

Effectiveness of Progressive Muscle Relaxation Technique on Pain Levels in Hypertension Patients at Bhayangkara Manado Hospital

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ABSTRACT

Hypertension is a major risk factor for cardiovascular disease. Hypertension is blood pressure that exceeds normal limits in general where systolic and diastolic pressures range from 130/80. Lowering blood pressure has been shown to reduce the incidence of stroke, heart attack, and heart failure. A headache that radiates to the neck is a complaint that is at least always felt by people with hypertension. Transformation of blood vessel structure is what causes pain in hypertension. Non-pharmacological treatments exist such as progressive muscle relaxation is effective in treating headaches, back pain, pain, high blood pressure and insomnia. The purpose of this study was to determine the effectiveness of progressive muscle relaxation techniques on pain levels in patients with hypertension. In this study using true-experimental research using the Pretest-Posttest Control group design, where there are 2 groups, namely the control group and the experimental group, then given a pre-test with the aim of knowing the initial situation, then given an intervention in the experimental group with the aim of knowing the results of differences between the experimental group and the control group. The results of statistical tests with the SPSS data processing program using the Independent T Test, at the level of significance get the results of the p value of 0.026 with the level of significance according to the guidelines $p \leq \alpha$ (value $\alpha \leq 0.005$) so that $p \leq 0.05$, H_a is accepted, which means that progressive muscle relaxation techniques are effective on pain levels in hypertension sufferers.

Keywords: Hypertension, Progressive Muscle Relaxation Technique, Pain Level

1. Introduction

Hypertension is the main risk factor for cardiovascular disease. Hypertension is blood pressure that exceeds normal limits in general where systolic and diastolic pressures range between 130/80, lowering blood pressure has been shown to reduce the incidence of strokes, heart attacks and heart failure. Data from the National Health and Nutrition Examination Survey (NHANES) shows the prevalence of hypertension (age-adjusted blood pressure) $\geq 130/80$ or currently taking medication to lower blood pressure) decreased from 47.0% in 1999-2000 to 41.7% in 2013–2014, and then increased to 45.4% in 2017–2018 (Ostchega, 2022).

Global hypertension cases are currently more than 1.3 billion people, or 31% of the world's elderly population. This figure displays a 5.1% increase compared to the global prevalence from 2000 to 2010 (Bloch, 2016).

The number of cases of hypertension in the country increased by around 8.3% in 2018. From January to December 2018, 41,590 deaths were caused by hypertension and its complications, ranks fifth of the top 10 causes of death in Indonesia. Increasing prevalence of lifestyle, for example smoking, consuming alcohol, lack of sports activities and consuming fruits and vegetables (Riskseddas, 2018).

Research findings based on measurements of population aged 18 years and over for Regencies/Cities, North Sulawesi Province, Riskesdas reported the prevalence of hypertension (33.12%) counted from 10,913 respondents in each Regency/City in North Sulawesi, with the order of prevalence of people with Most hypertension over the age of 18 years is in the Sangihe Islands (40.17%), Siau Tagulandang Biaro (29.49%), Talaud Islands (27.17%), Tomohon (25.69%), Minahasa (24.11%), Manado (23.50%), North Minahasa (23.03%), South Minahasa (21.73%), Southeast Minahasa (21.36%), East Bolaang Mongondow (20.08%), Bitung (17.67%), Bolaang Mongondow (15.60%), Kotamobagu (15.08%), South Bolaang Mongondow (12.19%), North Bolaang Mongondow (11, 41%) (Risquesdas, 2018).

Hypertension based on systolic blood pressure (SBP) at 130-139 mmHg and diastolic blood pressure (DBP) at 80-89 mmHg is included in the high normal hypertension group, while the grade 1 hypertension group where systolic blood pressure at 140-159 and diastolic blood pressure at 90-99 mmHg, and the second degree hypertension group with systolic blood pressure starting at 160 mmHg and diastolic blood pressure at 100 mmHg (Unger et al. 2020).

Headache that radiates to the neck is a complaint that at least is always felt by people with hypertension. This transformation of the blood vessel structure causes pain in hypertension. After that, vasoconstriction takes place which disrupts brain circulation and increases blood vessel resistance (Murtionio & Ngurah, 2020).

There are several types of non-pharmacological treatment, such as progressive muscle relaxation, deep breathing relaxation, visualization relaxation, massage relaxation (self massage), rhythmic movements and mindful exercises, meditation and yoga (Norelli et al., 2021).

One of the nonpharmacological methods, namely progressive muscle relaxation (ROP), is a therapeutic method that is widely used to induce neuromuscular relaxation. ROP includes stretching and relaxing the main muscles of the body. ROP has physiological and psychological benefits. ROP is effective in treating headaches, back pain, pain, high blood pressure and insomnia. Progressive relaxation has been shown to have various effects on psychological well-being and behavioral changes (Gökşin, 2018).

Progressive Muscle Relaxation (PMR) is a no-cost CAM relaxation technique available in the non-invasive Nurse Intervention Classification (NIC), which is easy to learn. Its function is to reduce pain, sleep problems, anxiety and so on, without any complications. This therapy can be carried out independently by the patient. PMR therapy can reduce adrenergic activity by always making movements to tense and relax the muscles throughout the body, as well as stimulating the release of natural chemicals in the body, namely beta endorphins and encephalins which function as natural pain relievers (Al Hasbi, 2020).

According to Hassanpour (2016) in a PMR study on hypertension accompanied by indications of myocardial infarction, PMR caused a decrease in systolic and diastolic blood pressure in patients with myocardial infarction with a history of hypertension, the results of research in the experimental group decreased the average systolic and diastolic blood pressure after interventions that significantly lower than the control group.

Based on the data the author has collected in the last 3 months at Bhayangkara Hospital Manado 2022, sufferer hypertension who came for treatment in August a total of 204 patients, in September a total of 283 patients and in October 280 patients for a total of 807 patients. The number of cases of hypertension accompanied by pain in the back of the neck and head is often found by the authors, especially when undergoing clinical nursing practice in the emergency room, supported by the background above so that the authors are interested in conducting research on "Effectiveness of Progressive Muscle Relaxation Techniques Against Pain Level in Patients with Hypertension".

2. Research Methodology

In this study, a true-experimental study was used using the Pretest-Posttest Control group design, in which there were 2 groups, namely the control group and the experimental group, and then they were given a pre-test with the aim of knowing the initial state, then they were given intervention in the experimental group with the aim of knowing the results of differences in the experimental group and the control group. Method Pretest-Posttest Control group design. According to the data that has been collected, the average population for the last 3 months (August, September, October) is 269 elderly people and 100 adults. as many as 30 people. Sampling in research using total sampling technique where the number of samples is equal to the number of population.

Data obtained directly by researchers through interviews or with questionnaires that have been given to respondents. The primary data in this study were the NRS questionnaire for measuring pain levels in hypertensive patients.

Data processing produces a frequency distribution based on the percentage of each characteristic of age, sex, occupation and frequency of pain levels and analyzes differences in pain levels before and after the intervention for each respondent subject starting with the data normality test to see if the data is normally distributed or not, then the homogeneity test for see if the distribution of data is homogeneous and to test the hypothesis using an unpaired sample t test (independent) or independent t-test with SPSS.

3. Results And Discussion

2.1 Results

Table 1. Distribution of Respondent Characteristics

Variable	Frequency (n)	Presentase (%)
Gender		
Man	10	33%
Woman	20	67%
Total	30	100%
Age		
35-45 (Adult)	15	50%
46-65 (Elderly)	15	50%
Total	30	100%
Work		
IRT	9	30%
Retired	4	13%
civil servant	7	24%
Private	7	24%

Police	1	3%
Self-employed	2	6%
Total	30%	100%

The number of respondents studied was 30 people. The majority of female respondents were the largest, namely 20 samples (67%) who had hypertension accompanied by pain. As for age, there were 15 samples (50%) of respondents who complained of pain in adulthood and in the elderly there were 15 samples (50%). For the respondent's occupation, IRT (30%) is the majority of the respondent's occupation.

Table 2. Pain Level of Respondent

Pain Level	Experiment Group				Control Group			
	Pre Test		Post Test		Pre Test		Post Test	
	F	%	F	%	F	%	F	%
No pain	-	-	-	-	-	-	-	-
Mild Pain	-	-	14	94%	-	-	8	54%
Moderate Pain	8	54%	1	6%	10	66%	7	46%
Severe Pain	7	46%	-	-	5	34%	-	-
Amount	15	100%	15	100%	15	100%	15	100%

Table 3. Descriptive Analysis of Pre Test and Post Test Data

	N	Min	Max	Mean	SD
Experiment Group Pre Test	15	4	9	6,33	1,676
Experimental Group Post Test	15	1	4	2,27	0,884
Control Group Pre Test	15	4	9	6,07	1,668
Control Group Post Test	15	1	6	3,27	1,387
Valid N	15				

Table 4. Pre-test and post-test data normality test results

Results	Homogeneity Test Levene Test			
	Statistic	df1	df2	P
Based on mean	2,240	1	28	0,146
Sig based on mean $p > a$ ($a > 0,05$)				

Table 5. Pre-test and post-test data homogeneity test results

	Normality Test Shapiro Wilk			
	N	Statistic	SD	P
Experiment Group Pre Test	15	0,925	1,676	0,227
Experimental Group Post Test	15	0,888	0,884	0,063
Control Group Pre Test	15	0,912	1,668	0,148
Control Group Post Test	15	0,943	1,387	0,420
Sig $p > a$ ($a > 0,05$)				

Table 6. Independent T Test Results

Group	N	Mean	SD	Standar Error Mean	P value
Experiment	15	2,27	0,884	0,228	0.026
Control	15	3,27	1,387	0,358	

3.2 Discussion

The frequency of the gender of the respondents in this study was predominantly female with a percentage of 67%, namely 20 people and 33% of men as a minority, namely 10 people. Gender differences themselves vary, and while awareness is higher among Women, levels of control are not always higher, suggesting that gender works in a complex rather than unidirectional manner. For example, in Morocco and Tunisia, women are more prone to hypertension. Several factors may lead to lower control among women, including higher rates of obesity (Christele et al. 2020). Findings suggest that the prevalence of orofacial pain in the northern Swedish population has increased over time and more so in women, suggesting that gender differences may be a factor in pain rates (Haggman et al. 2020).

Respondents range in age from late adulthood to the elderly (35-45 and 46-65). NSHD has shown an association between a rapid rise in blood pressure at ages 43-53 years and a greater left heart ventricular mass at ages 60-64 years, suggesting that this period is sensitive for heart and brain health (Lane et al. 2019). Hypertensive patients experience increased blood pressure so that it can pose a risk of decreased cardiac tissue perfusion which causes the patient to experience activity intolerance, the brain experiences retention of blood vessels in the brain which can cause an increase in intra-cranial pressure which then causes pain in the head and a lack of patient comfort during activities. (Silva et al. 2020).

Respondents' work can be seen that the highest majority of jobs are housewives in women with a percentage (30%) of 9 respondents. It can be concluded that the activities of housewives are less compared to other respondents with other types of work, therefore work has an effect of 20-30 % on health, regular physical activity can improve muscle and cardiorespiratory fitness, improve bone and functional health and reduce the risk of heart disease and hypertension. Regular physical activity, such as walking, cycling, exercising. Another option is relaxation techniques which include progressive muscle relaxation which can provide significant health benefits. help reduce the detrimental effects of high levels of sedentary behavior on the health of all adults and the elderly. Some physical activity is better than doing nothing. By being more active throughout the day in relatively simple ways, people can easily reach the recommended level of health (WHO, 2021).

This study aims to analyze the effectiveness of progressive muscle relaxation techniques on pain levels in hypertensive patients at TK.III Manado Hospital where there are two experimental groups and a control group where the experimental and control groups are given the same intervention or treatment from the hospital but receive different interventions. from researchers where the experimental group was given progressive muscle relaxation techniques while the control group was not given progressive muscle relaxation techniques to determine the effectiveness of progressive muscle relaxation techniques. Based on the results of data analysis obtained from respondents with hypertension who experienced pain at Bhayangkara TK.III Manado Hospital at the time of the study, interpretation of the respondents' pain scale data during the pre test obtained the most results experiencing moderate pain and the post test obtained the most results experiencing mild pain.

Based on the results of the pre test in the experimental group that was given progressive muscle relaxation techniques, there were 10 respondents who experienced moderate pain and 5 respondents with severe pain. After being given the intervention of progressive muscle relaxation techniques for 3 days, there was a decrease in pain levels as many as 3 respondents had no pain and 12 respondents had mild pain. The decrease in pain level in the experimental group varied from 2 to 6 scores. The mean reduction in pain level in the experimental group was 4.600. Whereas in the control group that was not given intervention there were 10 people with mild pain and 5 people with severe pain. After the post-test measurements were carried out on the third day together with the experimental group's post-test, there was a decrease in 11 people with mild pain and 4 people with moderate pain.

Based on the difference in the results of the pre-test and post-test differences in the experimental group, the mean value was 2.27, while in the control group, the mean value was 3.27, indicating that the experimental group that was given progressive muscle relaxation techniques was more efficient in reducing pain levels than the group that was progressive muscle relaxation techniques were not given. Apart from the difference in the mean pre and post test, the results of the independent t test statistical test show (p value $0.026 \leq 0.005$) so that $p \leq 0.05$ then H_a is accepted, which means that progressive muscle relaxation techniques are effective for pain levels in people with hypertension.

The results of this study are in line with previous studies, including the results of research conducted by Saputra & Syafrianti (2021) with the title of the research namely The Effectiveness of Using Progressive Muscle Relaxation Techniques in Reducing Pain Levels in Gastritis Patients in Palembang 2021. From 12 respondents before being given muscle relaxation progressive gastritis patients experiencing pain as many as 12 respondents (100%). After being given progressive muscle relaxation, gastritis patients who experienced pain were 3 respondents (25%) and those who did not

experienced pain were 9 respondents (75%). Statistical test results showed that the Wilcoxon test results obtained sig. 0.002 ($P < 0.05$). This study shows that there is a significant difference in the change in pain scale after Progressive Muscle Relaxation, with the conclusion that the Progressive Muscle Relaxation Technique can reduce pain in gastritis patients by means of muscle stretching exercises.

The results of other studies are in line with the results of this study, including the results of Loh El-Wui's research *Effect of progressive muscle relaxation on postoperative pain, fatigue, and vital signs in patients with head and neck cancers: A randomized controlled trial*. With the results the progressive muscle relaxation group showed significantly lower overall pain and muscle tone than the control group along with multiple measurement timelines ($p < 0.01$). Progressive muscle relaxation significantly reduced sleep disturbance and levels of fatigue, anxiety, and depression compared with a time trended control group ($p < 0.01$). Progressive muscle relaxation also reduced respiratory rate and diastolic blood pressure ($p < 0.01$), with the conclusion that progressive muscle relaxation can reduce sleep disturbances and levels of pain, fatigue, muscle tension, anxiety, and depression in head and neck cancer patients undergoing surgery big. Future studies should focus on improving exercise effectiveness and standardizing application.

4. Conclusions And Recommendations

3.1 Conclusion

After conducting data analysis on the effectiveness of progressive muscle relaxation techniques on pain levels in hypertensive patients at TK.III Manado Hospital, it can be concluded that: The majority of respondents are female, with a balanced age range between late adulthood and early elderly and the majority of respondents' occupations are mothers household. The average pain level in hypertensive patients before being given the intervention of progressive muscle relaxation techniques was mostly at a moderate level. The average pain level in hypertensive patients after being given progressive muscle relaxation techniques, especially in the intervention group, was at a mild pain level. Progressive muscle relaxation techniques are effective in reducing pain levels in hypertensive patients at Bhayangkara TK.III Hospital in Manado.

3.2 Suggestion

It is hoped that health workers and the public can apply progressive muscle relaxation techniques as a non-pharmacological alternative in reducing pain levels in people with hypertension and can reduce the use of drugs with side effects. It is hoped that it can add insight into the science of Education, especially in the science of nursing.

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