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The Effect of Benson Relaxation on Decreasing the Degree of Blood Pressure in Older Adults with Hypertension

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ABSTRACT

Introduction: Hypertension is still a health problem that impacts the quality of life of the older adult. This study was conducted to assess the effects of Benson's relaxation technique on reducing blood pressure in older adults.

Method: The quasi-experimental design used in this study includes a pre-post test control group. The sample consists of 40 respondents chosen through purposive sampling from 63 older adults and assigned to intervention and control groups. The independent variable of Benson relaxation was performed using standard operating procedures. The dependent variable of blood pressure both diastolic and systolic measured using sphygmomanometer, stethoscope and observation sheet. Blood pressure was categorized into degrees of blood pressure, namely pre-hypertension, grade 1 hypertension and grade 2 hypertension. Data were analyzed using the Wilcoxon signed-rank test and the Mann-Whitney U test.

Results: The result for the intervention group receiving Benson relaxation therapy thus had a significant effect on lowering blood pressure in the elderly population, and the p-value was 0.000. Meanwhile, the p-value for the control group was 0.320. The delta value was significantly higher for the intervention group than the control group. This, in turn, reveals that blood pressure level change is more evident within elderly individuals who have hypertension; therefore, blood pressure was lower in the intervention group.

Conclusion: The results obtained from this study indicate a positive effect of Benson relaxation therapy in lowering the elderly blood pressure; hence, it is an approach that can be further applied by nurses as a form of non-pharmacological therapy.

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1. INTRODUCTION

Hypertension, a condition resulting from impaired heart and blood vessel function, is a serious health issue that can be fatal (Sartika 2023). This chronic disease is marked by elevated blood pressure against arterial walls, forcing the heart to work harder to circulate blood throughout the body (Azizah, Hasanah, and Pakarti 2021; Primadewi 2022). Such strain can disrupt blood flow, damage blood vessels, and potentially lead to degenerative diseases or even death (Azizah et al. 2021; Sari, Ludiana, and Hasanah 2021). One of the causes of uncontrolled hypertension is due to the patient's non-compliance in taking medication and there are also no non-pharmacological therapeutic measures that can be applied as an intervention without medication. One of the causes of uncontrolled hypertension is due to patient non-compliance in taking anti-hypertensive drugs and also no non-pharmacological therapeutic measures that can reduce the degree of hypertension if carried out continuously (Ariyani et al. 2021; Pristianti and Vitaliati 2023). Several research results have been carried out showing that non-pharmacological therapy such as Benson relaxation can reduce blood

pressure (Kartikasari 2022; Pratiwi, Ayubbana, and Fitri 2021), however, this non-pharmacological therapy is still rarely used by patients with hypertension.

The prevalence of hypertension worldwide reached 972 million people or 26.4% (WHO, 2018; Sakati et al., 2023). Hypertension has the highest prevalence in Africa at 27%, followed by Southeast Asia, which ranks third globally with a prevalence of 25%. The Americas have the lowest prevalence at 18%. (Cheng et al. 2020). The number of individuals with hypertension is expected to rise annually, with projections indicating that by 2025, there will be 1.5 billion people affected. Additionally, hypertension and its related symptoms and complications are estimated to cause 9.4 million deaths each year (Chowdhury et al. 2020; Siagian and Tukatman 2021).

According to Indonesia's 2018 Basic Health Research, the prevalence of hypertension among individuals aged 18 and older increased by 6.3%, affecting 34.1% of the population, which totals around 260 million people. In East Java Province, the prevalence of hypertension stands at 20.43%, impacting approximately 1,828,999 people. Among them, 20.11% are women (1,003,257 individuals), and 20.83% are men (825,412 individuals) (Riskesdas 2018). Based on data from the Gresik Regency Health Service in 2018, it was recorded that the number of residents of Gresik Regency suffering from hypertension was 18,574 people. (Dinkes 2018). The results of previous research show that the risk factors of physical activity, salt consumption, fruit and vegetable consumption and stress influence the incidence of hypertension in the older adult at the Poasia Health Center, Kendari City (Jabani, Kusnan, and B 2021). It is also supported by research conducted that Progressive Muscle Relaxation Therapy (Benson) can reduce blood pressure and pain scale in intervention patients, so this therapy is recommended as a non-pharmacological intervention to reduce blood pressure in hypertensive patients (Pratiwi et al. 2021).

Hypertension is caused by a combination of factors, including reduced elasticity of the aortic wall, thickening and stiffening of heart valves, and a decline in the heart's ability to pump blood effectively. These changes lead to decreased contraction strength and blood volume. Additionally, the loss of elasticity in blood vessels, coupled with less effective oxygen delivery by peripheral blood vessels, results in increased resistance within the peripheral vascular system (Mulyadi 2019; Yulia et al. 2022). Common symptoms caused by this disease are severe headaches, shortness of breath, nosebleeds, red skin (especially on the face and neck), dizziness, chest pain and vision problems. Hypertension can also cause death due to the severe symptoms it causes in sufferers (Arini, Rahmawati, and Pratiwi 2022). Non-pharmacological therapy can be chosen because the use of drugs can cause dependency and is expensive, so it requires compliance with treatment because it takes a relatively long time to reduce blood pressure (Pristianti and Vitaliati 2023). This can cause boredom for people with hypertension when taking medication (Prabasari 2021). Non-pharmacological therapy can be an alternative for lowering blood pressure by reducing the activity of the sympathetic nervous system, which in turn can expand arteries and increase blood circulation, thereby increasing oxygen supply to all tissues, especially peripheral tissues which can reduce pressure due to hypertension (Tukan 2018). Benson relaxation therapy is one method that can be used to help lower blood pressure (Kartikasari 2022). This relaxation technique involves positioning the body in a calm state, promoting a sense of balance. Benson's relaxation method, combined with deep breathing, enhances oxygen circulation to the muscles, leading to muscle relaxation and a reduction in blood pressure (Febriyanti, Yusri, and Fridalni 2021).

To address non-compliance and boredom associated with hypertension medication, non-pharmacological therapies like Benson relaxation can be effective solutions. These relaxation techniques specifically target the challenges of managing hypertension. The core principle of the Benson relaxation technique lies in reducing muscle tension, which can lead to improvements in pulse rate, blood pressure, and breathing (Sihombing and Paulina 2022; Wartonah et al. 2022). Benson relaxation has several advantages apart from its simple method because it only focuses on deep breathing, which is done with a request to God Almighty, this technique can also be done anytime and anywhere, without requiring a special room (Saleh 2023). So, the aim of this research is to analyze the effect of the Benson relaxation technique in lowering blood pressure in older adults with hypertension

2. METHODS

Study Design

This study is a quantitative research employing a quasi-experimental design, specifically the Pre-Post Test Control Group Design method. Conducted from August to September 2023, it aims to evaluate the impact of Benson therapy as non-pharmacological treatment on blood pressure in older adults with hypertension.

Population, Samples, and Sampling

The research focuses on older adults with hypertension in Keramat Village, Gresik District, East Java, totaling 60 individuals. The study will include this population, divided into two groups: the treatment group and the control group. Participants must meet the following criteria: 1) aged over 60 years; 2) diagnosed with primary hypertension; 3) have mild to moderate hypertension (systolic 140-159 mmHg and diastolic 90-99 mmHg); 4) be able to

communicate effectively and have good cognitive function (as assessed by the Mini Mental Status Examination); 5) not be smokers or drinkers; and 6) be currently taking antihypertensive medication (captopril) at 9:00 AM after the intervention. Criteria for respondent dropout were that the respondent did not participate in training more than 3 times in a row, withdrew from the sample for certain reasons and suffered from illness or injury. In this study, subjects were selected using a non-probability sampling method using purposive sampling. The sample size used was 20 respondents in the treatment group and 20 respondents in the control group.

Instruments

In this study, the independent variable is the Benson relaxation technique administered to older adults through module guidelines, videos, and standard operating procedures. The training spans 4 weeks, with 2 sessions each week, totaling 8 sessions over the month. Each relaxation session lasts 30 minutes with a 5-minute break. The dependent variable is blood pressure, including both diastolic and systolic readings, which are measured using a sphygmomanometer and recorded on a blood pressure assessment observation sheet.

Procedure

The research procedure starts with the Preparation Stage, where researchers submit an application letter and complete an ethics test. Once approved, they collect data from older adults with hypertension, dividing them into treatment and control groups. Researchers then visit respondents at home, with support from trained enumerators. Before starting the intervention, respondents are informed about the research's purpose, benefits, duration, their rights, and are asked to sign an informed consent form.

Upon consent, the researcher provides a module and applies the Benson relaxation technique according to a pre-established SOP, which includes preparation, implementation, and evaluation stages. Both groups undergo a pre-test using a sphygmomanometer to measure blood pressure before the intervention. The intervention group receives Benson relaxation therapy twice a week for four weeks, while the control group follows the local health center's program. After eight sessions, the researcher measures the respondents' blood pressure again to evaluate the impact of the intervention.

Data Analysis

Descriptive analysis of research data is presented in a frequency table and presented in descriptive analysis in the form of the number of respondents and the percentage of results according to the category for each research variable. The inferential analysis used in this research is to test homogeneity using the Levene test, data shows homogeneous if the value based on mean shows >0.05. The normality test was carried out using Shapiro Wilk and the data was said to be normally distributed if the significance value was> 0.05. However, it was found that the data was not normally distributed where the pre-post test blood pressure in the intervention group and control group was 0.000 $p<0.05$. In hypothesis testing, the test used is the Wilcoxon rank test with a significance level of $p\leq0.05$, because the data scale is categorical, the homogeneity test is found to be inhomogeneous and the normality test obtained data is not normal. Meanwhile, to test for significant differences between the pre and post tests of the two groups using the man whitney test.

Ethical Clearance

This study has been approved by the Health Research Ethics Committee of the Faculty of Nursing, Universitas Airlangga (No. 2269-KEPK), ensuring the protection of participants' rights and welfare. Prospective respondents are informed about the research's purpose, benefits, and potential risks. Their confidentiality is guaranteed, and they can withdraw from the study at any time. Researchers are committed to conducting the study with honesty.

3. RESULTS

Table 1 shows that the majority of treatment groups were in the older adult age category, namely 60-65 years, with 16 respondents (80%), and the majority of respondents were female, 14 respondents (70%). The educational level of most of the respondents was elementary school, 12 respondents (60%), and 16 respondents (80%) worked as housewives. The majority of people who have suffered from hypertension have been suffering from hypertension for a long time in the range of 3-7 years, as many as 18 respondents (90%). The history of the drugs consumed by all respondents was antihypertensive drugs as many as 20 respondents (100%). The majority of the control group was aged 60-65 years, 12 respondents (60%), and 18 respondents (80%) were female. The education level in the control group was mostly elementary school, 13 respondents (65%), and 12 respondents (60%) worked as housewives. The duration of suffering from hypertension ranged from 3-7 years for 15 respondents (75%). Data on the characteristics of respondents before the intervention was carried out was first tested for homogeneity to prove that the two treatment groups and the control group were homogeneous. Based on the homogeneity test, it shows that subjects in the treatment and control groups have different characteristics, only the characteristics of the history of the drugs consumed are similar. All respondent characteristics show a p value <0.05, which means that all respondents from the two groups are not homogeneous. Inhomogeneous data characteristics are a requirement for conducting non-parametric tests, namely the Wilcoxson rank test.

Table 1. Characteristics of Older Adult Research Respondents with Hypertension (n=40)

Respondents Characteristics	Intervention Group		Control Group		Homogeneity Test
	n	%	n	%	
Age					
60-65 Years	16	80	12	60	0.000
66-70 Years	4	20	8	40	
Gender					
Man	6	30	4	20	0.002
Woman	14	70	16	80	
Education					
Elementary	12	60	13	65	0.004
Junior High	4	20	3	15	
Senior High	4	20	4	20	
Occupation					
Housewives	16	80	12	60	0.000
Retired	2	10	3	15	
Farmer	2	10	5	25	
Long Suffering					
3-7 years	18	90	15	75	0.007
10-12 years	2	10	5	25	

Table 2. Shows that the treatment group before being given the intervention was mostly in the grade 1 hypertension category with 12 respondents (60%) and 8 respondents (40%) in the prehypertension category. The results in the treatment group after being given the intervention had changes, namely in the grade 1 hypertension category there was a decrease by 5 respondents (25%), in the prehypertension category there was an increase by 11 respondents (55%), and in the normal category there were 4 respondents (20%). The control group showed a reduction in the grade 1 hypertension category from 80% to 65%, while in the prehypertension category there was an increase from 20% to 30%, and in the normal category there was an increase of 5%.

It shows that in the treatment group after being given the Benson relaxation intervention, most of them were in the prehypertension category and there were small changes in blood pressure in the normal category. Meanwhile, in the control group who received interventions according to the recommendations of the village police, most of them fell into the grade 1 hypertension category. Based on data normality testing, the results show a p value < 0,05 so the data shows that it is not normally distributed. It was found that the data was not normally distributed, so the non-parametric test was chosen as an inferential test, namely using the Wilcoxon rank test.

The Wilcoxon Signed Rank test results reveal that in the intervention group, the change in blood pressure categories from pre-test to post-test is statistically significant with a p-value of 0.000 ($p < 0.05$). This indicates that the Benson relaxation intervention significantly affects blood pressure categories in elderly individuals with hypertension. Conversely, the control group, which did not receive the intervention, had a p-value > 0.05, indicating no significant effect on blood pressure categories. Mann Whitney test results comparing pre-test values between the control and intervention groups showed no significant difference, with p-values > 0.05. However, after the intervention, significant differences were observed between the groups in post-test blood pressure categories, with a p-value of 0.000 ($p < 0.05$). Delta analysis, which assesses changes from pre-test to post-test, showed that the intervention group had a higher delta value ($\Delta = 7.8$) compared to the control group. This suggests that the intervention led to more noticeable changes in blood pressure categories among the elderly with hypertension.

4. DISCUSSION

The study examined the impact of Benson relaxation therapy on blood pressure in older adults with hypertension. Initially, most participants in the treatment group were classified as having grade 1 hypertension. After undergoing the therapy, the majority of their blood pressure readings fell into the prehypertension category. Statistical analysis using the Wilcoxon Sign Rank Test revealed a significant reduction in blood pressure, with a p-value of 0.004 ($\alpha < 0.05$), indicating a meaningful effect of the therapy. The mean blood pressure change before and after therapy was 1.60, with a standard deviation of 0.516, showing a notable difference in blood pressure levels. The decrease in blood pressure is associated with reduced cardiac workload, leading to a normalized heart rate and improved heart function. Reducing blood pressure which can also have an impact on reducing pulse rate can be done with non-pharmacological and pharmacological therapy (Puspitasari et al. 2023). Suggesting that Benson relaxation therapy not only reduces blood pressure but may also help in preventing the progression of hypertension.

The Benson Relaxation Technique is a non-pharmacological therapy that involves repeating specific words or phrases in a rhythmic pattern while cultivating a sense of surrender to a higher power and practicing deep breathing. This technique helps energize the body by allowing exhalation to release carbon dioxide (CO_2) and inhalation to provide oxygen, which is crucial for preventing brain tissue damage due to hypoxia. (Wartonah et al. 2022). When the brain receives an adequate supply of oxygen, it maintains a balanced state, leading to a general sense of relaxation in individuals. This state of relaxation is communicated to the hypothalamus, which then reduces the release of corticotropin-releasing factor (CRF). As a result, the pituitary gland is stimulated to increase the production of proopiomelanocortin (POMC), which subsequently boosts the production of enkephalins by the adrenal medulla (Khairiyah, Yuswar, and Purwanti 2022). Apart from that, the pituitary gland also produces β endorphine as a neurotransmitter. During Benson's

Table 2. Blood Pressure Category of Benson Relaxation Research Respondents on Blood Pressure in the Elderly with Hypertension (n=40)

Diastolic and Systolic Blood Pressure Categories	Treatment Group				Control Group			
	Pre Test		Post Test		Pre Test		Post Test	
	n	%	n	%	n	%	n	%
Normal	0	0,0	4	20,0	0	0,0	1	5,0
Pre Hypertension	8	40,0	11	55,0	4	20,0	6	30,0
Hypertension Grade 1	12	60,0	5	25,0	16	80,0	13	65,0
Hypertension Grade 2	0	0,0	0	0,0	0	0,0	0	0,0
Total	20	100	20	100	20	100	20	100
The normality test	0,000		0,005		0,000		0,000	

Table 3. Test The Effect of Benson Relaxation on the Blood Pressure Category of Older Adult with Hypertension

Variable	Group	Pretest (Mean ± SD)	Posttest (Mean ± SD)	Value Δ	P value
Diastolic and Systolic Blood Pressure Categories	Treatment Group	12,53±2,713	20,33±1,647	7,8	0,000 *
	Control Group	12,90±2,040	15,80±1,518	2,9	0,320 *
P value		0,550**	0,000**		

*Wilcoxon Signed Rank Test ** Mann Whitney Test

relaxation, the parasympathetic nerves are activated, which stimulates the decline in all functions increased by the sympathetic nervous system and stimulates the increase in all functions decreased by the sympathetic nerves (Hastuti et al. 2022). So that a mechanism occurs that can relax the body.

This relaxation technique can lead to a reduction in sympathetic nervous system activity, which in turn slightly dilates the arteries, enhancing blood circulation and improving oxygen delivery to all tissues, particularly peripheral tissues. As a result, blood pressure gradually stabilizes (Sudrajat and Wati 2023). This is supported by previous research on the effects of Benson relaxation on blood pressure in older adults with hypertension, which demonstrated a significant difference in blood pressure before and after the intervention (Kartikasari 2022). Therefore, based on both research findings and theoretical foundations, it can be concluded that Benson relaxation is effective in helping to reduce blood pressure in hypertensive patients, providing a non-pharmacological option for managing hypertension.

The research results showed that the two respondents, namely the treatment group and the control group, were in the age range of 60 to 65 years. As a person ages, the function of organs in the human body decreases (Lusiana et al. 2019). Changes in aging cause an increase in systolic blood pressure, an increase in mean arterial blood, an increase in pulse pressure, the aging process is associated with changes in the vascular system, heart and autonomic system (Nur, Khasanah, and Sukmaningtyas 2021). This incident causes blood vessels to lose sensitivity and elasticity of peripheral blood vessels for oxygenation which can cause blood pressure to rise due to increased resistance of peripheral blood vessels (Maghfiroh 2020; Rida 2019). A person who has entered old age from the age of 60-75 years is an age that is approaching the end of the cycle and the end of life will experience physical decline (Laily 2017). In this process, cumulative changes occur in living things, including cells and tissues that experience a decrease in the functional capacity of the heart, blood vessels, lungs, nerves and other body tissues (Cahyaningrum, Putri, and Dewi 2022). It can be concluded that age is one factor that cannot be denied for the majority of people who experience hypertension.

The study found that the majority of respondents in both groups were female. Gender is a significant factor that can influence blood pressure, with women being at an increased risk of hypertension, particularly after menopause (age 45 and older). Postmenopausal women typically experience lower estrogen levels, which is important because estrogen helps raise High-Density Lipoprotein (HDL) levels. HDL plays a crucial role in maintaining healthy blood vessels, so reduced estrogen after menopause contributes to the heightened risk of hypertension in women (Falah 2019). So the impact that will occur when HDL is low and Low Density Lipoprotein (LDL) is high is the occurrence of atherosclerosis so that blood pressure will be high (Siwi, Irawan, and Susanto 2020). In women who have experienced menopause, decreasing estrogen levels will also be followed by a decrease in HDL levels. If a healthier lifestyle or lifestyle is not followed, this will cause high blood pressure (Sundari and Hartutik 2023). Respondents in this study may also experience the impact of a decrease in estrogen followed by a decrease in HDL levels, so it can be seen that more women experienced hypertension than men in this study.

Based on educational and occupational characteristics, most of the two groups of respondents had elementary school education and worked as housewives. A person's education and occupation can be determining factors in the occurrence of hypertension (Siwi et al. 2020). Low

education will affect a person's work and level of knowledge in managing and managing healthy lifestyles, disease symptoms, and compliance with medical therapy (Widayanti and Soleman 2023). Stress caused by work piling up at home can also cause an individual's blood pressure to rise (Alvianti Anggi Tiastuty and Rahman Hidayat 2021). So, a person will be less able to manage the disease or symptoms that arise from the disease he is suffering from, meaning that someone does not know that the symptoms caused such as dizziness, nausea, vomiting, headaches, and visual disturbances are symptoms caused by hypertension (Senja and Prasetyo 2021). So many hypertension sufferers will experience an increase in blood pressure and an increase in the degree of hypertension, when they do not have sufficient education and knowledge and are stressed due to their work.

The results of the study showed that the characteristics of the respondents were based on the length of time they had suffered from hypertension and the medication consumed by both groups, namely the majority of perpetrators and controls were in the range of 3-7 years and all of them were taking antihypertensive medication. The length of time one suffers from an illness will have an impact on a person's ability to understand and respond to the illness so as to prevent complications (Pardede, Sianturi, and Veranita 2020). The results of research that has been carried out state that the length of time suffering from hypertension will affect a person's medication compliance (Ihwatun et al. 2020). The longer someone suffers from hypertension, the more likely they will not comply with the treatment they have been scheduled to undergo. This is because someone who takes antihypertensive medication every day will feel bored with the habit of having to depend on medication (Sari et al. 2023). Thus, with daily physical activity, individuals will feel dependent on the antihypertensive medication that they must take to carry out their activities and activities every day. Therefore, the large number of hypertensive patients undergoing treatment over a long period of time will affect the degree of health and recovery. The more the individual adheres to treatment, the better the degree of health the individual will get.

5. CONCLUSION

The Benson relaxation technique effectively reduces both diastolic and systolic blood pressure in hypertensive patients. This technique has been shown to lower hypertension levels, as evidenced by a shift from grade 1 hypertension to the prehypertension category in the majority of respondents following the intervention. These findings highlight the significant impact of Benson relaxation on blood pressure reduction in hypertensive patients.Comparative analysis between the intervention and control groups revealed substantial improvements in the intervention group both before and after the Benson relaxation technique. These results suggest that Benson relaxation is a valuable non-pharmacological therapy for managing hypertension and offers important insights for healthcare providers, especially nurses, in integrating complementary therapies into patient care. The study's findings support the development of Standard Operating Procedures (SOPs) for implementing such interventions in hospitals and other healthcare settings. Future research should focus on using updated instruments and methods in line with technological advancements and expanding the body of knowledge in nursing science.

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