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Original Research

INFLUENCE COMBINATION OF WARM WATER COMPRESS AND FINGER HAND RELAXATION TO REDUCE HEADACHE IN HYPERTENSION PATIENTS

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Abstract

Background

Hypertension is one of the main causes of premature death. Globally, sufferers reach one of the symptoms of headache. Warm water compresses and finger grip relaxation are commonly used as non-pharmacological therapy for these patients. This study aims to determine the effect of a combination of warm water compresses and finger grip relaxation to reduce headaches in hypertension sufferers.

Methods

The research design used quasi-experiment non-equivalent control group. This study has collected data from June – July 2023 at Prima Husada Hospital, Malang. A sample of 42 people was determined through snowball sampling and divided into two groups of equal size (the experimental group with a combination treatment of warm water compresses and finger grip relaxation and the control group with only warm water compresses treatment). The research instrument was a Numeric Rating Scale (NRS) observation sheet. Then the data were analyzed using paired sample T test and independent sample T test.

Results

The average pretest headache scale for the experimental group dominated by women aged 35-45 years who worked as IRT = 4.4762 (medium) and the control group dominated by women aged 46-55 years who worked as farmers = 4.7143 (medium); the average posttest headache scale for the experimental group = 2.7143 (mild) and the control group = 3.4286 (mild); and both treatments, both the combination of warm water compresses and finger grip relaxation and warm water compresses alone, have a significant effect in reducing headaches for hypertension sufferers (each p-value = 0.000), but the effects of the two are not significantly different. (p-value = 0.078).

Conclusion

These two treatment models are useful in reducing hypertension headaches, although the effectiveness of their effects is not significantly different. Therefore, health service institutions such as hospitals can choose one of the two to be used as a complementary therapy for headaches for hypertension sufferers.

Keywords: Compress; Relaxation Therapy; Headache; Hypertension

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INTRODUCTION

Hypertension is systolic and diastolic blood pressure with increased blood pressure above normal, which results in an increase in the death rate (Dewi 2020) . This disease is common, but if not treated adequately, it can cause serious consequences. In fact, this disease, which is nicknamed the silent killer, is said to be one of the main causes of premature death throughout the world (Al-Makki et al. 2022) .

The World Health Organization (WHO 2023) estimates that around 1.28 billion adults aged 30-79 years suffer from hypertension worldwide, of which two thirds live in low and middle income countries. Africa is the continent with the highest prevalence of hypertension, namely 27%, and the United States is the lowest, namely 18%. Interestingly, the data also state that around 46% of adults are not aware that they suffer from hypertension. This means that they do not undergo treatment for the hypertension they suffer from.

The most recent data from the Ministry of Health's Basic Health Research (Riskesdas) (Kemenkes RI 2018) state that the prevalence of hypertension sufferers in Indonesia is 34.11%. This prevalence rate is higher than in 2013, which was 25.8%. The data on the incidence of hypertension are based on the results of blood pressure measurements in Indonesian people aged 18 years and over. One of the provinces that contribute quite significantly to the incidence of hypertension is East Java at 8.01%.

Malang Regency is one of the areas under the coordination of East Java Province which contributes a considerable number of hypertension cases (essential), namely 7,475 people in 2017 for all age groups (BPS Malang Regency 2018) . One of the private hospitals in Malang Regency which reports quite significant cases of hypertension is Prima Husada Hospital Malang which is located on Jl. Raya Mondoroko, Banjararum, Singosari, Malang Regency with an average number of cases of 28 people (hypertension sufferers) every month in 2022; of the 28 hypertension sufferers around 21 – 22 people experience headaches.

Clinical symptoms arise from an increase in blood pressure, namely nausea and vomiting, nosebleeds, shortness of breath, chest pain, vision problems, ringing in the ears, heart rhythm disturbances, blood in the urine, and headaches (Holland 2021) . Headache is pain that is felt in the head or what is also known as cephalgia where the pain is usually felt above the orbitomeatal line and the back of the head, excluding pain in orofacial areas such as the nose, sinuses, jaw, temporomandibular joints and ears (Haryani 2018) . Headaches that occur due to

increased blood pressure in hypertension sufferers can be mild, even severe (Ferdisa and Ernawati 2021) .

Headache in hypertensive patients is caused by vascular damage to blood vessels. Pain arises as a defense mechanism for the body that arises when tissue is being damaged, causing the individual to react by moving the pain stimulus (Nurman 2017) . However, until now there are no international statistical data showing the prevalence of headaches in hypertensive patients. However, a national survey in the United States found that, of 4,356 respondents suffering from migraines, 21% of them had hypertension (Weil 2021) .

Symptoms that usually appear in hypertension headaches are: nosebleeds, chest pain, difficulty speaking, shortness of breath, blurred vision, numbness or tingling, facial flushing and blood spots in the eyes (subconjunctival hemorrhage). Hypertension headaches can increase with physical activity such as coughing or body movement. Hypertension headaches may indicate a severe hypertensive crisis which can cause stroke and damage to vital organs (Kahawita 2022) .

Pain management, including headaches in hypertensive patients, is not always pharmacological, such as providing analgesic therapy, but can also be non-pharmacological. Non-pharmacological therapies commonly used to treat pain include warm water compresses and relaxation handheld fingers (Valerian, Ayubbana, and Utami, 2021; Fadhilah and Maryatun, 2022) .

A warm compress is a compress using a bladder or compress tool and warm water which is applied to the area of the body that is experiencing pain. (Gotter and Marcin 2019) . Warm compresses can reduce pain because the warm feeling of the compress has a physiological impact on the body of the person being compressed, namely softening fibrous tissue, affecting tissue oxygenation, thereby preventing muscle stiffness, and improving blood flow. Therefore, with all these functions, a warm compress can relieve the pain a person experiences, including headaches (Suryanti, Nopiska, and Harpikriati 2021) . Apart from that, warm compresses can provide a feeling of warmth in order to fulfill the body's need for comfort, reduce or even relieve pain, reduce or relieve muscle spasm and provide a feeling of warmth and comfort in certain areas that are compressed (Tri 2018) .

The results of research conducted by Valerian, Ayubbana, and Utami (2021) showed that hypertensive patients who were given warm compress therapy showed headache levels on a scale of 4 before being given therapy and on a scale of 3 after being given therapy. Setyawan

and Kusuma (2017) also showed that the majority of hypertensive patients experienced headaches at a moderate level, 61.1% of people before being given warm compress therapy and this decreased to 55.6% after being given this therapy. This means that warm water compress therapy can reduce the level of headaches in hypertensive patients.

Furthermore, another therapy commonly used to reduce pain is finger grip relaxation and is an easy way to manage feelings and emotions and develop emotional intelligence in a person. This is because there are energy channels or meridians along the fingers of the human that are connected to various organs and emotions. Reflection points on the hand provide reflex (spontaneous) stimulation when gripping (Siauta, Embuai, and Tuasikal 2020) .

A number of studies have shown a significant effect of finger grip relaxation therapy on pain, but not specifically on headaches in hypertensive patients. Sulung and Rani (2017) stated that there was a significant influence of the finger-hold relaxation technique on pain intensity in post-appendectomy patients with a p-value of 0.000, where the average pain intensity before therapy was 4.80 and after therapy was 3.87. The case study of Larasati and Hidayati (2022) which used two post-operative patients also showed results stating that there was a decrease in the pain scale in patients after being given finger grip relaxation therapy where the first patient's pain scale before being given this therapy was 6 and 5, respectively, while the pain scale of both patients after being given this on the third day were on a scale of 2.

Based on the description above, the researcher is interested in conducting research with the title *"The Effect of a Combination of Warm Water Compresses and Relaxation Handheld Finger for Reduces Headacheon Sufferer Hypertension at Prima Husada Hospital Malang."*

METHODS

Research Design

This research used a quasi-experiment design non-equivalent control group, namely a research design that compares an experimental group and a control group where both are not chosen at random. The experimental group was given treatment in the form of a combination of warm water compresses and finger grip relaxation, while the control group was given treatment in the form of warm water compresses. Both groups had their hypertension headache levels seen before and after treatment.

Sample

The number of samples in this study were some hypertensive patients who experienced pain at Prima Husada Hospital Malang as many as 42 people. The number of samples was divided into two groups, namely the experimental group (the group given a combination of warm water compresses and finger grip relaxation) as many as 21 people and the control group (the group given warm water compresses) as many as 21 people. This is in accordance with the Quasi Experiment (Non-Equivalent Control Group Design) research design used in this study.

The research sample was also determined based on the inclusion and exclusion criteria. Inclusion criteria for the study included hypertensive patients presenting with headache symptoms at Prima Husada Hospital in Malang. Only those who were in a compos mentis condition were considered eligible. Additionally, patients had to be free from the influence of analgesics and must not have any limitations in their limbs or communication disorders. On the other hand, the exclusion criteria aimed to filter out patients who might confound the results. This included hypertensive headache patients with hearing impairments, as well as those who had experienced a cerebrovascular accident (CVA) or other complications. By applying these criteria, the researcher ensured that the sample was appropriate and relevant to the objectives of the study, allowing for more accurate and reliable findings.

Instrument

The instruments used in this study consisted of two types, namely observation sheets that the researcher designed herself to measure the independent variables and standard Numeric Rating Scale (NRS) observation sheets as determined by the College of Medicine Jacksonville to measure pain levels in adult patients (Manoppo, 2018). The patient sample was given warm compresses combined with finger grip relaxation, the control sample was given an intervention in the form of warm compresses only. Next, the sample was assessed using an observation sheet. The researcher filled in this sheet herself based on the answers given by the research respondents. Previously, respondents were asked to mention the scale of pain they felt from 0-10, after being given the intervention it was reviewed to find out the difference between the two treatments.

Procedure

The researcher conducted a study involving 21 hypertensive patients experiencing headaches, referred to as the experimental group. Initially, the researcher assessed the headache levels in these patients before administering the first combination treatment of warm water

compresses and finger grip relaxation (Rahmati and Pamungkas, 2022). Following this assessment, the researcher implemented a combination therapy that included warm water compresses at a temperature of 45-50°C, applied for 5 to 15 minutes, along with finger grip relaxation lasting 10 to 15 minutes. This therapy was initiated six hours after the patients received pharmacological treatment with analgesics, administered once daily for three consecutive days. After the third session of warm water compress and finger grip relaxation treatment, the researcher again observed the headache levels in the experimental group to evaluate the effectiveness of the intervention.

In parallel, a control group of 21 hypertensive patients was also studied. The researcher measured their headache levels before they received the first warm water compress treatment. This treatment, similar to that provided to the experimental group, involved warm water compresses at a temperature of 45-50°C for 5 to 15 minutes, starting six hours after the patients had received analgesics once daily for three consecutive days. Finally, the researcher assessed the headache levels in the control group after they had completed their third warm water compress treatment. Through these observations, the researcher aimed to understand the impact of the combined therapeutic approaches on headache relief in hypertensive patients.

Data Analysis

The researcher conducted univariate and bivariate data analysis. Univariate data analysis was conducted to describe the variables studied, which in this study will be shown through the average value, namely the average level of pain before and after treatment, both a combination of warm water compresses and finger grip relaxation and warm water compress treatment alone. Meanwhile, bivariate analysis was used to determine the difference in the effect of independent variables (a combination of warm compresses and finger grip relaxation) on the dependent variable (hypertensive headache). This study used the Paired Sample T-Test and Independent Sample T-Test with an alpha value of 0.05. The Paired Sample T-Test is basically a statistical test to see the difference in the average value of the dependent research variable produced by the two groups studied, where in this study there were two groups, namely the experimental group and the control group, both before and after treatment. Meanwhile, the Independent Sample T-Test was used to see the difference in the effect of the two treatments on the dependent variable (Sugiyono 2018).

Ethical Considerations

The researcher has obtained ethical clearance from the Health Research Ethics Commission (KEPK) of the Chakra Brahmanda Lentera Institute with the number 003.1/04/II/EC/KEP/LCBL/2023 and has been declared appropriate based on research ethics guidelines in nursing. The client first fills out an informed consent form. If in practice the prospective respondent refuses to participate, the researcher must accept and respect their decision. The respondent's social values are examined to consider whether this research has the potential to conflict with the respondent's social values. Furthermore, this research is carried out using scientific value standards so that it is expected to produce scientific findings for both researchers and respondents.

RESULT

Table 1 describes the characteristics of the experimental group, consisting of 21 participants. The participants are categorized based on several key variables, including gender, age, address, education level, and occupation. This information provides a detailed overview of the composition of the participants involved in the study, which will serve as a foundation for further analysis of the results.

Table 1 Demographic Data of the Experimental Group

Demographics	Information	F	%
Gender	Man	7	33.3
	Woman	14	66.7
	Total	21	100
Age	Early adulthood (26-35 years)	6	28.6
	Late adulthood (35-45 years)	10	47.6
	Early elderly (46-55 years)	5	23.8
	Total	**21**	**100**
Address (by district)	Klojen	2	9.5
	Fern	2	9.5
	Singosari	7	33.3
	Lowokwaru	2	9.5
	Blimbing	2	9.5
	Mace	4	19.0
	Pasuruan	1	4.8
	Karangploso	1	4.8
	Total	**21**	**100**
Education	Elementary School/Equivalent	3	14.3
	Middle School/Equivalent	8	38.1

	High School/Equivalent	4	19.0
	D3/D4	4	19.0
	S1-S3	2	9.5
	Total	**21**	**100**
Work	Private sector employee	5	23.8
	Farmer	4	19.0
	Trader	2	9.5
	IRT	6	28.6
	Teacher	1	4.8
	Self-employed	3	14.3
	Total	**21**	**100**

Table 2 describe about demographic data of the control group, consisting of 21 participants. This data includes the distribution of participants based on key variables such as gender, age, place of residence, education level, and occupation. This information provides an initial insight into the characteristics of the participants used as a comparison in the study

Table 2 Demographic Data of Control Group

Demographics	**Information**	**F**	**%**
Gender	Man	8	38.1
	Woman	13	61.9
	Total	21	100
Age	Early adulthood (26-35 years)	1	4.8
	Late adulthood (35-45 years)	8	38.1
	Early elderly (46-55 years)	9	42.9
	Late elderly (56-65 years)	3	14.3
	Total	21	100
Address (by district)	Klojen	4	19.0
	Singosari	1	4.8
	Lowokwaru	4	19.0
	Blimbing	3	14.3
	Mace	1	4.8
	Karangploso	8	38.1
	Total	**21**	**100**
Education	Elementary School/Equivalent	1	4.8
	Middle School/Equivalent	2	9.5
	High School/Equivalent	7	33.3
	D3/D4	5	23.8
	S1-S3	6	28.6
	Total	**21**	**100**
Work	Private sector employee	4	19.0
	Farmer	6	28.6
	Trader	2	9.5

	IRT	4	19.0
	Teacher	2	9.5
	Self-employed	1	4.8
	Civil servants	2	9.5
	Total	**21**	**100**

Identification of the Headache Scale of Hypertension Sufferers before Giving Combination Treatment of Warm Water Compress and Finger Relaxation (for the Experimental Group) and Treatment of Warm Water Compress Only (for the Control Group)

Table 3 Results of Pretest Identification of Headache Scale for Experimental and Control Groups

Group	Average	Minimum	Maximum
Experiment	4.4762	2	7
Control	4.7143	3	7

Identification of the Headache Scale of Hypertension Sufferers after Being Given Treatment with a Combination of Warm Water Compresses and Finger Relaxation (for the Experimental Group) and Treatment with Warm Water Compresses Only (for the Control Group)

Table 4 Results of Posttest Identification of Headache Scale for Experimental and Control Groups

Group	Average	Minimum	Maximum
Experiment	2.7143	1	5
Control	3.4286	1	6

Table 5 presents the results of the normality test for hypertension headache data, using the Shapiro-Wilk technique. The table includes p-values for both the experimental and control groups, pretest and posttest, compared against an alpha value of 0.05 to determine the normality of the data

Table 5 Normality Test Results for Hypertension Headache Data using the Shapiro Wilk Technique

Group	*p-value*	*Alpha value*
Experimental group pretest	0.139	0.05
Experimental group posttest	0.059	
Control group pretest	0.064	
Control group posttest	0.294	

Table 6 displays the results of the paired sample t-test, illustrating the mean differences and p-values for both the experimental and control groups between pretest and posttest assessments. The data highlights a significant difference in the experimental group, with a mean difference of 1.76190 and a p-value of 0.000, compared to the control group, which shows a mean difference of 1.28571 and a similar p-value of 0.000.

Table 6 Paired Sample T-Test Results

Information	*Mean* Difference	*p-value*	*Alpha value*
Pretest-Posttest experimental group	1.76190	0.000	0.05
Pretest-Posttest control group	1.28571	0.000	

Table 6 above shows that the experimental group show a p-value = 0.000. This means that there is a significant average difference between the hypertension headache scale in the experimental group (21 people) before and after being given treatment with a combination of warm water compresses and finger grip relaxation. Then, if the average value between the pretest and posttest hypertension headache scale in the experimental group is compared, there was a decrease or reduction with an average difference of 1.76190. In simpler terms, it can be said that the combination treatment of warm water compresses and finger grip relaxation has had a significant effect in reducing headaches hypertension sufferers at Prima Husada Hospital Malang.

DISCUSSION

This studies results of identifying the headache scale for hypertension sufferers in the experimental group before being given treatment with a combination of warm water compresses and finger grip relaxation showed an average value of 4.4762 (moderate headache). Meanwhile, the headache scale in the control group before being given warm water compress treatment alone showed an average value of 4.7143 (moderate headache). Theoretically, headaches in hypertension sufferers occur as a form of the body's defense mechanism for its tissue being damaged, so that the body responds or reacts by transferring the pain (Nurman 2017) . The intensity of headaches in hypertension sufferers certainly differs from one person to another. However, Ferdisa and Ernawati (2021) stated that the intensity of headaches as a result of increased blood pressure can be mild, even severe. Therefore, it is not surprising that the findings of this study show that the average headache in both the experimental and control

groups is in the moderate category. There are a number of factors that are likely to influence the moderate headache scale in the experimental and control groups, including gender, age, education, physical activity and stress.

The results of identifying the headache scale for hypertension sufferers in the experimental group after being given treatment with a combination of warm water compresses and finger grip relaxation showed an average of 2.7143 (mild headache). This indicates that there has been a decrease in the hypertension headache scale from the previous 4.4762 (moderate headache). Meanwhile, the results of identifying the control group's headache scale after being given warm water compress treatment alone showed an average of 3.4286 (mild headache). This also shows that there has been a decrease in the pain scale from the previous 4.7143 (moderate headache). This means that both the combination treatment of warm water compresses and finger grip relaxation and the warm water compress treatment alone have been able to reduce the headache scale for hypertension sufferers, namely from moderate to mild.

The combination treatment of warm water compresses and finger grip relaxation can influence the reduction or reduction in the scale of headaches for hypertension sufferers in the experimental group, because theoretically warm water compresses have several benefits, one of which is that it can reduce pain, because the heat produced by the compress is able to dilate blood vessels. and relieves muscle tension, which reduces the pain (Hannan, Suprayitno, and Yuliana 2018) . Apart from that, Rohimah and Kurniasih (2016) also stated that warm water compresses can provide a warm feeling to certain areas that are compressed, because this warm feeling is able to dilate blood vessels and smooth oxygen supply and can relieve muscle tension. For this reason, it is not surprising that warm water compresses can reduce or reduce pain in someone who receives this treatment. A similar opinion was expressed by Setyawan and Kusuma (2017), that the heat produced by a warm water compress will cause vasodilation or widening of blood vessels, causing muscle relaxation, which will increase circulation and increase the intake of oxygen and nutrients into the tissues.

Meanwhile, finger grip relaxation was able to reduce or reduce the pain scale of hypertension sufferers in the experimental group, because theoretically finger grip relaxation functions to manage feelings and emotions and can develop a person's emotional intelligence. Along a person's fingers there are energy channels or meridians that connect to various organs and emotions. The reflection points on the hand will provide reflex or spontaneous stimulation when a grip occurs. When this grip occurs, it will produce impulses which will be sent through

non-receptor efferent nerve fibers, which will cause the gates in the thalamus to close, so that the stimulus that goes to the cerebral cortex will be blocked and, therefore, the intensity of pain can be reduced (Liana cited in Siauta , Embuai, and Tuasikal 2020) .

This means that if the two treatments are combined as a treatment for headaches for hypertension sufferers, there will be two effects or benefits produced, namely the effect of a warm water compress and the relaxing effect of holding the fingers as already mentioned, so that it will provide a better effect in reducing the pain. The respondents' headache levels were compared with those without the combination; therefore, the identification results of this research on the pain scale of experimental group respondents after being given a combination of the two treatments were in the mild category.

CONCLUSION

The conclusions obtained by this research that the headache scale for hypertension sufferers in the experimental group before being given treatment with a combination of warm water compresses and finger grip relaxation was in the moderate category, while in the control group before being given treatment with warm water compresses alone was also in the medium category. The headache scale for hypertension sufferers in the experimental group after being given a combination of warm water compress treatment and finger grip relaxation was in the mild category, while the pain scale for hypertension sufferers in the control group after being given warm water compress treatment alone was also in the mild category. There is an effect of a combination of warm water compress treatment and finger grip relaxation to reduce headaches for hypertension sufferers and there is an effect of warm water compress treatment alone to reduce headaches for hypertension sufferers. However, even though both forms of treatment have a significant effect on reducing headaches for hypertension sufferers, their effects are not significantly different.

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CONFLICT OF INTEREST

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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