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The Impact of the Combination Therapy of Listening to the Holy Quran and Progressive Muscle Relaxation on Blood Pressure Reduction in Women of Reproductive Age with Hypertension: A Randomized Controlled Trial Study

Pengaruh Kombinasi Terapi Mendengarkan Al-Quran dan Relaksasi Otot Progresif terhadap Penurunan Tekanan Darah pada Wanita Usia Subur dengan Hipertensi: Studi Randomized Controlled Trial

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Blood pressure, complementary therapy, hypertension, Holy Qur'an, progressive muscle relaxation.

Abstract
Background: Hypertension is a global public health problem, including Indonesia as a silent killer. Nonpharmacological (complementary) therapies are experiencing an increasing trend to be given along with pharmacological therapy requires evaluation as a blood pressure lowering for evidence-based practice. Objective: To evaluate the effect of combined therapy of listening to the Holy Quran and progressive muscle relaxation (PMR) on lowering blood pressure in women of reproductive age with hypertension. Methods: The research design used a quasi-experimental study with a pretest-posttest control group design approach. Women of reproductive age with mild and moderate hypertension in the experimental and control groups, a total of 21 participants each, were carried out at the Community Health Center in Metro City, Indonesia. Participants were given audio or listening to the Holy Quran and RPO as an experimental group and standard hypertension drug therapy in the control group. Mann-Witney test to prove the hypothesis with a significant level < 0.05 was chosen as statistical analysis. **Results:** This study found that women of reproductive age who were given a combination therapy of listening to the Holy Quran and PMR affected lowering their blood pressure (p-value 0,001). Participant, after being given the treatment, experienced a decrease in systolic blood pressure of 15,71 mmHg (CI 95%: 13,77-17,66) and diastolic 10,71 mmHg (CI 95%: 9,41-12,02). Conclusion: Nonpharmacological therapy (complementary) of listening to the Holy Quran audio and PMR given simultaneously can reduce blood pressure in women of reproductive age with hypertension. Therefore, this complementary therapy can be used as a companion therapy along with conventional therapy for community health services.

Kata kunci:
Hipertensi, tekanan darah; mendengarkan Al-Qur'an, Relaksasi otot progresif; terapi komplementer.

Abstrak
Latar Belakang: Hipertensi menjadi masalah kesehatan masyarakat global, termasuk Indonesia sebagai silent killer. Terapi nonfarmakologi (komplementer) mengalami trend peningkatan untuk diberikan bersamaan dengan terapi farmakologi memerlukan evaluasi sebagai penurun tekanan darah untuk *evidence base practice*. **Tujuan:** Untuk mengevaluasi efek terapi kombinasi mendengarkan Al-Qur'an dan relaksasi otot progresif (ROP) terhadap penurunan tekanan darah pada wanita usia subur dengan hipertensi. **Metode:** Rancangan penelitian menggunakan studi quasi eksperimen pendekatan *pretest posttest control group design*. Wanita usia subur dengan hipertensi ringan dan sedang pada kelompok eksperimen dan kontrol masing-masing total 21 sebagai Partisipan yang dilaksanakan di Pusat Kesehatan Masyarakat di kota Metro, Indonesia. Partisipan diberikan terapi audio mendengarkan al-quran dan ROP sebagai kelompok eksperimen dan pemberian terapi obat standar hipertensi pada kelompok control. Uji *mann-witney* untuk membuktikan hipotesis dengan tingkat signifikan < 0,05 dipilih sebagai analisis statistic. **Hasil:** Studi ini menemukan bahwa ada pengaruh wanita usia subur yang diberikan terapi kombinasi mendengarkan al-quran dan ROP terhadap penurunan tekanan darah (*p-value* 0,001). Partisapan setelah diberikan perlakuan mengalami penurunan tekanan darah sistolik 15,71 mmHg (CI 95%: 13,77-17,66) dan diastolic 10,71 mmHg (CI 95%: 9,41-12,02). **Simpulan**: Terapi nonfarmakologi (komplementer) mendengarkan Al-Qur'an dan relaksasi otot progresif yang diberikan bersamaan mampu memberikan efek penurunan tekanan darah pada wanita usia subur dengan hipertensi. Oleh karena itu, terapi komplementer ini dapat dijadikan terapi pendamping bersamaan dengan terapi konvensional untuk pelayanan kesehatan komunitas.

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Introduction

Hypertension is an increase in blood pressure ≥ 90 mmHg or ≥ 140 mmHg, which is a global problem in both developed and developing countries (WHO, 2023). Hypertension contributes to 55% of the world's 55.4 million deaths attributed to cardiovascular, such as heart ischemic heart disease and stroke (WHO, 2020). Globally, 8.5 million deaths are attributed to uncontrolled hypertension. As many as 23.7% of the total 1.7 million deaths in Indonesia are caused by hypertension (WHO, 2019). WHO estimates hypertension in the world at 22% (WHO, 2023). In Indonesia, basic health research has reported that hypertension has increased, in 2013 it amounted to 25.8%, and in 2018 it was 34.1%. Hypertension in women is greater (36.85%) than male hypertension (31.34%) (Kemenkes, 2018). The incidence of hypertension in Lampung province increased from 7.4% in 2013 to 15.10% in 2018 (Dinkes Provisinsi Lampung, 2020). However, it is still below the national hypertension rate. Meanwhile, the prevalence of hypertension in Metro cities ranks first among the top 10 diseases, with a total of 17,401 (26.24%) (Dinkes Kota Metro, 2023).

Hypertension is closely related to a lifestyle that can be modified and is a major risk factor in coronary heart disease, heart failure, stroke, and as a *silent killer* (Purwono et al., 2020) (Ministry of Health, 2020). Research conducted by Rosdiana & Ishak (2019) and Maring et al. (2022) showed that age, family history, and physical activity were risk factors for hypertension in WUS, and Rosyid et al. (2023) obtained results of hormonal contraception, obesity, and stress related to the incidence of hypertension. Hypertension patients are generally ≥ 40 years old, but currently, hypertension can also occur at reproductive age (15-49) years with a percentage of ±28.2% of the total prevalence of hypertension in Indonesia. The prevalence of hypertension based on gender is 28.7% for men and 30.9% for women, so women are more at risk of hypertension (Kemenkes, 2017). Women of reproductive age who are exposed to hypertension in Women of Reproductive age (WUS) can have an impact during pregnancy: gestational hypertension 10%, Pre-Eclampsia (PE) 3-10%, Eclampsia (E) 24% (Manik et al., 2017), based on these data, hypertension before pregnancy can affect the incidence of *pre-eclampsia* and *eclampsia.* One of the main causes of maternal death is high blood pressure during pregnancy (Pre-eclampsia and eclampsia) (Achadi, 2019). Hypertension is the main cause of maternal mortality, amounting to 33.07% (Ministry of Health, 2019).

The trend of increasing the prevalence of hypertension and its impact requires efforts to control and handle not only pharmacological therapy but also non-pharmacological therapy that has been proven as a companion or complementary therapy, including progressive muscle relaxation therapy and listening to the Qur'an. Previous research has proven that high blood pressure is effective in reducing with listening to the Qur'an al-Quran hearing therapy interventions (Fernalia et al., 2020; Susilawati, 2019), and progressive muscle relaxation therapy (Damanik & Ziraluo, 2018). The design used in the study was quasi-experimental and pre-experimental, involving male and female participants.

The weaknesses of the study used quasi-experiment and pre-experiment with one group post-test design. Meanwhile, this study chose the RCT (Randomized Controlid Trial) study design which is the gold research design. These studies also do not combine pharmacological and non-pharmacological or complementary studies. Participants in this study involved only women of reproductive age which is still rare. This study may find complementary therapies that are more effective in lowering blood pressure in women of reproductive age to complement the shortcomings of previous studies. Which still rarely uses the control group. Therefore, this study aims to evaluate

the effect of combination therapy of listening to the Qur'an and progressive muscle relaxation on blood pressure in women of reproductive age.

Methods

The design of this study uses a Randomized Controlled Trial Study with a post-test with a control group design approach (Murti, 2018) so that the research consists of an experimental group and a control group that is randomized. The study design was used to prove the effect of the combination of Qur'anic listening therapy and progressive muscle relaxation on lowering blood pressure in women of reproductive age with mild hypertension. This research was conducted at the Public Health Center of Metro City, Lampung Province, Indonesia, from March to April 2021.

The sample as a study participant is a woman of reproductive age with mild-moderate hypertension. The number of samples was calculated using the formula of two different means of the independent group (Sastroasmoro, 2016) with X1-X2 (desired clinical difference) = 12.19 from the previous study by Susilawati (2019) with Zα (type I error rate) = 1.96 and Zβ (type II error rate) = 1.28. Then, plus 10% of the estimated dropout. So 21 participants were obtained for each experimental group and control group. The recruited participants met the inclusion criteria, namely women of reproductive age 15-49 who were medically diagnosed with mild or moderate hypertension, had no complaints of hearing loss, and had a mobile phone for the experimental group. Participants were excluded with the criteria of consuming blood pressure-lowering drugs other than standard treatment from the Community Health Center when visiting to receive treatment (experimental), not at home, or resigned as a Participant. The number of participants who met the requirements of the study was 100 out of 123 participants. Randomization was carried out using a simple random sampling technique so that 21 participants in the experimental group and 21 participants in the control group were obtained (see Figure 1).

The research instruments consisted of 3 sets of instruments, namely 1) instruments for intervention including a combination procedure of Qur'an listening therapy and progressive muscle relaxation (ROP); 2) digital tension meter; and 3) a questionnaire containing demographic data of participants, and recording the results of blood pressure observation. First, the instrument of the combination procedure of listening to the Qur'an and progressive muscle relaxation (ROP) was developed from the relevant literature by the Researcher. ROP procedure in order: (1) muscles of the back of the hand; (2) biceps muscles and biceps muscles; (3) shoulder muscles; (4) facial muscles: forehead, eyes, jaw, and mouth muscles; (5) eye muscles; and (6) jaw, mouth, and neck muscles. Participants were instructed to perform ROP in a comfortable chair (previously, participants had been trained to be able to be independent). The therapy procedure for listening to the Qur'an was developed by the Researcher. Namely, the letters Ar-Rahman, Al-Mulk, and An-Naba were chosen to be read by Shaykh Misari Rasyid on the grounds that they were preferred by the public, then recorded in MP3 form for 15 minutes

Secondly, a standard aneroid tension meter instrument is used to measure blood pressure before and after administering experiments. Third, the questionnaire contains demographic questions of the participants, including Initial name, age, education, occupation, address, and means of communication (mobile phone, if any), hypertension diagnosis, screening questions, and observation table containing records of pre-and post blood pressure measurement results. The questionnaire developed by the researcher is adjusted to the relevant literature.

The intervention was conducted by two intervenors, including the Researcher, at the Participant's home. Participants have been trained in advance to do ROP in their homes. After the participants agree to informed consent, they are given treatment by the experimental group with

ROP according to the above procedure. ROP is conducted 2 times a day in the morning and evening for 7 days. After enough rest, then the participants received treatment in the form of listening to the Qur'an for 15 minutes, given 2 times in the morning and evening. Both the experimental and control groups received standard hypertensive drug therapy according to the treatment guidelines provided by Medicine from the Center for Public Health (see Figure 1).

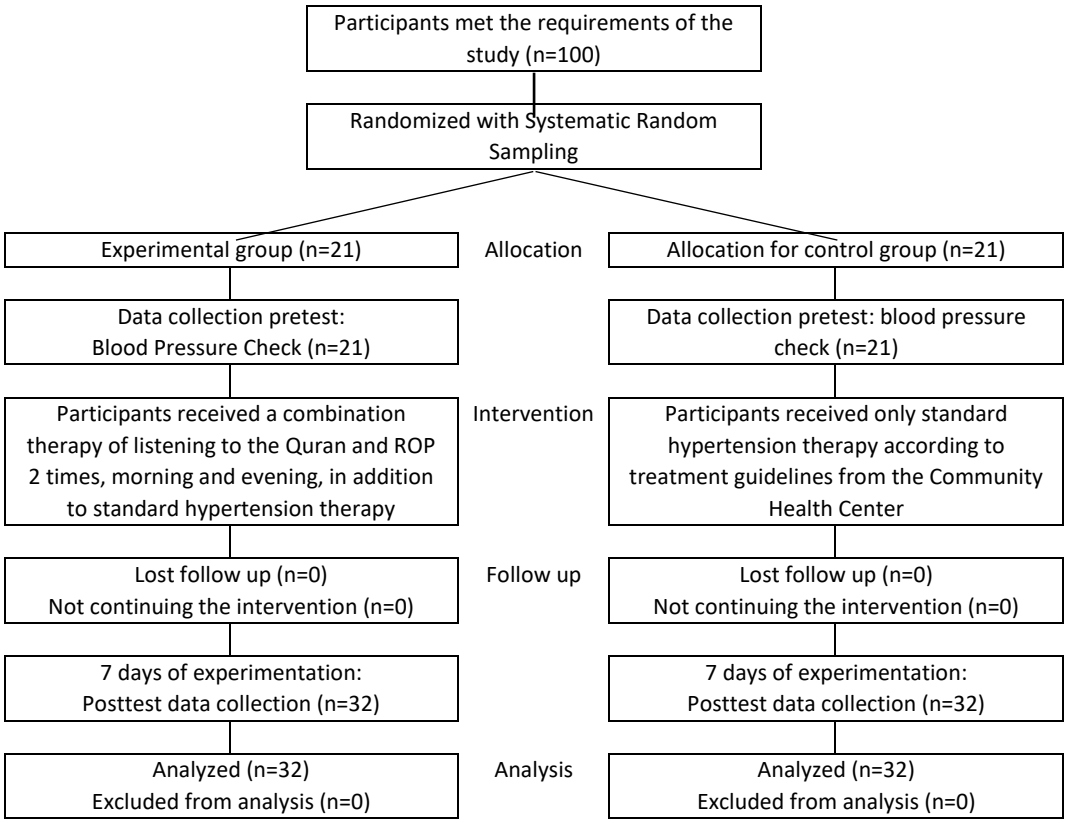

Figure 1. Research flow diagram between the experimental group and the control group

Data collection begins by explaining informed consent and obtaining written consent from the Participant. Data collection was carried out by the researcher before (pre)treatment on the first day, in the form of blood pressure measurement, and after the treatment was carried out on the 7th day after 2 hours, blood pressure was measured as post-test data in the experimental and control groups. Blood pressure measurement data is recorded with a numerical scale in the study observation form.

The observation data was statistically analyzed univariate and bivariate using a set of computers with a total of 32 participants for each experimental and control group. Univariate analysis obtained mean blood pressure data. Bivariate analysis was carried out to test the hypothesis of the effect of combination therapy of listening to the Qur'an and progressive muscle relaxation on the reduction of blood pressure using the Mann-Witney test in the experimental and control groups. The Mann-Whitney test was used because the data showed it was not normally distributed. The results of the Shapiro-Wilk test in the intervention group obtained a p-value of 0.010 and a p-value of 0.001 ($\alpha > 0.05$) in the control group. The research was conducted after being approved by the Health Polytechnic Ethics Commission of the Ministry of Health Tanjung Karang, Indonesia. The participants agree and sign a written informed consent form. The data is kept confidential and only used for research purposes.

Result

Participant Demographic Data

Demographic data on participants in Table shows that the majority of participants are 39-49 years old, a total of 76.2%. The majority of education was high school, a total of 57.1% of the intervention group and 66.6% of the control group. The majority of the occupations as housewives (not working) totaled 76.2% in the intervention group, and the control group totaled 71.4%.

Table 1.
Demographic characteristics of participants

Characteristics Participants	Experimental group		Control Group	
	n=21	Frequency (n=100%)	n=21	Frequency (n=100%)
Age				
15 - 27 years	2	9.5	2	9.5
28 - 38 years	3	14,3	3	14,3
39 - 49 years	16	76,2	16	76,2
Education				
Primary school	1	4,8	1	4.8
Junior high school	6	28,6	5	23,8
Senior high school	12	57,1	14	66,6
Diploma III/ Bachelor's degree	2	9.5	1	4,8
Occupation				
Trader	4	19	6	28,6
Housewife (not working)	16	76,2	15	71,4
Laborer	1	4,8	0	0

Results of Analysis

The experimental group in Table 2 showed the results of measuring the reduction of systolic blood pressure before and after the treatment with an average of 15.72 mmHg and 10.72 mmHg. Meanwhile, the control group experienced a decrease in blood pressure before and after the treatment, with an average systolic reduction of 7.14 mmHg and an average diastolic blood pressure of 6.43 mmHg. Both groups received the treatment of consuming standard hypertension drugs.

Table 2.
This means the blood pressure of participants with hypertension before and after treatment

Group	Mean BP	Mean Before (mmHg)	Mean After (mmHg)	Mean Decrease (mmHg)
Intervention Group	Systolic	153,1	137,38	15,72
	Diastolic	94,29	83,57	10,72
Control group	Systolic	144,76	137,62	7,14
	Diastolic	93,33	86,90	6,43

Table 3 shows the results of the Mann-Witney *test* in the group with a systolic *p-value* of 0.003 < 0.05 in the intervention group. *The diastolic p-value* of the intervention group was 0.001 < 0.05. *The systolic p-value* of the control group was 0.001 < 0.05. *The diastolic p-value of the* control group was 0.001 < 0.05, so it was concluded that there was an effect of combination therapy of listening to the Qur'an and progressive muscle relaxation on the reduction of blood pressure in women of reproductive age with hypertension at the Metro Health Center.

Table 3.
Effects of treatment on lowering blood pressure in the intervention group and control group in participants before and after treatment

Treatment Group	Mean BP Decrease (+ SD)	95% CI (Lower-Upper)	*P-value*
Systolic blood pressure			
Intervention	15,71 (±4,27)	13,77-17,66	0,001
Control	7,14 (±2,54)	5,99-8,30	
Diastolic blood pressure			
Intervention	10,71 (±2,87)	9,41-12,02	0,001
Control	6,43 (±2,31)	5,38-7,48	

Discussion

Community care using complementary therapy has become a trend to accompany conventional therapy. This study aims to evaluate the therapy of listening to the Quran and ROP in synergy to lower blood pressure. The results of the study found that the therapy of listening to the Qur'an combined with complementary therapy of RPO was effective in lowering blood pressure in the experimental group (p=0.0001) and the control group (p=0.0001).

Nonpharmacological or complementary therapy of listening to the Qur'an provides an effect on changes in electrical current in the muscles, blood circulation, heart rate, and blood levels in the skin. These changes indicate a relaxation or decrease in the tension of the reflective nerve veins which results in vasodilation accompanied by a reduction in heart rate. Listening to the Qur'an therapy of the Quran works on the brain. External stimuli (reading and listening to the Qur'an) can increase the production of chemicals called neuropeptides. These molecules act as receptors in the body and can provide feedback in the form of pleasure or comfort.

Progressive muscle relaxation can stimulate the secretion of chemicals similar to beta blockers in the peripheral nerves. This chemical functions to cover sympathetic nerve nodes to reduce tension and lower blood pressure (Tyani & Utomo, 2015). The progressive muscle relaxation mechanism can stimulate the parasympathetic nervous system, namely the rafe nucleus located under the pons and medulla, resulting in a decrease in body metabolism, pulse, and systolic and diastolic blood pressure (Putri, 2017). Progressive muscle relaxation has the effect of reducing or eliminating tension, providing a sense of comfort to fight stress, anxiety, and tension. According to Jacobson, tension has to do with the shrinking of muscle fibers, while the opposite of tension is the absence of muscle contraction. He found that the effects of tense and relaxed several muscle groups, and there were different effects of tense and relaxed sensations. A person can eliminate muscle contractions and experience a sense of relaxation (Soewondo et al., .2016), thus affecting the lowering of blood pressure.

The decrease in blood pressure in the treatment group and control group, the difference in systole in the intervention group and control group was 15.72 – 7.34 = 8.38 mmHg, the difference in diastole between the intervention group and the control group was 10.72 – 6.43 = 4.29 mmHg which means that the decrease in blood pressure in the intervention group was greater than that of the control group.

The positive perception obtained from listening stimulates the hypothalamus to release endorphins. This hormone will make a person feel happy. Furthermore, the amygdala (which helps coordinate responses to things in the environment that trigger an emotional response) will stimulate the activation and control of the autonomic nerves made up of the parasympathetic nerves that

serve to innervate the heart and slow down the heart rate, while the sympathetic nerves work the other way around. Controlled stimulation of the autonomic nerves will lead to the secretion of epinephrine and norepinephrine by the adrenal medulla. Control of the hormones epinephrine and norepinephrine will inhibit the formation of angiotensin (a hormone that can cause the narrowing of blood vessels so that it can cause vasoconstriction), which can then lower blood pressure (vasodilation occurs). Listening to the Qur'an gives positive energy, including from a psychological point of view, which can affect the body's chemical system and blood pressure in response to internal and external environmental conditions, which are considered to be the cause of health problems in a person. Listening to the Qur'an provides positive energy that stimulates the auditory organs and limbic system (functions to control emotions). The hypothalamus stimulates the release of brain waves (alpha). These (alpha) brain waves cause the release of the neurotransmitters serotonin and endorphin. Both will stimulate this chemical parasympathetic nervous system that opposes the sympathetic nervous system's work of cardiovascular reactivity on isometric grip tests, altering the cardiovascular system, such as vasodilation of blood vessels and decreased cardiac output, followed by a decrease in blood pressure.

Progressive muscle relaxation can stimulate the emergence of chemicals similar to beta blockers in peripheral nerves that can cover sympathetic nerve nodes that are useful for reducing tension and lowering blood pressure. Beta-blockers can reduce ischemia and angina due to their primary effects as inotropic and chronotropic negative. With a decrease in heart rate, the diastolic filling time for coronary perfusion will be extended. Progressive muscle relaxation techniques focus on muscle activity, identify tense muscles, and then reduce tension by performing relaxation techniques to get a feeling of relaxation. Damanik & Ziraluo (2018) relaxation response is part of a general decline in cognitive, physiological, and behavioral stimulation. Relaxation can stimulate the appearance of beta blocker-like chemicals in the peripheral nerves that can close sympathetic nerve nodes that are useful for reducing tension and lowering blood pressure. Progressive muscle relaxation can increase relaxation by decreasing sympathetic nerve activity and increasing parasympathetic nerve activity, releasing the neurotransmitter acetylcholine to inhibit sympathetic nerve activity by decreasing heart muscle contractility, arterial vasodilation, and veins, then lowering blood pressure.

The results of this study are consistent with the discovery of Damanik & Ziraluo (2018) that there is an effect of progressive muscle relaxation techniques on lowering blood pressure in hypertensive patients. The research design used a quasi-experiment to obtain the average results of blood pressure before and after the intervention was given. There was a decrease in systolic by 5 mmHg, and diastolic by 2 mmHg. Susilawati (2019) obtained the results that there was an effect of the influence of Qur'an listening therapy on the reduction of blood pressure in the elderly with hypertension with a pre-experimental design in which the average value of blood pressure of participants decreased by 10.5 mmHg and diastole by 6.00 mmHg. Research by Fernalia et al. (2020) shows that there is an effect of listening to the Qur'an surah al-kahfi on lowering blood pressure in the elderly who experience hypertension. The study design selected by the pre-test and post-test one group showed an average reduction in blood pressure of 7.41 mmHg and diastole of 4.08 mmHg.

There was a difference in systolic and diastolic blood pressure in the intervention group; the intervention group was given a combination therapy treatment of listening to the Qur'an and progressive muscle relaxation and continued to consume standard hypertension drugs, while the control group was only given standard hypertension drugs. There was a difference in blood pressure

reduction likely to occur due to differences in treatment in control and treatment groups and the length of the intervention. Thus, women of reproductive age with hypertension can lower high blood pressure with complementary therapy with combination therapy of listening to the Qur'an and progressive muscle relaxation in addition to continuing to take standard hypertension medications.

Conclusion

Complementary therapy is growing rapidly to be provided to the community. Women of reproductive age who are given complementary therapy, listening to the Qur'an, and progressive muscle relaxation can have the effect of lowering blood pressure in women of reproductive age. This study contributes to clinical therapy that Qur'anic listening therapy combined with progressive muscle relaxation can be used as part of complementary therapy by health workers in community health services. Education needs to be provided to the community, especially women of reproductive age; the benefits of listening to the Qur'an Al-Quran combined with progressive muscle relaxation can lower blood pressure in hypertensive patients.

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