Easta Journal of Innovative Community Services
Vol. 5, No. 01, Oktober 2026, pp. 24-34
ISSN: 2985-6159, DOI: 10.58812/ejincs.v5i01

Optimization of Anxiety Management for Hypertensive Patients via Education and Progressive Muscle Relaxation (PMR) Therapy

Tata Mahyuvi[1*], Difran Nobel Bistara[2], Erika Martining Wardani[3]
[1,2,3] Faculty of Nursing and Midwivery, Universitas Nahdlatul Ulama Surabaya, Surabaya, Indonesia
**Corresponding author*
E-mail: t-mahyuvi1922@unusa.ac.id (Tata Mahyuvi)*

Article History:
Received: July, 2026
Revised: October, 2026
Accepted: October, 2026

Abstract: *Hypertension is a global health challenge frequently associated with psychological distress. Unmanaged anxiety triggers sympathetic nervous system hyperactivity, which further elevates blood pressure and complicates management. Integrating health education with psychomotor interventions like Progressive Muscle Relaxation (PMR) is essential for community-based care. This study aimed to analyze the effectiveness of combining health education and PMR therapy in reducing anxiety levels among patients with hypertension. This pre-experimental study used a One-Group Pre-Test–Post-Test design involving 20 hypertensive patients selected via total sampling in Sumurlo Hamlet, Blendis Village, Tulungagung Regency. The intervention was systematically implemented across two sessions, combining oral hypertension education and guided practical training of PMR. Data were collected using the standardized Zung Self-Rating Anxiety Scale (ZSAS) questionnaire before and after the program. The data were analyzed using the Wilcoxon Signed-Rank Test α = 0.05. Prior to the intervention, 100% of the respondents experienced anxiety, with 55% at a moderate level and 20% at a severe level. Post-intervention, a significant clinical shift occurred: 75% of the respondents reported being completely free from anxiety, while moderate and severe anxiety levels dropped to 0%. Statistical analysis revealed a significant decrease in anxiety scores following the intervention with a ρ value = 0,000. The combination of structured health education and complementary PMR therapy is highly effective in eliminating moderate-to-severe anxiety among hypertensive individuals. This dual intervention provides a costless, accessible, and scalable non-pharmacological strategy suitable for community-based chronic disease management.*

Keywords: *Anxiety; Education; Hypertensive; Progressive Muscle Relaxation (PMR)*

Introduction

Hypertension remains one of the most critical global health challenges in the twenty-first century, frequently dubbed "the silent killer." This chronic condition triggers various fatal cardiovascular complications, such as stroke, myocardial infarction, and renal failure, if it is not managed adequately (Mahyuvi, 2025). Globally, the prevalence of hypertension continues to escalate, with estimations indicating that more than 1.28 billion adults worldwide are currently living with this condition (Leung et al., 2022).

In Indonesia, national data demonstrate that the prevalence of hypertension among the population aged over 18 years has reached an alarming rate of approximately 34.1%. This statistical trend shows a continuous upward trajectory. This rise is heavily driven by shifting toward sedentary lifestyles, an aging population, and elevated psychological stress levels across both urban and rural communities (Kemenkes RI, 2023).

The impact of hypertension manifests not only as physical impairments but also significantly compromises the psychological well-being of patients. The diagnosis of a chronic illness necessitating long-term pharmacological treatment, the constant threat of sudden complications, and subsequent limitations in daily activities frequently provoke negative psychological responses. Prominent among these debilitating responses is anxiety, with global estimates indicating that approximately 30% to 40% of hypertensive patients concurrently suffer from moderate-to-severe anxiety disorders (Nugraha et al., 2026).

The relationship between hypertension and anxiety is fundamentally bidirectional and reciprocal. When a patient experiences anxiety, the body activates the sympathetic nervous system and the hypothalamic-pituitary-adrenal (HPA) axis. This physiological activation triggers the pathological release of stress hormones, specifically adrenaline and cortisol, which directly induce vasoconstriction and elevate the heart rate (Mahyuvi et al., 2023). Consequently, unmanaged anxiety severely exacerbates blood pressure control, decreases medication adherence, and drastically diminishes the patient's overall quality of life (Cahyono et al., 2024).

Therefore, comprehensive interventions must not solely focus on blood pressure-lowering pharmacological therapies. Instead, clinical approaches must concurrently address structured health education and psychological management strategies (Dewanti & Supratman, 2020). Within the pillars of hypertension management, health education plays a fundamental role as an initial step to improve patient health literacy, modify maladaptive behaviors, and establish effective coping

mechanisms. However, verbal education alone often proves less adaptive if it is not integrated with psychomotor skills that patients can practice independently to achieve immediate physical and mental stress reduction (Abbasiah et al., 2023).

Based on recent Evidence-Based Nursing (EBN) principles, one of the most effective, safe, and low-cost non-pharmacological interventions to alleviate anxiety is Progressive Muscle Relaxation (PMR) therapy (Nasihin et al., 2022). PMR operates by training patients to systematically tense and relax specific muscle groups in an alternating, sequential manner. The underlying physiological mechanism of PMR stimulates parasympathetic nervous system activity, effectively serving as a regulatory brake against the overactive sympathetic nervous system during states of anxiety (Isrianawati et al., 2023).

A substantial body of recent clinical research confirms that routine PMR exercises stimulate endorphin release and significantly reduce blood cortisol levels. This biochemical shift is clinically proven to lower anxiety scores while stabilizing both systolic and diastolic blood pressure in hypertensive individuals (Desnita et al., 2023). The integration of comprehensive health education regarding the disease alongside self-directed PMR training is anticipated to produce a synergistic effect, enabling patients to comprehend their illness cognitively while possessing self-care clinical skills to control anxiety at home (Kusumawaty, 2021). Grounded in this phenomenon, this study was conducted to analyze the effectiveness of combining health education and Progressive Muscle Relaxation (PMR) therapy in reducing anxiety levels among patients with hypertension.

Method

This research, integrated within a community service program, was conducted on July 5, 2026, at RT 017/RW 006, Sumurlo Hamlet, Blendis Village, Gondang District, Tulungagung Regency. This study employed a quantitative approach with a pre-experimental design, specifically utilizing a One-Group Pre-Test–Post-Test design. The primary focus of the study was to evaluate the impact of combining health education and Progressive Muscle Relaxation (PMR) therapy interventions on reducing anxiety levels among hypertensive patients.

To protect the fundamental human rights and dignity of all participants, this study strictly adhered to nursing ethical principles, including respect for persons (respecting autonomy through the completion of informed consent), beneficence (maximizing the benefits of the intervention), non-maleficence (ensuring no harm to the subjects), and justice (fairness in treatment and subject selection). The principles

of anonymity and confidentiality were also rigorously maintained by applying alphanumeric coding across all instrument sheets without including the respondents' actual identities.

The study population and subjects comprised all hypertensive individuals within the Blendis Village, totaling 20 participants (n = 20). Sample selection was carried out using a non-probability sampling approach via total sampling technique to ensure that all participants met the predetermined inclusion criteria. In the conceptual framework of this study, the combination of health education and PMR therapy was positioned as the independent variable, while the anxiety level served as the dependent variable.The implementation of the program was systematically divided into three main phases:

1. Preparation Phase

   This phase involved conducting a problem analysis using primary and secondary data at the research site, drafting the community service proposal, preparing the necessary infrastructure (educational media, accommodations, and consumption), and coordinating technical logistics with the local neighborhood head.

2. Implementation Phase (Two-Session Intervention)

   Participants were voluntarily mobilized by the neighborhood head at a designated location. The intervention was delivered in adaptive Indonesian to ensure optimal comprehension and was divided into two main sessions:

   a. Session 1: Administration of the initial screening (baseline data collection), followed by health education covering an overview of hypertension.
   b. Session 2: Delivery of advanced health education combined with practical training on the PMR therapy intervention using lecture and interactive discussion methods over two cycles.

3. Evaluation Phase

   A final measurement (evaluation) of the respondents' anxiety levels was conducted after they received the comprehension reinforcement interventions and completed independent demonstrations of PMR.

The instrument used to measure anxiety levels during both the pre-test and post-test phases was the standardized Zung Self-Rating Anxiety Scale (ZSAS) questionnaire. The data management process initiated with an editing stage to verify the completeness of the questionnaire responses, thereby minimizing the risk of data bias. Subsequently, the researcher quantified the data, categorized the anxiety levels, and tabulated all findings into a master table. To verify the statistical significance of

the combined health education and PMR therapy in reducing anxiety, data were analyzed using the non-parametric Wilcoxon Signed-Rank Test. This test was selected to analyze changes in the mean anxiety scores between the pre-test and post-test phases within a single group. All statistical analyses were executed using computer software, with the threshold for statistical significance set at $\alpha = 0.05$ (Nursalam, 2020). The entire community service and research program was successfully and safely implemented in accordance with the planned timeline and target indicators.

Result

Table 1. Data on Characteristics of Respondents Gender, Age, Education and Occupation of Hypertensive Patients

Data Characteristic	Intervention	
	n	**%**
Gender		
Male	16	80
Women	4	30
Total	**20**	**100**
Age		
20-25 years	1	5
31-40 years old	9	45
41-50 years old	4	20
> 50 years	6	30
Total	**20**	**100**
Education		
Basics	17	85
Intermediate	3	15
Total	**20**	**100**
Jobs		
Farmer	10	50
Self-employed	8	40
Not working	2	10
Total	**20**	**100**

Table 2. Anxiety of Hypertensive Patients Before and After Health Education and Progressive Muscle Relaxation

Anxiety	Pre		Post		Uji Wilcoxon
	f	**%**	**f**	**%**	
Intervention Health Education and Progressive Muscle Relaxation					ρ value = 0,000
Not Anxious	-	-	15	75	

Anxiety	Pre		Post		Uji Wilcoxon
	f	%	f	%	
Lightweight	5	25	5	25	
Medium	11	55	-	-	
Weight	4	20	-	-	
Total	**20**	**100**	**20**	**100**	

Discussion

Based on the bivariate analysis using the Wilcoxon signed-rank test, a ρ value= 0,000 was obtained, indicating that the implementation of health education and complementary Progressive Muscle Relaxation (PMR) therapy was significantly effective in reducing anxiety levels among hypertension patients in RT 017/ RW 006, Sumurlo Hamlet, Blendis Village. Prior to the intervention, all respondents (100%) experienced varying degrees of anxiety, ranging from mild to severe. However, following the health education and PMR training, a massive clinical shift occurred, where the majority of respondents (75%) were reported to be completely free from anxiety. This proves that combining a cognitive approach through health education with a physical approach through progressive muscle relaxation exerts a potent therapeutic effect on the psychological status of hypertensive patients (Fitriani et al., 2025).

Anxiety in patients with hypertension is a psychological manifestation intricately linked to their physiological state. Pathophysiologically, anxiety triggers hyperactivity of the Hypothalamic-Pituitary-Adrenal (HPA) axis and the sympathetic nervous system. This stimulation elevates the secretion of stress hormones, such as cortisol, adrenaline, and noradrenaline, into the bloodstream, consequently increasing heart rate and systemic vasoconstriction. This vasoconstrictive state exacerbates high blood pressure in hypertensive patients, which subsequently fuels new anxiety due to the fear of fatal complications like strokes or heart attacks. Therefore, breaking the cycle of anxiety through non-pharmacological interventions is crucial to stabilizing the patient's hemodynamics (Mahyuvi et al., 2026).

The health education provided in this program serves as a pillar for the cognitive restructuring of hypertensive patients. Anxiety is frequently rooted in a lack of knowledge regarding disease progression, dietary restrictions, and the uncertainties of living with a chronic illness (Febiola & Hudiawati, 2024). By delivering structured educational materials on hypertension management, respondents' understanding increased, thereby minimizing negative perceptions or false threats regarding their condition. Once patients are cognitively reassured that

hypertension can be managed with proper lifestyle modifications, the anxiety stemming from the unknown naturally diminishes significantly (Anggraeni & Mariyati, 2021).

On the other hand, Progressive Muscle Relaxation (PMR) works directly on the neuromuscular system to induce a relaxation response (Pratiwi, 2019). This technique, which involves systematically tensing and relaxing specific muscle groups, stimulates the parasympathetic nervous system to override the previously hyperactive sympathetic system. As the body enters a state of deep relaxation, the secretion of stress hormones like cortisol and catecholamines is inhibited, while endorphin production increases (Burhan et al., 2022). This reduction in stress hormones alleviates physical tension and lowers the heart rate, which respondents subjectively experience as a reduction in fear, restlessness, and tension, thereby effectively dampening anxiety (Abrar et al., 2024).

Examining the demographic data in Table 1, the majority of the targeted hypertensive patients were male, accounting for 16 individuals (80%). Epidemiologically, from early to middle adulthood, men exhibit a higher risk of hypertension compared to women, which is often driven by lifestyle factors such as smoking habits, high coffee consumption, and elevated workplace stress. The socio-economic stressors experienced by men as primary breadwinners frequently trigger emotional responses in the form of anxiety. Therefore, the efficacy of PMR therapy within this male-dominated respondent group indicates that this physical relaxation technique is highly adaptive and well-accepted by men for reducing daily stressors (Nasihin et al., 2022).

In terms of age, the respondents were dominated by the productive age group, specifically 31–40 years old with 9 individuals (45%), and those over 50 years old with 6 individuals (30%). The 31–40 age bracket represents a peak phase for career development and family rearing, where mental burdens regarding future economic stability are exceptionally high. A diagnosis of hypertension during these productive years often shocks patients, triggering moderate (55%) to severe (20%) anxiety prior to the intervention. The application of PMR in this productive age group yielded excellent outcomes, as they possess the motor skills and cognitive capacity necessary to follow and perform the muscle relaxation movements independently and disciplinedly (Anggraeni & Mariyati, 2021).

The educational background of the respondents at the program site was predominantly classified as primary education, representing 17 individuals (85%). This lower level of formal education correlates linearly with limited access to and capacity for processing complex health information independently. This baseline

explains why the respondents' anxiety levels before the intervention were mostly moderate to severe, due to a deficiency in health literacy regarding hypertension mitigation. The success of this intervention demonstrates that educational methods packaged simply, interactively, and combined with direct PMR demonstrations can successfully overcome basic educational barriers, ensuring that the program's core messages are effectively delivered and applied (Anggraeni & Mariyati, 2021).

Occupational factors also played a significant role in the initial anxiety levels of the sufferers, given that most respondents worked as farmers (50%) and entrepreneurs (40%). Farming involves strenuous physical labor under intense sunlight, which can induce acute physical exhaustion. Chronic physical fatigue, if not balanced with adequate relaxation, can manifest as skeletal muscle tension and psychological anxiety. When taught the PMR technique, farmers were able to systematically relax large muscle groups that had become tense from agricultural labor. This physical relaxation offered instant rejuvenation, lowering the threshold for emotional stress caused by daily physical workloads (Abbasiah et al., 2023).

Before the intervention was conducted, 5 respondents (25%) were recorded as experiencing mild anxiety. Post-intervention, after implementing health education and PMR, the number of respondents in the mild anxiety category remained unchanged at 5 individuals (25%). This stability indicates a psychological shift among the respondents who previously suffered from moderate and severe anxiety. Those who initially fell into higher anxiety brackets experienced a reduction in symptoms down to a mild level, while the majority of others shifted directly into the non-anxious category. This reinforces the evidence that PMR works progressively in reducing anxiety, depending on the baseline severity of stress experienced by each individual (Abdelsaid et al., 2019).

The most prominent phenomenon resulting from this community service program was the complete eradication of moderate anxiety (dropping from 55% to 0%) and severe anxiety (dropping from 20% to 0%) post-intervention. Prior to the program's commencement, severe and moderate anxiety dominated the psychological landscape of hypertensive patients in Sumurlo Hamlet. This extreme decline to 0% confirms complementary nursing theories, which state that the human body possesses an innate self-healing capacity against emotional stress when provided with appropriate and continuous relaxation stimuli. The elimination of severe anxiety consequently minimizes the risk of acute hypertensive crises triggered by spontaneous emotional spikes (Cahyono et al., 2024).

The success of the program in RT 017/ RW 006, Sumurlo Hamlet, is also attributed to the applicable and cost-effective nature of PMR therapy. This

complementary therapy is completely costless, requires no specialized equipment, and can be practiced independently by hypertensive patients amidst their daily routines, whether before sleeping or while resting after working in the fields. Within the context of community nursing, this empowerment approach through PMR is ideal because it fosters long-term independence among health volunteers (kader) and patient families, ensuring that the psychological management of hypertensive patients no longer relies solely on anxiolytic medications (Mahyuvi et al., 2022).

Overall, the integration of health education and PMR therapy within the framework of community empowerment addresses the holistic bio-psycho-socio-spiritual needs of hypertensive patients. Through education, the cognitive-social dimensions of the patients are fulfilled, while PMR concurrently addresses the biological-psychological dimensions (muscle relaxation and anxiety reduction) (Trilestari et al., 2025). These findings support holistic nursing theories, which assert that blood pressure stabilization in chronic hypertensive patients cannot be optimally achieved without proper mental health management. Thus, the synergy of these two interventions is scientifically proven to be an effective solution for mitigating anxiety among hypertensive patients in rural areas characterized by lower-middle socioeconomic backgrounds.

Conclusion

Based on the implementation of this community service program, it can be concluded that the community empowerment approach, integrating health education with complementary Progressive Muscle Relaxation (PMR) therapy, is highly effective in reducing anxiety levels among patients with hypertension in RT 017/ RW 006, Sumurlo Hamlet, Blendis Village, Gondang District, Tulungagung Regency. This non-pharmacological intervention provides a scalable and accessible method for community-based hypertension management.

Acknowledgements

The authors express their sincere gratitude to all parties who supported this community service and research project. Special recognition is extended to Universitas Nahdlatul Ulama Surabaya for its institutional support, as well as to all community members who voluntarily participated as respondents in this study.

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