



# The Effectiveness of Progressive Muscle Relaxation Therapy and Guided Imagery Techniques for Reducing Blood Pressure in Hypertension Patients

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## Abstract

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**BACKGROUND:** Hypertension is abnormally high blood pressure. The number of hypertensive people continues to increase every year. It is estimated that in 2025 there will be 1.5 billion people affected by hypertension, and 10.44 million people die each year due to hypertension and its complications.

**AIM:** To determine the effectiveness of progressive muscle relaxation therapy and guided imagination techniques in reducing blood pressure in patients with hypertension.

**METHODS:** This study used a quasi-experimental methodology with a two-group pretest and posttest design, as well as a large sample of 36 respondents divided into two groups: progressive muscle relaxation therapy and guided imagining approaches. Every day for 6 days, each group received 15 min of treatment. Blood pressure was measured before and after each treatment.

**RESULTS:** The results of the study using the Friedman, Wilcoxon, Kruskal-Wallis, and Mann-Whitney tests showed that systolic and diastolic blood pressure decreased in progressive muscle relaxation therapy by 9.89 mmHg and 7.73 mmHg ( $p = 0.000$   $\alpha < 0.05$ ) and technique guided imagination by 4.2 mmHg and 3.2 mmHg ( $p = 0.000$   $\alpha < 0.05$ ).

**CONCLUSION:** The progressive muscle relaxation therapy was more effective than the guided imagination technique in reducing blood pressure in patients with hypertension. As a nurse, it is hoped that they can apply therapies such as progressive muscle relaxation therapy and guided imagination techniques as an alternative to nonpharmacological therapy in handling hypertension clients.

## Introduction

Hypertension is a health disorder that is still being discussed by people around the world because it is known as a disease that kills secretly. When hypertension strikes without warning, the majority of individuals are unaware that they have it and will only become aware of it when difficulties arise [1].

According to Riskesdas (2018), 63 million Indonesians suffer from hypertension. With a population of 63,309,620 people, Indonesia has a death rate of 427,218 incidents each year [2].

Hypertension can also attack various groups in society, from the upper middle class to lower middle-class social levels [3]. In addition, the increasing age of a person at risk of suffering from hypertension will be even greater due to stiffness in the blood vessels, and a person is said to suffer from hypertension if the increase in systolic and diastolic blood pressure is consistently above 140/90 mmHg [4].

According to data from the South Sulawesi provincial health office, there were 142,571 people with hypertension in 2018, with males accounting for 54,749

and females accounting for 87,882. In South Sulawesi, the districts with the highest prevalence of high blood pressure (hypertension) were Selayar (32.49%), Soppeng (24.92%), and Takalar (14.82%), all of which are in the Takalar district in this study. Takalar Regency is divided into 9 sub-districts, 76 villages, and 24 sub-districts [5].

In 2018, a total of 15 health clinics in Takalar Regency discovered cases of hypertension in 757 people, with details of male sex in 105 people and female sex in 652 people [6]. The Pattopakang Public Health Center is a health center located in the Mangarobombang sub-district, which is the second-largest sub-district with the highest number of hypertension sufferers. Hypertension is on the rise at the Pattopakang Health Center, according to data from 2019 to 2020. The cause of the annual increase in hypertension is related to lifestyle and stress, which causes the incidence of hypertension at the Pattopakang Public Health Center to rise every year. Alternatives to blood pressure regulation include progressive muscular relaxation and guided imagination approaches [6].

Therefore, in line with the theory that says there is an effect of progressive muscle relaxation techniques on

blood pressure in patients with hypertension at the Bojong Soang Health Center, Bandung Regency, progressive muscle relaxation exercises can be used as one of the materials in providing health education for Puskesmas officers in handling nonpharmacological hypertension [7].

According to the above explanation, the efforts that can be made to overcome the problem of blood pressure in hypertensive patients are based on previous research, which states that interventions that can reduce blood pressure in hypertensive patients include progressive muscle relaxation therapy and guided imagination techniques to reduce blood pressure in patients with hypertension. Therefore, researchers are interested in researching "the effectiveness of progressive muscle relaxation therapy and guided imagination techniques on controlling the blood pressure of hypertensive patients in the work area of the Pattopakang Public Health Center," with the aim of the study being to determine the effectiveness of progressive muscle relaxation therapy and guided imagination techniques on controlling blood pressure in patients with hypertension in the work area of the Pattopakang Public Health Center.

## Methods

The Two Group Pretest and Posttest Design research design was used in this quasi-experimental study (Sugiyono, 2018). In this study, there were two intervention groups: intervention group I, which received progressive muscle relaxation therapy, and intervention group II, which received guided imagination techniques, and both groups had their blood pressure measured 15 minutes before and after the progressive muscle relaxation therapy intervention. In both groups, a pretest and a posttest were administered at the first and last meetings.

According to interviews with the person in charge of the Pattopakang Public Health Center's (noncommunicable disease) program with Prolanis (chronic disease management program), there were 50 female hypertension sufferers in Cikoang Hamlet, Cikoang Village, and the Pattopakang Community Health Center Working Area. Therefore, the population in the study was taken from patients with hypertension who were in the Cikoang hamlet, Cikoang Village. The working area of the Pattopakang Public Health Center could accommodate 50 people. The sample in this study, according to the inclusion criteria, was female aged 40–60 years and had a systolic blood pressure of 140–159 mmHg and a diastolic blood pressure of 90–99 mmHg. They did not routinely take antihypertensive drugs and did not have a history of Diabetes mellitus or obesity. The determination of the

sample size in this study was made using the Taro Yamane formula  $\left( n = \frac{N}{1 + N(d)^2} \right)$ , so that the sample

size was determined as 32 people. The respondents were divided into two groups so that 18 respondents were obtained from the progressive muscle relaxation therapy intervention group and 18 respondents from the guided imagination technique intervention [2].

## Results

The results of this study were obtained from blood pressure measurements filled in on the observation sheet. After all the data have been collected, the completeness check is carried out, and then, the data are processed and analyzed using univariate and bivariate methods. In the following, the researcher will present data analysis on each variable.

### **Characteristics of respondents who were given progressive muscle relaxation therapy and guided imagination techniques**

The participants in this study were hypertensive clients who lived in the Pattopakang Health Center's work area and met the inclusion criteria, a total of 36 people (Table 1) shows the characteristics of the respondents who were surveyed.

**Table 1: The distribution of respondent characteristics by gender and profession**

Characteristics	Frequency (%)
Gender	
Woman	36 (100)
Age	
35–45-year-old (late adult)	6 (16.7)
45–60 years (early Elderly)	30 (83.3)
Profession	
IRT	20 (55.6)
Farmer	11 (30.6)
Trader	5 (13.8)

Source: 2021 primary data.

The number of respondents analyzed was 36, with all respondents being female, as shown in Table 1, and the correct value is 100%. Furthermore, the majority of respondents with hypertension are between the ages of 45 and 60, with up to 30 respondents falling into this category (83.3%). Meanwhile, based on their line of employment, more housewives are suffering from hypertension than ever before, with up to 20 people responding (55.6%).

According to Table 2, the difference in systolic blood pressure before and after progressive muscle relaxation therapy is 152.68 mmHg with a standard deviation of 3.235 and 142.79 mmHg with a standard deviation of 5.828; while diastolic blood pressure before and after therapy relaxation is 94.67 resulting in an average value of 9.89 mmHg for

**Table 2: The distribution of systolic and diastolic blood pressure before and after administration of progressive muscle relaxation therapy in Cikoang Hamlet, Cikoang Village, the work area of the Pattopakang Public Health Center**

Serial number	Variable	n	Mean	SD	p
3.23	Systolic pre-test for progressive muscle relaxation therapy	18	152.68	3.23	0.000
5.83	Systolic posttest for progressive muscle relaxation therapy	18	142.79	5.83	
2.29	Diastolic pretest progressive muscle relaxation therapy	18	94.67	2.29	0.000
3.73	Diastolic pretest progressive muscle relaxation therapy	18	86.94	3.73	

Source: 2021 primary data. SD: Standard deviation.

systolic blood pressure and 7.89 mmHg for diastolic blood pressure. The Wilcoxon test yielded a P value of 0.000 ( $\leq 0.05$ ) in statistical testing, indicating that there is a significant difference in changes in systolic and diastolic blood pressure after progressive muscle relaxation therapy.

According to Table 3, the average difference in systolic blood pressure before the guided imagining technique was 150.76 mmHg, and the systolic blood pressure after the technique was 146.56 mmHg. The difference in diastolic blood pressure before the guided imagination technique was 93.62 mmHg, and the diastolic blood pressure after the guided imagination technique was 90.42 mmHg, resulting in an average systolic blood pressure reduction of 4.2 mmHg and a diastolic blood pressure reduction of 3.2 mmHg. Statistical testing utilizing the Wilcoxon test yielded  $p = 0.000$  ( $\leq 0.05$ ), indicating that there is a significant difference in the decrease in blood pressure after the guided imagination technique is performed in patients with hypertension.

**Table 3: The distribution of systolic, diastolic blood pressure before and after administration guided imagination technique**

Serial number	Variable	n	Mean	SD	p
3.51	Imagination therapy systolic pretest	18	150.76	3.51	0.000
3.60	Imagination therapy systolic posttest	18	146.56	3.60	
2.06	Imagination therapy diastolic pretest	18	93.62	2.06	
2.64	Imagination therapy diastolic posttest	18	90.42	2.64	

Source: 2021 primary data. SD: Standard deviation.

According to Table 4, the systolic is 9.89 mmHg and the diastolic is 7.73 mmHg after progressive muscle relaxation therapy, whereas the average value of blood pressure decrease after systolic guided imagination technique is 4.2 mmHg and the diastolic is 3.2 mmHg. The Mann-Whitney test yielded  $p = 0.000$ .  $< 0.001$ , indicating that there is a significant difference in blood pressure reduction between progressive muscle relaxation therapy and guided imagination techniques, with progressive muscle relaxation techniques showing a greater reduction in blood pressure than guided imagination techniques.

**Table 4: The comparison of the effectiveness of progressive muscle relaxation therapy and guided imagination techniques on changes in blood pressure**

Serial number	Variable	n	Mean	SD	p
5.83	Systolic posttest progressive muscle relaxation therapy	18	142.79	5.83	0.000
3.73	Diastolic posttest progressive muscle relaxation therapy	18	86.94	3.73	
3.60	Imagination therapy systolic posttest	18	146.56	3.60	0.000
2.64	Imagination therapy diastolic posttest	18	90.42	2.64	

Source: 2021 primary data. SD: Standard deviation.

## Discussion

### **Characteristics of respondents who were given progressive muscle relaxation therapy and guided imagination techniques**

In this study, the characteristics of the respondents studied were gender, age, and occupation. The results of the study showed that the age of the respondents in this study was mostly in the age range of 45-60 years. This shows that the older you get, the higher your risk of developing hypertension [11]. With increasing age, structural and functional changes occur in the vascular system so that it can cause an increase in blood pressure [12]. According to Smeltzer and Bare (2008), the changes include a decrease in vascular smooth muscle and a loss of connective tissue flexibility [13]. The aorta and major arteries ability to handle the volume of blood pumped by the heart will be affected, resulting in a drop in cardiac output and an increase in peripheral resistance. Increased age increases a person's risk of hypertension physiologically. Hypertension is more frequent in the elderly, and the chance of developing it grows as one gets older [14].

This occurs as a result of the aging process, which affects the elderly. The stages of reducing various organ functioning describe this process. The more vulnerable the body is to numerous hypertension attacks that might lead to death, the more vulnerable it is. According to the findings of a study conducted at the Sronol Health Center Semarang on 30 hypertension patients seeking treatment, the most common age of hypertension patients seeking treatment was 45 (53.3%), compared to 45 years (46.7%), because people between the ages of 45 and 60 are more concerned about their health [15]. Furthermore, at this age, a person is still able and willing to accept information about the therapy being provided, because as a person gets older, their perception and mindset change, making it more difficult to deliver knowledge about the therapy being provided [16].

### **Average systolic and diastolic blood pressure before and after progressive muscle relaxation therapy administration in Cikoang hamlet, Cikoang village, the Pattopakang public health center's work area**

After the normality test on systolic and diastolic blood pressure revealed a significant result of  $P < 0.05$ ,

indicating that the data was not normally distributed, the Wilcoxon test was used to compare systolic and diastolic blood pressure before and after progressive muscle relaxation therapy.

According to Table 2, p value of 0.000, meaning 0.05, indicates that there is a significant difference in systolic and diastolic blood pressure before and after progressive muscle relaxation treatment intervention. After six days of progressive muscle relaxation therapy, systolic blood pressure was reduced by 9.89 mmHg and diastolic blood pressure was reduced by 7.73 mmHg, according to this study. Progressive muscle relaxation therapy, according to the study, can control systolic and diastolic blood pressure in hypertension patients since it is simple to apply and makes the body and mind quiet and relaxed. The findings support the hypothesis that achieving a relaxed state, such as through progressive muscle relaxation techniques, is an effective non-pharmacological method of controlling hypertension [17]. Progressive muscle relaxation works as a vasodilator, widening blood vessels and lowering blood pressure immediately. This is the most affordable technique of relaxing. There aren't any negative side effects. It's simple to practice and has a calming and relaxing effect on the body and mind [18].

***Average systolic and diastolic blood pressure before and after the guided imagining approach was administered in Cikoang Hamlet, Cikoang Village, the Pattopakang Public Health Center's work area***

Table 3 displays the results of the blood pressure difference test before and after the guided imagination technique therapy, based on the study's findings. Using the Wilcoxon test in SPSS 23, p value of 0.000, meaning <0.05, was achieved, indicating that there is a significant difference in systolic and diastolic blood pressure before and after the guided imagining approach therapy. The average reduction in blood pressure after using the guided imagining technique was 4.2 mmHg systolic and 3.2 mmHg diastolic, according to the results.

According to the researcher's assumptions, the guided imagination technique is effective in controlling systolic and diastolic blood pressure in patients with hypertension because the body produces endorphins, which are catecholamines that can cause a reduced heart rate and lower blood pressure when performed [19],[20].

***The effect of progressive muscle relaxation therapy and guided imagery techniques on blood pressure changes in the Cikoang Hamlet, Cikoang Village, the Pattopakang Public Health Center's work area***

The findings of the different tests with the Mann-Whitney test obtained a p value of <0.001 based on

the results of the study in Table 4, indicating that there is a difference between progressive muscle relaxation therapy and guided imagining techniques. As a result, this study shows that progressive muscle relaxation therapy is more successful than guided imagination because progressive muscle relaxation therapy engages both neuronal and hormonal mechanisms, whereas guided imagination just activates neural mechanisms [1],[21],[22]. Furthermore, progressive muscle relaxation therapy is less difficult to perform than guided imagination approaches, which must be performed in a peaceful (rather than noisy) atmosphere.

The difference in the decrease in systolic and diastolic blood pressure in the respondents given between the intervention of progressive muscle relaxation therapy and guided imagination techniques is due to different physiological mechanisms, according to the researcher's assumptions made during the study, because the relaxation effect of progressive muscle relaxation therapy causes blood vessels to vasodilate so that blood circulation, oxygen, and nutrients can work propably.

Based on the above research on the effectiveness of progressive muscle relaxation therapy and guided imagination techniques, it is closely related to the nursing theory described because Orem employs the therapeutic self-care demand approach, which entails the totality of self-care activities carried out over a period of time in order to meet self-care needs. It is intended that after progressive muscle relaxation therapy has been demonstrated to be more effective than guided imagining therapy, patients who suffer from hypertension or high blood pressure would be able to use this therapy as an alternative to reduce blood pressure.

## Conclusion

Based on data analysis from the results of research that has been carried out in Cikoang Hamlet, Cikoang Village, and the work area of the Pattopakang Health Center related to the effectiveness of progressive muscle relaxation therapy and guided imagination techniques in women with hypertension, it can be concluded as follows: The characteristics of the respondents revealed that the respondents in the study were all genders, 100% women, totaling 36 people. Given that the majority of the respondents in this study were 45–60-years-old (early elderly), and that the majority of the respondents occupations were housewives, the findings of the research can be concluded that the mean systolic and diastolic blood pressure before and after doing progressive muscle relaxation therapy for 6 days showed a significant difference between systolic and diastolic blood pressure

before and after doing progressive muscle relaxation therapy. The significance of monitoring systolic and diastolic blood pressure before and after the guided imagining technique.

## References

1. Fajria L. Differences in effects of deep breathing therapy and progressive muscle relaxation therapy on blood pressure reduction in elderly hypertension in the elderly Posyandu, Surau Gadang Village, Nanggalo Padang District, 2012. *NERS J Nurs.* 2016;9(1):64-69.
2. Nurhasana H, Mahmud NU, Sididi M. Description of Knowledge and Attitude of Preventing Relapse of Hypertension in Hypertension Patients in the Work Area of Antang Public Health Center Makassar City in 2020. *Window Public Health J.* 2020;1(2):157-65. <https://doi.org/10.33096/woph.v1i2.128>
3. Indonesian Ministry of Health. *The Silent Killer Hypertension.* Jakarta, Indonesia: Indonesian Ministry of Health; 2019. p. 15.
4. Anam K. Healthy lifestyle prevents hypertension disease. *Langsat J.* 2016;3(2):97-102.
5. Astuti ET, Oktariani M. Nursing care for hypertensive patients in fulfilling the need for safety and comfort. *J Nurs.* 2020;23(1):1-8.
6. Haris A. Takalar district. In: Takalar BK, editor. *Figures.* Indonesia: Takalar District Statistics Center; 2020.
7. Wijaya I, RNK K, Haris H. Relationship between lifestyle and diet with hypertension incidence in the work area of towata health center, Takalar Regency. *Indones Health Promot Publication Media.* 2020;1(3):5-11.
8. Rosdiana I, Cahyati Y. Effect of progressive muscle relaxation (PMR) on blood pressure among patients with hypertension. *Int J Adv Life Sci Research.* 2019:28-35.
9. Roter D, Frankel R. Quantitative and qualitative approaches to the evaluation of the medical dialogue. *Social Sci Med.* 1992;34:1097-103.
10. Imas M, Na T. *Teaching Materials Of Medical Record And Health Information (Rmik) Health Research Methodology.* Jakarta: Indonesian Ministry Of Health; 2018.
11. Aristotle. Correlation of age and sex with hypertension in the emergency center unit of Siti Khadijah Islamic Hospital Palembang 2017. *Indonesian J Nurses.* 2019;3(1):9-16.
12. Richardo D, Haksama S, Lusno M, Wulandari A. Relationship of age and family history as non-modifiable factors with the event of hypertension. *Sci Dev Media.* 2021;15(10):5495-504.
13. Smeltzer, Suzanne C, Brenda G. Bare. 2008. *Nursing Textbook. Medical-Surgery* Brunner and Suddarth. Vol. 2. EGC: Jakarta.
14. Purwono J, Sari R, Ratnasari A, Budianto A. Salt consumption patterns with hypertension in the elderly. *J Health Discuss.* 2020;5(1):531-42. <https://doi.org/10.52822/jwk.v5i1.12>
15. Kurniasih I, Setiawan MR. Analysis of risk factors for hypertension in sronold public health center, Semarang Period September – October 2011. *Muhammadiyah Med J.* 2013;1(2):54-9.
16. Surahmat R, Novitalia N. The effect of brain gym therapy on the cognitive level of elderly who has dementia at the tresna werdha social home, Tama Inderalaya Resident. *Sriwijaya Med Mag.* 2017;49(4):191-96.
17. Murniati M, Sundari RI, Dewi FK. Progressive muscle relaxation training for elderly posyandu cadres at elderly posyandu RW 05 Kalibagor village. *J Community Engage Health.* 2020;3(1):74-81. <https://doi.org/10.30994/jceh.v3i1.3>
18. Erwanto. *Elderly and Family Nursing.* Yogyakarta: Nuha Medika; 2017.
19. Handayani KP. The effect of relaxation of finger hands on blood pressure of hypertension patients. *J Nurs Res.* 2020;6(1):1-7. <https://doi.org/10.32660/jpk.v6i1.442>
20. Hidayat MF, Nahariani P, Mubarrok AS. The effect of java classic music therapy on blood pressure reduction in hypertension elderly at upt panti werdha mojopahit mojokerto. *Sci J Nurs.* 2018;4(1):31-6. <https://doi.org/10.33023/jikep.v4i1.132>
21. Husna N, Johan T. The effect of slow deep breathing exercise on blood pressure elderly in pstw sabai nan aluih, Sicincin Padang Pariaman, 2020. In *Proceeding International Conference Syedza Saintika 2020.*
22. Megawati M. The effect of progressive muscle relaxation techniques on blood pressure reduction in elderly hypertension patients In *Puskesmas Mulioarjo Year 2020. Panmed Sci J (Pharmacist, Analyst, Nurse, Nutrition, Midwifery, Environment, Dentist),* 2020;15(3):376-82. <https://doi.org/10.36911/panmed.v15i3.790>