



## Progressive Muscle Relaxation Using Video Aids Reduces Blood Pressure of Hypertension Patients



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Blood pressure;  
Hypertension patient;  
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### Abstract

Progressive muscle relaxation using video is used hypertensive patients to conduct movement activities to reduce stress. Therefore, the muscles of the body relax. Hypertension or high blood pressure is still a serious threat that affects the productivity of a person's life in NTB. The study was intended to determine the effectiveness of progressive muscle relaxation using video aids to reduce blood pressure in hypertension patients. This research was conducted in the Work Area of Dasan Agung Public Health Center, Mataram City in May to September 2017. Quasi-experimental design of pre and post-test control group. The number of respondents was 60 people consisting of 30 controls and 30 interventions for sampling Random Sampling. Data analysis using T-test. The results showed there were differences of changing in blood pressure of respondents who were given progressive muscle relaxation using video aids compared to those who did not use. Conclusion Progressive muscle relaxation with video ads decreases blood pressure in hypertension patients compared to those who did not.

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## 1. Introduction

Relaxation is the mental and physical freedom from tension and stress. It is one technique in behavioral therapy developed by [Jacobson and Wolpe \(1976\)](#), to reduce tension and anxiety. The use of relaxation in the clinical field has been started since the 20<sup>th</sup> century, when [Edmund Jacobson \(1938\)](#), explained the things that are done when tense and relaxed. (1) When the body and mind relax, the tension that automatically makes the muscles tighten will be ignored ([Ramdhani, 2009](#)). [Hamarno \(2010\)](#), progressive muscle relaxation is a method to help reduce stress so that the body's muscles relax.

According to *Joint National Committee on Prevention, Detection, Evaluation, and Treatment on High Blood Pressure VII (JNC VII)*, nearly one billion people in the world or 1 in 4 adults have hypertension ([Prasetyaningrum, 2014](#)). [Herawati & Azizah \(2016\)](#), the prevalence of hypertension in Indonesia in 35–44 years old were 24.8%, 45–54 years old was 35.6%, 55–64 years old 45.9%, 65–74 years old 57.6% and more than 75 years old 63.8%. [Kesoema et al., \(2016\)](#), results and interviewed health workers at the Public Health service to people who suffer from hypertension is counseling about limiting salt-containing foods, avoiding stress, and providing antihypertensive drug therapy, while non-pharmacological techniques at Mataram City Health Centers, for example, progressive muscle relaxation techniques in hypertensive patients not yet implemented, while the implementation of progressive muscle relaxation contributes positively is to the reduction in blood pressure in sufferers a hypertension.

Based on the explanation above, the researcher was interested in conducting research on the effectiveness of progressive muscle relaxation with video aids to reduce blood pressure in hypertensive patients in the working area of Dasan Agung Health Center in 2017. The research was intended to determine the effectiveness of progressive muscle relaxation using video aids in hypertensive patients.

## 2. Materials and Methods

Quasi-experimental research design Pre-Post Group Design test control ([Sugiyono, 2011](#)). The population is 138 respondents and after being calculated using the Slovin formula ([Sugiyono, 2011](#)), in getting a sample of 60 samples. The research group was divided into two *i.e.*, the intervention group which was hypertensive patients who carried out progressive muscle relaxation measures with video aids and the control group *i.e.*, hypertensive patients were given an extension leaflet on hypertension control. The number of respondents consisted of 60 people consisting of 30 intervention groups and 30 control groups. The method of selecting samples using Random Sampling techniques. [Sugiyono \(2011\)](#), effectiveness analysis techniques in the implementation of progressive muscle relaxation videos on changes in blood pressure in hypertensive patients are carried out by the T-test because of normal data distribution ([Sugiyono, 2011](#)).

## 3. Results and Discussions

### Characteristics of Respondents

The characteristics of respondents in the present study included age, education, occupation, duration of hypertension, and history.

Table 1  
Respondent Characteristics

Variable	Intervention group (n=30)		Control Group (n=30)		P value
	n	%	n	%	
Age					
	1	3.33	2	6.67	0.000
Late adults (36 - 45 years old)	20	66.67	7	23.40	
Early Elderly (46 - 55 years old)	6	20.00	17	56.60	
Late Elderly (56 - 65 years old)	3	10.00	4	14.33	
Education					
No education	11	36.70	11	36.70	0.112
Basic Education (elementary-middle school)	9	30.00	12	40.00	
Middle School Education	8	26.70	6	20.00	
Higher Education/College	2	6.60	1	3.30	
Occupation					
Work	17	56.70	14	46.70	0.465
Not working	13	43.30	16	53.30	
Duration of suffering from hypertension					
< 6 months	3	10.00	3	10.00	0.000
> 6 months	27	90.00	27	90.00	
Family History with Hypertension					
There is no history	14	46.67	14	46.67	0.000
There is history	16	53.33	16	53.33	

The age of the respondents was mostly early elderly (46–55 years old) about 66.67%, the most education was basic education as much as 40%, not working about 56.70%, duration of hypertension > 6 months about 90%, there was a family history of 53.33%

Table 2  
Identification of Blood Pressure

Blood Pressure Category (MAP)	Intervention group				Control Group			
	Pre		Post		Pre		Post	
	n	%	n	%	n	%	n	%
Normal	0	0.0	10	33.3	0	0.0	0	0.0
High Normal	3	10.0	10	33.3	11	36.7	2	6.7
Mild hypertension	16	53.3	10	33.4	12	40.0	20	66.7
Moderate hypertension	8	26.7	0	0.0	6	20.0	8	26.8
Severe hypertension	3	10.0	0	0.0	1	3.3	0	0.0
Malignant hypertension	0	0.0	0	0.0	0	0.0	0	0.0

Table 2 shows that in the pre-intervention group the mildest hypertension was 16 respondents (53.3%) and post-intervention had a decrease in blood pressure. In the control group of mild hypertension was 12 people (40%) while the post experienced an increase to 20 people (66.7%).

Table 3  
Differences in Blood Pressure Before and After Intervention (Progressive Muscle Relaxation) and Group Control

Observation	Blood Pressure							
	Intervention group				Control group			
	Mean	SD	p-value	Correlation	Mean	SD	p-value	Correlation
Pre Test	115.83	9.728	0.000	0.897	112.67	11.266	0.000	0.913
Post Test	104.17	8.230			114.83	9.563		

The results of the study for progressive muscle relaxation with video aids on changes of the blood pressure in hypertensive patients using the T-test obtained a significant value of 0,000, meaning that there were differences between respondents who were given progressive muscle relaxation using video compared to those who did not use progressive relaxation videos ( $p < 0.05$ ). In order to see the correlation between the intervention group at 0.897 while the control group at 0.913 means that there is much difference to these changes. In order to see the number of change for the intervention group can reduce blood pressure by 11 times while for the control group increased two times to increase blood pressure.

### Discussion

#### Age of Respondents

The age of the respondents is in the early elderly and the late elderly shows that age has the most important role with the incidence of hypertension. The analysis results showed a significant relationship between age and hypertension incidence ( $p < 0.05$ ). This is due to the increasing age of a person will contribute to the hypertension occurrence. Aging results of changing in the structure of large blood vessels, therefore, the lumen becomes narrower, and the walls of the blood vessels become stiff, causing an increase in blood pressure systole. [Kaplan \(2005\)](#), the study was supported by [Ekowati & Sulistyowati \(2009\)](#), who found that the prevalence of hypertension will increase with increasing age. Research conducted by [Hasurungan \(2002\)](#), in the elderly found that compared to 55-59 years old, at 60-64 years old there was an increased risk of hypertension of 2.18 times, 65-69 years old about 2.45 times and  $\geq 70$  years old about 2.97 times.

#### Education of Respondents

Education of respondents was not related to the hypertension incidence ( $p > 0.05$ ). The study result is different from the research conducted by [Nasihah \(2012\)](#), stated that there was a significant relationship between education and hypertension incidence. In terms of OR (adjusted), there is a tendency for people with lower education (no education, elementary/junior high) to have a risk of hypertension occurrence 1.2 times greater than that of highly educated residents. This shows a significant relationship that higher education has a lower risk of hypertension. [Nasihah \(2012\)](#), the higher a person's education, the easier it is for them to receive information, both from community groups and from social media, and in the end the more knowledge they have. Conversely, if a person has a low-level education, it will hinder the development of one's attitude towards the information acceptance and newly introduced values. [Mubarok \(2009\)](#), whereas according to [Suirakoa & Supariasa \(2012\)](#), stated the level of education of a person influences the ability of someone to receive information and process it, before, it becomes a good or bad behavior that has an impact on their health status. [Suirakoa & Supariasa \(2012\)](#), was reinforced by the research conducted by [Ekowati & Sulistyowati \(2009\)](#), stated that individual knowledge influences awareness of hypertension prevention behavior, the higher individual knowledge about the hypertension causes, trigger factors, symptoms signs, and normal blood pressure and not normal then individuals will tend to avoid things that can trigger hypertension.

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### *Occupation of Respondents*

The research results of the occupation of respondent are not related to the hypertension incidence ( $p > 0.05$ ). This study is supported by research conducted by [Dendy et al., \(2012\)](#), occupation did not affect the hypertension occurrence due to lack of activities conducted by respondents where most of them only live in the home and did routine activities that make them feel tired. In contrast to respondents who work more activities and take the time to exercise. Individuals whose activities are a low risk of developing hypertension 30-50% than active individuals.

### *Duration of suffering from hypertension*

The results of the chi-square test showed that the control group  $p = 0,000$  and the intervention group  $p = 0,00$ . This shows there is a long-standing relationship with hypertension to changes in blood pressure in hypertensive patients. In this study, the majority of respondents experienced hypertension over six months or the respondents experienced chronic hypertension. This is related to the age at which the age of the respondent from 46 years old experiences hypertension. Prolonged hypertension can cause cortisol and the hormone epinephrine to increase, both of which can increase blood pressure. The response of individuals who are aware of suffering from long-standing hypertension can cause anxiety and fear that can cause anxiety. This is supported by research conducted by [Cheung et al., \(2005\)](#), stated that long-suffering from hypertension has a relationship with increased anxiety, so that, it can aggravate the increase in blood pressure.

### *Family History with Hypertension*

The chi-square test results showed that the control group  $p = 0,000$  and the intervention group  $p = 0,000$ . It is to show that there is a relationship between family history of hypertension and the changes in the blood pressure in hypertensive patients. Thus, the study shows that family history provides the most important role for the hypertension cause. This is supported by research conducted by [Sugiharto \(2007\)](#), family history with hypertension or heredity proven to be a risk factor for hypertension, with a value of  $p = 0,0001$ , OR adjusted = 4.04 and 95% CI = 1.92–8.47. This means that parents (mother, father, grandmother, or grandfather) have a history of hypertension at risk of hypertension by 4.04 times compared to people whose parents do not suffer from hypertension) ([Sugiharto, 2007](#)). This is in accordance with the research conducted by [Qiu et al., \(2003\)](#), stated that families who have a history of hypertension and heart disease increase the risk of hypertension 2-5 times. According to [Sheps \(2005\)](#), hypertension tends to be a hereditary disease. If one of our parents has hypertension, then throughout our lives we have 25% chance of getting it too. If both parents have hypertension, then [Sheps \(2005\)](#), the chances of getting hypertension are 60%.

The role of genetic factors in the hypertension emergence is evidenced by the occurrence discovery for more hypertension in monozygotic twins (one ovum) than heterozygotes (different ovum). A sufferer who has the genetic characteristics of primary hypertension (essential) if left naturally without therapeutic intervention, along with the environment will cause hypertension to develop and within about 30-50 years there will be signs and symptoms ([Sugiyono, 2011](#)).

The blood pressure before and after actions counseling is for hypertension and progressive muscle relaxation in hypertension patients. Table 3 shows blood pressure checks before and after counseling on the prevention of hypertension and progressive muscle relaxation exercises using video aids in the intervention group and converted into MAP (*Mean Arterial Pressure*). Based on the MAP, it was seen that 100% of respondents had a drop in blood pressure in the intervention group while for the control group. It was seen that most of the respondent had increased blood pressure.

It is to show that the progressive muscle relaxation with video aids contributes to a decrease in blood pressure. The video media has a function, one of which is an effective function, [Nurfathiyah et al., \(2011\)](#), video media is able to arouse the emotions and attitudes of the audience. The respondents pay attention to the video while watching and following the movements according to the scene they are watching. It can distract respondents and provide stimuli that produce mental and physical effects. These effects include masking unpleasant sounds and feelings, focusing on video can be slow and balance brain waves, affect breathing,

heart rate, blood pressure, affect muscle tension, and improving body movement and coordination, and can regulate hormones related to stress (Nurfathiyah *et al.*, 2011).

The management effectiveness of progressive muscle relaxation videos is to change the blood pressure in hypertensive patients. The results showed that there were differences between respondents who were given progressive muscle relaxation using video compared to those who did not use progressive relaxation videos ( $p < 0.05$ ). In order to see the correlation between the intervention group at 0.897 while the control group at 0.913 means that there is a significant difference to these changes. In order to see the number of changing for the intervention group can reduce blood pressure as much as 11 times while for the control group increased two times to increase the blood pressure

The result of the present study is in accordance with the research results by Yung *et al.*, (2001), which stated that progressive muscle relaxation therapy can reduce the blood pressure, even this therapy is more effective than cognitive imagery relaxation. Progressive muscle relaxation therapy given along with breathing control techniques can also reduce the blood pressure, especially systolic pressure in pregnant women with hypertension (Aalami *et al.*, 2016). Kesoema *et al.*, (2016), stated that progressive relaxation therapy can help improve the sleep quality for people with hypertension, which in turn can reduce blood pressure.

One complicating factor in pre-hypertensive patients is anxiety. In a stressful situation, the hypothalamus will respond by activating the sympathetic nervous system and HPA (*hypothalamus-pituitary-adrenal*) axis which will then cause tremors, tachycardia and increased the blood pressure. Qiu *et al.*, (2003), research conducted by Kesoema *et al.*, (2016), shows results that were in accordance with this study, namely progressive author relaxation can reduce stress both physically and emotionally, thus, as to reduce stress and secretion of the hormone cortisol, which ultimately lowers the blood pressure. The research in patients with type 2 diabetes mellitus, Maghfirah *et al.*, (2015), also concluded that progressive muscle relaxation can reduce psychological stress and lower blood pressure.

Progressive muscle relaxation technique is to focus attention on a muscle activity, at identifying tense muscles and/then reducing tension by doing relaxation techniques to get a relaxed feeling. Purwanto (2013), the relaxation response is part of the general decline in cognitive, physiological and behavioral stimulation. A relaxation can stimulate the appearance of chemicals similar to beta-blockers in the peripheral nerves which can close the sympathetic nerve nodes which are useful for reducing tension and lowering the blood pressure (Hartono, 2007).

Muttaqin (2009), Suwitri & Sidiartha (2018), progressive muscle relaxation can increase relaxation by decreasing sympathetic nerve activity and increasing parasympathetic nerve activity resulting in vasodilation of arteriolar diameter. The parasympathetic nervous system releases neurotransmitters acetylcholine to inhibit sympathetic nerve activity by decreasing cardiac muscle contractility, arteriolar vasodilation, and veins and then lowering the blood pressure.

#### 4. Conclusion

Based on the research results, it was concluded that the majority of the elderly were early (46–55 years old), the most education was not schooling and elementary education, and respondents mostly worked, long suffered from hypertension mostly > 6 months, and most had a family history of hypertension. The results of the implementation of progressive muscle relaxation with video aids in the intervention group 100% decreased blood pressure while in the control group varied. Reviewing the mean value of the intervention group can reduce the blood pressure about 11 times are compared with the control group.

#### *Recommendation*

Suggestions for hypertension sufferer should make progressive muscle relaxation using video tools on a regular basis. Suggestions for health facilities make progressive muscle relaxation a program to help lower blood pressure in patients with hypertension.

#### *Ethical Clearance*

The study was conducted received ethical approval from the Ministry of Health of Mataram Health Polytechnic No. LB.01.03/1/1513.1/2017 on June 20, 2017.

*Conflict of interest*

This research was conducted in 2017 funding the Mataram Ministry of Health Polytechnic grant. This research is original research and has never been published in other journals.

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