International Journal of Nursing and Midwifery Science (IJNMS)
This is an Open Access article distributed authors retain copyright licensed under a Creative Commons Attribution-ShareAlike 4.0 International License that allows others to share the work commercially with an acknowledgement of the work's authorship and initial publication in this journal.
http://ijnms.net/index.php/ijnms
ORIGINAL RESEARCH

e- ISSN: 2686-2123
p- ISSN: 2686-0538

STABILIZATION OF BLOOD PRESSURE THROUGH SLOW DEEP BREATHING METHOD

Enny Virda Yuniarti, Afiyah Kurnia Safitri
University Bina Sehat PPNI Mojokerto
Corresponding Email: syifa.enny79@gmail.com

ABSTRACT

Hypertension was an increased in systolic and diastolic blood pressure above normal limits. Age is a factor in hypertension, in old age there is a narrowing of blood vessels resulting in an increase in blood pressure. Treatment of hypertension can be done non-pharmacologically, one of which is slow deep breathing. This study aims to determine the effect of slow deep breathing on blood pressure changes in elderly people with hypertension. The research design used was Pre-Experimental with the One Group Pretest-Posttest Design. The population in this study were all elderly people with hypertension in Garu Hamlet, Podoroto Village, Kec. Kesamben Kab. Jombang as many as 34 elderly. The sample in this study were 34 respondents with the total sampling technique. The research instrument uses a digital sphygmomanometer to measure blood pressure. The results of the Paired T-Test analysis show p value = 0.000 <α 0.05. These results indicate that there is an effect of slow deep breathing on blood pressure changes in the elderly with hypertension in Garu Hamlet, Podoroto Village, Kesamben District, Jombang Regency. Slow deep breathing stimulates the release of endorphins, thereby reducing sympathetic nervous activity and increasing parasympathetic nervous activity which causes a relaxing effect and causes a decrease in blood pressure.

Keywords

Slow deep breathing, blood pressure, hypertension

INTRODUCTION

Elderly is a condition of a person entering the final stage in life. As we get older, every human being will experience aging (degenerative) which causes physiological functions and endurance to decrease. In old age there is often thickening of the artery walls so that the arteries experience a decrease in elasticity and stiffness which results in the heart having to pump blood more strongly and at each heart beat blood must pass through blood vessels

that are narrower than usual, resulting in an increase in blood pressure.

According to the World Health Organization (WHO) in 2015 the prevalence of hypertension in the world reached 1.13 billion people. In 2013 the prevalence of hypertension in Indonesia decreased from 31.7% to 25.8%. (Riskesdas, 2013). Based on data (Riskesdas, 2018) in East Java Province in 2018 the prevalence of hypertension was 36.32%. There are several factors that cause hypertension such as age, gender, lifestyle, cholesterol, excessive salt consumption, obesity, smoking, caffeine, alcoholic beverages, and also stress (Heny siswanti, 2018). If high blood pressure is not controlled for a long period of time, it can cause complications, namely problems with the kidneys (chronic kidney failure), heart (coronary artery disease, myocardial infarction, congestive heart failure), brain (which can cause stroke, hypertensive encephalopathy), and if it hits the eye, hypertensive retinopathy will occur (Faradilla Miftah Suranata, Agung Waluyo, Wati Jumaiyah & Natashia, 2019).

Efforts to reduce the prevalence of hypertension can be done with a combination of pharmacology and non-pharmacology. In addition to the consumption of lifestyle change drugs such as exercising, limiting excess salt consumption, losing weight, as well as various relaxation techniques such as yoga, progressive muscle exercises, meditation, and one of them is with deep and long breathing exercises (Slow Deep Breathing) it can be done (Ping et al., 2018).

Slow deep breathing is a type of nonpharmacological modality therapy that causes increased baroreflex sensitivity and decreases sympathetic nerve activity, where chemoreflex activation has the potential for high blood pressure (Hendra Kusuma & Nurhidayati, 2021). Based on the above background, researchers are interested in carrying out research on the effect of slow deep breathing on changes in blood pressure of the elderly with hypertension in Garu Hamlet, Podoroto Village, Kesamben District, Jombang Regency.

METHOD

The design used is a pre-experimental one group pre-test post-test design, and type of research used is a cross-national survey. The population in the study was all elderly with hypertension in Dususn Garu, Podoroto Village, Kesamben District, Jombang, as many as 34 elderly people. The sample in the study was 34 respondents with a sampling technique using total sampling. The study was conducted in Garu Hamlet from May to August 2023. Data were taken through filling out questionnaires and pre-test post-test blood pressure measurement results. Data processing in this study was analyzed using univariate and bivariate analysis. Univariate analysis was carried out on variables of age, sex, education, consumption of hypertension drugs, long suffering from high blood pressure, consumption of alcoholic beverages, family history of disease with hypertension, smoking, body mass index (BMI), blood pressure before the intervention, blood pressure after the intervention and differences in blood pressure before and after the intervention. While the bivariate analysis used is the Paired T-Test.

RESULTS

Table 1. Frequency Distribution Based on Respondent Characteristics

Characteristics of Respondents	Frequency	
	f	%
Age		
45-59	7	20,6
60-74	27	79,4
Gender		

Male	8	23,5
Female	26	76,5
Education		
Elementary school	16	47,1
Primary High School	10	29,4
Senior High School	8	23,5
Consumption of Hypertension Drugs		
Routine	9	26,5
Not Routine	25	73,5
Long suffering from hypertension		
1-2 years	31	91,2
>2 years	3	8,8
Alcohol Consumption		
Yes	0	0
No	34	100
Family history of the disease		
Exist	2	5,9
None	32	94,1
Smoke		
Yes	5	14,7
No	29	85,3
Body Mass Index		
Heavy skinny	0	0
Light skinny	1	2,9
Normaly	21	61,8
Light grease	7	20,6
Obese	5	14,7
Total	34	100

Table 2. Frequency distribution based on the effect of slow deep breathing on blood pressure before and after SDB in hypertensive patients

Variabel	Mean Pre	Mean Post	Difference	P Value
Sistole Blood Pres	155.2059	146.5588	8,64	0,000
Diastole Blood Pres	90.1471	83.6176	6,52	0,000

DISCUSSION

There are several factors that affect the amount of blood pressure in each person, factors that cannot be changed such as age, sex, genetics, and factors that can be changed, namely consumption of alcoholic beverages, smoking habits, excess weight (Bakris & Sorrentino, 2013).

Based on the results of the study, it showed that most of the age of respondents, namely 60-74 years, was 27 people (79.4%). The incidence of hypertension rises with age, because in old age there is often thickening of the artery walls so that the arteries experience a decrease in elasticity and stiffness due to arteriosclerosis. Arteriosclerosis itself causes the heart to pump blood even stronger and blood in each heartbeat is forced through narrow vessels than usual, resulting in an increase in blood pressure (Azizah et al., 2022). Most of the respondents were women as many as 26 people (76.5%). Women are more at risk of developing hypertension because when experiencing premenopouse women slowly begin to lose the hormone estrogen which plays a role in protecting blood vessels from damage. This process continues with changes in the quantity of estrogen hormone naturally according to age, which usually occurs in women aged 45-55 years before entering old age (Manurung, 2018).

Most of the respondents' education was elementary school as many as 16 people (47.1%). Higher education plays a positive role in lifestyle that determines an individual's health status (Muhaimin, 2018). Education affects the occurrence of hypertension, because education provides an opportunity to shape thought processes that affect the behavior of each individual. Respondents did not take hypertension drugs as many as 25 people (73.5%). According to research (Andri et al., 2018) blood pressure can change naturally due to complex interactions of factors, including when

people do not take hypertension medication regularly. Pradmanabhan said that the risk of heart attack and stroke increases by more than 40% if patients do not take medication. All respondents did not consume alcohol as much as 34 people (100%).

According to research (Makaremas et al., 2018) the longer the consumption of alcohol, the higher the blood pressure because the ethanol content in alcoholic beverages has a negative impact on health if consumed continuously. Consuming alcohol for a long time can affect the increase in blood cortisol levels, so that the activity of renin-angiotensin and aldosterone also increases, if RAAS increases causing an increase in blood pressure. Most respondents did not have a family suffering from hypertension as many as 32 people (94.1%). A family history of hypertension has a greater risk of developing hypertension compared to families without a history of hypertension. If both parents have a history of hypertension, then the incidence of hypertension in offspring increases 4-15 times (44.8%), if only one parent has hypertension then 12.8% of offspring are affected by hypertension (Makaremas et al., 2018). Respondents did not smoke as many as 29 people (85.3%). Smoking habits can increase the risk of increased blood pressure because the content of nicotine and carbon dioxide in cigarettes can cause the endothelial lining of arteries to be damaged, decreased elasticity in blood vessels (stiffness of blood vessels) thus blocking blood flow and causing an increase in blood pressure (Faradilla Miftah Suranata, Agung Waluyo, Wati Jumaiyah & Natashia, 2019). Most respondents had a normal body mass index of 21 people (61.8%). Body weight is one of the factors causing hypertension. According to the National Institutes for Health USA, the prevalence of hypertension in someone with BMI >30 in the obesity category is 38% for men and 32% for women, compared to the prevalence of 18% for men and 17% for women who have BMI <25 in normal nutritional status based on international standards (Lutfiah, 2021).

The effect of slow deep breathing on changes in blood pressure

The average systole blood pressure before slow deep breathing was 155.20 mmHg and after being given slow deep breathing intervention for 4 days in the morning with a frequency of 1 time a day decreased to 146.55 mmHg, so that systole blood pressure decreased by an average of 8.64 mmHg. The average diastole blood pressure before slow deep breathing was 90.14 mmHg and after being given slow deep breathing intervention for 4 days in the morning with a frequency of 1 time a day decreased to 83.61 mmHg, so that systole blood pressure decreased by an average of 6.52 mmHg. Based on the results of the Paired T-Test analysis which shows a significance value (p = 0.000) which means p value = 0.000 < α 0.05, it can be concluded that Ho is rejected, meaning that there is an effect of slow deep breathing on changes in blood pressure of the elderly with hypertension in Garu Hamlet, Podoroto Village, Kesamben District, Jombang Regency.

According to research (Azizah et al., 2022), deep and slow breathing exercises result in decreased sympathetic output which results in decreased production of epinephrine hormone produced by alpha receptors, affecting vascular smooth muscle and vasodilation occurs. Vasoditasi of blood vessels causes peripheral resistance to decrease so that blood pressure also decreases. Deep and slow breathing techniques can improve oxygen saturation as well as increase oxygen in the body. Increased oxygen in the body will stimulate the emergence of nitrite oxidation which will later enter the brain and lungs so that the body becomes calmer. Nitrite oxidation can

also affect blood vessels so that blood vessels become elastic which triggers a decrease in blood pressure.

The results of this study are also supported by research conducted by (Heny siswanti, 2018) on the effect of slow deep breathing on changes in blood pressure in hypertensive patients at the Kalimatan Jepara Health Center. After being given intervention for 4 days with a frequency of 2 times a day, the average result of reducing systole blood pressure by 6.87 mmHg and an average decrease in diastole blood pressure by 4.71 mmHg, so it can be concluded that there is an effect of slow deep breathing therapy on blood pressure in hypertensive patients in the Working Area of the Kalimatan Jepara Health Center.

Also supported by research (Kurniasari, 2020) on the effect of slow deep breathing exercise on reducing blood pressure in the elderly with hypertension, after intervening for 5 days with a frequency of 1 time a day, the average result of reducing systole blood pressure was 6.33 mmHg, and the average decrease in diastole blood pressure was 4.06 mmHg, so it can be concluded that there is an effect of slow deep breathing exercise on reducing elderly blood pressure with hypertension In Tamping Hamlet, Mojotamping Village, Working Area of Puskesmas Bangsal.

Based on research (Andri et al., 2018) conducted within 4 days with a frequency of 2 times a day, it was found that there was a decrease in systolic blood pressure by 2.69 mmHg and diastolic blood pressure by 3.87 mmHg in the slow deep breathing exercise group, so it can be concluded that there is an influence of slow deep breathing exercise on changes in blood pressure in patients with hypertension.

Critchley's 2015 study of slow deep breathing showed that slow deep breathing can affect the cortex cerebri and parts of the medulla associated with relaxation in the nervous system, affecting the mechanism of lowering blood pressure. Slow and deep breathing is able to increase oxygen levels in the body and stimulate body chemoreceptors where chemoreceptor stimulation can provide a vasodilating response to blood vessels then reduce vascular pressure resulting in a decrease in blood pressure (Yanti, 2016).

CONCLUSIONS

The results of the study on the effect of slow deep breathing on changes in blood pressure of the elderly with hypertension in Garu Hamlet, Podoroto Village, Kesamben District, Jombang Regency were concluded as follows: Average blood pressure of elderly systole and diastole with hypertension before slow deep breathing intervention was given, namely systole blood pressure 155.20 mmHg and diastole blood pressure 90.14 mmHg. The difference in the average blood pressure of systole and diastole before and after the intervention of slow deep breathing of 8.64 mmHg and diastole blood pressure of 6.52 mmHg, it can be concluded that there is an effect of slow deep breathing on changes in blood pressure of the elderly with hypertension.

REFERENCES

Andri, J., Waluyo, A., Jumaiyah, W., & Nastashia, D. (2018). Efektivitas Isometric Handgrip Exercise dan Slow Deep Breathing Exercise terhadap Perubahan Tekanan Darah pada Penderita Hipertensi. *Jurnal Keperawatan Silampari*, *2*(1), 371–384.

Azizah, W., Hasanah, U., & Pakarti, A. T. (2022). Penerapan Slow Deep Breathing Terhadap Tekanan Darah Pada Pasien Hipertensi. *Jurnal Cendikia Muda*.

Bakris, G. L., & Sorrentino, M. J. (2013). *Hypertension* (3rd ed.).

Faradilla Miftah Suranata, Agung Waluyo, Wati Jumaiyah, D., & Natashia. (2019). *Slow Deep Breathing Dan Alternate Nostril Breathing Terhadap Penurunan Tekanan Darah Pada Pasien Hipertensi*.

Hendra Kusuma, A., & Nurhidayati, E. (2021). Upaya Penurunan Tekanan Darah dengan Latihan Slow Deep Breathing pada Penderita Hipertensi. *Pengabdian* Dan *Bakti*, *3*(2), 83–87.

Heny siswanti, M. P. (2018). *Slow Deep Terhadap* Perubahan *Tekanan Darah Pada Pasien Hipertensi*. 129–135.

Juli Andri, Fahri Permata, Padila, Andry Sartika, M. B. A. (2021).*Penurunan Tekanan Darah* Pada *Pasien Hipertensi Menggunakan Intervensi Slow Deep Breathing Exercise*. *5*, 255–262.

Kurniasari, Y. D. (2020). *Pengaruh Slow Deep* Breathing *Exercise Terhadap Penurunan Tekanan Darah Lansia Dengan Hipertensi*.

Lutfiah, F. (2021). *Faktor-faktor yang Mempengaruhi Hipertensi Pada Lansia: Scoping Review*. 1477– 1485.

Makaremas, J. E., Kandou, G. D., & Nelwan, J. E. (2018). Kebiasaan Konsumsi Alkohol dan Kejadian Hipertensi Pada Laki-laki Usia 35- 59 Tahun di Kota Bitung. *Jurnal KESMAS*, *7*(5), 1–7.

Manurung, N. (2018). Keperawatan Medikal Bedah Konsep Mind Mapping Dan NANDA NIC NOC Jilid 2. Jakarta Timur: CV. Trans Info Media.

Ping, K. F., Bakar, A., Subramaniam, S., Narayanan, P., Keong, N. K., Heong, A. A., & Meng, O. L. (2018). The Impact Of Music Guided Deep Breathing Exercise On Blood Pressure Control - A Participant Blinded Randomised Controlled Study. *Medical Journal of Malaysia*, *73*(4), 233–238.

Riskesdas. (2013). *Riset Kesehatan Dasar Badan Penelitian Dan Pengembangan Kesehatan Kementerian Kesehatan RI*.

Riskesdas. (2018). *Riset Kesehatan Dasar Badan Penelitian Dan Pengembangan Kesehatan Kementerian Kesehatan RI*.

Yanti, N. P. E. D. (2016). Pengaruh Slow Deep Breathing Terhadap Tekanan Darah Pada Penderita Hipertensi Di Wilayah Kerja Puskesmas I Denpasar Timur. *Nurscope. Jurnal Keperawatan Dan Pemikiran Ilmiah*

Dokter, P., & Kardiovaskular, S. (2015). Pedoman tatalaksana hipertensi pada penyakit kardiovaskular.

Drevenhorn, E. (2006). Counselling Patients with Hypertension at Health Centres – a Nursing Perspective Eva. *Institute of Health and Care Sciences*, *2*, 1–68.

Godfrey, K.,Becker, K..,Groves, S (2014). Hypertension Education Intervention With Ugandan Nurse Working in Hospital Outpatient Clinic :APilot Study. Hindawi Publishing CorporationNursing Research and PracticeVolume 2014, Article ID 710702, 6 pages

Kemenkes, R. (2013). Riset Kesehatan Dasar.

Kemenkes RI. (2018a). Hasil Utama Riskesdas 2018. Retrieved from http://www.depkes.go.id/resources/download/info-terkini/hasil-riskesdas-2018.pdf

Kemenkes RI. (2018b). Hipertensi membunuh diam-diam, ketahui tekanan darah anda, 2–3.

Kozier, B. (2010). Buku Ajar Fundamental Keperawatan: Konsep, Proses, dan Praktik.

Roger, V. (2011). Heart disease and stroke statistics-2011 update: A report from the American Heart Association. *Circulation*, *123*(4)