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THE EFFECT OF PROGRESSIVE MUSCLE RELAXATION THERAPY ON LOWERING BLOOD PRESSURE IN ADULT CLIENTS WITH HYPERTENSION

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ABSTRACT

Hypertension ranks the fifth most common cause of death in Indonesia. Progressive muscle relaxation therapy can produce a calm heart rate that can lower blood pressure and reduce stress hormone levels so that it can help lower high blood pressure. This study aims to determine whether there is an effect of progressive muscle relaxation exercises on reducing blood pressure. Quasy Experimental Design using one group pre-post test method design. The population of this study were 30 hypertensive patients who were registered at the study site. The sample uses the total sampling method. All samples were given progressive muscle relaxation therapy intervention which was carried out by tightening and relaxing muscles in one part of the bodyat a certain time to provide physical relaxation which was carried out in 4 sessions consisting of 14 movements for 25-30 minutes carried out twice a day for 2 days. Mean systolic blood pressure before intervention was 138.67mm/Hg and diastolic before 84.33 mm/Hg. The mean systolic blood pressureafter intervention) was 125.67 mm/Hg and diastolic pressure was 77.33 mm/Hg. There is the effect of progressive muscle relaxation therapy on the reduction of both systolic and diastolic blood pressure with a P value (0.000) <α (0.05). Progressive muscle relaxation therapy has an effect on lowering blood pressure in adult clients with hypertension.

Keywords: adult; hypertension; progressive muscle relaxation therapy

INTRODUCTION

Hypertension is often referred to as the “silent disease” or “silent killer” because the majority of people with hypertension are not aware of the disease until they have a blood pressure check. The incidence of hypertension increases with age (Andini et al., 2018). Hypertension is when readings consistently range above 140 mmHg systolic and above 90 mmHg diastolic. Without proper treatment it can cause stroke, myocardial infarction, kidney failure and encephalopathy (brain damage). WHO (World Health Organization) reports that hypertension affects 22% of world population, with around 36% of incidence rate in Southeast Asia. It also made up 23.7% of the total 1.7 million deaths in Indonesia in 2016 (Anitasari, 2019). A Basic Health Research (*Riskesdas*) in 2018 observed an increase in the hypertension incidence rate in 2018 compared to 2013. In the results, the hypertension incidence rate in 2018 reached 34.1%, higher than the 25.8% prevalence in 2013. The result was obtained by measuring the blood pressure of Indonesian citizens aged 18 years and above (The Ministry of Health of Indonesia, 2018). Also, based on the results, 39.60% of the tested population in West Java had hypertension. By gender, 26.36% of them were male and only 14.76% of them were female (The Ministry of Health of Indonesia, 2018). In Bogor, 101,027 hypertension cases (15.01%) were identified. This number is higher than the average total cases of 0.2% (The Ministry of Health of Indonesia, 2018**).**

Until now, treatments for hypertension include pharmacological and non-pharmacological therapies (Black & Hawk, 2014; LeMone & Bauldoff, 2016). Pharmacological therapies are generally performed over a long period of time and present side effects on the body, are costly, and may give rise to tedium that leads to non-compliance with therapy (Black & Hawk, 2014). Whereas, non-pharmacological therapies include modifications to lifestyle such as weight loss, limiting sodium intake, altering fat diet, physical exercise/sport, limiting alcohol and caffein

consumption, avoiding smoking, and taking potassium, calcium, magnesium, fiber and vitamin C supplements. Another non-pharmacological therapy is relaxation and stress management (Black & Hawk, 2014; LeMone & Bauldoff, 2016). Among the many relaxation techniques, progressive muscle relaxation is arguably one of the easiest to undertake.

Progressive relaxation is one of the relaxation techniques that combines deep breathing exercises and a series of specific muscle contractions and relaxations. Progressive muscle relaxation consists of specific movements for the elderly such as tensing and relaxing muscles from the facial muscle group to the legs for 20 minutes. Furthermore, after having progressive muscle relaxation, people report a feeling of happiness and refresh which also induce hormones like serotonin (Rahayu et al., 2020). Progressive relaxation therapy is expected to produce a relaxed body condition and free from everyday tension. Relaxation techniques can result in calm heartbeats and reduced blood pressure and stress hormone in elderly (Indah and Sugiyanto, 2016). Based on the data obtained from dr. Deasy Triwahyuni Clinic from September to November 2020, there were 94 clients presenting with hypertension and 32 (34%) of them were adults. The data shows that the prevalence of hypertension is high among adults. Therefore, the researchers are interested in examining the benefits of progressive muscle relaxation therapy to lower blood pressure in adult clients with hypertension. This research is important to do so that it can be an alternative complementary therapy in reducing high blood pressure.

METHOD

This study employed a quasi-experimental design with one group pre-post test without control group. The sampling technique used was accidental sampling with a total of 30 samples. The study was conducted by measuring the blood pressure of the sample first (pre test). After that, the researchers collected samples for progressive muscle relaxation therapy and at the end of the study, blood pressure was re-measured as post-intervention data. The study was conducted by following the SOP of progressive muscle relaxation technique. The results were tested for normality and treated to a univariate descriptive analysis and bivariate Wilcoxon test. All samples were given progressive muscle relaxation therapy intervention which was carried out by tightening and relaxing muscles in one part of the bodyat a certain time to provide physical relaxation which was carried out in 4 sessions consisting of 14 movements for 25-30 minutes carried out twice a day for 2 days.

RESULTS

Table 1.
Frequency Distribution of Characteristics in Adult Clients with Hypertension

Characteristics	f	%
Age		
Late Adolescence (19-25 Years)	2	6,7
Early Adult (26-35 Years)	23	76,7
Late Adult (36-45 Years)	5	16,7
Gender		
Male	18	60
Female	12	40
History of Hypertension		
There are	28	93,3
Non	2	6,7
Hypertension duration		
< 5 Years	18	60
> 5 Years	12	40

Table 2.
Distribution of Blood Pressures Before the Intervention with Progressive Muscle Relaxation on Adult Clients with Hypertension

Blood Pressure	Mean	Median	Standard Deviation	Maximum-Minimum
Systolic	138.67	140	9.73	130-160
Diastolic	84.33	90	8.17	70-90

As seen in Table 1, a mean systolic blood pressure before intervention (pretest) of 138.67 mm/Hg was obtained with the lowest value being 130 and the highest being 160 mm/Hg. A mean diastolic blood pressure before intervention (pretest) of 84.33 mm/Hg was obtained with the lowest value being 70 and the highest being 90 mm/Hg.

Table 3.
Distribution of Blood Pressures After the Intervention with Progressive Muscle Relaxation on Adult Clients with Hypertension \

Blood Pressure	Mean	Median	Standard Deviation	Maximum-Minimum
Systolic	125.67	120	8.97	110-150
Diastolic	77.33	70	9.07	70-90

As seen in Table 2, a mean systolic blood pressure after intervention (posttest) of 125.67 mm/Hg was obtained with the lowest value being 110 and the highest being 150 mm/Hg. A mean diastolic blood pressure before intervention (posttest) of 77.33 mm/Hg was obtained with the lowest value being 70 and the highest being 90 mm/Hg.

Table 4.
Normality of the Blood Pressure Data Before and After Progressive Muscle Relaxation Therapy on Lowering Blood Pressure in Adult Clients with Hypertension

Blood Pressure		Shapiro-Wilk Test			Conclusion
		Statistic	df	P value	
Before	Systolic	0.804	30	0.000	Abnormal distribution
	Diastolic	0.670	30	0.000	Abnormal distribution
After	Systolic	0.800	30	0.000	A bnormal distribution
	Diastolic	0.692	30	0.000	Abnormal distribution

As seen in Table 3, a p value below 0.05 (5% alpha) was obtained, which means that the data was abnormally distributed. Because of that, the bivariate analysis was performed using the Wilcoxon test.

Table 5.
Effects of Progressive Muscle Relaxation Therapy on Lowering Blood Pressure in Adult Clients with Hypertension

Blood Pressure		*Mean*	*Negative ranks*	*Positive ranks*	*Ties*	*Z count*	*P value*
Systolic	Before	138.67	30	0	0	-5.007	0.000
	After	125.67					
Diastolic	Before	84.33	15	0	15	-3.520	0.000
	After	77.33					

As seen in Table 4, the mean systolic blood before the intervention was 138.67 and 125.67 after

the intervention. 30 respondents had a lower systolic blood pressure after the intervention compared to the systolic blood pressure before the intervention (negative ranks). The Wilcoxon test produced a *p* value of (0.000) < (0.05), H0 is rejected which means that progressive muscle relaxation therapy has an effect on lowering the systolic blood pressure in adult clients with hypertension at dr. Deasy Triwahyuni Clinic-Bogor. The mean diastolic blood before the intervention was 84.33 and 77.33 after the intervention. 15 respondents had a lower diastolic blood pressure after the intervention compared to the diastolic blood pressure before the intervention (negative ranks) and 15 respondents had a similar diastolic blood pressure before and after the intervention (ties).

DISCUSSION

Blood Pressure Before the Intervention

The results of the study show that the mean systolic and diastolic blood pressures before the intervention (pretest) were 138.67 mm/Hg and 84.33 mm/Hg, respectively. These are in line with a study by Rahayu et al. (2020) on the effect of progressive muscle relaxation technique on the blood pressure of elderly with hypertension with systolic and diastolic blood pressures before an intervention of 149 mm/Hg and 89.5 mm/Hg, respectively. A study by Damanik and Zilaruo (2018) on the effect of progressive muscle relaxation technique on hypertension patients at RSU Imelda obtained systolic and diastolic blood pressures of 160.61 mm/Hg and 96.22 mm/Hg, respectively. Primary hypertension is a condition in which high blood pressure occurs as a result of a person's lifestyle and environmental factors. Along with changing lifestyles due to following the era of globalization, cases of hypertension continue to increase. Factors causing hypertension include age, heredity, gender, overweight, lack of exercise, smoking habit, alcohol consumption, excessive sodium intake, caffein intake and stress (Casey & Benson, 2012).

Blood Pressure After the Intervention

The results of the study show that the mean systolic and diastolic blood pressures before the intervention (pretest) were 125.67 mm/Hg and 77.33 mm/Hg, respectively. It shows that there is a decrease in blood pressure before and after the intervention. These are in line with the study by Rahayu et al. (2020) about the effect of progressive muscle relaxation technique on the blood pressure of elderly with hypertension with systolic and diastolic blood pressures after an intervention of 137 mm/Hg and 79 mm/Hg, respectively, indicating a decrease in the blood pressures. The study by Damanik and Zilaruo (2018) at RSU Imelda observed a decrease in both systolic and diastolic blood pressures to 156.57 mm/Hg and 94.17 mm/Hg. These are in line with a theory by Potter & Perry (2015) stating that progressive muscle relaxation exercise trains an individual on how to relax effectively and reduce tension on the body. It is a method to help reduce tension so that body muscles can relax. It aims to reduce stress anxiety, muscle tension and sleeping disorders. It works by inducing relaxation to reduce sympathetic nerve activity and increase parasympathetic nerve activity resulting in vasodilation of arteriolar diameter. Parasympathetic nerve will then release acetylcholine that inhibits sympathetic nerve activity and decreases cardiac muscle contractility and venous and arterial vasodilation (Muttaqin, 2014). Progressive muscle relaxation possesses a vasodilatory property that can dilate blood vessels and decrease blood pressure directly. This relaxation technique is inexpensive, brings no side effects, easy to do, and calms the body and mind (Jacob, 2010 in Erwanto et al., 2017).

The Effect of Progressive Muscle Relaxation Therapy on Lowering Blood Pressure

The results of the study demonstrate the effect of progressive muscle relaxation therapy on lowering both systolic and diastolic blood pressure in adult clients with hypertension at dr. Deasy Triwahyuni Clinic-Bogor. This is in line with a study by Baharudding (2016) showing

that progressive muscle relaxation has a significant effect on lowering blood pressure in primary hypertension patients at Puskesmas Gunung Lingkas, Tarakan City (p value = 0.006). A study by Ilham et al. (2019) demonstrated the significant effect of this technique on systolic (p value = 0.001) and diastolic (p value = 0.002) blood pressures in elderly with hypertension before and after having progressive muscle relaxation therapy at PSTW Budi Luhur, Jambi. Progressive relaxation is relaxation technique that combines deep breathing exercises and a series of specific muscle contractions and relaxations (Rahayu et al., 2020). Progressive relaxation therapy is expected to make the body relax and free from everyday tension. Benefits of this relaxation technique include decreased blood pressure, cardiac frequency, cardiac dysrhythmia, oxygen requirement and consumption, reduced muscle tension, metabolic rate, increased alpha brain waves when a patient is conscious, relaxed concentration, improved fitness, concentration and better faculties to cope with stressors (Perry & Potter, 2014). Progressive muscle relaxation can stimulate changes in blood pressure in people with hypertension by calming tense muscles. The relaxation response is closely related to the Hypothalamus-Pituitary-Adrenal (HPA) axis, because this muscle relaxation can stimulate chemicals such as beta blockers in peripheral nerves that function to close the sympathetic nerve node which results in decreased secretion of CRH (Corticotropin-Releasing Hormone) and ACTH (Adrenocorticotropic Hormone) in the hypothalamus. A reduction of this hormone will lessen the function of sympathetic nerves, slows the release of adrenaline and non-adrenaline which in turn will decrease heart rate, dilate blood vessels, decrease cardiac pump so that the arterial blood pressure of the heart decreases, lowering the total peripheral resistance which will lower blood pressure (Guyton & Hall, 2012; Smeltzer & Bare, 2017, Baharudin, 2016).

CONCLUSION

In summary, the mean systolic blood pressure before the intervention (pretest) was 138.67 mm/Hg and for the mean diastolic blood pressure it was 84.33 mm/Hg. After the intervention (posttest), the systolic and diastolic blood pressures were 125.67 mm/Hg and 77.33 mm/Hg, respectively. In conclusion, there is a relationship between progressive muscle relaxation therapy and decreased blood pressure in adult clients with hypertension at dr. Deasy Triwahyuni Clinic-Bogor.

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