

The Effectiveness of Feet Soak with Warm Water and Murottal Al-Qur'an to Reduce Blood Pressure In Hypertensive Patients

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ABSTRACT

Background: hypertension is a public health problem that is often found in developed and developing countries. There have been many managements of hypertension using non-pharmacological therapy because of their few side effects. Moreover, using more than one therapy in several studies has proven effective.

Purpose: to determine the effectiveness of feet soak with warm water and murottal Al-Qur'an to reduce blood pressure in hypertensive patients.

Methods: this study used Quasy Experiments with Nonequivalent Control Group Design. These samples were 36 respondents. The sampling technique used purposive sampling and the tests used Paired Sample T-Test and Independent Sample T-Test.

Results: the results showed that blood pressure before being given combination therapy with feet soak and murottal Al-Qur'an, showed average value 152.33 (systolic) and 94.17 (diastolic), while after being given combination therapy, the average value becomes 135.17 (systolic) and 81.11 (diastolic) means it has decreased with p value = $0.000 < 0.05$. In control group, there was no decreased change in diastolic blood pressure ($p = 0.100$).

Conclusion: the combination of feet soak therapy and murrotal Al-Qur'an is effective in reducing systolic and diastolic blood pressure in hypertensive patients. This combination therapy can be applied easily using standard operating procedures that have been made in this study.

Keywords:

Hypertension; blood pressure; foot soak; murottal.

BACKGROUND

Hypertension is a major public health problem due to its high prevalence worldwide. Approximately 7.6 million annual deaths (13.5% of the world's total deaths) are caused by high blood pressure (Kishore et al., 2016). World Health Organization (WHO) data in 2015 showed that around 1.1 billion people in the world suffer from hypertension, it is expected to increase until 1.5 billion by 2025 (Singh et al., 2017; Livana & Basthomi, 2020).

The Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) in 2003 defined hypertension as a condition where systolic blood ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg (Department of Health and Human Services, 2003). Hypertension is often referred to as the "silent killer" because people with hypertension often do not know the symptoms seen in the early stages until the occurrence of medical complications such as heart attack, stroke, or chronic kidney disease (Singh et al., 2017; Livana & Basthomi, 2020). The complications caused must be controlled or treated immediately, so it's not to make things worse. One of the treatments of hypertension is by giving antihypertensive drugs that work to reduce blood pressure. However, antihypertensive drugs are relatively expensive and have many side effects, so people with hypertension often do not comply with therapy and turn to find other alternatives using nonpharmacological therapies (Machus et al., 2020).

One of the methods of nonpharmacological therapy to reduce blood pressure is using feet soak therapy with warm water. Warm water feet soaking therapy takes place conductively where heat transfer occurs from warm water to the body so as to improve blood circulation by widening blood vessels (Pristiyani & Mujahid, 2020). Research using warm water feet soak to treat hypertension was once conducted by combining lemon aromatherapy, the results were effective in reducing systolic blood pressure in prehypertensive patients. In the study, the prevention was given on the same day and time, once a day in a closed room. Warm water feet soak is carried out with a water level of 15 cm from the soles of the feet and given for 15 minutes with temperature in 39-40 °C (Fadlilah et al., 2021).

A similar nonpharmacological therapeutic method that can be used to reduce blood pressure is religious relaxation by listening to the murottal Al-Quran. The large number of Muslims in Indonesia, even making it the country with the most Muslims in the world, makes murottal Qur'an therapy very popularly used in Indonesia (Sari & Pujiastuti, 2021). When hypertensive patients listen to the murottal, the central nervous system will communicate the hypothalamus to increase endorfine hormones in the pituitary gland, as well as suppress the hormones stress epinephrine and norepinephrine in the adrenal glands so that it can help to reduce blood pressure (Oktalina et al., 2020). Research using the murottal Al-Qur'an to treat hypertension has also been carried out by combining wet cupping therapy. The results of both therapies are effective in reducing systolic and diastolic blood pressure in hypertensive clients (Sari & Pujiastuti, 2021). There are also studies that combine warm water feet soak therapy and Qur'an murottal to reduce blood pressure in people with hypertension which is done for 15 minutes once every 3 days. As a result, murottal Al-Qur'an and warm water feet soak combination therapy have an effect on reducing systolic and diastolic blood pressure (Oktalina et al., 2020). In the study of feet soaking and murrotal Al-Qur'an combination therapy in previous studies has not used

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control groups and explanations of unstructured implementation procedures. So, it is necessary to develop similar research, especially because of the benefits of these two non-pharmacological therapies that have been proven effective for reducing blood pressure in people with hypertension. So, it is hoped that the problem of hypertension will get other alternative treatments that are safer and more comfortable by applying a combination therapy of warm water foot soak and murottal Al-Qur'an.

OBJECTIVE

To find out the effectiveness of warm water foot soak and murottal Al-Qur'an combination to reduce blood pressure in people with hypertension.

METHODS

The research design used *Quasy Experiment with Nonequivalent Control Group Design*. This research was conducted in the working area of Puskesmas Boja 2, Kendal Regency in November 2022. The population in the study was all hypertensive patients in the working area of Puskesmas Boja 2. The sample was determined by the formula $(t - 1)(r - 1) \geq 15$, the number of samples for each intervention group and control group was 16 respondents, in order to avoid *a drop out*, added 10% so that it became 18 respondents per group. The sampling technique used *purposive sampling*, with inclusion criteria: systolic / diastolic blood pressure $\geq 140 / \geq 90$ mmHg, age ≥ 35 years, and has never received feet soaking and murottal therapy before or 2 weeks later. Then, the exclusion criteria: have wounds on the legs, have hearing loss and have degenerative diseases. The research instrument used a voice recording (MP3) of Surah Ar-Rahman chanted by Ahmad Saud (validated in the art laboratory of the Faculty of Culture and Arts, Semarang State University), standard operating procedure for combination therapy of warm water foot soak and murottals Al-Qur'an, digital sphygmomanometers, and observation sheets. Data analysis using Paired Sample T-test and Independent Sample T-test.

Feet soak therapy used warm water about 38-40°C which was measured by a water thermometer, and to kept the water warm at the top of the basin is covered with a towel. The water level of the feet soak was 15 cm from the sole of the feet which was measured by a ruler. In the intervention group, feet soak therapy was performed together with murottal therapy every afternoon once a day in 14 minutes for 14 days. Meanwhile, in the control group, feet soak therapy was given without murottal therapy. Pretest-Posttest was performed to measure the blood pressure of systole and diastole in the intervention group and control group twice during day 1 and day 14. Pre-test blood pressure measurement was done 5 minutes before the intervention and post-test measurement was done 5 minutes after the last day of intervention.

RESULTS

Table 1. Characteristic respondents based on gender, genetic and age

Characteristics of Respondents	Group				P Value
	Intervention (n=18)		Control (n-18)		
	N	%	N	%	
Gender					0.458*

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Characteristics of Respondents	Group				P Value
	Intervention (n=18)		Control (n=18)		
	N	%	N	%	
Female	14	77.8%	13	72.2%	0.458*
Male	4	22.2%	5	27.8%	
Genetics					0.954*
Yes	13	72.2%	14	77.8%	
No	5	27.8%	4	22.2%	
Age					
Mean ± SD	48.28±8.302		49.61±8.452		

*Levene Test

Table 1 shows a female-dominated sex distribution of 14 people (77.8%) in the intervention group and 13 people (72.2%) in the control group. Meanwhile, for men in the intervention group are 4 people (22.2%) and the control group 5 people (27.8%). The distribution of respondents based on a history of congenital hypertension (genetic) in the intervention group are 13 people (72.2%) and in the control group 14 people (77.8%). In the intervention group has an average age of 48 years and in the control group has an average age of 49 years. The p-value results for all characteristic variables show a value ($p > 0.05$), then it can be inferred between the variables of the intervention group and control are homogeneous.

Table 2. Homogeneity test results

Variable	P-Value	Information
Systolic	0.783	Homogeneous
Diastolic	0.933	Homogeneous

*Levene Test

The results of the systolic data homogeneity test in the intervention and control group obtained p value = 0.783 ($p > 0.05$). In the diastolic data of the intervention and control group, obtained p value = 0.933 ($p > 0.05$). These results show that the measured data came from a homogeneous (same) population.

Table 3. Normality Test Results

Variable			Group	
			Intervention P Value	Control P Value
Blood Pressure	Pre-Test	Systolic	0.357	0.654
		Diastolic	0.199	0.111
Blood Pressure	Post-Test	Systolic	0.741	0.586
		Diastolic	0.497	0.336

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Table 3 shows statistically the variable data has p-value of > 0.05 , means that the data is normally distributed. So, the research continued using parametric statistical tests using Paired Sample T-Test.

Table 4. Mean differences before and after treatment in the intervention group and the control group

Variable	Blood Pressure		P-Value		
	Pre	Post			
	Mean±SD	Mean±SD			
Group	Intervention	Systolic	152.33±5.951	135.17±6.627	0.000
		Diastolic	94.17±4.176	81.11±4.114	0.000
	Control	Systolic	152.50±6.032	150.11±5.519	0.001
		Diastolic	93.67±5.269	92.89±4.071	0.100

Paired Sample T-Test

Table 4 shows that the average initial condition of the systolic blood pressure of the intervention group was 152.33 mmHg and in the control group 152.50 mmHg, while the diastolic blood pressure was 94.17 mmHg in the intervention group and 93.67 mmHg in the control group. The final condition after treatment, the average systolic and diastolic blood pressure showed decreased in systolic to 135.17 mmHg in the intervention group and 150.11 mmHg in the control group, as well as diastolic of 81.11 mmHg in the intervention group and 92.89 mmHg in the control group.

Based on the results of statistical tests, it shows that p-value for systolic blood pressure before and after treatment in the intervention group is 0.000 (<0.05), and in the control group 0.001 (<0.05), it can be concluded that there are differences in mean systolic blood pressure before and after treatment was given in the intervention group and the control group. Meanwhile, in the results of diastolic blood pressure measurement before and after treatment in the intervention group of 0.000 (<0.05), there is difference in the average diastolic blood pressure before and after given a combination therapy of feet soak and murottal Al-Qur'an. However, in the control group, there is no difference in average diastolic blood pressure before and after given feet soak therapy ($p=0.100$).

Table 5. Comparison of Systolic and Diastolic Blood Pressure *Posttest* Intervention Group and Control Group

Blood pressure	Group		Mean Difference Mean±SD	P-Value	
	Intervention	Control			
	Mean±SD	Mean±SD			
Post-Post	Systolic	135.17±6.625	150.11±5.519	-14.944±2.033	0.000
	Diastolic	81.11±4.114	92.89±4.071	-11.778±1.364	0.000

Independent Sample T-Test

Table 5 shows that the mean difference in posttest systolic blood pressure in the intervention and control groups is -14,944 mmHg. Negative results shows that the mean posttest systolic blood pressure of the intervention group is lower than the control group.

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The results of the bivariate analysis of posttest systolic blood pressure of the intervention and control groups obtained p -value 0.000, it means that there is a significant difference from the posttest systolic blood pressure of the intervention group and the posttest of control group. Meanwhile, the mean difference in posttest diastolic blood pressure in the intervention and control groups is -11.778 mmHg. Negative results shows that the mean posttest diastolic blood pressure of the intervention group is lower than the control group. The results of the bivariate analysis of posttest diastolic blood pressure intervention and control groups obtained p -value 0.000, so it means that there is a significant difference from the posttest diastolic blood pressure of the intervention group and the posttest of control group.

DISCUSSION

The results showed that there was a decrease in the average systolic and diastolic blood pressure in hypertensive patients with the administration of a combination therapy of warm water feet soak and murottal Al-Qur'an. The average systolic blood pressure before experiment was 152.33 mmHg and the average diastolic blood pressure before experiment was 94.17 mmHg. Then after given combination therapy of soaking the feet with warm water and murottal Al-Qur'an, the average result of systolic blood pressure after experiment dropped to 135.17 mmHg and the average diastolic blood pressure after experiment dropped to 81.11 mmHg. Systolic blood pressure is the amount of pressure against the walls of the arteries each time the heart contracts or when pressing blood out of the heart. Meanwhile, diastolic blood pressure is the amount of pressure in the arteries between the heart rate and when the heart is at rest (Penggali et al., 2015).

The results showed that there was a difference in the average systolic ($p = 0.000$) and diastolic ($p = 0.000$) blood pressure before and after being given a combination therapy of soaking feet with warm water and murottal Al-Qur'an. In the control group that was only given warm water feet soak, there was a difference in the average systolic blood pressure after given the therapy ($p = 0.001$), but at diastolic pressure, there was no difference in the mean before and after giving warm water feet soak ($p = 0.100$). In another study that used only warm water feet soak therapy, it was proven that it was not effective in reducing blood pressure in patients with hypertension after being assessed 3 times the treatment (posttest O2, O3, O4) by comparing 3 mean *posttest* systolic blood pressure, Friedman's test obtained P -value = $0.689 > (\alpha = 0.05)$, so there was no difference between the results of systolic blood pressure after giving feet soak therapy with the first, second and third measurement (Masi & Rottie, 2017). However, in another research, there is research which use warm water feet soak to overcome hypertension by combining lemon aromatherapy, the results are effective in reducing systolic blood pressure in prehypertensive patients ($p = 0.000$) (Fadlilah et al., 2021). Another study compared feet soak therapy with captopril administration, there's no significant difference between warm water feet soak therapy and captopril administration in reducing systolic ($p = 0.154$) and diastolic blood pressure ($p = 0.675$). The administration of warm water feet soak therapy and captopril are equally effective in reducing blood pressure (Ilkafah, 2016).

Feet soak therapy is a nonpharmacological treatment whose way of working is to dilate blood vessels and reduce muscle tension. The therapy facilitates the flow of blood vessels

that can affect arterial pressure by the bareceptors in the corpus sinuses and aortic arcus that convey impulses carried by nerve fibers with bringing cues from all parts of the body to provide information to the brain regarding blood pressure, blood volume and special needs of all organs to sympathetic nerve centers leading to medulla. It can stimulate systolic pressure by stretching the ventricular muscles to stimulate the ventricular muscles to perform ventricular contractions. At the beginning of contraction, the aortic valve and the semilunar valve have not yet opened. To open the aortic valve, the pressure inside the ventricle must exceed the pressure of the aortic valve. With the dilation of these blood vessels, blood flow will be smooth, and it will be easy to push blood into the heart so that it can decrease the systolic blood pressure. While diastolic blood pressure occurs in a state of isovolemic ventricular relaxation. When the ventricles relax, the ventricular pressure drops drastically, then blood flow becomes smooth due to the dilation of blood vessels so that it will reduce the diastolic blood pressure (Oktalina et al., 2020; Sudirman et al., 2022).

The results of the bivariate analysis of posttest systolic blood pressure intervention and control group ($p=0.000$), while posttest diastolic blood pressure intervention and control group ($p=0.000$), it means that there is a significant difference from systolic and diastolic posttest blood pressure intervention group and posttest control group. The results showed mean difference in posttest systolic blood pressure in intervention and control groups was -14.944 mmHg. Meanwhile, the mean difference in posttest diastolic blood pressure in intervention and control groups was -11.778 mmHg. Negative results showed that the mean posttest systolic and diastolic blood pressure of the intervention group was lower than the control group. So there was a greater decrease in intervention group which given the combined therapy of warm water feet soak and murottal Al-Qur'an. Similar studies that have been carried out obtained the average result of pressure changes before and after treatment with the murottal Al-Qur'an and feet soaking therapy with the results of the t test showing that p value 0.000, so that combination therapy of warm water feet soak and murottal Al-Qur'an influence against changes in blood pressure (Oktalina et al., 2020). So, it means that warm water feet soak therapy will be more effective in reducing blood pressure if done together with murottal Al-Qur'an therapy

In one of the studies that used murottal Al-Qur'an to reduce blood pressure in hypertensive patients, was obtained p value = 0.000, which means that therapy in listening to the Qur'an affects changes in blood pressure. The average blood pressure values of cystole and diastole before being given Qur'an listening therapy were 159 mmHg and 90.09 mmHg and after being given Qur'an listening therapy the average value of systolic and diastolic blood pressure dropped to 149.27 mmHg and 81 mmHg (Despitasaki et al., 2019). Another study conducted by Sherly et al., (2022) compared murottal therapy with music therapy, proving murottal therapy shows a decrease in blood pressure at a longer interval than music therapy. There was a decrease in blood pressure in the murottal treatment $p=0.001$ in systolic and $p=0.002$ for diastolic. According to the word of God in Surah Yunus (57) which states that Al-Qur'an is a healer of diseases (which are) in the bosom and a guide and mercy for people of faith, so Al-Qur'an is a cure for all kinds of

diseases, both birth and mental illnesses (Sherly et al., 2022). So in this case, the provision of murottal Al-Qur'an therapy is a healing drug for people with hypertension.

One of the factors that can increase blood pressure is emotional instability. Murottal Al-Qur'an provides calm and a sense of peace for those who listen, so as to create emotional stability that can prevent vasoconstriction of blood vessels and reduce blood pressure (Mamlukah et al., 2020). Based on the theory, it is stated that listening to the recitation of Al-Quran verses with tartil will cause peace of mind. Sound effects including chanting verses of Al-Quran can affect the overall physiology of the human body by activating the neocortex and consecutively into the limbic system, hypothalamus, and autonomic nervous system. Auditory stimulation has a distraction effect that can increase endorphin formation and relax muscles (Sumaryani & Puspita Sari, 2015). According to the medical view, murottal therapy exerts the influence of changes in electrical current in muscles, blood circulation, heart rate and blood levels on the skin. These changes indicate a decrease in reflective nerve tension that can loosen the veins and increase blood levels in the skin, accompanied by a decrease in the frequency of the heart's defuncture. Murottal therapy works on the brain by providing stimulation to produce chemicals in the form of neuropeptides that will empathize into receptors in the body, this providing feedback in the form of comfort. So that the condition will slow down the heart rate and reduce blood pressure (Sherly et al., 2022).

In this study, the administration of warm water feet soaking therapy was carried out together with the murottal Al-Qur'an. The treatment is given once a day (every afternoon) in 14 minutes for 14 days. This is based on the fact that soaking feet in warm water should be done repeatedly and regularly (Sudirman et al., 2022), The treatment time is based on Snayder & Lindquist (2014), which says that the right time to do therapy is in the afternoon (Fadlilah et al., 2020) and murottal as auditory therapy must be heard for a minimum of 10-15 minutes to give an effect therapeutic (Oktalina et al., 2020; Nuhan et al., 2018; Wirakhmi & Hikmanti, 2016). In this study, using the murottal Al-Qur'an Surah Ar-Rahman which has been widely used in research has proven its benefits. Surah Ar-Rahman tells the breadth of Allah's mercy. God has created human in the best possible form. Surah Ar-Rahman is interpreted as a surah that explains the importance of being grateful for the vast gift of God, including being grateful for all conditions (Sumaryani & Puspita Sari, 2015).

In this study using Surah Ar-Rahman chanted by Ahmad Saud has been validated in the art laboratory of the Faculty of Culture and Arts, Semarang State University. Surah Ar-Rahman has a medium timbre, pitch of 44 Hz, harmony regular and consistent, rhythm andante, volume of 60 decibels and intensity of medium amplitude. At a low pitch with a slow rhythm and low volume will cause a relaxing effect, while the volume that can cause a therapeutic effect is 40-60 dB. Surah Ar-Rahman consists of 78 verses. All of the verses have a short verse character so that they are comfortable to listen to and can have a relaxing effect for even new listeners. There are 31 verses of the language stylistic form

that are repeated over and over again. The repetition of this verse is to emphasize very strong conviction (Wirakhmi & Hikmanti, 2016).

CONCLUSION

Combination therapy of warm water feet soak and murottal Al-Qur'an is effective in reducing blood pressure in hypertensive patients by reducing the average systolic blood pressure by 152.33 to 135.17 mmHg (p value = 0.000) and average diastolic blood pressure 94.17 mmHg to 81.11 mmHg (p value = 0.000). Health care providers can apply combination therapy of warm water feet soak and murottal Al-Qur'an in accordance with Standard Operating Procedures (SOP) that have been made to be used as an alternative to non-pharmacological management in people with hypertension.

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