports activities and smoking behavior on hypertension in the elderly at the Tomini Health Center, ParigiMontong Regency, Central Sulawesi in 2019 (Arlianti A, Muhaimin T, Anwar S,2019)

The elderly in this study did not have a low-salt diet, excessive sodium intake can cause disruption of body fluid balance, causing edema or asystes and hypertension. This is in line with research conducted by Palimbong, Kurniasari&Refilda on the effectiveness of a low-salt diet on ordinary and soft foods against the duration of recovery of hypertensive patients in 2018, The results of the study found a comparison between initial blood pressure and final blood pressure in ordinary diet patients showed a significant 0.000 with a p-value of < 0.005 with the conclusion that there was an influence of a low-salt diet with a decrease in blood pressure (Kiha RR, Palimbong S, Kurniasari MD,2018)



Respondents' Average of Systolic and Diastolic Blood Pressure Before Intervention (Slow Deep Breathing Exercise) in Air Tawar Public Health Center

Based on the results of the study, it is known that the average value of systolic and diastolic blood pressure before intervention (slow deep breathing exercise) was 149/100 mmHg with a systolic standard deviation of 6,708 and a standard deviation of diastolic blood pressure of 6,489

This research is almost the same with the results of research conducted by Sumartini and Miranti on the Effect of Slow Deep Breathing on Changes in Blood Pressure of Hypertensive Elderly at the Ubung Lombok Health Center in 2019, obtained the average systolic blood pressure before the slow deep breathing exercise intervention, namely 151.33 mmHg and diastole of 96.00 mmHg. Likewise with the results of Septiawan, Permana and Yuniarti's research on the effect of slow deep breathing exercises on the value of blood pressure in hypertensive patients, where the systole blood pressure before the intervention was 149.05 mmHg and diastole blood pressure before the intervention was 90.15 mmHg (Sumartini NP, M.I, 2019).

According to Khotimah, slow deep breathing exercises can lower blood pressure, systolic or diastolic pressure. The work of this therapy can provide cardiopulmonary stretching. Stretching stimulation in the aortic arcus and carotid sinuses is received and passed by the vagus nerve to the medulla oblongata (the center of cardiovascular regulation...), (and further there is an increase in baroreceptors, implus, afferent of the receptors reaches the center of the heart which will stimulate the parasympathetic nerve and inhibit the sympathetic center, thus becoming a systemic vasodilation, decreased pulse and heart distraction, this will further cause dilatation of blood vessels and consequently will make blood pressure decrease (Khotimah MN, Rahman HF, Fauzi AK, Andayani SA, 2021).

Based on the results of this study, the average of blood pressure of systole and diastole can be lowered with slow deep breathing exercise relaxation intervention

Respondents' Average of Systolic and Diastolic Blood Pressure After Intervention (Slow Deep Breathing Exercise) in Air Tawar Public Health Center

Based on the results of the study, it is known that the average of systolic and diastolic blood pressure after intervention (slow deep breathing exercise) is 140/92 mmHg, this shows that there is a decrease in systolic and diastolic blood pressure after intervention (slow deep breathing exercise)

This research is almost the same with the results of a study conducted by Sumartini & Miranti on the Effect of Slow Deep Breathing on Changes in Blood Pressure of Hypertensive Elderly at the Ubung Lombok Public Health Center in 2019, obtained an average of systolic blood pressure after a slow deep breathing exercise intervention of 136.00 mmHg and diastole of 85.33 mmHg. (Sumartini NP, M.I, 2019).

Slow deep breathing is a breathing in the abdomen with a slow frequency and, rhythmically, and comfortably by closing your eyes when inhaling. The effect of this therapy is a distraction or distraction that will cause a relaxing effect for the body and be able to control sodium in the blood so that it is able to control blood pressure

Based on the results of this study, the blood pressure of the elderly after intervention (slow deep breathing exercise) decreased (Haryanti RP. Monograf Efektivitas, 2021)

The Effect of Slow Deep Breathing Exercise on Changes in Systolic and Diastolic Blood Pressure in Elderly With Hypertension in Air Tawar Public Health Center

Based on the results statistically see the effect of slow deep breathing exercise on changes in blood pressure in the elderly with hypertension in the work area of the Freshwater Health Center, a p-value of 0.001 is obtained, meaning that there is a relationship between slow deep breathing exercise and blood pressure.

The Slow deep breathing exercise is a breathing in the abdomen with a slow frequency and slowly, rhythmically, and comfortably by closing your eyes when inhaling. The effect of this therapy is distraction or distraction that will cause a relaxing effect for the body and be able to control sodium in the blood so that it is able to control blood pressure (Haryanti RP. Monograf Efektivitas, 2021)

Based on research by Andri, Permata, Padila & Sartika on Reducing Blood Pressure in Hypertensive Patients Using Slow Deep Breathing Exercise Intervention, states that blood pressure before and after slow deep breathing exercise there is a significant decrease. Based on the results of research by Kurniasari et al. in July Andri et al., (2021) argued that if slow deep breathing is done



regularly and correctly, it can reduce the blood pressure of the elderly and the elderly can stop taking antihypertensive drugs to avoid possible side effects of the drug (Andri J, Permata F, Padila, Sartika A, Andrianto MB, 2021)

The results of this study are in line with the research conducted by Ni Sumartini & Miranti on the effect of slow deep breathing exercise on the blood pressure of hypertensive elderly at the central Lombok health center seen a significant value of diastole pre-post (p value) 0.00 and diastole pre-post (p value) 0.00 so that H_0 was rejected, it can be concluded that there is an effect of slow deep breathing exercise on the blood pressure of hypertensive elderly at the Ubung Health Center in Central Lombok (Sumartini NP, M.I., 2019).

Besides The slow deep breathing exercises, other relaxation therapies such as dhikr therapy and classical music can lower blood pressure. According to Zainudin, et al, dhikr therapy is one way to approach God that aims to gain peace of mind and peace of mind (Zainuddin R, Ahmad EH, Syahrani S, Mahmud Y, Nurbaiti N, 2022)

According to the research done by Rika Purnika, Bambang Roesmono and Kassaming about the effect of dhikr meditation on changes in diastolic pressure in hypertensive patients, the result of p value = 0.001 with a meaningfulness level of $p < 0.05$ was obtained, it can be concluded that there is an influence of dhikr meditation on changes in blood pressure in hypertensive patients in the internal room of Nene Mallorno Hospital, Sidenreng Rappang Regency (Purnika R, Roesmono B, Kassaming, 2019)

According to Netty et al, about the effect of classical music therapy on reducing blood pressure in the elderly with hypertension in Simpang Rumbio village, KTK, Solok City with mild hypertension obtained p-value = 0.001 (0.005). This result shows that there is an influence between systolic blood pressure before and after classical music therapy in Simpang Rumbio Working Area of KTK Public Health Center, (Netty Herawati, Kurniati Maya Sari., WD dan ATM, 2018)

Based on the results of this study, slow deep breathing has shown to have an effect in changes in blood pressure, so families and respondents need to do slow deep breathing every day which can be done at the respondent's rest time, besides that it can also be done when the respondent feels stressed and painful (Khotimah MN, Rahman HF, Fauzi AK, Andayani SA, 2021)

In addition to slow deep breathing exercise activities, respondents can control by utilizing Public Health Center services. Public Health Center can make slow deep breathing exercise as an effort to control blood pressure in hypertensive elderly.

CONCLUSIONS

There is an effect of slow deep breathing exercise on changes in blood pressure in the elderly with hypertension in the work area of Air Tawar Public Health Center, as evidenced by the difference between 8.50 with a p-value of 0.002 and a diastole difference of 8.00 with a p-value of 0.003.

For Health Workers of Public Health Center, to control blood pressure in the elderly with hypertension, slow deep breathing exercise relaxation techniques can be used as an alternative intervention to lower the blood pressure of the elderly with hypertension in the work area of Air Tawar Public Health Center. For Educational Institutions, To increase students' insight into the treatment of hypertension in a non-pharmacological manner, reading materials at the Poltekkes Library of the Ministry of Health of the Republic of Indonesia Padang in more cases, especially regarding the treatment of hypertension nonpharmacologically. For the next researcher, this research can be continued by conducting research on blood pressure control with other relaxation techniques such as dhikr therapy and classical music therapy.

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