

THE EFFECT OF PROGRESSIVE MUSCLE RELAXATION EXERCISES ON DECLINE BLOOD PRESSURE IN THE PROLANIS HYPERTENSION GROUP AT UPTD PUSKESMAS JIKEN

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Abstract. Hypertension or high blood pressure is a non-communicable disease that is still a health problem in the world. This is because hypertension does not cause specific symptoms, so hypertension is called the silent killer. Based on a preliminary study conducted by researchers, the efforts made by the Jiken Community Health Center to manage hypertension are by holding a chronic disease management program (proteins) by holding health education, and exercise. Meanwhile, a combination of progressive muscle relaxation or other complementary therapies has not been carried out. This quasi-experiment one group design pre-test post-test research was conducted on 56 respondents using a purposive sampling technique based on inclusion criteria and the data was analyzed using the Wilcoxon test. The statistical test shows p-value = 0.000 ($p < 0.05$), so it can be concluded that there is a significant effect of progressive muscle relaxation training on reducing blood pressure in hypertension sufferers in the Jiken Community Health Center working area. It is hoped that the combination of progressive muscle relaxation can be applied as a non-pharmacological complementary therapy in efforts to treat hypertension.

Keywords: [hypertension, progressive muscle relaxation.]

INTRODUCTION

Hypertension or high blood pressure is a non-communicable disease that is still a health problem in the world. This is because hypertension does not cause specific symptoms, so hypertension is called a silent killer or a disease that secretly kills. If hypertension is not managed properly and appropriately it can cause complications such as stroke, heart failure, kidney failure, liver disease, and others.

The appropriate management for treating hypertension is through a combination of two methods, namely pharmacological and non-pharmacological. Pharmacological therapy is a therapy where hypertension sufferers must take medication to control the disease. Meanwhile, non-pharmacological therapy is supporting therapy when pharmacological treatment is inadequate in controlling blood pressure (Prabu, 2017).

Non-pharmacological therapy is carried out without administering drugs or chemicals. This therapy includes various types of physical activity such as diet management, counseling to quit smoking, lifestyle modification, relaxation therapy such as progressive muscle relaxation, aroma therapy, Benson relaxation, music therapy, and others.

with Ischemic Heart Disease, Diabetes, Tuberculosis, Cirrhosis, diarrhea, COPD, Alzheimer's, lower respiratory tract infections, and neonatal disorders as well as traffic accidents.

Based on Riskesdas 2018, the prevalence of hypertension based on measurement results in the population aged 18 years was 34.1%, the highest in South Kalimantan (44.1%), while the lowest was in Papua (22.2%). Hypertension occurred in the age group 31-44 years (31.6%), age 45-54 years (45.3%), age 55-64 years (55.2%).

In Blora Regency the number of hypertension sufferers is 230,100 people. In this case, Blora district does not occupy the highest position in Central Java, but based on evaluations every year it is increasing, and in the Jiken Community Health Center itself the number of hypertension sufferers for the period October 2022 is 1135 people. and there were 70 participants in the prolanis (Chronic Disease

Management Program) Hypertension group. This means that there are still many hypertension sufferers in the Jiken sub-district who are not yet aware that they are sick because they feel that they have no complaints and feel that they are healthy and only find out after complications occur.

Based on the results of a preliminary study conducted by researchers, the efforts that have been made by the Jiken Community Health Center to control hypertension are by implementing a Chronic Disease Management Program (prolanis) which is carried out once a month every 19th to provide education and provide drug therapy by doctors and exercise every once a week. Currently, the Prolanis program has provided non-pharmacological therapy in the form of health education for every patient seeking treatment and aerobic exercise which is carried out together in the grounds of the Jiken Community Health Center.

Jiken Community Health Center does not yet teach other complementary therapies such as a combination of progressive muscle relaxation for hypertension sufferers. The results of interviews conducted by researchers with several hypertension sufferers who were met during self-examination at the Jiken Community Health Center stated that they often felt dizzy and had difficulty sleeping at night. Apart from that, respondents felt tired and sleepy quickly when doing activities in the morning and respondents often complained of being bored if they had to take medication every day.

Based on the description above, the researcher wants to apply Progressive Muscle Relaxation Exercise therapy to patients in the Prolanis Hypertension group at the Jiken Community Health Center UPTD. Because progressive muscle relaxation is the right choice to help lower blood pressure in hypertension sufferers, besides not requiring expensive costs, this progressive muscle relaxation exercise can be done anytime and anywhere according to the respondent's wishes. Besides that, progressive muscle relaxation exercises can provide benefits such as reducing stress frequent dizziness or pain, and difficulty sleeping at night.

METHODS

This research used a quasi-experimental one-group design pretest post-test. The research was conducted on 56 respondents who met the inclusion criteria. Each respondent was given treatment for 3 consecutive days. Blood pressure measurements were carried out during the 3 meeting days, namely pretest (before treatment) and after intervention (posttest).

The sampling method used in this research was total sampling and analyzed using the Wilcoxon Test with a normality test using the Shapiro Wilk Test.

RESULTS AND DISCUSSION

1. RESULT

a. Univariate Analysis

Respondent Characteristics

Table 1. Distribution of age characteristics of research respondents in the Jiken Health Center working area

Variable	f	%
Age		
45-59	25	44.6
60-74	31	55.4
75-90	0	0
Total	56	100

Table 2. Distribution of gender characteristics of research respondents in the Jiken Health Center work area

Variable	f	%
Gender		
Man	18	32.1
Woman	38	67.9
Total	56	100

Table 3. Distribution of job characteristics of research respondents in the Jiken Health Center work area

Variable	f	%
Work		
ASN	0	0
Private	2	3.6
Self-employed	8	14.3
Doesn't work	3	5.4
IRT	25	44.6
Retired	18	32.1
Total	56	100

Table 4. Distribution of educational characteristics of research respondents in the Jiken Health Center working area

Variable	f	%
Education		
elementary school	22	39.3
JUNIOR HIGH SCHOOL	2	3.6
SENIOR HIGH SCHOOL	14	25.0
College	18	32.1
No school	0	0
Total	56	100

Description of Systolic Blood Pressure Changes Before and After Treatment

Table 5. Changes in Systolic Blood Pressure Day 1

Systole	Mean	Min	Max	elementary school
Pretest	152.84	130	178	11,432
Posttest	150.02	130	170	10,768

Table 6. Changes in Systolic Blood Pressure Day 2

Systole	Mean	Min	Max	elementary school
Pretest	148.25	126	170	11,162
Posttest	146.14	128	168	10,421

Table 7. Changes in Systolic Blood Pressure on Day 3

Systole	Mean	Min	Max	elementary school
Pretest	144.73	126	166	10,671
Posttest	144.88	124	164	10,635

Description of Diastolic Blood Pressure Changes Before and After Treatment

Table 8. Changes in Diastolic Blood Pressure on Day 1

Diastole	Mean	Min	Max	elementary school
Pretest	84.9	74	100	84.29
Posttest	81.79	74	96	81.79

Table 9. Changes in Diastolic Blood Pressure on Day 2

Diastole	Mean	Min	Max	elementary school
Pretest	81.11	74	98	5,284
Posttest	80.23	70	92	4,277

Table 10. Changes in Diastolic Blood Pressure on Day 3

Diastole	Mean	Min	Max	elementary school
Pretest	79.66	70	98	4,985
Posttest	79.36	70	96	4,815

b. Bivariate Analysis

Analysis of Blood Pressure Reduction Before and After Treatment

To analyze the decrease in blood pressure before and after treatment, a statistical test was carried out, namely the mean difference test using a paired T-test (dependent T-Test). However, before carrying out the paired T-test, a data normality test was carried out first using the Shapiro-Wilk test. In the normality test, the data obtained was $p = 0.000$, so it could be concluded that the data was not normally distributed because the $p\text{-value} < 0.05$, and the data did not meet the requirements for the T-test, so an alternative test with the Wilcoxon test was used.

Table 11. Differences in systolic blood pressure before and after giving progressive muscle relaxation exercises

	Mean	Negative Rank	Positive Rank	Ties	P
Systole Pretest	152.84	50a	0b	6c	0,000
Posttest Systole	144.88				

Based on Table 11, the results show that the average systolic blood pressure before being given treatment was 152.84 mmHg and after being given treatment was 144.88 mmHg with a negative rank value of 50, meaning that 50 respondents experienced a decrease in blood pressure in systole while the value was positive. namely, 0 means that no respondents experienced an increase in blood pressure, and a Ties value of 6 means that some respondents had the same systolic blood pressure and the value of $p = 0.000$ ($p < 0.05$).

Table 12. Differences in diastolic blood pressure before and after giving progressive muscle relaxation exercises

	Mean	Negative Rank	Positive Rank	Ties	P
Diastole Pretest	84.29	49a	0b	7c	0,000
Posttest Diastole	79.36				

Based on Table 12, the results show that the average diastolic blood pressure before being given treatment was 84.29 and after being given treatment was 79.36 with a negative rank value of 49, meaning that 49 respondents experienced a decrease in blood pressure, a positive rank value of 0

means no there is an increase in blood pressure, and the Ties value is 7, namely some respondents have constant blood pressure with a value of $p = 0.000$ ($p > 0.005$).

2. DISCUSSION

Respondent Characteristics

Characteristics of hypertensive respondents in the prolanis group of UPTD Jiken Community Health Center in this study, the majority of those suffering from hypertension were in the elderly group (60-74 years). Based on the results of this study, there were 8 out of 31 elderly respondents did not experience changes after being given progressive muscle relaxation exercises, of which 4 respondents did not experience changes in systole and 4 respondents did not experience changes in diastole.

Blood pressure is influenced by age because increasing age can cause blood pressure to increase, thereby increasing the risk of developing hypertension. This is by research conducted by Akbar Nur and Humairah (2020) that someone aged ≥ 60 years suffers more from hypertension than someone aged ≤ 60 years.

The age factor greatly influences the incidence of hypertension. Over the age of 60, the arterial walls will thicken due to the buildup of collagen in the muscle layer, so that the blood vessels will gradually narrow and become stiff. Loss of blood vessel elasticity can also be caused by a decrease in the sensitivity of the baroreceptor reflex which is influenced by increasing age, where the baroreflex functions to balance the hemodynamic system in the body (Sutra Eni and Wijaya, 2017).

Regarding the gender characteristics of respondents, this study showed that the majority of hypertension sufferers were women, 11 out of 38 women did not experience changes in blood pressure, 6 respondents did not experience changes in systole and 5 respondents did not experience changes in pressure in diastole. Gender influences the incidence of hypertension. This is in line with research conducted by Falah (2019) which states that there is a significant relationship between gender and hypertension.

Occupational characteristics in this study, the highest percentage suffering from hypertension were housewives (IRT), namely 25 people, of whom 4 respondents did not experience changes in blood pressure, namely 2 people did not experience changes in systolic pressure and 2 people did not experience changes in diastolic pressure. This is by research conducted by Maulidina (2019) with the majority of research respondents not working. Someone who does not work has less physical activity.

Regular physical activity helps improve circulation in the body and strengthens the muscles of body organs such as the heart muscle. In addition, regular physical activity increases the elasticity of blood vessels due to vasodilation and vasoconstriction of the blood vessel walls when they contract. Someone who lacks physical activity is at risk of having high blood pressure due to poor circulation. Physical activity reduces the risk of hypertension by reducing blood vessel resistance and suppressing the activity of the sympathetic nervous system and the renin-angiotensin system (Hardati & Ahmad, 2017).

The next characteristic of respondents is educational status. In this study, the highest percentage of respondents who suffered from hypertension were those with elementary school/equivalent education. A total of 7 people out of 22 people did not experience a decrease in blood pressure, 3 respondents did not experience a change in systolic pressure and 4 people did not experience a change in diastolic pressure after being given treatment.

A low level of education affects the knowledge possessed, the more information can influence or increase a person's knowledge, the more they will behave by the knowledge they have. lack of information or knowledge which gives rise to unhealthy behavior and lifestyle such as not knowing about the dangers and prevention of hypertension (Maulidina, 2019).

The Effect of a Combination of Progressive Muscle Relaxation Exercises on Reducing Blood Pressure in the Prolanis Hypertension Group

Based on this research, various blood pressure measurement results were obtained for each respondent. Based on statistical tests using the Wilcoxon test, it shows that there is a significant effect of providing Progressive Muscle Relaxation Exercises on reducing blood pressure in the prolanis group at Uptd Jiken Community Health Center with a value of $p = 0.000$ ($p < 0.05$)

Providing progressive muscle relaxation exercises can be used as a complementary therapy to lower blood pressure for hypertension sufferers. The results of this study are research results from Masrurroh & Setianingsih (2019) who conducted research by observing 2 respondents who were still being treated in the hospital. The results of this study stated that the application of progressive muscle relaxation had

a good effect in reducing blood pressure, namely 20-30 mmHg in systolic pressure and 13-17 mmHg in diastolic pressure.

Apart from that, Rahayu & Hayati (2020) stated that there was an influence of progressive muscle relaxation on systolic blood pressure values in the elderly, where the average before treatment was 149/89 mmHg became 137/79 mmHg after treatment or a decrease of 21.8 mmHg.

This research was carried out for 3 consecutive days and the results showed that providing progressive muscle relaxation training had a significant effect on reducing blood pressure in hypertensive sufferers. This is in line with research conducted by Wahyuni et al. (2017) in a study entitled "Effectiveness of Progressive Muscle Relaxation in Reducing High Blood Pressure in the Elderly" stated that after administering progressive muscle relaxation for 7 consecutive days there was a decrease in the average systolic blood pressure with a mean value of 5.92. So it can be concluded that progressive muscle relaxation can reduce blood pressure.

In this study, some respondents did not experience changes in blood pressure before and after being given treatment, namely 4 respondents with systolic pressure and 4 respondents with diastolic pressure. This is because some respondents felt stressed. After all, they were thinking about many things, such as thinking about their child getting married, and then some respondents stated they were thinking about their child not being able to visit them.

Apart from that, some respondents felt stressed because the grandchildren they were looking after were fussy, causing them to do more activities and feel tired. This can happen because stress and fatigue due to workload can cause blood pressure to increase.

When stress occurs, sympathetic nerve activation occurs which can cause an increase in the release of norepinephrine from sympathetic nerves in the heart and blood vessels, thereby increasing cardiac output and increasing systemic vascular resistance. Then the adrenal medulla will secrete more catecholamines (epinephrine and norepinephrine).

Activation of the sympathetic nervous system can increase circulation of angiotensin II, aldosterone, and vasopressin which can increase systemic vascular resistance. Prolonged elevations in angiotensin II and catecholamines can lead to cardiac and vascular hypertrophy both of which can contribute to sustained increases in blood pressure (DA Amira et al., 2021).

Research conducted by Sunarsih & Ilyas (2018), it is stated that there is a significant relationship between stress due to workload and the incidence of hypertension at the Lampung University Polyclinic.

Based on the description of previous research that has been explained, it can be seen that progressive muscle relaxation affects reducing blood pressure. The average reduction in blood pressure varies, this is due to differences in the characteristics of respondents when providing intervention. In this study, progressive muscle relaxation training was able to reduce blood pressure in hypertension sufferers. This has the consequence that hypertension sufferers can carry out continuous progressive muscle relaxation exercises to help control blood pressure so that it approaches normal.

CONCLUSION

We would like to thank the UPTD of the Jiken Community Health Center for providing researchers with the opportunity to conduct research. We do not forget to express our gratitude to those who have helped us a lot in preparing the research.

There is an influence of progressive muscle relaxation techniques on reducing blood pressure in hypertensive clients in the hypertension prolans group of UPTD Jiken Community Health Center so that progressive muscle relaxation training can be used as an intervention in providing health education by community health center staff in non-pharmacological treatment of hypertension.

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