



The Effect of A Combination Of Foot Bath Ginger Boiling Water and *Slow Deep Breathing* Exercises On Blood Pressure Reduction In Hypertensive Patients

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ABSTRACT

High blood pressure is a disease where there is a drastic increase in blood pressure, where the increase in blood pressure is more than normal. The purpose of this study was to determine the effect of a combination of foot bath ginger boiling water and slow deep breathing on blood pressure reduction in hypertensive patients. The research design used in this study was Quasy experimental Design with a pre-test and post-test control group design research design, with non-probability sampling techniques, the sample size in this study was 44 respondents divided into 2 namely 22 treatment groups and 22 groups control. The treatment is carried out 6 times for 3 weeks in intensity 2 times a week. Each intervention will be conducted then the respondent will be measured pre-test, then post-test measurements will be carried out after the respondent gets foot bath ginger soak and slow deep breathing treatment. The results showed that after the foot bath treatment of ginger boiled water and slow deep breathing systolic and diastolic blood pressure changed by an average of 40.42%, and for systolic blood pressure was 125.00 mmHg, and diastolic blood pressure 79.55mmHg. The results of the study stated that there was an influence from the administration of the foot bath intervention of ginger cooking water and slow deep breathing on the decrease in blood pressure in hypertensive patients. This can be seen from the Wilcoxon test results with a P value = 0,000 or ($p < \alpha = 0.05$). It can be concluded that the foot baths of ginger cooking water and slow deep breathing have an effect on reducing blood pressure in hypertensive patients. Foot Bath ginger boiling water with a combination of slow deep breathing is very good and suitable for hypertensive patients who choose to use treatment with therapeutic methods, where the therapy can widen blood vessels so that blood circulation becomes smooth so that blood pressure can drop.

Keyword : Foot Bath Ginger Boiling Water;*slow deep breathing*;Blood Pressure

Introduction

Health development according to the 2009 law on health aims to increase awareness, willingness and ability to live a healthy life for each individual. One of the

ways to achieve the goal of health development is that each individual is obliged to have a healthy lifestyle. At this time there has been a change in a person's healthy life or lifestyle, resulting in a shift in

disease patterns in which the burden of disease is no longer dominated by infectious diseases, but also non-communicable diseases such as hypertension (Kemenkes RI, 2018). Hypertension is often called the silent killer or silent killer because the symptoms of hypertension are the same as other diseases or they do not often show symptoms (Smeltzer, 2013.) Hypertension is a disease of the heart and blood vessels characterized by an increase in blood pressure. Hypertension or high blood pressure is a condition in which changes in blood pressure increase chronically (Harnani and Axmalia, 2017).

The prevalence of hypertension according to the latest statistical data ((WHO, 2016) states that there are 24.7% of Southeast Asia's population and 23.5% of Indonesia's population and around one billion people around the world who suffer from hypertension and two-thirds of them are in low-income developing countries. The prevalence of hypertension in Indonesia based on measurement results is 34.1% and in the first position is South Kalimantan province at 44.1% followed by West Java province at 40%. Provinces, 416 districts and 98 cities) in Indonesia totaling 300,000 household samples (Kemenkes RI, 2018). The prevalence of hypertension in East Java based on measurement results is 36.32% and in the first position is Madiun City at 48% followed by Nganjuk at 45% The percentage of sample data was obtained from all provinces and districts / cities (34 Provinces, 416 districts and 98 cities) in Indonesia a total of 29,960 household samples (Riskesdas Jatim, 2018). The prevalence of hypertension in Malang City based on measurement results is 32% (Dinkes, 2018). The percentage of sample data was obtained from all provinces and districts / cities (34 Provinces, 416 districts and 98 cities) in Indonesia totaling 300,000 household samples (Kemenkes RI, 2018).

Based on a preliminary survey in September in the work area of the Lawang Community Health Center, hypertension patients were treated with pharmacological therapy and also the holding of elderly exercise. Data on hypertension sufferers in the 2018-2019 period were 2496 hypertension patients divided into several villages and sub-districts including Bedali Village 424, 379 Sumberporong, 291 Lawang, 283 Ketindan, 275 Turirejo, 185 Sidodadi, 149 Sumberngepoh, 143 Sidoluhur, 131 Wonorejo, 102 Srigading, 86 Kalirejo and 48 Mulyoarjo. Researchers took the second highest prevalence of hypertension data in Sumberporong Village where the number of visits with hypertension sufferers in the last 2 months, namely July and August in Sumberporong Village were 48 people.

Hypertension or high blood pressure can also cause complications if not treated immediately, long-term hypertension can cause damage to the kidneys (kidney failure), heart (coronary heart disease) and brain if hypertension is not detected early and gets adequate treatment then these complications will occur (Dilianti, 2017). The causes of hypertension are due to toxins, heredity (genetic), age, gender, stress, obesity, smoking, and high cholesterol (Susilo, 2011). The risk of hypertension is 17 times higher in people whose age is > 40 years compared to those aged <40 years, meaning that it is known that increasing a person's age will be followed by an increase in the incidence of hypertension (Bhuiyan, 2015).

In most hypertension sufferers can be treated pharmacologically and non pharmacologically Pharmacological treatment usually uses drugs that have side effects. Non-pharmacological treatment can be done by changing a healthier lifestyle and doing therapy, one of which is by soaking feet using boiled ginger water which can be done by everyone. The effect of soaking feet

using warm water is the same as walking barefoot for 30 minutes (Harnani and Axmalia, 2017). Scientifically warm water has a physiological impact on the body, first it affects blood vessels where warm water makes blood circulation smooth, second is the loading factor in the water which will strengthen the muscles and ligaments that affect the joints of the body (Bhuiyan, 2015). Soak feet can use boiled ginger water, ginger itself can also be beneficial for health, namely to lower blood pressure. In a study conducted by Ojulari, Okesina, and Owoyele (2014) on the effects of ginger extract (*Zingiber Officinale*) on blood pressure and heart rate in healthy people at Ilorin University, Kwara State, Nigeria, 60 respondents stated that there was an effect of lowering blood pressure after 2 hours of ginger extract administration. Ginger can improve blood circulation and keep blood pressure low (Bhuiyan, 2015).

The intervention of foot soaking with boiled ginger water can also be combined with other relaxation interventions, namely Slow Deep Breathing or deep breathing relaxation in the respiratory system in the form of a state of inspiration and expiration of exhalation with a breathing frequency of 6-10 times per minute resulting in an increase in cardiopulmonary strain (Josep Izzo I , 2008). According to (Smeltzer, 2013) states that deep breath relaxation can increase alveoli, maintain gas exchange, prevent lung atelectation, reduce physical and emotional stress, deep breath relaxation will also make individuals feel relaxed and calm in mind.

Based on the background or phenomenon above, the researcher wanted to know the effect of a combination of boiled ginger water and *Slow Deep Breathing* on reducing blood pressure in hypertensive patients both before and after being given a combination of boiled ginger water and Slow Deep Breathing in the Work Area of Lawang

Public Health Center in Sumberporong Village, Malang Regency.

Methods

This study used a *Quasy experimental design* with a pretest-posttest control group design. The population in this study were 44 people with hypertension in the Lawang Community Health Center, in Sumberporong Village, who were outpatients in the period of September 2019.

The number of samples from this study were 44 people who were divided into 2 groups, namely 22 intervention groups and 22 control groups who had the criteria for systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg, aged ≥ 20 to ≤ 80 years and patients with composmentis. , cooperative, there are no obstacles to physical mobility. The research was conducted in the Lawang Community Health Center Work Area in Sumberporong Village on 17 November - 7 December 2019.

The intervention group was given a combination treatment of foot soak in boiled ginger and slow deep breathing was given for 3 weeks where 1 week was done 2 times. For the control group, only the blood pressure was observed. Before the treatment was carried out in the intervention group, blood pressure was measured and after the treatment was carried out another measurement was carried out. In the control group, blood pressure measurements were carried out after 20 minutes of measuring blood pressure again.

Results

Table 1 Frequency Distribution of Basic Characteristics of Respondents

Variable	N		%	
	P	K	P	K
a. Gender				
Male	6	8	27,3	36,4
Female	16	14	72,7	63,6
b. Age				
21-40	1	0	4,5	0

41-60	21	9	95,5	40,9
>60	0	13	0	59,1
c. Consume excess salt				
Yes	19	20	86,4	90,9
No	3	2	13,6	9,1
d. Family History				
Yes	14	13	45,5	59,1
No	8	9	54,5	40,9
e. Smoking History				
Yes	5	4	22,7	18,2
No	17	18	77,3	81,8
f. Exercise Habbits				
Yes	10	3	45,5	13,6
No	12	19	54,5	86,4
g. Drug Consumption				
Amlodipine	13	15	59,1	68,2
Captopril	9	7	40,9	31,8

Based on table 1 shows that based on gender is more dominant in the treatment group, namely 16 female respondents (72.7%), based on age is more dominant in the treatment group with the largest respondent, namely the age range 41-60 with 21 respondents (95.5 %), based on family history more dominant in the treatment group with the largest answer "Yes" a number of 14 respondents (45.5%), based on excess salt consumption is more dominant in the treatment group with the largest answer "Yes" a number of 19 respondents (86.4%) , based on smoking history was more dominant in the control group with the answer "No" as many as 18 respondents (81.8%), based on exercise habits more dominant in the control group with the answer "No" a number of 19 respondents (86.4%), based on drug consumption more dominant in the control group with the answer "Amlodipine" a number of 15 respondents (68.2%).

Table 2 Average Systolic and Diastolic Blood Pressure of Respondents in Sumberporong Lawang Village with the Shapiro Wilk Normality Test

Variabel	Kelompok Perlakuan		
	N	Mean	SD
Pre-test TD Sistolik	22	168,64	15,521
Pre-test TD Diastolik	22	97,27	8,270
Post-test TD Sistolik	22	125,00	5,976
Post-test TD Diastolik	22	79,55	3,751
Kelompok Kontrol			
Variabel	N	Mean	SD
Pre-test TD Sistolik	22	179,55	14,631
Pre-test TD Diastolik	22	95,00	8,018
Post-test TD Sistolik	22	155,91	18,429
Post-test TD Diastolik	22	83,64	8,477

Based on table 2, it is known that the average systolic blood pressure in the treatment group before the combination of foot soak in ginger and slow deep breathing was 168.64 mmHg and after the combination of foot soaking with ginger and slow deep breathing was 125.00 mmHg, while the mean blood pressure was carried out. The pre-test systolic control was 179.55 mmHg, then the post-test measurements were taken to be 155.91 mmHg. Meanwhile, the mean diastolic blood pressure in the treatment group before the combination of foot soak in ginger and slow deep breathing was 97.27 mmHg and after the combination of foot soak with ginger and slow deep breathing was 79.55 mmHg, while the mean systolic blood pressure in pre-control. -test was 95.00 mmHg, then the post-test was measured to be 83.64mmHg.

Table 3 Differences in systolic and diastolic blood pressure before and after intervention in the treatment group and the control group with the *Wilcoxon sign rank test*

Kelompok Perlakuan			
Variabel	N	Sig (2tailed)	^
Sistolik	22	0,000	11,50
Diastolik	22	0,000	11,50

Kelompok Kontrol			
Variabel	N	Sig (2tailed)	^
Sistolik	22	0,000	11,50
Diastolik	22	0,000	11,50

After the normality test was carried out, it was known that the distribution of data was not normally distributed so that the difference analysis was carried out by the Wilcoxon test as shown in Table 4.9 that the pre-post test of systolic blood pressure in the treatment group obtained sig. (tailed) or p value of 0.000 < 0.05 and the pre-post systolic blood pressure test in the control group obtained sig. (tailed) or a p value of 0.000 < 0.05, which means H1 is accepted, which means there is a difference in the average between before and after treatment and it can be concluded that there is an effect of a combination of foot soaking in ginger and slow deep breathing on lowering blood pressure systolic in hypertensive patients between the treatment and control groups.

Then the pre-post diastolic blood pressure test in the treatment group obtained sig. (tailed) or p value of 0.000 < 0.05 and the pre-post diastolic blood pressure test in the control group obtained sig. (tailed) or a p value of 0.000 < 0.05, which means H1 is accepted, meaning that there is a difference in the average between before and after treatment and it can be concluded that there is an effect of a combination of foot soaking in ginger and slow deep breathing on the

decrease in systolic blood pressure. in hypertensive patients between the treatment and control groups.

Table 4 Comparative analysis of systolic and diastolic blood pressures before and after intervention in the treatment and control groups

		Mean Ranks	Sum of Ranks	N	Sig.(2-tailed)
Sistolik	Post Perlakuan	12,11	266,50	22	0,000
	Post Kontrol	32,89	723,50	22	
Diastolik	Post Perlakuan	19,30	424,50	22	0,049
	Post Kontrol	25,70	565,50	22	

Source: Mann Whitney Statistical Test with SPSS

Based on the Mann Whitney test as in table 4.10, the pre-post test systolic blood pressure in the treatment and control groups shows a p value of 0.000 where p value < 0.05, which means H1 is accepted and H0 is rejected, which means that there is a difference in the average between before and After being given the treatment, it can be concluded that there is an effect of a combination of foot soak in boiled ginger and slow deep breathing on a decrease in blood pressure in hypertensive patients between the treatment and control groups.

Discussion

Systolic and Diastolic Blood Pressure Before and After Intervention in the Treatment and Control Groups

Table 2 shows the mean blood pressure in the treatment group before the combination of foot soak in boiled ginger and slow deep breathing to the decrease in blood pressure was 168.64 / 97.27 mmHg and after treatment was 125.00 / 79.55 mmHg, while the mean Blood pressure in the control group was 179.55 / 95.00 mmHg and after treatment was 155.91 / 83.64 mmHg.

Judging from the results of the research above, it was found that the blood

pressure of respondents in Sumberporong Village, before being given treatment, was 44 people who experienced severe high blood pressure, this is because most of the habits of the respondents did not pay attention to health such as lack of exercise, excessive salt consumption, smoking.

From the data on the characteristics of the research respondents, it can be seen that the most dominant or the most influential ones in triggering hypertension are excess salt consumption and lack of exercise habits. Consumption of excess salt can trigger hypertension where salt or sodium draws fluid outside the cells so that it is not excreted, causing fluid buildup in the body. This is what makes blood volume and pressure increase.

This is supported by research by Khoiro (2014) that the average blood pressure before the systolic foot soak therapy was 160 mmHg and the average diastolic blood pressure was 100 mmHg. After the warm water foot soak therapy, the average blood pressure decreased by 150 mmHg systolic and 90 mmHg diastolic.

Other supporting research, namely (Ikafah, 2016), the results of the study showed that there were significant differences in systolic and diastolic blood pressure before and after foot soaking in hypertensive patients where there were 4 respondents who experienced a decrease in blood pressure by 20 mmHg, 6 respondents who experienced a decrease blood pressure of 15 mmHg, 9 respondents who experienced a decrease in blood pressure of 10 mmHg.

Differences in systolic and diastolic blood pressures before and after intervention in the treatment and control groups

Table 3 shows the systolic p value in the treatment group of 0.000 with a decrease of 11.50 mmHg and a diastolic p value of 0.000 with a decrease of 11.50 mmHg, which means that there is an effect of a combination

of foot soak in boiled ginger and slow deep breathing on lowering blood pressure in hypertensive patients.

This study is one of the studies using complementary therapeutic methods using water as the medium with a combination of slow deep breathing relaxation therapy. It is hoped that the results of lowering blood pressure can be more maximal than those using only drugs or only pharmacological therapy. Hydrotherapy is a therapeutic method using water as a medium to treat or alleviate painful conditions with a therapeutic method with a "lowtech" approach that relies on the body's responses to water (Panti and Islah, 2017). While the Slow Deep Breathing Technique is carried out by regulating deep and slow breathing which can increase the amount of oxygen in the body and stimulate the release of endorphins which have an effect on decreasing sympathetic nerve responses and increasing sympathetic nerve responses throughout the body which results in a relaxed state (Astria, 2015).

Table 3 shows the systolic p value in the control group of 0.000 with a decrease of 11.50 mmHg and a diastolic p value of 0.000 with a decrease of 11.50 mmHg, which means that there is a decrease in blood pressure in the control group even though there is no treatment. In the control group, there was a decrease in blood pressure because the respondents only used pharmacological therapy as the therapy, namely by consuming anti-hypertensive drugs, including amlodipine and captopril drugs. Where the control group only used drugs to lower blood pressure without any other therapeutic action.

Analysis of the effect of a combination of foot soaking in ginger cooking water and slow deep breathing on a decrease in blood pressure in hypertensive patients

Table 3 shows the comparison between the treatment and control groups in

order to obtain a systolic p value of 11.50 and a distolic p value of 11.50, which means that there is a combination of foot soak in boiled ginger and slow deep breathing to decrease blood pressure in hypertensive patients. Based on this analysis, it can be concluded that between the treatment group and the control group both gave the results of a decrease in blood pressure, the difference was that the treatment group was given foot soaking therapy with ginger and slow deep breathing, while the control group only used pharmacological therapy according to the doctor's recommendation without do any therapy.

The statistical results of Mann Whitney stated that between the control group and the treatment group there were significant differences, meaning that there was a significant effect on the combination of foot soak in boiled ginger and slow deep breathing on changes in blood pressure in patients with hypertension, as evidenced by changes in blood pressure in all treatment groups with mean systolic 125.00 and mean diastolic pressure 79.55.

Immersing the feet (body) in a warm solution provides circulation, reduces edema, improves muscle circulation. Warm soaking in combination with ginger will provide a warm feeling that can widen blood vessels so that blood flow is smooth (Kurniawati, 2010, p. 147). In this situation, a systemic response will occur through a vasodilation mechanism (widening of blood vessels) (Potter & Perry, 2010). The results of another study conducted by (Nurrahmani, 2017) showed that there was a decrease in systolic and diastolic blood pressure after being given foot soak in boiled ginger.

In the provision of Slow Deep Breathing therapy in line with the research conducted (Hartanti, 2016), the results of his research showed that the blood pressure of respondents with hypertension experienced a decrease in both systolic blood pressure and

diastolic blood pressure, this happened because the stretch stimulation in the aortic arch and carotid sinus was accepted and transmitted by the vagus nerve to the medulla oblongata, and a subsequent increase in the baroreceptor reflex. Afferent impulses from baroreceptors reach the heart center which stimulates the parasympathetic nerves and inhibits the sympathetic nervous system, resulting in systemic vasodilation, decreased heart rate and contraction.

This study, researchers tried to combine the therapy of foot soak in boiled ginger water and slow deep breathing so that the results show a more significant reduction where the two benefits of this therapy both have the effect of lowering blood pressure. Researchers argue that the combined effect of foot soak in boiled ginger and slow deep breathing has a significant effect on lowering blood pressure in hypertensive patients than the control group which was only given antihypertension pharmacological therapy alone.

Conclusion

Based on research on the effect of a combination of foot soaking in boiled ginger water and slow deep breathing on high blood pressure levels in Sumberporong Village, the following conclusions can be drawn:

1. Systolic and diastolic blood pressures before and after the intervention of foot soak in boiled ginger water and slow deep breathing are as follows:
 - a. The systolic high blood pressure of respondents before being given a combination of foot soak in boiled ginger and slow deep breathing in the intervention group had an average score of 168.64 (SD 15.521), this value is included in the category of severe high blood pressure.
 - b. The diastolic high blood pressure before being given a combination of foot soak in boiled ginger and slow

- deep breathing in the intervention group had an average score of 97.27 (SD 8.270), this value is included in the category of severe high blood pressure.
- c. The systolic high blood pressure after being given foot soak in boiled ginger and slow deep breathing in the intervention group had an average score of 125.00 (SD 5,976), this value is included in the category of mild high blood pressure.
 - d. The diastolic high blood pressure before being given a combination of foot soak in boiled ginger and slow deep breathing in the intervention group had an average score of 79.55 (SD 3.751), this value is included in the category of mild high blood pressure.
2. Identifying systolic and diastolic blood pressures in the control group.
 - a. The systolic high blood pressure before being given treatment in the control group had an average score of 179.55 (SD 14.631), this value is included in the category of severe high blood pressure.
 - b. The diastolic high blood pressure of respondents before being given treatment in the control group had an average score of 95.00 (SD 8,018), this value is included in the category of severe high blood pressure.
 - c. The systolic high blood pressure after being given treatment in the control group had an average score of 155.91 (SD 18.429), this value is included in the medium high blood pressure category.
 - d. Respondents' diastolic high blood pressure after being given treatment in the control group had an average score of 83.64 (SD 8,477), this value is included in the medium high blood pressure category..
 3. The results of the Wilcoxon systolic blood pressure test show that in the control group

- the p-value of 0,000 is smaller than α (0.05), so H_0 is rejected, meaning that there is an average difference between the before and after values in the control group. Meanwhile, in the intervention group, it is known that the p-value is 0.000 smaller than α (0.05), which means that there is also an average difference between the values before being given the combined treatment of foot soak in ginger boiled water and slow deep breathing.
4. The results of the Wilcoxon diastolic blood pressure test show that in the control group the p-value of 0,000 is smaller than α (0.05), so H_0 is rejected, meaning that there is an average difference between the before and after values in the control group. Then in the intervention group, it is known that the p-value is 0.000 smaller than α (0.05), which means that there is also an average difference between the values before and after being given the combination treatment of foot soak with ginger and slow deep breathing.
 5. The results of the Man Whitney test showed that the pre-post test systolic blood pressure in the treatment and control groups showed a p value of 0.000 where the p value <0.05 , which means H_1 is accepted and H_0 is rejected, which means there is a difference in the average between before and after it was given. treatment and it can be concluded that there is an effect of a combination of foot soak in boiled ginger water and slow deep breathing on a decrease in blood pressure in hypertensive patients between the treatment and control groups.

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