Vol. 3 No. 2 Edisi April 2026 E. ISSN. 3032-2472
Multidisciplinary Indonesian Center Journal (MICJO)
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THE EFFECT OF DEEP BREATHING RELAXATION TECHNIQUES ON BLOOD PRESSURE IN THE ELDERLY IN BATE LINTENG AND LAMBUNOT VILLAGES, ACEH BESAR

PENGARUH TEKNIK RELAKSASI PERNAPASAN DALAM TERHADAP TEKANAN DARAH PADA LANSIA DI DESA BATE LINTENG DAN LAMBUNOT, ACEH BESAR

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DOI: https://doi.org/10.62567/micjo.v3i2.2424

Abstract

Hypertension is a chronic condition characterized by increased blood pressure on the artery walls, which can lead to serious complications such as stroke, kidney failure, and heart disease. This study aimed to determine the effect of deep breathing relaxation techniques on lowering blood pressure in elderly people in Bate Linteng and Lambunot Villages, Aceh Besar. This quantitative study used a pre-experimental design using a one-group pretest-posttest. The study was conducted from August 26 to August 31, 2024, with a population and sample of 16 elderly respondents with a history of hypertension. Data collection was conducted through observation using an observation sheet and the provision of deep breathing relaxation techniques. The results showed that the average blood pressure before the intervention was 148/90 mmHg with a standard deviation of 9.674, while after the intervention, it decreased to 143/87 mmHg with a standard deviation of 9.050. The statistical test results using the Paired Sample t-Test showed a significance value of 0.000 ($p < 0.05$), indicating a significant effect between deep breathing relaxation techniques and blood pressure reduction. The results of this study are expected to provide information for hypertension sufferers and their families that deep breathing relaxation techniques are a form of non-pharmacological therapy that can be performed independently to control blood pressure.

Keywords: Hypertension, Disease, Health, Deep Breathing Relaxation, Elderly.

Abstrak

Hipertensi adalah kondisi kronis yang ditandai dengan peningkatan tekanan darah pada dinding arteri, yang dapat menyebabkan komplikasi serius seperti stroke, gagal ginjal, dan penyakit jantung. Penelitian ini bertujuan untuk mengetahui pengaruh teknik relaksasi pernapasan dalam terhadap penurunan tekanan darah pada lansia di Desa Bate Linteng dan Lambunot, Aceh Besar. Penelitian kuantitatif ini menggunakan desain pra-eksperimental dengan menggunakan pretest-posttest satu kelompok. Penelitian ini dilakukan dari tanggal 26 Agustus hingga 31 Agustus 2024, dengan populasi dan sampel sebanyak 16 responden lansia dengan riwayat hipertensi. Pengumpulan data dilakukan melalui observasi menggunakan lembar observasi dan pemberian teknik relaksasi pernapasan dalam. Hasil

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penelitian menunjukkan bahwa tekanan darah rata-rata sebelum intervensi adalah 148/90 mmHg dengan standar deviasi 9,674, sedangkan setelah intervensi, menurun menjadi 143/87 mmHg dengan standar deviasi 9,050. Hasil uji statistik menggunakan Uji t Sampel Berpasangan menunjukkan nilai signifikansi 0,000 ($p < 0,05$), yang mengindikasikan adanya pengaruh signifikan antara teknik relaksasi pernapasan dalam dan penurunan tekanan darah. Hasil penelitian ini diharapkan dapat memberikan informasi bagi penderita hipertensi dan keluarganya bahwa teknik relaksasi pernapasan dalam merupakan bentuk terapi non-farmakologis yang dapat dilakukan secara mandiri untuk mengendalikan tekanan darah.

Kata Kunci: Hipertensi, Penyakit, Kesehatan, Relaksasi Pernapasan Dalam, Lansia.

1. INTRODUCTION

Elderly or old age (elderly) is the age over 60 years old, the final stage of the aging process, which impacts three aspects: biological, economic, and social. Biologically, the elderly experience a continuous aging process characterized by decreased physical endurance and susceptibility to disease. (Sukmawati, 2023). According to Utomo (2019), common health problems in the elderly include changes in the body's systems, including: the respiratory system, for example, chronic obstructive pulmonary disease, tuberculosis, and pneumonia; the neurological system, such as cerebrovascular accidents; the musculoskeletal system, osteoarthritis, rheumatoid arthritis, and gouty arthritis; and the cardiovascular system, such as coronary heart disease, cardiac heart failure, and hypertension.

Hypertension, or high blood pressure, is a chronic condition characterized by increased blood pressure on the walls of the arteries. This condition causes the heart to work harder to circulate blood throughout the body through the blood vessels. Hypertension can lead to degenerative diseases and even death. Therefore, hypertension is nicknamed the silent killer, as it can affect anyone and has no specific symptoms (Azizah, 2022).

Treatment for the elderly can be carried out through pharmacological and non-pharmacological therapies. As previously explained, the elderly experience a decline in the function of body systems. This requires caution when undertaking pharmacological therapy related to disease, minimizing pharmacological therapy as much as possible to reduce these risks. One such non-pharmacological therapy is deep breathing relaxation techniques. Deep breathing relaxation involves breathing through the abdomen at a slow, rhythmic, and comfortable rate, with the eyes closed while inhaling. (Hendriani, 2022)

WHO data indicates that hypertension affects 22% of the global population, with the incidence reaching 36% in Southeast Asia. By 2025, it is predicted that 29% of adults worldwide will have hypertension (WHO, 2018). According to 2018 data from the Ministry of Health, the incidence of hypertension in Indonesia is 45.9% for those aged 55-64, 57.6% for those aged 65-74, and 63.8% for those aged 75 and over (Ministry of Health, 2019).

Based on the results of a comprehensive survey based on community health centers (Puskesmas) in 23 districts/cities in Aceh Province in 2018, the number of hypertension sufferers was 184,842. Then, in 2019, the number of hypertension sufferers increased to 1,113,987, in 2020 to 1,222,285, and in 2021, the number of hypertension sufferers increased again to 1,516,104.

Astari's (2022) study, "The Effect of Deep Breathing Relaxation Therapy on Reducing Blood Pressure in Elderly Hypertensive Patients in Tihingan Village, Banjarangkan, Klunkung," used a pre-experimental research method and a one-group pre-posttest approach. The results showed the effect of deep breathing relaxation therapy on reducing blood pressure in elderly hypertensive patients in the village. The results of Parinduri's research (2020), The Effect of Deep Breathing Relaxation Techniques on Reducing Blood Pressure in Hypertension Patients in the Sidangkal Community Health Center Work Area, using a quasi-experimental research method. that there is a very significant difference in reducing blood pressure in the elderly through deep breathing relaxation techniques. Nababan's research (2022), The Effectiveness of Deep Breathing Therapy on Reducing Blood Pressure in Hypertension Patients,

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using a quasi-experimental research method with a cross-sectional design. that there is the effectiveness of deep breathing therapy on reducing blood pressure in hypertension patients. This is because deep breathing therapy by regulating respiratory frequency has an effect in the form of decreasing oxygen consumption by body cells and increasing CO2 levels. Increased CO2 levels stimulate the baroreceptor reflex, which then reduces sympathetic activity in the heart, thereby lowering blood pressure.

Based on the initial data obtained from the Simpang Tiga Community Health Center (Puskesmas Simpang Tiga), which had 139 respondents, the researchers interviewed 10 elderly people. The 10 respondents stated that they had never practiced deep breathing relaxation. They also did not know how to practice deep breathing relaxation for hypertension. Among the treatments they had previously used were 1-3 people using benazepril, captoril, and enalapril; 4-7 people using fosinopril, lisinopril, perindopril, and ramipril; and 8-10 people using trandolapril, quinapril, and moexipril. These medications were obtained from doctors or community health centers and are known to lower blood pressure. Of the 1-10 respondents, 3 people consumed cucumber and bay leaf decoction.

Based on the above description, the authors are interested in conducting a study entitled "The Effect of Deep Breathing Relaxation Techniques on Lowering Blood Pressure in the Elderly in Bate Linteng Village and Lambunot Village, Aceh Besar."

2. RESEARCH METHOD

Research Type and Design

This study is quantitative with a pre-experimental design using a one-group pretest-posttest design. This study aims to compare measurement results before and after the intervention (Astari, 2022).

Population and Sample

The population in this study was all elderly people in Bate Linteng village with high blood pressure, totaling 16 respondents.

The sampling technique used probability sampling with total sampling. Therefore, the sample size for this study was 16 individuals.

Data Collection Instrument

This study used secondary data obtained from the Simpang Tiga Community Health Center in Aceh Besar Regency, including data on elderly individuals. The observation sheet contained respondents' biographical data related to demographics and blood pressure. The demographic characteristics studied included gender, age, occupation, and education.

Research Location and Time

This research was conducted from August 26, 2024, to September 5, 2024, in Bate Linteng Village and Lambunot Village, Aceh Besar.

Data Analysis

The data analysis techniques used in this study are:

Univariate Analysis

Univariate analysis was conducted to explain or describe the characteristics of each research variable. Univariate analysis was used to descriptively describe the frequency distribution and proportion of each studied variable, both the independent and dependent variables. Univariate analysis was used to examine the frequency distribution of demographic characteristics of the elderly at the Simpang Tiga Community Health Center in Aceh Besar (Notoatmodjo, 2015).

Bivariate Analysis

One of the requirements for conducting a t-test is a data normality test, which is a test of goodness-of-fit to determine whether a population is normally distributed. This is a prerequisite test to determine whether the sample drawn comes from a normal distribution.

Before conducting further statistical analysis, a normality test was first performed on the data. The normality test aims to determine whether the data used in the study are normally distributed. In this study, normality testing was performed using the Shapiro-Wilk test using SPSS 20 for Windows. Data

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are considered normally distributed if the significance value (Sig.) or p-value is >0.05. Conversely, if the significance value is <0.05, the data are not normally distributed.

Statistical analysis in this study used the t-test technique. The purpose of the t-test analysis was to examine differences between the experimental groups, namely the pretest and posttest. The t-test used in this study was the paired simple t-test using SPSS 20 for Windows. The paired simple t-test is used to determine the difference between the means of two paired samples with approximately normally distributed data. The results of the paired sample t-test are based on the following conditions:

1) If the p-value is <0.05, Ho is rejected and Ha is accepted. This means that deep breathing relaxation techniques have an effect on lowering blood pressure in the elderly at the Simpang Tiga Community Health Center in Aceh Besar.
2) If p Value > (0.05) it means that Ho is accepted and Ha is rejected, which means that there is no effect of deep breathing relaxation techniques on reducing blood pressure in the elderly at the Simpang Tiga Aceh Besar Community Health Center.

3. RESULT AND DISCCUSSION

Research Results

Data collection was conducted from August 26, 2024, to September 5, 2024. The sample size was 16 respondents. Data collection techniques included providing observation sheets and Deep Breathing Relaxation Techniques to elderly individuals with a history of high blood pressure. Based on the research results, the following data were obtained:

Respondent Demographics

The characteristics of respondents in this study include: gender, age, occupation, and education.

Table 1. Respondent Demographics

Respondent characteristics	Category	Frequency	Percent
Gender	Female	16	100
Age	50-60 years	8	50
	61-70 years	4	25
	71-80 years	3	18.8
	81-90 years	1	6.3
	Total	16	100
Work	IRT	15	93.8
	Teacher	1	6.3
	Total	16	100
Education	SD	5	31.3
	SMP	3	18.8
	SMA	5	31.3
	DIII	1	6.3
	S1	2	12.5
	Total	16	100

Table 1 shows the demographic characteristics of the respondents involved in this study, which consisted of 16 people. All respondents were female (100%). Based on age category, the majority of respondents were in the 50–60 years age range (8 people (50%), followed by 61–70 years old (4 people (25%), 71–80 years old (3 people (18.8%), and 81–90 years old (1 person (6.3%). Based on occupation, the majority of respondents were housewives (IRT) (15 people (93.8%), and only 1 person (6.3%) worked as a teacher. In terms of educational level, respondents had diverse educational backgrounds, namely 5 people (31.3%) graduated from elementary school, 3 people (18.8%), 5 people (31.3%), 1 person (6.3%) graduated from junior high school, and 2 people (12.5%) graduated from high school.

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These data indicate that the majority of respondents had elementary and secondary education backgrounds.

Univariate Data

a. Before Deep Breathing Relaxation Technique Administered

The results of data processing for categorization before administering Deep Breathing Relaxation Technique on Blood Pressure in Elderly People in Bate Linteng Village and Lambunot Village, Aceh Besar, with 16 respondents can be seen in Table 3.2 below.

Table 2. Before Deep Breathing Relaxation Technique Administered

Respondent	Sistole	Diastole
R1	140	85
R2	132	87
R3	145	89
R4	140	79
R5	155	98
R6	169	88
R7	158	98
R8	156	92
R9	158	95
R10	142	98
R11	143	87
R12	153	95
R13	143	89
R14	144	83
R15	151	86
R16	137	88

Table 2 shows that the average blood pressure before the intervention was 148/90 mmHg. The highest blood pressure was 169/88 mmHg, while the lowest was 132/87 mmHg.

After the Deep Breathing Relaxation Technique

The results of data processing for categorizing the effects of the Deep Breathing Relaxation Technique on blood pressure in the elderly in Bate Linteng Village and Lambunot Village, Aceh Besar, with 16 respondents, can be seen in Table 3.3 below.

Table 3. After the Deep Breathing Relaxation Technique

Respondent	Sistole	Diastole
R1	133	80
R2	129	85
R3	137	83
R4	136	79
R5	145	95
R6	162	86
R7	154	92
R8	151	89
R9	152	89
R10	137	95
R11	139	85
R12	149	91
R13	141	87

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R14	137	83
R15	148	84
R16	135	83

Table 3 shows that the average blood pressure before the intervention was 143/87 mmHg. The highest blood pressure was 162/86 mmHg, while the lowest was 129/85 mmHg.

Bivariate Data

Table 4. Data Normality Test (Shapiro-Wilk)

Time	N	Statistik	Sig. (p)	Conclusion
Before	7.6	0.937	0.562	Normal
After	7.6	0.941	0.593	Normal

A normality test was conducted to determine whether the data for each variable was normally distributed. Based on the results of the Shapiro-Wilk test presented in the Normality Test Table, all significance values (Sig.) or p-values for each group were greater than 0.05. This indicates that the data in all categories, both before (pre-test) and after (post-test), were normally distributed. Thus, the data met the assumption of normality, and parametric statistical analysis was possible.

Table 5. Relationship Before and After Deep Breathing Relaxation Technique

	Mean	N	Std. Deviation	Sig
Pretes	147.88	16	9.674	0,000
Post test	142.81	16	9.050	

Table 3.5 shows the results of the statistical test with the Paired Samples Test, the resulting P value is 0.000 < 0.05, which means that it can be concluded that there is an effect of deep breathing relaxation techniques on reducing blood pressure in patients with hypertension.

Discussion

Based on the research results, it was found that there was a decrease in blood pressure after the deep breathing relaxation technique intervention. The analysis showed that the average blood pressure before the intervention was 147.88 mmHg and after the intervention was 142.81 mmHg. A statistical test using the Paired Sample t-Test yielded a significance value of 0.000 ($p < 0.05$), indicating a significant difference between blood pressure before and after the intervention.

This is supported by the results of research conducted by Yuliandra et al. (2023), which found that the average blood pressure before the intervention was 147/100 mmHg and after the intervention was 139/90 mmHg. This is also supported by research conducted by Yulis Susanti and Muhammad Khabib Burhannudin Iqomh, who found that before the deep breathing relaxation method, systolic blood pressure was 162.30 mmHg, diastolic blood pressure was 100.95 mmHg, and after the deep breathing relaxation method, systolic blood pressure was 145.65 mmHg, and diastolic blood pressure was 90.90 mmHg (Susanti et al., 2021).

These results align with previous research by Kartika et al. (2021), which stated that hypertension is a common cardiovascular disease and requires serious treatment because it can lead to complications such as stroke, kidney failure, and heart disease. This research is also supported by findings by Puspitasari (2020), who found that hypertension is a major contributing factor to stroke.

Deep breathing relaxation technique interventions have been shown to have a positive effect on lowering blood pressure in the elderly. This is consistent with the theory that deep breathing techniques can increase pulmonary ventilation, improve blood oxygenation, and reduce sympathetic nervous system activity, all of which contribute to lower blood pressure. Furthermore, this technique is easy for patients to perform independently without the need for special equipment (Julidia Safitri Parinduri, 2020).

Based on the research results, all respondents in this study were elderly women, the majority aged 50–60 years (50%), housewives (93.8%), and with primary to secondary education (elementary and high school respectively 31.3%). These characteristics indicate that deep breathing relaxation techniques can be effectively applied to elderly women with low to secondary education and relatively

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light daily activities. The results showed a significant reduction in blood pressure after the intervention, indicating that this technique could be an alternative non-pharmacological therapy that is easy to implement and understand for elderly groups in rural areas such as Bate Linteng and Lambunot Villages, Aceh Besar.

In this study, the assumption of normality is an important requirement to determine the validity of the statistical test used. Based on the results of the Shapiro-Wilk normality test, all blood pressure data before and after the deep breathing relaxation technique intervention have a significance value greater than 0.05, which means the data are normally distributed. Thus, it can be concluded that the data meets the requirements for a parametric test, namely the Paired Sample t-Test. The selection of this test is in accordance with the opinion of Sugiyono (2018), who stated that the paired t-test is used when the data is on an interval or ratio scale and is normally distributed. Fulfillment of this assumption strengthens that the changes in blood pressure that occur are a result of the intervention, not due to deviant data distribution. Therefore, the results of the statistical analysis in this study can be said to be valid and can be used as a basis for concluding the effectiveness of deep breathing relaxation techniques on reducing blood pressure in the elderly.

4. CONCLUSION

Based on the results of a study conducted on 16 elderly people in Bate Linteng Village and Lambunot Village, Aceh Besar, the analysis showed a difference in average blood pressure before and after the intervention. The average blood pressure before the intervention was 147.88 mmHg and decreased to 142.81 mmHg after the intervention. The results of the Paired Sample t-Test statistical test showed a significance value (p-value) of 0.000, meaning $p < 0.05$. Therefore, it can be concluded that deep breathing relaxation techniques have a significant effect on reducing blood pressure in elderly people with hypertension in Bate Linteng Village and Lambunot Village, Aceh Besar.

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