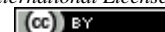


# The Effect of Progressive Muscle Relaxation Therapy on Sleep Quality in Elderly Hypertensive Patients

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## ABSTRACT

Hypertension causes sleep quality disturbances. A cost-effective and accessible intervention for sleep quality issues is progressive muscle relaxation therapy, a non-pharmacological approach that can improve sleep quality by alleviating negative feelings and promoting comfort and relaxation in the muscles. The objective of this study was to determine the effect of progressive muscle relaxation therapy on the sleep quality of elderly hypertensive patients at UPT Puskesmas Babakan Sari RW 14, Bandung City. This study employed a quasi-experimental design with a one-group pre-post test. The population consisted of 118 hypertensive patients, and accidental sampling was used, resulting in 15 respondents visited at their homes. The sleep quality was measured using the PSQI questionnaire. Data analysis included univariate analysis using frequency distribution and bivariate analysis using the paired samples T-Test. Results showed that the average PSQI score before the intervention was 9.93, which decreased to 4.0 after the intervention. The paired samples T-Test with T value of 6.615 (df=34) and a correlation of 0.770 and a significance level of 0.000 ( $P<0.05$ ), indicating a significant effect of progressive muscle relaxation on sleep quality. There is an effect of progressive muscle relaxation therapy on the sleep quality. Hypertensive patients are encouraged to continue practicing progressive muscle relaxation weekly to improve sleep quality and help control blood pressure.

## 1. Introduction

Hypertension is a prevalent medical condition among the elderly, significantly impacting various aspects of health, including sleep quality [1]. Studies indicate that nearly 50% of individuals with hypertension experience sleep disturbances, which can exacerbate their overall health [2]. These disturbances not only diminish the quality of life but also heighten the risk of cardiovascular complications [3], [4].

Progressive muscle relaxation therapy (PMR) has emerged as a promising non-pharmacological intervention for improving sleep quality [5]. PMR involves a systematic approach to relaxing muscle groups, which can reduce tension and foster relaxation, ultimately enhancing sleep quality [6]. Previous research has shown that PMR can be effective in mitigating sleep disturbances in various populations, suggesting its potential benefits for elderly hypertensive

patients [7],[8],[9]. Given the critical relationship between hypertension and sleep quality, and the effectiveness of PMR as an intervention. The research gap in this study is that previous research has not specifically examined the effects of Progressive Muscle Relaxation (PMR) on the population in the Babakan Sari area. Additionally, this study is unique because it employs a systematic and structured approach to PMR, which has not been widely explored in the context of this population. This study aims to investigate the impact of progressive muscle relaxation therapy specifically on the sleep quality of elderly hypertensive patients at Puskesmas Babakan Sari, Bandung City. Understanding this relationship can provide valuable insights for improving health outcomes in this vulnerable population.

The primary purpose of this study is to assess the effect of progressive muscle relaxation therapy on the sleep

quality of elderly hypertensive patients. Additionally, the study seeks to identify changes in sleep quality before and after the implementation of PMR, providing a clearer understanding of its potential benefit.

## 2. Research Method

### 2.1. Study Design

This study utilized a quasi-experimental design with a one-group pre-posttest approach. This method allows for the evaluation of changes in sleep quality among the same group of participants before and after the intervention, providing insights into the effects of progressive muscle relaxation therapy (PMR).

### 2.2. Participants

The population for this study consisted of 118 hypertensive patients. The accidental sampling method was used in this study by selecting 15 respondents from a population, based on their availability and willingness to participate. This technique was chosen because it is practical and allows the researcher to easily access respondents in situations that require a quick approach. To minimize potential bias, the intervention was carried out at the respondents' homes, creating a comfortable and natural environment, and reducing the likelihood of external stressors that could affect the study's results. These respondents were visited at their homes to ensure a comfortable environment for the intervention.

### 2.3. Intervention: Progressive Muscle Relaxation Therapy

The PMR intervention was conducted over a period of four weeks. Participants engaged in PMR sessions twice a week, with each session lasting approximately 30 minutes [10]. The sessions were conducted by trained facilitators who guided the participants through the following steps:

1. **Introduction:** A brief explanation of PMR and its benefits.
2. **Guided Relaxation:** Participants were instructed to sit or lie down in a comfortable position. They were then guided through a systematic process of tensing and relaxing various muscle groups, starting from the toes and progressing to the head.
3. **Breathing Techniques:** Deep breathing exercises were incorporated to enhance relaxation.
4. **Feedback:** At the end of each session, participants were encouraged to share their experiences, which helped reinforce the practice.
5. **To ensure reproducibility,** detailed session protocols, including scripts for guidance and timing, were provided to the facilitators [11], [4], [12].

### 2.4. Measurement of Sleep Quality

The Pittsburgh Sleep Quality Index (PSQI) questionnaire was used to assess sleep quality before and after the intervention [1], [13]. The PSQI is a validated instrument that evaluates sleep quality based on seven components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction. Each component is scored from 0 to 3, with lower scores indicating better sleep quality [14].

### 2.5. Data Analysis

Data analysis was performed using statistical software. Univariate analysis included frequency distribution to summarize the demographic characteristics of the participants. Bivariate analysis was conducted using the paired samples T-Test to compare the sleep quality scores before and after the intervention. A significance level of  $p < 0.05$  was used to determine statistical significance [13], [15].

## 3. Result and Discussion

This study discusses the results regarding the effect of progressive muscle relaxation therapy on sleep quality at the Babakan Sari Community Health Center, RW 14, Bandung City, conducted from July 29 to August 18, 2024. The total number of respondents in this study was 15 individuals. The results and discussions will be presented in table form to clarify the frequency and presentation of data, which consists of the general characteristics of the respondents, sleep quality, and the effects of progressive muscle relaxation.

### 3.1. Respondent Characteristics

Table 1. Respondent Characteristics

Characteristic	Treatment Frequency	%
Age		
65-74 (Elderly)	8	53.3
75-90 (Old Elderly)	7	46.7
Total	15	100.0
Gender		
Male	2	13.3
Female	13	86.7
Total	15	100.0
Occupation		
Employed	5	33.3
Unemployed	10	66.7
Total	15	100.0
Income		
<Minimum Wage	15	100.0
Total	15	100.0
Education		
Low (Elementary-Junior High)	11	73.4
High (Senior High/Vocational)	4	26.7
Total	15	100.0

Based on Table 1, the frequency by age indicates that most of the treatment group (53.3%) consists of elderly individuals (65-74 years old), totaling 8 individuals. The frequency by gender shows that nearly all (86.7%) of the treatment group, totaling 13 individuals, are female. The

frequency by occupation indicates that most (66.7%) of the treatment group, totaling 10 individuals, are unemployed. The income frequency reveals that all (100%) of the treatment group, totaling 15 individuals, have an income below the minimum wage. The frequency by education level indicates that in both the treatment and control groups, most (73.4%) consist of individuals with low education levels.

### 3.2. Overview of the Mean Sleep Quality (PSQI)

Table 2. Overview of the Mean Sleep Quality

	Mean $\pm$ SD	Min-Max
Before	9.930 $\pm$ 3.058	4-16
After	4.000 $\pm$ 1.414	2-6
Total	15.000	15

Table 2 shows the mean sleep quality before progressive muscle relaxation, with a mean of 9.93 and a standard deviation of 3.058, with the lowest score being 4 and the highest being 16. After the intervention, the mean value decreased to 4.00, with a standard deviation of 1.414, where the lowest score was 2 and the highest was 6.

### 3.3. Sleep Quality Overview

Table 3. Sleep Quality Before and After

Sleep Quality	Count	%	Sleep Quality	Count	%
Pre			Post		
Good	1	6.7	Good	12	80.0
Poor	14	93.3	Poor	3	20.0
Total	15	100.0	Total	15	100.0

Table 3 shows the distribution of sleep quality among respondents before the intervention, where nearly all (93.3%) or 14 respondents experienced poor sleep quality. After the intervention, the majority (80%) or 12 respondents experienced good sleep quality.

### 3.4. Effects of Progressive Muscle Relaxation on Sleep Quality

Table 4. Effects of Progressive Muscle Relaxation on Sleep Quality

Sleep Quality	t	df	Correlation	Sig. (2-tailed)
Pre-test – Post-test	6.615	14	0.77	0

Table 4 presents the results of the Paired Samples T-Test, which shows a calculated t-value of 6.615 (df=14). Additionally, a correlation coefficient of 0.770 was obtained, with a significance value (Sig.) of 0.000 ( $P < 0.05$ ). Statistically, this indicates that there is a significant difference in sleep quality before and after the progressive muscle relaxation intervention.

### 3.5. Discussion

The findings of this study provide compelling evidence that progressive muscle relaxation therapy (PMR) significantly improves sleep quality among elderly hypertensive patients. Prior to the intervention, a staggering 93.3% of respondents reported poor sleep quality, with an average Pittsburgh Sleep Quality Index (PSQI) score of 9.93. This aligns with previous studies that indicate a high prevalence of sleep disturbances in

hypertensive populations, often attributed to increased anxiety and stress levels associated with managing chronic conditions [16]. These initial results highlight the critical need for effective, non-pharmacological interventions to address sleep issues in this demographic [17].

The demographic data from this study reveal significant insights into the characteristics of the treatment group. With 53.3% of participants aged 65-74 years, this age cohort is particularly vulnerable to sleep disturbances, primarily due to age-related physiological changes, such as alterations in circadian rhythms and a decrease in sleep efficiency [5]. Previous research supports this observation, indicating that older adults frequently experience sleep problems, which can adversely affect their overall health and quality of life [11], [18]. Understanding these demographic nuances is crucial for tailoring interventions that meet the specific needs of elderly patients.

The predominance of female participants (86.7%) further highlights a critical aspect of sleep quality research. Women are known to report poorer sleep quality than men, often due to hormonal fluctuations related to menopause and caregiving responsibilities [18]. Studies have shown that women tend to experience more anxiety and depressive symptoms, which can contribute to sleep disturbances [19]. This finding underscores the need for gender-sensitive approaches in managing sleep quality, particularly in elderly populations where these factors are compounded by the challenges of aging.

Additionally, the economic status of the participants presents another layer of complexity in understanding sleep quality. With 66.7% of the respondents unemployed and all earning below the minimum wage, these socioeconomic factors are likely contributing to their heightened stress and anxiety levels [20]. Research indicates that lower socioeconomic status is associated with poorer sleep quality, as financial stressors can lead to chronic anxiety and hinder the ability to engage in healthy sleep practices [14]. This situation emphasizes the importance of addressing socioeconomic determinants of health when designing interventions for sleep improvement.

The findings from this study are consistent with previous literature that suggests a comprehensive approach is necessary to improve sleep quality among elderly patients. For instance, incorporating psychosocial support alongside relaxation techniques, such as progressive muscle relaxation therapy (PMR), may enhance the overall effectiveness of sleep interventions [21], [22]. The combination of addressing both psychological and physiological aspects can help mitigate the multifaceted issues contributing to poor sleep in this demographic.

In conclusion, the demographic characteristics of the treatment group highlight significant factors influencing sleep quality in elderly hypertensive patients. As the study demonstrates, age, gender, and socioeconomic status are critical elements that healthcare providers must consider when designing interventions. Future research should aim to explore these variables in greater depth and consider how integrative approaches can better support this vulnerable population. By addressing these multifactorial influences, we can enhance the effectiveness of interventions like PMR and ultimately improve the health outcomes for elderly individuals struggling with hypertension and sleep disturbances.

After the implementation of PMR, the majority of participants (80%) experienced a notable improvement in sleep quality, as evidenced by a reduction in the mean PSQI score to 4.00. This marked shift underscores the potential of PMR to alleviate the physiological and psychological stressors that contribute to poor sleep. By engaging in systematic relaxation techniques, participants were able to reduce muscle tension and foster a state of relaxation, which is essential for promoting restorative sleep. This finding supports the notion that interventions focusing on relaxation can be instrumental in managing sleep disturbances, particularly among those with chronic health conditions.

Statistical analysis further confirmed the efficacy of PMR, with a T value of 6.615 and a significance level of 0.000 ( $P < 0.05$ ). This robust statistical evidence indicates that the observed changes in sleep quality were not due to chance, reinforcing the reliability of PMR as an intervention. The strong correlation coefficient of 0.770 suggests a significant relationship between the application of PMR and improvements in sleep quality. These results align with other research that advocates for the use of relaxation techniques in clinical settings, emphasizing their role in enhancing overall well-being [23].

Despite the overall positive outcomes, it is important to acknowledge the variability in individual responses to PMR. While the majority experienced significant improvements, a few participants did not report substantial changes in their sleep quality. This discrepancy may stem from several factors, including personal stressors, comorbid conditions, or variations in individual adherence to the PMR technique. Future studies should explore these variables to understand better the barriers that some patients may face in achieving optimal results from relaxation therapies. A personalized approach that tailor's interventions to individual needs may enhance efficacy and engagement [24].

In conclusion, this study highlights the importance of integrating progressive muscle relaxation therapy into care strategies for elderly hypertensive patients. Given the significant improvements in sleep quality observed, healthcare providers should consider recommending

PMR as a viable intervention. Regular practice of PMR can not only enhance sleep quality but also contribute to better management of hypertension by reducing stress levels. Continued research in this area will be essential for establishing comprehensive guidelines that incorporate relaxation techniques into clinical practice, ultimately improving health outcomes for patients with chronic conditions. By fostering an environment that supports non-pharmacological interventions, we can enhance the quality of life for those affected by hypertension and related sleep disturbances [23].

#### **4. Conclusion**

In conclusion, this study provides strong evidence that progressive muscle relaxation therapy (PMR) significantly enhances sleep quality in elderly hypertensive patients. These findings suggest that healthcare providers should integrate PMR into standard care for elderly hypertensive patients. By promoting relaxation and reducing muscle tension, PMR improves sleep quality and helps alleviate stress from managing chronic conditions.

The positive outcomes of this study suggest that PMR can be easily implemented in community health programs, outpatient settings, and at home, offering an accessible and cost-effective option for improving patient quality of life without relying on pharmacological treatments. Practical recommendations for implementing the research findings Healthcare providers should consider integrating PMR into routine care for elderly hypertensive patients.

Future studies should investigate the impact of variables such as adherence to the technique, comorbid conditions, and individual psychological profiles on the efficacy of PMR. In summary, continued exploration in this field will be essential for developing comprehensive, integrative strategies that address both sleep disturbances and hypertension, ultimately improving health outcomes for this demographic.

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