

The Effect of Slow Deep Breathing Exercises on Elderly Women With Hypertension

Rini Widarti¹ *, Hermawati¹, Endah Sri Wahyuni¹

¹Faculty of Health Sciences, 'Aisyiyah University Surakarta, Indonesia

*E-mail: riniwidarti@aiska-university.ac.id

ARTICLE INFO

Keywords : slow deep breathing; elderly; hypertension

ABSTRACT

Background: The elderly or the elderly are the last stage of the human life cycle and experience degenerative processes in various aspects, especially in older women, which results in a higher risk of exposure to disease and ends in death, one of which is hypertension. Older women are closely related to the occurrence of hypertension when a woman experiences menopause. Treatment of hypertension can be done using non-pharmacological methods using slow deep breathing exercises. **Purpose:** To determine the effect of slow deep breathing exercises on older women with hypertension. **Method:** This study used the time series quasi-experimental method with one pre-test and post-test group. **Results:** The analysis of the Paired Sample T Test yielded p-values of 0.049 and 0.009 ($p < 0.05$), indicating that the alternative hypothesis (H_a) is supported. This implies that there is a significant impact of slow deep breathing exercises on blood pressure in older women when comparing the measurements before and after the intervention. **Conclusion:** Slow deep breathing exercises have an impact on the blood pressure of older women with hypertension.

INTRODUCTION

Aging, abbreviated as elderly, refers to someone who has reached the age of 60 years or above. Every living being will undergo a process known as aging. This aging process is not a disease, but a gradual process that results in cumulative changes, including a decline in the body's ability to withstand internal and external stimuli (Mujiadi and Rachmah, 2022). Elderly (senior citizens) is a term used to refer to individuals who are 60 years old or above. The elderly are a group of people
Volume 22 Number 1, Februari 2024

who are in the final stage of life and experience the aging process (Tanjoto and Suhartono, 2021). The WHO categorizes the elderly into three categories: older age, which is between 60-70 years old, advanced age, which is between 75-89 years old, and very advanced age, which is above 90 years old (Manurung, Ritonga and Damanik, 2020). Humans aspire to live long lives and enjoy them to the fullest. Each individual has their own destiny, resulting in different lifespans. This condition is influenced by various
ISSN 1858-3385, E-ISSN 2549-7006 93

factors, such as the economic condition, level of knowledge, advancements in technology, availability of healthcare facilities, and other factors specific to each nation. Life expectancy varies from country to country depending on these factors. The better the quality and quantity of these factors, and the easier it is for the elderly to utilize them, the higher their life expectancy will be, and vice versa (Mujiadi and Rachmah, 2022). Based on the data from the health profile of Indonesia, there is a total of 25,901,989 individuals aged 60 and above, while the number of individuals aged 70 and above with high risk is 9,351,933 from 34 provinces. West Java is the most populous province with a population of 49,316,712 (Kemenkes RI, 2019). At that age, the elderly experience a decline in immune function, including a decrease in the immune system's ability to defend the body. This decline in immune function is associated with various health conditions, one of which is hypertension, a disease characterized by high blood pressure and impaired heart function (Akbar, Syamsidar and Widya Nengsih, 2020). Hypertension, being one of the most fatal illnesses globally, is currently ranked as the third primary cause of mortality, following heart disease and cancer (Setyaningrum and Suib, 2019). The global incidence of hypertension is remarkably high, as reported by the World Health Organization

(WHO) and the International Society of Hypertension (ISH). Currently, there are 600 million individuals worldwide affected by hypertension, with 3 million fatalities annually. WHO further reveals that the total number of people with hypertension globally reaches one billion, with two-thirds residing in low to middle-income developing nations. There is a significant expectation of a substantial increase in the prevalence of hypertension, with estimates indicating that 29% of adults worldwide will likely be affected by the year 2025. The consequences of hypertension are severe, causing approximately 8 million deaths each year, including 1.5 million fatalities in Southeast Asia alone, where one-third of the population suffers from this condition (Ekarini *et al*, 2019). Hypertension is closely related to lifestyle factors and dietary patterns. Lifestyle greatly influences the behaviors or habits of individuals, which can have both positive and negative effects on health. Hypertension is not widely recognized as a dangerous disease, yet it is a silent killer because individuals with hypertension often feel healthy and have no significant complaints, leading them to underestimate the seriousness of the condition. As a result, hypertension is often detected during routine check-ups or when patients come with other complaints. The severe consequences of hypertension manifest when complications arise, such as coronary

heart disease, impaired kidney function, cognitive decline, and stroke. Hypertension significantly diminishes life expectancy and serves as a primary contributor to various degenerative diseases that can result in fatality. Moreover, the treatment and care required for hypertension are expensive, placing a financial burden on patients. It is important to note that hypertension also negatively impacts overall quality of life. Without regular treatment and monitoring, high blood pressure can lead to critical situations, including death. Prolonged high blood pressure puts excessive strain on the heart, leading to potential damage to blood vessels in the heart, kidneys, brain, and eyes (Harahap *et al*, 2021). As for risk factors, hypertension also contributes to the development of cardiovascular disease, the main killer of people worldwide. Lack of exercise, excessive salt intake, overeating, a deficiency in fruits and vegetables, and stress are some factors that can contribute to hypertension (Jabani, Kusnan and B, 2021).

As per the World Health Organization (WHO), the standard blood pressure reading for adults is 120/80 mmHg. The first number, 120 mmHg, signifies the systolic pressure, indicating the pressure exerted by the heart while pumping blood. On the other hand, the second number, 80 mmHg, represents the diastolic pressure, reflecting the pressure when the heart

muscle relaxes and receives blood from the entire body. Blood pressure tends to increase with age. This is because as age increases, especially in older age, blood vessels naturally thicken and become stiffer. These changes can increase the risk of hypertension (Fatma *et al.*, 2021). Hypertension is defined as an elevation in systolic blood pressure exceeding 140 mmHg or diastolic blood pressure exceeding 90 mmHg. Findings from a study conducted by Amalia and Sjarqiah in 2023 indicated that women have a higher susceptibility to hypertension when compared to men (Amalia and Sjarqiah, 2023). Men tend to experience hypertension more frequently under the age of 55, while in women, it is more common to occur after the age of 55. After menopause, women who previously had normal blood pressure may develop hypertension due to hormonal changes in the body (Fatma *et al.*, 2021). During the follow-up period, menopausal women have approximately a 20% greater likelihood of developing hypertension compared to women who still have their teeth. Our study found no significant connection between periodontal disease and hypertension (Trtica Majnarić *et al.*, 2019). Menopause is a phase where women no longer experience menstruation. Facing menopause with anxiety and fear of not being able to bear children due to the decline in estrogen, progesterone, and sex

hormones can result in physical symptoms commonly experienced during menopause. These symptoms include sudden hot flashes that affect the upper body, excessive sweating at night, difficulty sleeping, skin irritation, oral and dental symptoms, vaginal dryness, difficulty in controlling urination, and weight gain (Gordon *et al.*, 2019). In menopausal women, there is an increased incidence of hypertension which has an impact on the decline in quality of life (Kabodi *et al.*, 2019). Hypnotherapy, diversion, massage, use of music, slow deep breathing or benson relaxation, and cupping therapy are a few non-pharmacological treatments for hypertension (Mukhlis *et al.*, 2020). A slow deep breathing exercise is an intentional practice that gradually enhances the frequency and depth of breaths, aiming to induce a soothing and calming effect (Yusuf, Isnaniah and Yuliati, 2021).

METHODS AND MATERIALS

In this study, a quasi-experimental time series design was employed, involving pre-test and post-test measurements on a single group. The target population consisted of elderly residents residing in the 'Aisyiyah Nursing Home. A purposive sampling strategy was used, whereby the sample was specifically selected based on certain criteria, and it consisted of 17 older individuals. Over a period of four weeks,

the participants engaged in the slow deep breathing exercise, performing it 12 times.

RESULTS AND DISCUSSION

In this study, sphygmomanometer pre-test and post-test slow deep breathing exercises were used to measure blood pressure in

Age	Frequency	Percent
60-74	9	52.9
75-90	8	47.1
Total	17	100.0

order to define the features of respondents based on age and blood pressure. The table below presents the attributes of the participants:

Table 1 Characteristics of Respondents by Age Frequency

Table 1 shows 9 respondents (52.9%) aged 60-74 years and 8 (47.1%) aged 75-90 years.

Table 2 Characteristics of Respondents Based on Degree of Hypertension

Blood pressure	Frequency	Percent
Degree 1	14	82.4
Degree 2	3	17.6
Total	17	100.0

Table 2 shows that respondents with degree 1 hypertension were 14 people (82.4%) and respondents with degree 2 hypertension were 3 people (17.6%).

Table 3 Distribution of Blood Pressure Before Slow Deep Breathing Exercise

Blood pressure	Median	Min	Max	Mean	Std. Deviation
Pre systolic	140.00	130	160	143.47	11.609
Pre diastolic	90.00	80	100	88.24	7.276

Based on the information presented in table 3, the data reveals that before engaging in the slow deep breathing exercise, the median value of the systolic blood pressure for the elderly individuals
 ISSN 1858-3385, E-ISSN 2549-7006 96

was recorded as 140.00 mmHg, with a standard deviation of 11.609. Likewise, the median value of the diastolic blood pressure prior to the exercise was documented as 90.00 mmHg, with a standard deviation of 7.276.

Table 4 Distribution of Blood Pressure

Blood Pressure	Median	Min	Max	Mean	Std. Deviation
Post systolic	129.00	110	161	133.24	15.849
Post diastolic	78.00	53	95	76.88	11.926

After Slow Deep Breathing Exercise

Based on table 4 above, blood pressure in the elderly after slow deep breathing exercises is known that the median systolic blood pressure before 129.00 mmHg with a standard deviation value of 15,849 while the median diastolic blood pressure after slow deep breathing exercise is 78.00 mmHg with a standard deviation value of 11,926. Bivariate analysis was used to determine the effect of Slow, Deep Breathing Exercises on blood pressure in older women with hypertension. The influence test in this study used the Paired Sample T Test.

Blood Pressure	df	Sig. (2-tailed)
Pre systolic – Post systolic	16	.049
DiastolicPre – DiastolicPost	16	.009

Table 5 Paired Sample T Test

Table 5 provides the findings of the paired sample t-test, which examines the impact of slow deep breathing exercises on blood pressure among elderly women with

Volume 22 Number 1, Februari 2024

hypertension. The results of the test indicated a significance value of 0.049 and 0.009 ($p < 0.05$). Consequently, the alternative hypothesis (H_a) was accepted, suggesting that slow deep breathing exercises have a significant effect on blood pressure among elderly women with hypertension at the 'Aisyiyah Nursing Home in Surakarta City. The elderly do slow deep breathing exercises regularly 12 times for four weeks in the morning. Based on the research conducted by Sumartini and Miranti in 2019, it is shown that regular deep breathing relaxation techniques help improve blood circulation and contribute to lowering blood pressure to normal levels. As known, blocked blood vessels can cause an increase in blood pressure, posing a risk of complications. The administration of slow deep breathing relaxation provides an alternative non-pharmacological treatment for patients, in addition to exercise, physical therapy, and medication, to enhance patients' knowledge in managing blood pressure in individuals with hypertension. This exercise is effective in reducing systolic and diastolic blood pressure and has a significant effect on reducing blood pressure in older adults with hypertension. Slow Deep Breathing Exercise is done by inhaling slowly and exhaling slowly, while doing this movement, the elderly feel relaxed (Sumartini, 2019). Similar findings were also found in a study conducted by

ISSN 1858-3385, E-ISSN 2549-7006 97

Yusuf, Isnaniah, and Yuliati in 2019, which showed that Slow Deep Breathing therapy is capable of reducing blood pressure (Yusuf, Isnaniah and Yuliati, 2021). In a research conducted by (Gholamrezaei *et al.*, 2021) it is suggested that long-term practice of slow deep breathing can effectively lower blood pressure levels and contribute to reducing psychological stress associated with hypertension. Hypertensive patients experience greater comfort and calmness when compared to other breathing techniques. Moreover, the study supports the notion that slow deep breathing can enhance baroreceptor stimulation, influenced by blood pressure variability responses through specific respiratory exercises based on certain mechanisms. It also highlights the potential of slow deep breathing to modulate autonomic and emotional functions, offering potential benefits for managing pain and hypertension.

CONCLUSIONS AND SUGGESTIONS

Based on the findings of a study done on 17 elderly people at the Aisiyiah Nursing Home, it can be suggested that future researchers include elderly men who have hypertension in their research sample because slow, deep breathing exercises have been shown to lower blood pressure in older women with hypertension.

REFERENCES

- Akbar, F., Syamsidar and Widya Nengsih (2020) 'Karakteristik Lanjut Usia Dengan Hipertensi Di Desa Banua Baru', *Bina Generasi: Jurnal Kesehatan*, 11(2), pp. 6–8. Available at: <https://doi.org/10.35907/bgjk.v11i2.141>.
- Amalia, V.N. and Sjarqiah, U. (2023) 'Gambaran Karakteristik Hipertensi Pada Pasien Lansia di Rumah Sakit Islam Jakarta Sukapura Tahun 2020', *Muhammadiyah Journal of Geriatric*, 3(2), p. 62. Available at: <https://doi.org/10.24853/mujg.3.2.62-68>.
- Ekarini, N.L.P., Heryati, H. and Maryam, R.S. (2019) 'Pengaruh Terapi Relaksasi Otot Progresif terhadap Respon Fisiologis Pasien Hipertensi', *Jurnal Kesehatan*, 10(1), p. 47. Available at: <https://doi.org/10.26630/jk.v10i1.1139>.
- Fatma, E.M. *et al.* (2021) *H i p e r t e n s i : Kenali Penyebab, Tanda Gejala Dan Penangannya*. Kementerian Kesehatan Republik Indonesia Poltekkes Jakarta III.
- Gholamrezaei, A. *et al.* (2021) 'Psychophysiological responses to various slow, deep breathing techniques', *Psychophysiology*, 58(2), pp. 1–16. Available at: <https://doi.org/10.1111/psyp.1371>

- Gordon, J.H. *et al.* (2019) 'Association of Periodontal Disease and Edentulism with Hypertension Risk in Postmenopausal Women', *American Journal of Hypertension*, 32(2), pp. 193–201. Available at: <https://doi.org/10.1093/ajh/hpy164>.
- Harahap Reni Agustina, Nabila Fitri, Lestari Rika Lestari, T.S., Rahma, Fitri Zaime, S. and Ananda, D.R. (2021) *Gaya Hidup Terhadap Resiko Hipertensi Pada Lansia, Angewandte Chemie International Edition*, 6(11), 951–952.
- Jabani, A.S., Kusnan, A. and B, I.M.C. (2021) 'Prevalensi dan Faktor Risiko Hipertensi Derajat 2 Di Wilayah Kerja Puskesmas Poasia Kota Kendari', *Jurnal Ilmiah Ilmu Keperawatan*, 12(4), pp. 31–42. Available at: <https://stikes-nhm.e-journal.id/NU/article/view/494>.
- Kabodi, S. *et al.* (2019) 'Women's Quality of Life in Menopause with a Focus on Hypertension', *Journal of Obstetrics and Gynecology of India*, 69(3), pp. 279–283. Available at: <https://doi.org/10.1007/s13224-018-1172-y>.
- Kemenkes R1 (2019) *Profil kesehatan Indonesia 2019*, Kementrian Kesehatan Republik Indonesia. Available at: <https://pusdatin.kemkes.go.id/resources/download/pusdatin/profil-kesehatan-indonesia/Profil-Kesehatan-indonesia-2019.pdf>.
- Manurung, S.S., Ritonga, I.L. and Damanik, H. (2020) *Buku Ajar Keperawatan Gerontik*. Deepublish Publisher.
- Mujiadi and Rachmah, S. (2022) *Buku Ajar Keperawatan*. Edited by K. Diah. STIKes Majapahit Mojokerto.
- Mukhlis, H. *et al.* (2020) 'Cupping Therapy for Hypertensive Patients: A quasi-Experimental Research', *Journal of Critical ...*, 7(14), pp. 1437–1443. Available at: <https://doi.org/10.31838/jcr.07.14.326>.
- Setyaningrum, N. and Suib, S. (2019) 'Efektifitas Slow Deep Breathing Dengan Zikir Terhadap Penurunan Tekanan Darah Pada Penderita Hipertensi', *IJNP (Indonesian Journal of Nursing Practices)*, 3(1), pp. 35–41. Available at: <https://doi.org/10.18196/ijnp.3191>.

- Sumartini, M. (2019) 'Pengaruh Slow Deep Breathing Terhadap Tekanan Darah Lansia Hipertensi Di Puskesmas Ubung Lombok Tengah', *Jurnal Keperawatan Terpadu*, 1(1), pp. 38–49.
- Tanjoto, E.A. and Suhartono, E. (2021) 'Literature Review: Korelasi Stres Okidatif dengan Tekanan Darah pada Lanjut Usia', *Homeostasis*, 4(1), pp. 227–236.
- Trtica Majnarić, L. *et al.* (2019) 'The Effect of Hypertension Duration and the Age of Onset on CV Risk Factors Expression in Perimenopausal Women', *International Journal of Hypertension*, 2019. Available at: <https://doi.org/10.1155/2019/9848125>.
- Yusuf, B., Isnaniah, I. and Yuliati, Y. (2021) 'Penerapan Latihan Slow Deep Breathing Terhadap Penurunan Tekanan Darah Pada Penderita Hipertensi: Literature Review', *IMJ (Indonesian Midwifery Journal)*, 4(2). Available at: <https://doi.org/10.31000/imj.v4i2.4272>.