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Effectiveness of Progressive Muscle Relaxation Therapy on Blood Pressure in Elderly Hypertension Sufferers

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Abstrak

Hipertensi merupakan salah satu masalah kesehatan yang banyak dialami secara global dan menjadi faktor utama penyebab penyakit jantung, stroke, serta kerusakan ginjal. Faktor-faktor seperti gaya hidup tidak aktif, pola makan yang tidak seimbang (kaya akan garam namun rendah kalium), dan stres berkepanjangan dapat memperburuk kondisi ini. Penelitian ini dilakukan untuk mengetahui perubahan rata-rata tekanan darah pada lansia sebelum dan sesudah diberi terapi PMR. Penelitian ini menerapkan desain kuantitatif dengan metode pra-eksperimental, menggunakan pendekatan kohort dan rancangan satu kelompok dengan pengukuran sebelum dan sesudah intervensi. Sebanyak 30 lansia penderita hipertensi dari Pusat Pelayanan Lansia Sosial Umum Turusgede, Rembang, dipilih sebagai sampel melalui teknik purposive sampling. Para peserta menerima terapi Progressive Muscle Relaxation (PMR) sebanyak tiga kali dalam satu minggu, masing-masing sesi berlangsung selama 10–15 menit. Tekanan darah diukur dua kali, yaitu sebelum dan setelah intervensi, menggunakan alat pengukur tekanan darah (sphygmomanometer). Data yang diperoleh kemudian dianalisis dengan uji Wilcoxon. Hasil penelitian menunjukkan rerata usia responden adalah 66,30 ± 8,10 tahun (95% CI: 63,27–69,33), dengan mayoritas berjenis kelamin perempuan (53,3%). Rerata tekanan darah sebelum intervensi adalah 143,33 mmHg dan median sesudah intervensi menurun menjadi 132,67 mmHg. Analisis statistik menunjukkan perbedaan signifikan sebelum dan sesudah intervensi ($p = 0,000$; $\alpha < 0,05$). PMR telah terbukti mampu menurunkan tekanan darah sistolik dan diastolik secara signifikan pada lanjut usia yang mengalami hipertensi. Sebagai pendekatan non-farmakologis, metode ini tergolong praktis, aman, dan mudah dijalankan, sehingga cocok digunakan secara rutin sebagai bagian dari upaya pengendalian tekanan darah pada lansia.

Kata Kunci: *Hipertensi, Lansia, Progressive Muscle Relaxation, Tekanan Darah*

Abstract

Hypertension is a major global health concern linked to heart disease, stroke, and kidney failure, often worsened by inactivity, poor diet, and chronic stress. This study assessed changes in average blood pressure among elderly hypertensive patients before and after PMR therapy. This study applied a basic quantitative approach using a one-group pre-test and post-test design. Thirty elderly people with hypertension were chosen from the Elderly Social Services Home in Turusgede, Rembang, using purposive sampling. The intervention involved progressive muscle relaxation (PMR), which was done three times over one week, with each session lasting 10-15 minutes. Blood pressure was measured before and after the intervention using a sphygmomanometer. Data analysis was conducted using the Wilcoxon signed-rank test. The average age of participants was 66.30 ± 8.10 years, with a 95% confidence interval ranging from 63.27 to 69.33 years. Most of the participants were female, comprising 53.3% of the sample. Before the intervention, the average systolic blood pressure recorded was 143.33 mmHg, which decreased to a median value of 132.67 mmHg following the therapy. Statistical analysis confirmed a significant change between the pre- and post-intervention readings ($p = 0.000$; $\alpha < 0.05$). PMR has been shown to effectively lower both systolic and diastolic blood pressure in older adults with hypertension. As a non-drug approach, it provides a straightforward, safe, and easily implementable technique that can be used regularly to aid in controlling blood pressure among the elderly.

Keywords: *Blood Pressure, Elderly, Hypertension, Progressive Muscle Relaxation*

INTRODUCTION

High blood pressure, or hypertension, is a major global health issue and a leading cause of heart disease, stroke, and kidney disorders. As of 2023, around 1.28 billion adults aged 30 to 79 were estimated to be living with hypertension, with the majority found in low- and middle-income nations. The likelihood of developing hypertension rises with age, affecting nearly 50% of individuals over the age of 50. This trend is also evident in Indonesia. Based on the 2018 Basic Health Research, the prevalence of hypertension among Indonesian adults aged 18 and above increased sharply from 25.8% in 2013 to 34.1% in 2018. The rates are particularly high among the elderly, with 55.23% of those aged 55–64, 63.22% of individuals aged 65–74, and 69.54% of those aged 75 and older affected by the condition (Kementrian Kesehatan Republik Indonesia, 2019).

The high prevalence of hypertension in the elderly is attributed to age-related physiological changes, including decreased arterial elasticity, endothelial dysfunction, and increased peripheral vascular resistance, all of which contribute to elevated blood pressure levels (Carey et al., 2018; Cheng et al., 2023). These changes are often compounded by sedentary lifestyles, dietary habits high in sodium and low in potassium, and chronic

psychological stress, which further exacerbate cardiovascular risk (Zhou et al., 2021). While pharmacological treatments remain the cornerstone of hypertension management, they have limitations. Antihypertensive medications can cause adverse effects such as dizziness, electrolyte imbalance, and renal impairment, which may lead to reduced adherence among older adults with polypharmacy or multiple comorbidities (Sheppard et al., 2022).

As a result, there is a growing interest in non-pharmacological interventions that are both safe and effective. Lifestyle modifications such as diet, exercise, mindfulness-based practices, and relaxation therapies are increasingly recognized as essential components of comprehensive hypertension management (Whelton et al., 2018). Among these, Progressive Muscle Relaxation (PMR) stands out as a practical and accessible technique that reduces sympathetic nervous system activity and enhances parasympathetic responses, thereby promoting cardiovascular homeostasis and lowering blood pressure The integration of such interventions is particularly important in geriatric care, where minimizing drug dependence and maximizing quality of life are primary goals (Yuniati & Sari, 2022).

Progressive Muscle Relaxation (PMR) is a drug-free method that involves intentionally tightening and then releasing specific muscle groups to promote relaxation and reduce stress levels. This approach is known to stimulate the parasympathetic nervous system, which helps lower heart rate and blood pressure. Recent research supports the effectiveness of PMR in reducing both systolic and diastolic blood pressure in individuals with hypertension, indicating its value as a complementary treatment option (Hafid, 2022; Yuniati & Sari, 2022). Considering the rising incidence of hypertension among older adults and the demand for safe, effective treatment alternatives, this study evaluates the impact of PMR on lowering blood pressure in elderly individuals with hypertension. The primary goal is to determine changes in average blood pressure levels before and after the application of PMR, highlighting its potential role as a supportive, non-pharmacological therapy.

RESEARCH METHOD

This research used a quantitative pre-experimental method with a cohort approach, utilizing a one-group pre-test and post-test design. The main goal was to examine the change in average blood pressure levels in elderly individuals diagnosed with hypertension following the implementation of Progressive Muscle Relaxation (PMR). Thirty elderly participants were recruited from the Social Services Home for the Elderly in Turusgede, Rembang, through purposive non-probability sampling.

The intervention consisted of Progressive Muscle Relaxation exercises administered three times over one week. Each session lasted approximately 10 to 15 minutes. The muscle groups

targeted during PMR included: (1) forehead and eye muscles; (2) cheek muscles; (3) muscles around the mouth; (4) anterior neck muscles; (5) shoulder muscles; (6) arm muscles; (7) chest and abdominal muscles; (8) pelvic muscles; (9) gluteal muscles; and (10) leg muscles. Blood pressure measurements were taken twice: once before the intervention and once after the participants had completed three PMR sessions. Measurements were conducted using a sphygmomanometer applied to the brachial artery of either the left or right arm, with results recorded in millimeters of mercury (mmHg). The data analysis was carried out using the Wilcoxon signed-rank method.

RESULTS AND DISCUSSION

Table 1 Respondents' Characteristics

Variable	Mean	Median	SD	Min-Max	95% CI *Lower-Upper*
Age*	66.30	68.50	8.10	50.00-79.00	63.27-69.33

Variable		n	%
Gender	Man	14	46.7
	Women	16	53.3
	Total	30	100.0

*The data was normally distributed

Table 1 indicates that the average age of participants was 66.30 years, with a standard deviation of 8.10 years and a 95% confidence interval between 63.27 and 69.33 years. The majority of the respondents were female, totaling 16 individuals or 53.3%.

Table 2 Blood Pressure Before and After Intervention

Blood Pressure	Mean	Median	SD	Min-Max	95% CI *Lower-Upper*	p-value
Pre*	143.33	140.00	19.71	100.00-180.00	135.97-150.69	0.000*
Post	132.67	130.00	15.96	110.00-170.00	126.71-138.63	

*The data was normally distributed

According to Table 2, the average systolic blood pressure prior to the intervention was 143.33 mmHg, with a standard deviation of 19.71 mmHg. After the intervention, the median systolic blood pressure dropped to 132.67 mmHg. Statistical analysis confirmed a significant difference between pre- and post-intervention values ($p = 0.000$; $\alpha < 0.05$), demonstrating

the intervention's effectiveness in lowering blood pressure.

DISCUSSION

Blood Pressure Before Given Progressive Muscle Relaxation

This study demonstrates that Progressive Muscle Relaxation (PMR) therapy significantly reduces systolic blood pressure in elderly individuals with hypertension. The observed decrease from a mean of 143.33 mmHg pre-intervention to a median of 132.67 mmHg post-intervention is statistically significant ($p = 0.000$; $\alpha < 0.05$), indicating the efficacy of PMR in managing hypertension among the elderly. These findings align with previous research highlighting the benefits of PMR in blood pressure regulation. Hijriana et al (2024) reported that PMR effectively stabilized blood pressure in hypertensive patients, attributing the therapy's ability to reduce bodily tension and elicit a relaxation response that slows heart rate and enhances blood circulation. Likewise, research conducted by Rosdiana & Cahyati (2019) demonstrated that Progressive Muscle Relaxation (PMR) significantly reduced both systolic and diastolic blood pressure in individuals with hypertension, highlighting its value as an alternative, non-drug-based treatment.

PMR decreases blood pressure by stimulating the parasympathetic nervous system, which in turn suppresses sympathetic activity, slows the heart rate, and promotes blood vessel dilation. This physiological response contributes to lower blood pressure levels (Wang et al., 2021). Moreover, PMR has been shown to alleviate stress and anxiety, factors that can exacerbate hypertension, thereby providing a holistic approach to blood pressure management. These findings have significant practical implications, particularly for elderly populations who may be more susceptible to the side effects of antihypertensive medications. PMR offers a safe, cost-effective, and easily implementable strategy for blood pressure control that can be incorporated into routine care for the elderly in various settings, including social service homes and community centers. However, this study's limitations include its pre-experimental design without a control group, which may affect the generalizability of the results. Upcoming studies are encouraged to employ randomized controlled trials with larger participant groups to confirm these results and examine the sustained impact of PMR on blood pressure and cardiovascular health in older adults.

Blood Pressure After Given Progressive Muscle Relaxation

The results of this study show that Progressive Muscle Relaxation (PMR) therapy effectively lowers systolic blood pressure in older adults with hypertension. The observed

decrease from a mean of 143.33 mmHg pre-intervention to a median of 132.67 mmHg post-intervention is statistically significant ($p = 0.000$; $\alpha < 0.05$), underscoring the efficacy of PMR in managing hypertension among the elderly. These results are consistent with previous research demonstrating the benefits of PMR in blood pressure regulation. For instance, Fauziah et al (2024) reported that PMR effectively stabilized blood pressure in hypertensive patients, attributing the therapy's ability to reduce bodily tension and elicit a relaxation response that slows heart rate and enhances blood circulation. In the same way, Gayatri et al (2023) reported that PMR significantly reduced both systolic and diastolic blood pressure among hypertensive patients, reinforcing its effectiveness as a non-drug therapeutic approach.

PMR lowers blood pressure by triggering the parasympathetic nervous system, which helps reduce sympathetic activity, slows the heart rate, and causes the blood vessels to widen. This physiological response contributes to lower blood pressure levels (Hasina et al., 2024). Moreover, PMR has been shown to alleviate stress and anxiety, factors that can exacerbate hypertension, thereby providing a holistic approach to blood pressure management. These findings have significant practical implications, particularly for elderly populations who may be more susceptible to the side effects of antihypertensive medications. PMR offers a safe, cost-effective, and easily implementable strategy for blood pressure control that can be incorporated into routine care for the elderly in various settings, including social service homes and community centers. However, this study's limitations include its pre-experimental design without a control group, which may affect the generalizability of the results. Further studies should employ randomized controlled trials with more extensive sample sizes to confirm these results and investigate the long-term impact of PMR on blood pressure.

CONCLUSION

Progressive Muscle Relaxation (PMR) has been shown to effectively lower both systolic and diastolic blood pressure in older adults with hypertension. This non-pharmacological intervention offers a simple, safe, and accessible method that can be applied routinely to support blood pressure management in the elderly.

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