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Original Research Article

COMBINATION OF FOOT HYDROTHERAPY AND SLOW DEEP BREATHING ON BLOOD PRESSURE IN HYPERTENSIVE PATIENTS

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ABSTRACT

Introduction. Hypertension becomes very dangerous when the patient cannot control blood pressure, because it will cause complications. One of the nonpharmacological therapies that can be done is foot hydrotherapy using warm red ginger decoction and slow deep breathing. The purpose of this study was to determine the effect of the combination of red ginger foot hydrotherapy and slow deep breathing on blood pressure in patients with hypertension. **Method**. Pre-experimental research design with one group pre-test post-test design approach with a sample of 20 people. Total sampling technique. Observation sheet measuring instrument and sphygmomanometer with Wilcoxon statistical test. **Result & Analysis**. The results of the study obtained blood pressure values before the intervention and found that all respondents had blood pressure in the category of hypertension stage 2 (100%) and after the intervention found 55% in the elevated category and stage 1 hypertension as much as 45%. The results of the static test p-value = 0.000, which shows the effect of the Red Ginger Foot Hydrotherapy combination of Slow Deep Breathing on the blood pressure of hypertensive patients. **Discussion**. Doing red ginger foot hydrotherapy in combination with slow deep breathing can control blood pressure, but must be supported to consume drugs regularly, exercise, carrying out a diet, and avoiding stress.

Keywords: Red Ginger Foot Hydrotherapy, Slow Deep Breathing, hypertension

INTRODUCTION

Hypertension is known by ordinary people as "high blood" which is when systole pressure is measured ≥140 mmHg or diastole pressure is measured ≥90 mmHg (WHO, 2015). often does not cause complaints and sufferers will wake up when symptoms are felt to get worse (Kemenkes RI, 2015). Hypertension is seen as a major risk factor for the incidence of cerebrovascular diseases such as stroke or transient ischemic attack (Rikmasari and Noprizon, 2020).

Some factors that can affect the magnitude of the risk of hypertension include age, genetics, physical activity, stress, and medication adherence. Other factors that cause hypertension are lifestyle such as consumption of junk food (high in calories, high in fat, low in fiber, high in sodium/salt), smoking, alcohol consumption, and lack of physical activity (Iswahyuni, 2017). The risk of hypertension will be even greater if, in the patient's body, there are also cardiovascular risk factors that will have an impact on increasing the mortality and morbidity rate of people with hypertension (Rikmasari and Noprizon, 2020).

Hypertension becomes very dangerous when patients do not control it because if it occurs for a long time it will cause complications of the disease such as coronary heart disease, stroke, kidney

failure and visual impairment (Anshari, 2020). Hypertension can also pose a risk of coronary artery disease such as myocardial infarction or angina, kidney failure, dementia, or atrial fibrillation (Rikmasari and Noprizon, 2020).

The number of people with hypertension continues to increase every year. Data from the World Health Organization (WHO) in 2015 shows around 1.13 billion people diagnosed with hypertension and is expected to increase by 1.5 billion by 2025 (Mills *et al.*, 2016). The incidence of hypertension in Indonesia also tends to increase. According to the results of Basic Health Research (RISKESDAS) in 2018 regarding the national prevalence of hypertension in the population aged >18 years in Indonesia, which was 34.1% from 25.8% of cases in 2013 (Kementerian Kesehatan (Kemenkes) RI, 2019). Based on the results of Riskesdas 2018, the prevalence of people with high blood pressure in East Java Province is 36.3%. The prevalence increases with age. When compared to Riskesdas 2013 (26.4%). The prevalence of high blood pressure has increased significantly. The estimated number of hypertensive patients aged approximately 15 years in East Java Province is around 11,008,334 population, with a proportion of men at 48.83% and women at 51.17%. Of these, people with hypertension who get health services are 35.60% or 3,919,489 residents (Dinkes Jatim, 2021).

Based on the results of an initial survey that has been conducted in the Sedayu RW 03 area, Morokrembangan Village, Krembangan District, Surabaya City, 10 people suffering from hypertension, all of them know about their hypertension. 6 out of 10 When you have a headache, you just rest, 3 people take medicine, and 1 person takes celery.

Hypertension is often referred to as a dark killer because it is a deadly disease without being accompanied by symptoms first as a warning to its victims (Akbar, Nur and Humaerah, 2020). The causes that affect blood pressure are age, sex, education level, physical activity, genetic factors (heredity), food intake, smoking habits, and stress (Akbar, Nur and Humaerah, 2020). A person will be more susceptible to hypertension if there are family members with a history of hypertension. In addition, someone over 65 years old and has congenital diseases such as diabetes and kidney disorders is also at higher risk of hypertension. Risk factors for hypertension that we can control can be present from unhealthy diets, sedentary lifestyles, cigarette and alcohol consumption, and obesity (WHO, 2019).

Hypertensive patients are required to consume antihypertensive drugs regularly such as Angiotensin Converting Enzymes (ACE), beta-blockers, direct renin inhibitors, and others as a tertiary prevention measure. These various drugs can cause a rapid drop in blood pressure. However, various kinds of effects will appear depending on the length and duration of use. The treatment has side effects such as headaches, disorders of the liver and heart, weakness, and nausea. In efforts to minimize pharmacological side effects and help blood pressure decrease, a non-pharmacological approach is needed as a companion to pharmacological management (Izzat, Jauhar and Surachmi, 2021).

One of the nonpharmacological therapies that can be applied to patients with hypertension is hydrotherapy (foot soak) using warm red ginger decoction (Silfiyani and Khayati, 2021) and slow deep breathing (deep breath relaxation) (Andri *et al.*, 2018).

The results of a study conducted by (Silfiyani and Khayati, 2021) on red ginger foot hydrotherapy said that after therapy for 6 times 2 weeks, the evaluation results found a decrease in blood pressure values after doing foot hydrotherapy with warm red ginger decoction. Changes occurred in all respondents with an average decrease in systole of 17.66 mmHg and an average decrease in dyastole of 5.06

mmHg.While in the intervention group of slow deep breathing exercise experienced a decrease in systolic blood pressure by 2.69 mmHg and diastolic blood pressure of 3.87 mmHg (Andri *et al.*, 2018).

Based on the description above, Changes in blood pressure are influenced not only by pharmacological therapy, but also by non-pharmacological therapies that are expected to change blood pressure in patients with hypertension. This study has never been done before because it combines foot hydrotherapy with relaxation techniques, namely Slow Deep Breathing in people with hypertension. The purpose of the study was to analyze *"The Effect of* Red Ginger Foot Hydrotherapy Technique Combination of Slow Deep Breathing on Blood Pressure in Hypertensive Patients".

METHOD AND ANALYSIS

The research was conducted in December 2022 – January 2023 in the Sedayu RW 3 area of Morokrembangan Village, Krembangan District, Surabaya City. The research design used was pre-experimental one group pre post test. The population is 20 people with hypertension. The sampling technique is total sampling. Research instruments are observation sheets and questionnaires containing demographic data. Before the implementation of the respoden research, informed consent is given as evidence of willingness to be researched and willing to follow all stages of research.

Preparation of tools for conducting research is to prepare 50gr of ginger coarsely crushed then boiled with a ratio of ginger: water which is 1:30 (50gr ginger: 1.5 liters of water), let stand a few minutes then apply at a temperature of 39-40 ° C. Then transfer the red ginger soaking water to the basin and soak the feet until it close to the ankles, then cover the basin with a towel, while soaking the respondents are taught to slow deep breathing / deep breathing relaxation by placing hands on the abdomen, recommend breathing through the nose slowly for 3 seconds, hold the breath for 3 seconds, then exhale slowly through the mouth. Red Ginger *Foot Hydrotherapy* technique is carried out 6 times in 2 weeks with researcher supervision and *Slow Deep Breathing* is carried out 3 times a day, namely morning, afternoon and evening for 4 days without the need for researcher supervision. Researchers asked respondents to routinely perform actions that had been given during the specified time limit. The statistical test used is Wilcoxon signed-rank.

RESULT

This research was conducted at RW 003 hall, Jl. Sedayu, RW 003, Morokrembangan Village, Krembangan District, Surabaya City with a total of 20 respondents aged 46-83 years. Activities carried out in the RW 003 area include elderly gymnastics which is carried out once a week, health checks from the puskesmas once a month, and blood pressure measurements once a month.

Research activities were carried out by gathering residents in one place, activities carried out at the research site include blood pressure measurement, education about hypertension, and intervention of red ginger foot hydrotherapy combination of slow deep breathing in patients with hypertension. The response of residents was very enthusiastic in following the activities carried out during the study.

Table 1 Frequency Distribution of Respondent Characteristics Based on Demographic Data, December 2022

Characteristics	F	Presentase	Min	Max	Mean
Gender					
Male	1	13 %			
Female	19	87 %			
Total	20	100 %			

Characteristics	F	Presentase	Min	Max	Mean
Age					
≤ 50 years	2	10 %	46	83	62
51-55 years	3	15 %			
56-60 years	4	20 %			
61-65 years	3	15 %			
66 -70 years	5	25 %			
≥ 71 years	3	15 %			
Total	20	100%			
Education					
Elementary	6	30 %			
Junior School	2	10 %			
Senior School	10	50 %			
Higher Education	2	10 %			
Total	20	100%			
Work					
Housewife	17	85 %			
Private	1	5 %			
Pension	2	10 %			
Total	20	100 %			

Based on table 1 shows that the majority of female respondents amounted to 19 respondents (95%), average (*mean*) 62 years old, with the highest level of education is high school amounting to 10 respondents (50%), the majority of respondents have jobs as Housewives (IRT) totaling 17 respondents (85%).

Table 2 Characteristics of Respondents Based on Blood Pressure Before and After Red Ginger Foot Hydrotherapy Combination Slow Deep Breathing, December 2022

Systolic Blood Pressure	F	Min	Max	Mean
Pre-Test				
Hypertension stage 2	20	140	169	152.10
Post-Test				
High/elevated	11			
Hypertension stage 1	9	120	135	126.50
P value = 0.000				

Based on table 2 shows the comparison of systolic blood pressure before and after Red Ginger Foot Hydrotherapy Combination Slow Deep Breathing. The initial systolic blood pressure value (pre-test) is known that the mean (average) blood pressure value is 152, with a minimum of 140 and a maximum value of 169, while in the final systolic blood pressure value (post-test) it is known that the mean (average) blood pressure value is 126, with a minimum value of 120 and a maximum value of 135. Before the intervention, the majority of respondents had a systolic blood pressure value of 155 as much as 4 (20%) and the majority of respondents experienced a decrease in systolic blood pressure of 135 as much as 7 (35%) after the intervention.

The statistical test section shows the results of the Wilcoxon Test. A significance value of 0.000 ($p < 0.05$) was obtained, thus it can be concluded that "there is a significant difference in blood pressure between before the intervention and after the intervention"

DISCUSSION

1. Identify blood pressure in patients with hypertension before being given Red Ginger Foot Hydrotherapy Combination Slow Deep Breathing.

Based on the results of research on respondents on Jl. Sedayu RW 003, Morokrembangan sub-district, Krembangan District, Surabaya City, a total of 20 respondents before being given Red Ginger Foot Hydrotherapy, the combination of Slow Deep Breathing showed that all respondents had blood pressure in the category of hypertension stage 2 as many as 20 respondents (100%), known to mean (average) blood pressure values are 152, with a minimum of 140 and a maximum value of 169. Hypertension is an abnormal systolic and diastolic blood suppression, the exact limits of this hypertension are uncertain. Acceptable values differ according to age and sex, but in general systolic ranges from 140-90 mmHg and diastolic between 90-95 mmHg

is considered a borderline of hypertension (Nanda, 2016).

This is supported by research data, the majority of respondents participating in this study were 95% female. According to research (Silfiyani and Khayati, 2021) most respondents with hypertension are female as much as 90%. There are two risk factors that cause hypertension, hypertension factors that cannot be changed are family history, age, gender, ethnicity, while hypertension factors that can be changed are diabetes mellitus, stress, obesity, nutrition, drug abuse (Williams and Hopper, 2015) From that the risk in men and women is almost the same between the ages of 55 to 74 years, women are at greater risk (Fajri, 2017).

The age range of 46-83 years is obtained at least 46 years, maximum age 83 years and average (mean) 62 years, primary hypertension usually appears between the ages of 30-50 years, the incidence of hypertension increases with the age of 50-60% of clients aged more than 60 years have blood pressure more than 140/90 mmHg (Fajri, 2017). The majority of respondents have a job as housewives with the highest level of education is high school 10 (50%). The majority of respondents did not have a history of other disease as many as 16 respondents (80%), the majority of respondents had never taken antihypertensive drugs as many as 10 respondents (50%), pharmacological therapy is drugs that help stabilize, lower blood pressure and reduce the risk of complications due to hypertension. The majority of respondents did nothing to control their blood pressure as many as 19 respondents (95%).

The incidence of hypertension is higher in women than in men, because women experience hormonal changes that cause organ disorders or damage to other organs resulting in increased blood pressure. The level of education can affect a person's ability and knowledge in implementing healthy living behaviors, especially controlling blood pressure.

2. Identification of blood pressure in patients with hypertension after being given Red Ginger Foot Hydrotherapy Combination Slow Deep Breathing.

Based on the results of research on respondents on Jl. Sedayu RW 003, Morokrembangan Village, Krembangan District, Surabaya City, a total of 20 respondents after being given Red Ginger Foot Hydrotherapy Combination Slow Deep Breathing for 6 days, researchers assessed blood pressure to respondents after being given the intervention obtained the results of high / elevated blood pressure as many as 11 respondents (55%), and stage 1 hypertension as many as 9 respondents (45%), Known mean (average) blood pressure values are 126, with a minimum value of 120 and a maximum value of 135.

Management of hypertension is divided into two, namely pharmacological therapy (drugs) and non-pharmacological therapy consisting of limiting salt intake, diet / nutrition modification, weight loss, regular exercise and smoking cessation (Ulya, 2017) In this study, researchers focused on non-pharmacological management, namely relaxation techniques in the form of Red Ginger Foot Hydrotherapy Combination of Slow Deep Breathing. Red ginger contains gingerol chemical compounds and minerals in the form of potassium that can lower blood pressure (Silfiyani and Khayati, 2021). Slow deep breathing affects blood pressure through increasing baroreceptor sensitivity and decreasing sympathetic nervous system activity and increasing parasympathetic nervous system activity in hypertensive patients (Andri *et al.*, 2021). Foot hydrotherapy with warm red ginger decoction was carried out 6 times in 2 weeks (Silfiyani and Khayati, 2021) combination of slow deep breathing exercises was carried out three times a day,

namely morning and evening for 4 days (Anggraini, 2020).

On average, respondents experienced a decrease in blood pressure of 25.60 mmHg after being given Red Ginger Foot Hydrotherapy Combination Slow Deep Breathing. According to research (Silfiyani and Khayati, 2021) the results showed changes occurred in all subjects with an average systole decrease of 17.66 mmHg. While in the study (Andri *et al.*, 2018) the slow deep breathing exercise intervention group experienced a decrease in systolic blood pressure by 2.69 mmHg.

Red Ginger Foot Hydrotherapy Slow Deep Breathing Combination is an intervention that can be applied to respondents who have hypertension, if the combination is carried out regularly it can decrease blood pressure, because foot hydrotherapy contains red ginger contains gingerol chemical compounds and minerals in the form of potassium which can lower blood pressure, and slow deep breathing increases parasympathetic nerve activity so that it affects the decrease in frequency heart rate, breathing frequency and lowering blood pressure.

3. The effect of Red Ginger Foot Hydrotherapy Combination of Slow Deep Breathing on blood pressure in patients with hypertension

Based on the results of statistical tests, it is known that the results of the Wilcoxon Signed Rank Test test obtained the result P value = 0.000 which means there is an effect of Red Ginger Foot Hydrotherapy Combination of Slow Deep Breathing on Blood Pressure in Hypertensive Patients Jl. Sedayu RW 003 Morokrembangan Village, Krembangan District, Surabaya City.

The results of this study are supported by (Rahmadani, 2021) about the effect of warm red ginger water foot soak on blood pressure in the elderly with hypertension. And also supported by previous research in research conducted by (Sumartini and Miranti, 2019) on the effect of slow deep breathing on blood pressure of hypertensive elderly.

Soaking Therapy (Hydrotherapy) comes from the Greek word "hydrotherapia" which literally means "treatment with water". This approach uses water to maintain health, prevent and cure disease by conveying temperature and exerting pressure on the body such as using whirlpools, where it can stimulate nerve endings and cause reflex effects. The reflex effect has an impact on blood vessels in terms of producing changes in blood flow and metabolic function (Rahmadani, 2021). Slow deep breathing is a relaxation realized to regulate deep and slow breathing, this has an impact on increasing the effectiveness of baroreflexes and can affect blood pressure, resulting in decreased chemoreflex activity, increased baroreflex sensitivity, decreased sympathetic nerve activity.

With Red Ginger Foot Hydrotherapy Combination Slow Deep Breathing can lower blood pressure. At the time of the activity, respondents were collected in one place that had the same disease history, so that several respondents could share related diseases and interventions provided. The timing of the intervention and the amount of ginger administration must be considered, with the amount of dose in accordance with the SOP during the study. Before therapy, respondents were measured blood pressure and a respondent's therapy was also measured to determine the effect on Red Ginger Foot Hydrotherapy Combination Slow Deep Breathing. There are some respondents as many as 25% who regularly consume drugs like this that can help lower blood pressure.

Red Ginger Foot Hydrotherapy Combination Slow Deep Breathing which is carried out regularly and in accordance with the direction of researchers so that it can show significant reduction results, both men and women who have done Red

Ginger Foot Hydrotherapy Combination Slow Deep Breathing.

CONCLUSION

A combination of foot hydrotherapy using a red ginger bath accompanied by slow deep breathing techniques can provide a sense of relaxation in breathing and blood vessels to help lower blood pressure. Techniques can be an alternative to control blood pressure in addition to being supported by diet and therapy from a doctor.

REFERENCES

Akbar, F., Nur, H. and Humaerah, U. I. (2020) 'Karakteristik Hipertensi Pada Lanjut Usia Di Desa Buku (Characteristics of Hypertension in the Elderly)', *Jwk*, 5(2), pp. 35–42.

Andri, J. *et al.* (2018) 'Efektivitas Isometric Handgrip Exercise dan Slow Deep Breathing Exercise terhadap Perubahan Tekanan Darah pada Penderita Hipertensi', *Jurnal Keperawatan Silampari*, 2(1), pp. 371–384. doi: 10.31539/jks.v2i1.382.

Andri, J. *et al.* (2021) 'Penurunan Tekanan Darah pada Pasien Hipertensi Menggunakan Intervensi Slow Deep Breathing Exercise', *Jurnal Keperawatan Silampari*, 5(1), pp. 255–262. doi: https://doi.org/10.31539/jks.v5i1.2917.

Anggraini, Y. (2020) 'Efektifitas Teknik Relaksasi Nafas Dalam Terhadap Tekanan Darah Pada Pasien Hipertensi di Jakarta', *JKFT: Universitas Muhammadiyah Tangerang*, 5(1), pp. 41–47.

Anshari, Z. (2020) 'Komplikasi Hipertensi Dalam Kaitannya Dengan Pengetahuan Pasien Terhadap Hipertensi Dan Upaya Pencegahannya', *Jurnal Penelitian Keperawatan Medik*, 2(2), pp. 44–51. doi: 10.36656/jpkm.v2i2.289.

Dinkes Jatim (2021) *Profil Kesehatan*. Surabaya.

Fajri, Y. S. (2017) *Asuhan Keperawatan Keluarga Dengan Hipertensi Pada Lansia Tahap Awal Di Wilayah Kerja Pusesmas Andalas Padang*, *Politeknik Kesehatan Kemenkes Padang*. Politeknik Kesehatan Kemenkes Padang.

Iswahyuni, S. (2017) 'Hubungan Antara Aktifitas Fisik Dan Hipertensi Pada Lansia', *Profesi (Profesional Islam) : Media Publikasi Penelitian*, 14(2), pp. 1–4. doi: 10.26576/profesi.155.

Izzat, Y., Jauhar, M. and Surachmi, F. (2021) 'Literature Review : Hydrotherapy Reduce Blood Pressure among Hipertensive Clients', *Jurnal Ilmu Keperawatan (Journal of Nursing Science)*, 9(2), pp. 178–186. doi: 10.21776/ub.jik.2021.009.02.5.

Kemenkes RI (2015) *Hipertensi Penyakit Paling Banyak Diidap Masyarakat*, *Kementrian Kesehatan RI*. doi: http://doi.org/351.077Indr.

Kementerian Kesehatan (Kemenkes) RI (2019) 'Laporan Nasional RISKESDAS 2018', *Badan Penelitian dan Pengembangan Kesehatan*. Jakarta: Lembaga Penerbit Badan Penelitian dan Pengembangan Kesehatan, pp. 1–628. Available at: http://labdata.litbang.kemkes.go.id/images/download/laporan/RKD/2018/Laporan_Nasional_RKD2018_FINAL.pdf.

Mills, K. T. *et al.* (2016) 'Global disparities of hypertension prevalence and control', *Circulation*, 134(6), pp. 441–450. doi: 10.1161/CIRCULATIONAHA.115.018912.

Nanda, M. D. (2016) 'Asuhan Keperawatan pada Nn . F dengan Prioritas Masalah Kebutuhan Dasar Rasa Nyaman (Nyeri) di Kelurahan Sitirejo II Kecamatan Medan Amplas', *Universitas Sumatera Utara*, pp. 1–39.

Rahmadani, W. (2021) *Pengaruh Rendam Kaki Air Jahe Merah Hangat terhadap Tekanan Darah pada Lansia dengan Hipertensi di Puskesmas Pasar Ikan Kota Bengkulu*. Politeknik Kesehatan Kemenkes Bengkulu.

Rikmasari, Y. and Noprizon (2020) 'Hubungan Kepatuhan Menggunakan Obat dengan Keberhasilan Terapi Pasien Hipertensi di RS PT Pusri Palembang', *SCIENTIA J. Far. Kes*, 10(1), pp. 97–103.

Silfiyani, L. D. and Khayati, N. (2021) 'Aplikasi foot hydrotheraphy dengan jahe merah (zingiber officanale var rubrum) terhadap penurunan tekanan darah pada lanjut usia dengan hipertensi', *Ners Muda*, 2(3), pp. 127–140. doi: 10.26714/nm.v2i3.8018.

Sumartini, N. P. and Miranti, I. (2019) 'Pengaruh Slow Deep Breathing Terhadap Tekanan Darah Lansia Hipertensi di Puskesmas Ubung Lombok Tengah', *Jurnal Keperawatan Terpadu (Integrated Nursing Journal)*, 1(1), pp. 38–49. doi: 10.32807/jkt.v1i1.26.

Ulya, M. (2017) 'Pengaruh Kombinasi Terapi Merendam Kaki Dengan Air Hangat Dan Inhalasi Aromaterapi Terhadap Tekanan Darah Pasien Hipertensi Di Desa Brabo Tanggungharjo Grobogan Jawa Tengah', p. 152.

WHO (2015) *Noncommunicable diseases : Hypertension, World Health Organization*. Available at: https://www.who.int/news-room/questions-and-answers/item/noncommunicable-diseases-hypertension.

WHO (2019) *Hypertension*.

Williams, L. s. and Hopper, P. D. (2015) *Medical Surgical Nursing*. Philadepia: F.A. Davis Company.