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THE EFFECT OF PROGRESSIVE MUSCLE RELAXATION TECHNIQUE ON DECREASING BLOOD PRESSURE AMONG ELDERLY IN KENDARI CITY

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ABSTRACT

Background: The effect of increasing the life expectancy is increasing problem of degenerative diseases. One disease caused by a degenerative process is hypertension. This study aimed to analyze the effect of Progressive Muscle Relaxation (PMR) techniques on reducing blood pressure in the elderly. **Methods:** This research was a quasi experiment with a pre-post test with control group design. The population in this study were all elderly who experienced hypertension. The sample in this study amounted to 30 people, divided into two groups, 15 intervention groups and 15 control groups. Data analyzed using t-test. **Results:** There was a decrease in systole pressure after the intervention, with a different mean of 12 mmHg, and the results of statistical analysis showed a significant difference (p = 0,000). The results of the analysis on diastolic pressure also showed a decrease in diastolic pressure after intervention with a mean difference of eight, but the difference was not significant (p = 0.054). Analysis of differences in systolic and diastolic blood pressure in the control group before and after the intervention, both systolic and diastolic blood pressure showed no significant differences between the pre and post measurement. The results of the statistical analysis also showed significant differences in systolic and diastolic blood pressure between the intervention group and the control group (p-value = 0.00). **Conclusions:** There was an effect of PMR techniques on reducing blood pressure in both systole and diastole.

KEYWORDS: Progressive Muscle Relaxation Technique, Blood Pressure, Elderly.

INTRODUCTION

The various effects of increasing the life expectancy of the elderly, among others, are the increase in the number of elderly people and the increasing problem of degenerative diseases. One disease caused by a degenerative process is hypertension. The onset of hypertension in the elderly is also influenced by psychosocial changes.[1] Psychological changes that occur in old age have negative consequences, changes in the cardiovascular system and psychological stress that pose a risk of hypertension.[2]

Hypertension is responsible for at least 45% of death due to heart disease and 51% of death due to stroke.[3] Based on data from World Health Organization (WHO), hypertension is the biggest cause of death in the population aged 65 years with more deaths in developing countries. General description of hypertension problems in the Southeast Sulawesi Province from year to year has increased. In 2007, the percentage of cases of hypertension amounted to 17% of cases that often occur in the top 10 diseases and increased in 2013 to 22%. The prevalence of hypertension based on measurements is quite high (> 30%) in South Konawe District, Konawe, Kolaka, Wakatobi, and North Kolaka.[4]

Non-pharmacological therapy, such as lifestyle behavior and pharmacology, is needed to decrease blood pressure.[5,6] The management through lifestyle behavior is very potential in improving blood pressure control and even in decreasing the need for pharmacological management.[6]

Progressive Muscle Relaxation (PMR) is one technique to reduce stress. The effect of PMR techniques physiologically is to relax tense muscles, the digestive and cardiovascular tract, causing blood pressure to become normal, headaches become lost, digestion becomes normal. Psychological effects are reducing anxiety, eliminating depression, overcoming sleep difficulties and eliminating insomnia.[7] The previous research showed that muscle relaxation techniques can reduce insomnia complaints, effective in reducing pain in clients with glaucoma; and effective against skeletal muscle relaxation and blood pressure stability in hemorrhagic stroke patients.[8,9]

This study aimed to analyze the effect of PMR techniques on reducing blood pressure in the elderly and developing a PMR Technique Model in the Elderly.

METHODS

This research was a quasi-experiment with a pre-post test with control group design. The study was conducted in September - October 2015 at the Social Home of Tresna Werdha Minaula Kendari. The sample in this study amounted to 30 people, divided into 2 groups, namely 15 in intervention group and 15 in control group. The sampling technique used was a simple random sampling.

The intervention was a progressive technique in the form of contraction and relaxation exercises in each muscle group in sequence according to the guidelines and schedule. The intervention used a booklet that contained instructions for implementing PMR techniques accompanied by pictures of contraction and relaxation movements in each muscle group alternately. The PMR technique in this study was carried out sitting on the floor while leaning against the wall with pillows placed on the back and legs straightened. Its movement is tense the muscle group (muscle contraction) and holds it for 5 seconds then relax (muscle relaxation) for 5 seconds. Each movement is repeated twice. Relaxation techniques were carried out on 10 muscle groups consisting of 1) leg and thigh muscles; 2) wrist muscles; 3) forearm muscles; 4) elbow and upper arm muscles; 5) abdominal muscles; 6) chest muscles; 7) back muscles; 8) shoulder muscles; 9) head and neck muscles; 10) facial muscles. Interventions were conducted twice a day, namely in the morning at 09.00 and in the afternoon at 17.00 for 5 days, so that the total PMR technique carried out was 10 times.

Data analysis using t-test to determine the effect of PMR techniques with blood pressure.

RESULTS

Characteristics of respondents shown that the majority 18 people (60%) of elderly people with hypertension are male (Table 1).

Table 1: Distribution of characteristics of respondents.

Characteristics		Groups		Total (%)
		Intervention n (%)	Control n (%)	
Sex	Male	9 (60)	9 (60)	18 (60)
	Female	6 (40)	6 (40)	12 (40)
Age	60-74	8 (53,3)	8 (53,3)	18 (53,3)
	75-90	7 (46,7)	7 (46,7)	12 (46,7)

Table 2: Distribution of Blood Pressure in intervention and control group.

Blood Pressure		Amount (%)		Mean ± SD	
		Pre	Post	Pre	Post
Intervention Group					
Systolic	Normal	0 (0)	11 (73,3)	154 ± 15,9	132± 17,8
	Mild Hypertension	13 (86,7)	3 (20)		
	Moderate Hypertension	1 (6,7)	0 (0)		
	Severe Hypertension	1 (6,7)	1 (6,7)		
Diastolic	Normal	4 (26,7)	12 (80)	87,3± 15,3	79,3 ± 7,0
	Mild Hypertension	6 (40)	3 (20)		
	Moderate Hypertension	4 (26,7)	0(0)		
	Severe Hypertension	1 (6,7)	0 (0)		
Control Group					
Systolic	Normal	0(0)	0(0)	151,3 ±9,9	154 ±9,1
	Mild Hypertension	14 (93,3)	13 (86,7)		
	Moderate Hypertension	1 (6,7)	2 (13,3)		
	Severe Hypertension	0 (0)	0 (0)		
Diastolic	Normal	3 (20,0)	2 (13,3)	88± 4,1	88,7 ±3,5
	Mild Hypertension	12 (80.0)	13 (86,7)		
	Moderate Hypertension	0 (0)	0 (0)		
	Severe Hypertension	0 (0)	0 (0)		

In table 2, it is shown that in the intervention group, the results of the initial systole measurement (pre) obtained the highest percentage were those who experienced mild hypertension (86.7%). Whereas in the results of diastole measurements there were 40% who experienced mild hypertension and 26.7% had moderate hypertension. After the intervention, the second blood pressure (post) was measured and it was found that at systolic pressure 73% of the results were normal and the remaining 20% had mild hypertension. Also seen in table 2 that there was a decrease in the average systolic and diastolic blood pressure in the intervention group. Furthermore, for the control group, pre and post measurements were also carried out. For systolic blood pressure, the highest percentage in the mild hypertension group was 93.3% at the pre-measurement and to 86% at the post-measurement, because there was 1 sample that had increased blood pressure to moderate hypertension. For diastolic blood pressure, the highest percentage of mild hypertension was 80% and in post measurements, there was an increase in mild hypertension to 86.7%, because there were 1 patient whose diastolic pressure increases. In the control group, the increase in the average value of systole and diastole were at the final measurement (post).

Table 3: Differences in blood pressure in the intervention group between before and after the intervention.

Blood Pressure		n	Mean ± SD	Mean Difference	pValue
Systole	Pre	15	154 ± 15,9	22	0,000
	Post	15	132 ± 17,8		
Diastole	Pre	15	87,3 ± 15,3	8	0,054
	Post	15	79,3±7,0		

It shown in table 3 that there was a decrease in systole pressure after the intervention, with a different mean of 12 mmHg, and the results of statistical analysis showed a significant difference (p = 0,000). The results of the analysis on diastolic pressure also showed a decrease in diastolic pressure after intervention with a mean difference of 8, but the difference was not significant (p = 0.054). Furthermore, analysis of differences in systolic and diastolic blood pressure in the control group before and after the intervention shown in table 4, both systolic and diastolic blood pressure showed no significant differences between the pre and post measurements.

Table 4: Blood pressure differences in the control group.

Blood Pressure		n	Mean ±SD	Mean Difference	p-value
Systole	Pre	15	151,3 ± 9,9	1,3	0,10
	Post	15	154 ± 9,1		
Diastole	Pre	15	88 ± 4,1	0,67	0,67
	Post	15	88,7 ±3,5		

Table 5: Differences in blood pressure after the intervention of PMR techniques between the intervention group and the control group.

Blood Pressure		N	Mean ±SD	p value
Systolic	Intervention	15	132,00± 17,8	0,00
	Control	15	154,00± 9,1	
Diastolic	Intervention	15	79,33±7,0	0,00
	Control	15	88,67±3,5	

Table 5 shows that the mean of systolic and diastolic blood pressure in the intervention group was lower than the average in the control group. Based on the results of the statistical analysis also showed significant differences in systolic and diastolic blood pressure between the intervention group and the control group (p-value = 0.00). The results of this study indicate that there was an effect of PMR techniques on the reduction in blood pressure of elderly people who have hypertension as indicated by a decrease in blood pressure, both

systolic and diastolic blood pressure in the intervention group which was carried out by PMR techniques.

DISCUSSION

This study found the majority of elderly people with hypertension were male. This result is in accordance with theory that gender is one of the risk factors for hypertension. The majority of men with hypertension can be caused by active smoking. Smoking habits are associated with an increased incidence of malignant hypertension. Thomas S. Bowman et al, found that the highest incidence of hypertension was in people smoking more than 15 cigarettes per day.[10,11]

The intervention of PMR techniques in accordance with the guidelines and schedule is expected to provide a greater relaxation effect and provide a better therapeutic effect in lowering blood pressure in both systole and diastole. This study found that in the elderly who do PMR techniques regularly or according to guidelines (n = 12), which was twice a day for five days showed a decrease in blood pressure was greater, which was equal to 10-20 mmHg, whereas in elderly with hypertension who did not implement PMR techniques according to guidelines (n = 3) only showed a decrease in blood pressure of 0.5-10 mmHg.

This finding is supported by several studies showing that PMR techniques can reduce insomnia complaints**,** effective against skeletal muscle relaxation and blood pressure stability in hemorrhagic stroke patients.[12,13,14] PMR techniques were first applied to patients in hospitals who experience high blood pressure. Patients were guided to carry out PMR techniques for two to three times a day in a week, the result showed that the patient's blood pressure decreased and within a few weeks the patient's blood pressure became normal.[7]

Elderly people who live in nursing homes can experience stress due to loneliness or lack of family support. In time of stress, there will be tension in certain body muscle groups that are sometimes not realized. Muscle tension is not always a sign of strength, but can also indicate the presence of energy being discarded. By learning and practicing PMR techniques can avoid unnecessary scattering of energy and store it for things that are needed.[15] PMR techniques can be used to maintain physical and mental balanceand are important competencies possessed by nurses.[16]

PMR has been applied to patients with various health problems including hypertension, insomnia, headaches, and childbirth.[7,15] PMR techniques have been used as a way to deal with stress (stress management) in everyday life.[16,17]

Relaxation has a healing effect.[18,19] The impact of this intervention is not limited to healing high blood pressure and heart disease, but can also relieve pain.[20] To get the therapeutic effect of PMR techniques, this exercise must be carried out regularly every day in a systematic order, ie twice a day in the morning and evening for five days, so that the total implementation of PMR techniques is 10 times. This will make individuals aware of the tension in the body muscles and achieve total muscle relaxation. Total muscle relaxation conditions will counteract the negative effects of stress by restoring the balance of the physiological conditions of the body due to the effects of the endocrine system and sympathetic nervous system that occur during stress.[15]

In this study, it was found that the majority of respondents (80%) performed relaxation techniques according to guidelines and schedules, namely twice a day in the morning and evening for five days, so that the total implementation of PMR techniques carried out by respondents was 10 times, while the remaining 20% only performs PMR techniques 8 times. The implementation of PMR techniques in accordance with the guidelines and schedule will provide a greater relaxation effect and provide a better therapeutic effect in reducing blood pressure in both systole and diastole. This is evident from the results of the study found that in the elderly who did PMR techniques regularly or according to guidelines (n = 12), which was twice a day for 5 days showed a decrease in blood pressure was greater, which was equal to 10-20 mmHg, whereas in elderly with hypertension who did not carry out PMR techniques according to guidelines (n = 3), only showed a decrease in blood pressure of 0.5-10 mmHg.

CONCLUSION

There was an effect of Progressive Muscle Relaxation techniques on reducing blood pressure in both systole and diastole.

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