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The Effect of Progressive Muscle Relaxation Techniques to Decrease Blood Pressure for Patients with Hypertension in Mataram

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Abstract

Introduction: Hypertension is one of the leading causes of mortality in Indonesia, there is a significant increasing trend in annual hypertension prevalence in Indonesia. Hypertension is one of the most common diseases in NTB (Nusa Tenggara Barat), the prevalence of hypertension measured based on blood pressure in NTB is 1,523,574 (32.4%), it is higher than the national rate (1,255,537 (26.7%) of 4,702,389 people). The highest prevalence of hypertension in Mataram City is in Cakranegara Primary Care, there are 724 people with hypertension in this primary care working area. The purpose of this study is to determine the average number of patient's hypertension rate at Cakranegara Primary Care before and after given muscle relaxation techniques.

Method: This study uses "Quasi Experiment Design" with control group as comparison. The population in this study are 724 hypertension patients and 27 patients as sample based on inclusion and exclusion criteria.

Results: The results of this study indicates that the T-test calculation using Quasi Experiment Design shows the difference of average of hypertension rate before and after given progressive muscle relaxation technique. It is 10,306 mmHg in intervention group and 1,425 mmHg in control group. The p-value in the intervention group is 0.000 that is smaller than α=0.05 and the p-value of control group is 0.431 that is greater than α=0.05.

Conclusion: From this study, we can conclude that there is a difference of hypertension rate between intervention and control group. We hope this progressive muscle relaxation technique can be used as an appropriate alternative or complementing treatment to control Hypertension rate.

Keywords: Hypertension; Progressive muscle relaxation technique

Introduction

Hypertension or high blood pressure is an abnormal blood pressure in the arteries continuously for more than one period. This occurs due to arterioles construction. Arteriole construction makes blood difficult to flow and increases pressure against the arterial wall. Hypertension adds more workload for the heart and arteries, which is might be continued and causes heart and blood vessels damage [1].

Based on the causes, hypertension is divided into 2 kind of types, primary hypertension and secondary hypertension, primary hypertension which is also called idiopathic hypertension might be caused by genetic or hereditary, environment, hyperactive reninn sympathetic nervous system, angiotensin and the increasing of intracellular Na+, Ca, obesity, smoking, excessive salt consumption and lifestyle. While secondary hypertension might be caused by estrogen use, kidney disease, Cushing's syndrome and pregnancy-related hypertension [2].

According to WHO, the blood pressure limit that is still considered normal is 140/90 mmHg, while blood pressure >160/95 mmHg is stated as hypertension. Blood pressure between normal tension and hypertension is called borderline hypertension. The WHO limit does not differentiate age and sex [1].

Hypertension classification is divided based on blood pressure values (Table 1) [3].

Hypertension is a global health problem that requires attention because it can lead to death in both developed and developing countries. According to the World Health Organization (WHO) in 2012, the prevalence of hypertension cases was 839 million and it is expected to increase in 2025 to 1, 15 billion (29%) of the total world population, with more sufferers in women (30%) than men (29%). About 80% of hypertension cases occur mainly in developing countries, including Indonesia [4].

Based on Riskesdas data [5], the tendency of hypertension prevalence diagnosis by health workers based on interviews in 2007 amounted to 79,250,000 people (31.7%) and decreased in 2013 to 65,048,100 people (25.8%) from 252.125. 458 people of the Indonesian population and the prevalence of hypertension in NTB based on the results of blood pressure measuring 1,523,574 people (32.4%) which is higher than the national figure which is 1,255,537 (26.7%) of 4,702,389 inhabitants NTB and the data of hypertension patients in Mataram city in 2015 were 3532 people with hypertension and presented in the form of the table below, which shows the data of the hypertension of hypertension patients in the existing primary care in the area of Mataram City.

Based on the background above, the formulation of the problem of this study is "How big is the effect of progressive muscle relaxation techniques on blood pressure reduction in hypertension patients at Primary care in Mataram".

The aim of this study is to find out the effect of progressive muscle relaxation techniques on blood pressure reduction in hypertension patients at Primary care in Mataram (Figure 1) [4,6,7].

Methods

This study uses a "Quasi Experiment Design" using a control group as the comparison. The research used twice observation, before and after

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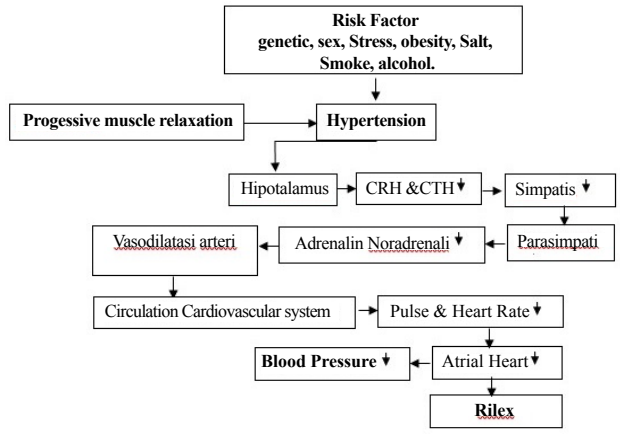

Figure 1: Conceptual framework [4,6,7].

being given progressive muscle relaxation techniques. The observation conducted by measuring respondent's blood pressure before being given progressive muscle relaxation techniques in the intervention group and the control group and after being given progressive muscle relaxation techniques. The population in this study were 724 people with hypertension and a sample of 27 people who were withdrawn based on inclusion and exclusion criterias (Table 2).

Result

Univariate analysis

Before being given intervention (Table 3)

After being given an intervention (Table 4)

Bivariate analysis

Statistical tests using SPSS 16 software showed the average value of blood pressure in the control group before giving progressive muscle relaxation techniques was 159.00 mmHg and the average blood pressure value after giving progressive muscle relaxation technique therapy was 157.58 mmHg. The average blood pressure level shows a decrease in blood pressure after being given progressive muscle relaxation techniques. The blood pressure drop averaged 1,425. P-value obtained 0.431 greater than α=0.05 means that there is no significant effect on the provision of progressive muscle relaxation techniques to decrease blood pressure in the intervention group at primary care in Mataram (Table 5).

While the results of the analysis in the intervention group before being given progressive muscle relaxation technique was 152.44 mmHg and the average value after the progressive muscle relaxation techniques was 142.14 mmHg. The average blood pressure level showed a decrease in blood pressure after being given a progressive muscle relaxation technique, each of which decreased the average blood pressure, each blood pressure decreased by an average of 10.306 mmHg. The value of p value obtained 0,000, which is smaller than α=0.02 and it means that there is a significant effect on the provision of progressive muscle relaxation techniques to decrease blood pressure in the intervention group at Primary care in Mataram.

Discussion

Blood pressure identification before progressive muscle relaxation techniques are performed

Based on the results of the study it can be known that before therapy progressive muscle relaxation techniques, the respondent's blood pressure varies greatly according to the determination of blood pressure specified in the inclusion criteria. Variation in respondent's blood pressure before intervention is presented in Table 4, the distribution of data in the intervention group and the control group can be seen in Table 4 and the distribution of respondents in the intervention group is known to be normal 0 respondents (0%), high normal 0

Classification	Systolic (mmHg)	Diastolic (mmHg)
Normal	<130	<85
Highly normal	130-139	85-89
Stage 1 (light)	140-159	90-99
Stage 2 (moderate)	160-179	100-109
Stage 3 (severe)	180-209	110-119
Stage 4 (very severe)	>209	>120

Table 1: Hypertension classification based on blood pressure [3].

Variable	N (%)
Control group	13
Sex	
Male	46.2
Female	53.8
Age (Year)	
26-36	7.69
36-45	30.76
46-55	38.46
56-65	23.08
>65	-
Education	
Under elementary school	69.2
Elementary school	-
Junior high school	7.7
Senior high school	23.1
College	-
Work	
Merchan	46.6
Farmer	30.8
	23.1
Intervensi Group	14
Sex	
Male	50
Female	50
Age (Year)	
26-36	7.69
36-45	50
46-55	14.29
56-65	28.57
>65	-
Education	
No	64.3
Elementary School	-
Junior High School	-
Senior High School	35.7
University	-
Work	
Housewife	28.6
Marketeer	35.7
Farmer	35.7

Table 2: Socio-demographic characteristics of patient with hypertension.

respondents (0%), stage 1 hypertension (mild) 2 respondents (14.3%), stage 2 (moderate) 12 respondents (85.7%), while in the control group can be known the normal category 0 respondents (0%), high normal 0 respondents (0%), stage 1 hypertension (mild) 5 respondents (38.46%), stage 2 (moderate) 8 respondents (61.54%).

Blood pressure identification after progressive muscle relaxation techniques were carried out in the intervention group and control group at Primary care in Mataram

Based on the results of the study, it was found that after progressive muscle relaxation, the respondent's blood pressure is decreased and varied. Blood pressure in the intervention group and the control group after being given therapeutic are presented in Table 4 in the intervention group with normal hypertension categorized as many as 3 respondents (21.4%), high normal as many as 9 people (64.3%) and categorical stage 1 (mild) amounted to 2 people (14.3%). The data showed in the respondents' blood pressure grade after being given progressive muscle relaxation techniques and while the comparison group (control) in stage 1 hypertension experienced no change in stage 1 was 5 people (38.45%) and stage 2 hypertension (moderate) was 2 respondents (61.54%). In the intervention group, there is a decrease in hypertension grade from stage 2 to stage 1 and normal can be caused by the provision of progressive muscle relaxation techniques.

Research conducted by Amigo et al. [8] found that systolic blood pressure in hypertensive patients who use drugs or not, has decreased after being given relaxation training. Furthermore, this study revealed that in the experimental group who did not use the drug more experienced a decrease in systolic blood pressure than the control group that used the drug.

According to Evelyn journal in a book entitled "*Book of Anatomy and Physiology for Paramedics*", systolic blood pressure is produced by the heart muscle which pushes the contents of the ventricles into the artery that has been tense. During diastolic arteries still expand because peripheral resistance of the arterioles prevents all blood from flowing into the tissues. Thus blood pressure depends in part on strength and volume in the arteriole wall. This contraction is maintained by the vasoconstrictor nerve and is controlled by the vasomotor center in the media oblongata. Blood pressure changes slightly along with physiological changes in motion, such as during physical exercise, when there is a mental change due to anxiety and emotion.

Variable	N (%)
Control group	
Normal	-
Highly normal	-
Stage 1	38.46
Stage 2	61.54
Intervention group	
Normal	-
Highly normal	-
Stage 1	14.37
Stage 2	85.63

Table 3: Hypertension data distribution of respondents based on blood pressure in control and intervention groups before provision of progressive muscle relaxation therapy in Mataram.

Variable	N (%)
Control group	
Normal	-
Highly normal	-
Stage 1	38.46
Stage 2	61.54
Intervention group	
Normal	21.4
Highly normal	64.3
Stage 1	14.3
Stage 2	-

Table 4: Hypertension data distribution of Respondents Based on Blood Pressure in Control Groups and Interventions after Progressive Muscle Relaxation Therapy at Primary care in Mataram.

Variable	N	Mean (mmHg)	*P* value
Control group			
Before intervention	13	159	0.431
After intervention	13	157.58	
Intervensi group			
Before intervention	14	152.44	0
After intervention	14	142.44	

Table 5: Data distribution of blood pressure between mean before and after giving therapy progressive muscle relaxation techniques in intervention and control groups in Mataram.

Statistical tests showed that the average of blood pressure with muscle relaxation technique counted as many as 152.44 mmHg and blood pressure with progressive muscle relaxation technique therapy was 142.14 mmHg. The average of blood pressure shows a decrease of 10.30 mmHg. The p-value obtained by 0,000, which is smaller than α=0.02 and it means that there is a progression at primary care in Mataram. Whereas in the control group, average blood pressure at the beginning of the examination was 159.00 mmHg while and at the end of the inspection was 157.58 mmHg. The p-value obtained by 0.431, which is greater than α=0.02, it can be concluded that the control group has no change or no influence.

The results of the study were also strengthened by a statement from Tyani et al. [9] in a journal entitled "*Effectiveness of progressive muscle relaxation on blood pressure in patients with essential hypertension*", which stated the results of the study showed an average blood pressure in the experimental group before progressive muscle relaxation is given, the systolic was 156.60 mmHg and the diastole was 94.47. While the results of the average blood pressure after progressive muscle relaxation was 146.53 mmHg and diastole 88.20 mmHg, the average blood pressure in the experimental group decreased by 10.07 mmHg and diastole 6.27 mmHg. The results of the t test dependent on the mean of systolic blood pressure before and after the intervention in the experimental group showed p value of 0.001 and the mean of diastolic blood pressure before and after the intervention in the experimental group showed a p value of 0.000, the p value <α (0.05), meaning that there were significant differences in the mean systole and diastole blood pressure before and after the intervention was given to the experimental group, whereas the independent t-test results in the mean systole blood pressure after intervention in the un-intervened experimental and control group showed p value of 0,000 and average blood pressure of diastole after intervention in the experimental group and controls that were not intervened showed p value of 0,000. So, it can be concluded that progressive muscle relaxation is effective in reducing blood pressure in patients with essential hypertension.

The results were also supported by Suratini's statement [10] in a journal entitled "*The effect of progressive relaxation on blood pressure reduction*" which states that progressive relaxation can reduce systolic blood pressure, this study was also supported by Mansur and Awal research [11] which showed that there was an effect of Relaxation

Technique on Decreasing Blood Pressure on Hypertension Patients in Mojo Hamlet RT: 03 RW: 01 Mojo Village, Mojo District, Kediri Regency and in line with Sulistyarini' research which states that relaxation can lower blood pressure both systolic and diastolic in patients with hypertension [12-16].

From the results of the study, it can be concluded that there is an effect between progressive relaxation on the level of systolic and diastolic blood pressure, progressive muscle relaxation techniques affect the reduction of blood pressure in hypertension patients, so that hypertension sufferers can apply and carry out progressive muscle relaxation techniques regularly as one of the complementary therapies in blood pressure reduction [17-22].

Conclusion

The conclusion in this study indicate that there is an effect of progressive muscle relaxation techniques on decreasing blood pressure in hypertension patients and it is hoped that the results of this study can be used as a reference for researchers and health workers in overcoming hypertension.

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