

## **EFFECTIVENESS OF PROGRESSIVE MUSCLE RELAXATION AS COMPLEMENTARY THERAPY IN MANAGING BLOOD PRESSURE AMONG ADULT WITH HYPERTENSION**

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### **ABSTRACT**

Hypertension is a major cause of premature death worldwide. Some complementary health approaches are showing promise to lowering blood pressure, one of which is progressive muscle relaxation (PMR). This study aimed to determine the effectiveness of progressive muscle relaxation as complementary therapy in managing blood pressure among adult with hypertension. This was a quasi-experimental design with pre and post-test with control group approach. Stratified random sampling was done to determine the research area, followed by purposive sampling to recruit the respondents. Sample size was calculated using G-Power analysis. There were 62 respondents for intervention group and 60 respondents for control group. After 12 sessions of PMR in six days, there was a decreased systolic blood pressure to 29.9 mmHg and diastolic blood pressure to 14.7mmHg. PMR significantly decreased systolic and diastolic blood pressure among adult with hypertension. PMR as complementary therapy could be combined with pharmacological therapy to help ensure a maximum decrease in blood pressure.

Keywords: blood pressure; hypertension; progressive muscle relaxation

### **INTRODUCTION**

Hypertension is a major cause of premature death worldwide (WHO, 2023). Hypertension or high blood pressure is when the pressure in blood vessels is too high (140/90 mmHg or higher) (WHO, 2023). An estimated 46% of adults with hypertension are unaware that they have the condition (WHO, 2023; Astuti et al., 2019; Li et al., 2015). The risk factors of hypertension are divided into two categories: modifiable and non-modifiable. For modifiable risk includes unhealthy diets, physical inactivity, tobacco and alcohol consumptions, and overweight or obese. Whereas, non-modifiable risk factors are family history of hypertension and co-existing diseases like diabetes and kidney disease. Some symptoms of hypertension are severe headache, chest pain dizziness, difficulty of breathing, nausea, vomiting, blurred vision, anxiety, confusion, nosebleeds, abnormal health rhythm (WHO, 2023; Kemenkes, 2023; CDC, 2023).

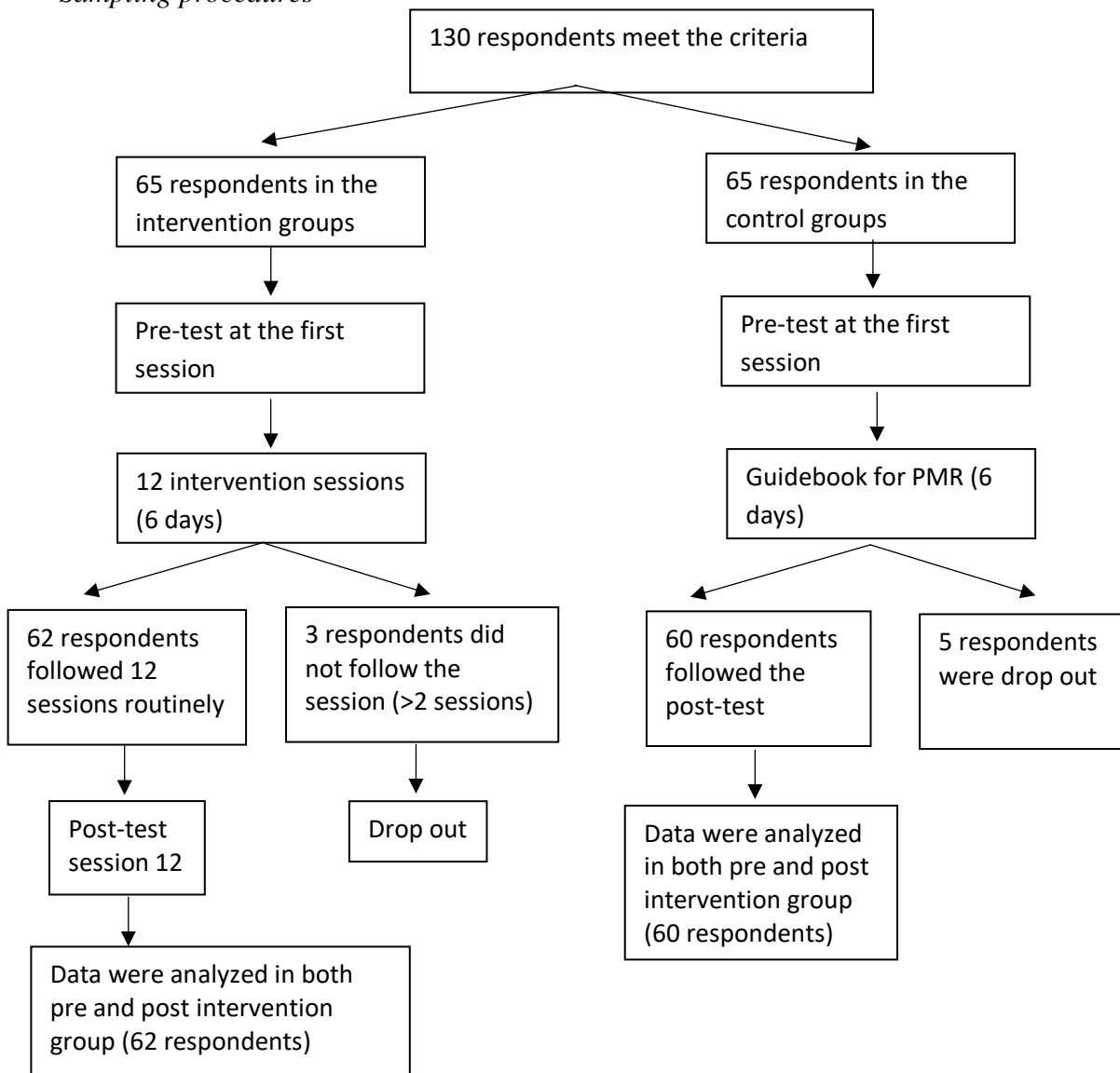
One of the global targets for noncommunicable disease is to reduce the prevalence of hypertension by 33% between 2010 and 2030 (WHO, 2023; Kemenkes, 2023). Some complementary health approaches are showing promise as elements of a program of lifestyle change that can help lower blood pressure, one of which is progressive muscle relaxation (PMR). Research results show that some psychological and/or physical practices, like relaxation technique may help reduce blood pressure in people with hypertension (NIH, 2023; Rosyada et al., 2022; Astuti et al., 2019; Li et al., 2015). PMR is a specific relaxation technique that involves tensing and relaxing muscle groups in a sequence from feet to head (or head to feet) throughout whole body (Stoppler, 2023). PMR

can be combined with pharmacological therapy in lowering blood pressure (Astuti et al., 2019). Therefore, this study aimed to examine the effectiveness of PMR as complementary therapy in managing blood pressure among adult with hypertension.

## METHOD

Stratified random sampling was used as sampling method. The researcher did two times drawing. The first drawing was to determine the district as research area, from 12 sub-district in Sukoharjo District, Gatak Sub-District was chosen as a place for research. The second drawing from 14 village in Gatak Sub-District, Blimbing village was obtained as research area for intervention group and Trangsan village for control group. In the next phase, the researcher used purposive sampling to determine community groups which were used as research place. The inclusion criteria were adults with systolic blood pressure  $\geq 140$  mmHg and diastolic  $\geq 90$  mmHg, who had or had not undergone standard anti-hypertension therapy. Exclusion criteria was adult with complication diseases and critical hypertension (systolic blood pressure  $\geq 180$  mmHg or diastolic blood pressure  $\geq 120$  mmHg).

### *Sampling procedures*



The study was conducted for 12 sessions in six days. PMR was done twice a day: in the morning and evening. At the first session, the respondents were given introductory group discussion of hypertension. After it, they were taught how to relax and contrast 16 muscles groups (forehead, eyes, cheeks, mouth, shoulders, arms, lower back, legs, feet, and toes). Second to twelve session sessions the intervention group doing the PMR and noted in exercise recording forms. The control groups were given education about PMR. Blood pressure (systolic and diastolic) were evaluated after the intervention given. The present study has received ethical clearance and was approved by research ethic committee with number 033/019/5/EC/KEP/LCBL/2023. The intervention caused no harmful side effects for the respondents did in accordance with the procedure.

## RESULTS

The mean age of the respondents in the intervention group was 40.5 (SD = 5.6), while in control group was 39.6 (SD=5.3). The homogeneity test using chi-squared test (for categorical data) and independent t-test (numerical data) were done to examine all the characteristics of variables. The test result conclude that the characteristics of the respondents were homogenous both in the intervention group and control group. Table 1 presents the characteristic of the respondents.

Table 1  
Characteristic of the respondents

Characteristic	Intervention (n = 63) f (%)	Control (n = 60) f (%)
Gender, female (%)	38 (60)	36 (60)
Education level, senior high school (%)	40 (63)	42 (70)
BMI, Normal (%)	39 (62)	39 (65)
Family history, No (%)	45 (71)	42 (70)
Smoking history, No (%)	37 (59)	36 (60)
Anti-hypertensive medication, Yes (%)	35 (55)	32 (53)

## DISCUSSION

Participating in progressive muscle relaxation (PMR) can release some hormone that play important role in reducing blood pressure. PMR can decrease corticotrope releasing hormone (CRH) and adrenocorticotropin hormone (ACTH) levels in hypothalamus. This resulted in a decreased heart rate, widening of the blood vessels, decrease blood vessel resistance and decreased exertion of cardiac muscle. This process could decrease cardiac arterial blood pressure (Astuti et al., 2019; Hafid, 2022). PMR conducting in hypertensive patients who use drugs or not, has decreased after being given relaxation training (Arisjulyanto, 2018; Astuti et al., 2019; Ermayani et al., 2020; Kusumawaty et al., 2021; Rosyada, 2022).

The output of the study showed that blood pressure decreased as many as 29.9mmHg for systolic blood pressure and 14.7mmHg for diastolic blood pressure. For control group significant reduction of blood pressure also found, but in lower number as many as 17.1 mmHg for systolic blood pressure and 13 mmHg for diastolic blood pressure. Table 2 shows the difference of blood pressure before and after intervention in intervention and control group. Previous research showed similar result in which PMR can lowering blood pressure as many as 30mmHg for systolic blood pressure and 15mmHg for diastolic blood pressure (Rosyada et al., 2022).

Table 2.  
 Differences of blood pressure before and after intervention in both group

Variable	Mean		Mean different (mmHg)	P
	Pre (mmHg)	Post (mmHg)		
Systolic				0.001
Intervention	151.6	121.7	29.9	
Control	154.9	137.8	17.1	
Diastolic				0.001
Intervention	97.3	82.6	14.7	
Control	96.9	83.9	13	

The results of the study were also supported by Ermayani et al. (2020) who stated intervention PMR provides the most powerful influence on systolic and diastolic blood pressure ( $p=0.000$ ). In addition, the PMR therapy was more effective when combined with the usual care for managing hypertension (Hafid, 2022). Researchers argue that PMR is a self-management technique to reduce systolic and diastolic blood pressure. This procedure is easy because can be done anywhere and anytime (Kusumawaty et al., 2021).

## CONCLUSION

There was a significant decreasing of systolic and diastolic blood pressure after given intervention (PMR). PMR act as complementary therapy that could be combined with pharmacological therapy to help ensure a maximum decrease in blood pressure. Further studies are expected to be used as the basis for further research on the effect PMR with a combination of other complementary therapy to achieve holistic nursing care.

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