Original Article

Pain Management in Hypertension Through Pressure Point Massage

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ABSTRACT

Background: *Hypertension is a disorder of the cardiovascular system characterized by increased blood pressure that causes pain in the back of the neck area. Giving a massage is one effort to reduce pain. This study was to determine the effect of pressure point massage on pain levels in hypertension.*
Methods: *The design of this research was pre-experiment, involving 44 respondents by purposive sampling from 73 people with hypertension as a population. The dependent variable of pain level was measured using a pain scale, and the data was analyzed by paired t-test with α 0.05*
Results: *The results were a decrease in pain levels (pre-test 77.3% moderate pain and post-test 87% mild pain). The results of the data analysis using paired t-test were obtained p-value = 0.001 (<α), showing that there was an influence of pressure point massage on the level of pain in hypertension.*
Conclusion: *Blood circulation becomes smooth because of pressure point massage, which can stimulate endorphin neurotransmitters in the autonomic nerves so that the body relaxes. Pressure point massage intervention can be applied as an alternative therapy option in the management of hypertension, which supports the treatment of hypertension so that blood pressure can be well controlled.*

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Introduction

Non-communicable diseases continue to be a particular concern in the world of health, such as in Indonesia, making these non-communicable diseases develop into serious and dangerous health problems. An example of this is cardiovascular disease. There are many types of cardiovascular disease, one of which is frequently encountered is hypertension (Widayati et al., 2024).

According to data obtained from the Indonesian Ministry of Health, in 2022, hypertension is still the number one cause of death in the world. However, this disease can basically be prevented by various efforts with pharmacological and non-pharmacological therapy. Hypertension is a non-communicable disease that many people experience due to an increase in systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg (Y. Sari, 2017). Back neck pain is one of the health problems often experienced by hypertension sufferers. Increased blood pressure in hypertension sufferers is usually followed by muscle tension, especially in the neck and shoulder area. It causes complaints of pain in the back of the neck area (Fadlilah & Rahil, 2019).

The data of Basic Health Research in Indonesia in 2018, it was found that

hypertension was in the first place as a non-communicable disease with a total of 63,309,602 sufferers (34.1%) with an increase of 8.31% from the previous 25.8% to 34.1 % (Riskesdas, 2018). The number of hypertension sufferers calculated based on age above 18 years in the East Java Province has increased by 36.32% and is ranked 6th nationally. The number of cases of hypertension sufferers in Tulungagung Regency based on the health profile of Tulungagung Regency is 21,214 cases. Based on a preliminary study carried out by researchers at the UPTD Health Center of the Akungunung Community Health Center, there were data on 73 hypertensive patients in Pakisrejo Village, Tulisgunung District, Tulungagung, with a blood pressure range of 160/90 mmHg to 179/109 mmHg in middle-aged women. After conducting interviews with 10 hypertension sufferers in Pakisrejo Village, it was found that 70% complained of pain in the back of the neck area.

In hypertension, when blood pressure rises, the body responds by increasing tension in specific muscles, which can then cause stiffness and pain in the neck (Puspita et al., 2023). This condition can affect the patient's comfort and quality of life, as well as worsen health conditions if not treated appropriately (Widayati & Nuari, 2020). Effective treatment of back neck pain can help reduce the burden on hypertension sufferers in dealing with disturbing physical symptoms so that quality of life is maintained well (Putri et al., 2023)(G. M. Sari et al., 2023).

One non-pharmacological method that can be applied to treat back neck pain is pressure point massage therapy. This technique involves applying pressure to specific points on the body, which is believed to be associated with reducing pain and muscle tension (Lukman et al., 2020). Pressure point massage works by stimulating the nerves and soft tissue around the pressure points, which then sends signals to the brain to release endorphins. Endorphins are known as natural pain-relieving hormones in the body and are believed to reduce the perception of pain in individuals (Pramiyanti et al., 2024).

Pressure point massage is performed by pressing specific points on the body to help relieve pain, increase circulation, and reduce tension. In hypertensive sufferers with back neck pain, this mechanism can help reduce pain through Muscle Relaxation and Reducing Tension, Endorphin stimulation and Pain Reduction, Increasing Blood Circulation, reducing the activity of the sympathetic nervous system (which controls the stress response) and increasing the activity of the parasympathetic system (which controlling relaxation, and decreasing Cortisol Production (Ni'am et al., 2022).

Several studies show that pressure point massage has a significant effect in reducing pain intensity and increasing relaxation in various patient groups, including hypertension sufferers. In addition, this therapy also has the potential to reduce blood pressure through muscle and nervous system relaxation mechanisms, which can help in overall hypertension management (Rahayu et al., 2023). However, scientific evidence regarding the effectiveness of this technique in hypertension sufferers, especially those with complaints of back neck pain, still requires further study to understand how much impact it has on reducing pain intensity and whether there are certain potential risks or contraindications.

This study aimed to analyze the effect of pressure point massage on the level of back and neck pain in patients with hypertension. Hopefully, the results of this study can be used as a reference for non-

pharmacological interventions in the safe and effective treatment of neck and back pain, as well as as an additional alternative in the comprehensive management of hypertension.

Methods

The design of this research was pre-experimental. The type of pre-experimental design was group pre-test – post-test design. The sample size was 44 respondents from a population of 73 people with hypertension. The sampling technique used in this study was purposive sampling, namely a method for selecting samples according to inclusion criteria: (1) the patient of grade 2 hypertension with a blood pressure of > 160 mmHg, (2) compos mentis level of consciousness, (3) aged 36-50 years, (4) not taking medication, (5) Experiencing pain in the back of the neck area. This research has previously been declared ethically appropriate with number 026/EC/LPPM/STIKES/KH/I/2024. The research location is in the working area of the local health centre, Tanggunggunung, Tulungagung Regency. The independent variable in this study is pressure point massage, which is an intervention given once a day for a duration of 10 minutes. The dependent variable was pain level, which is measured using a pain scale with the criteria of mild, moderate and severe pain. The reliability test of the instrument obtained a Cronbach Alpha value of 0.96. Data was analyzed using the paired t-test.

Results

Characteristics of respondents based on gender found that the majority (59.1%) of respondents were female. Characteristics based on age were obtained by almost half (45.4%) of respondents aged 41-45 years. Based on education, it was found that the majority (68.2%) of respondents had an elementary school education. In terms of job characteristics, almost all (81.8%) of the respondents had jobs as farmers, in terms of characteristics of number of children, the majority (68.2%) of respondents had two children, In terms of income level characteristics, it was found that the majority (59.1%) of respondents had an income of IDR 1,000,000 to IDR 2,000,000. The majority (54.6%) of respondents smoke, all (100%) of respondents consume salty food, the majority (68.2%) of respondents drink coffee, the majority (59.1%) of respondents have a family history of hypertension, the majority (72.7%) of respondents have suffered from hypertension for 1-5 years, all (100%) of respondents have never known information about the combination of slow deep breathing and neck reflexology, all (100%) of respondents have main complaints of headache, neck and pressure. Blood of all (100%) respondents had blood pressure level 2, and the majority (72.7%) of respondents had blood pressure at grade 2, namely systolic 160-179 mmHg and diastolic 100-109 mmHg.

Table 1 Frequency Distribution of Pain Levels in Hypertension Sufferers Before and After Pressure Point Massage Intervention

Pain Category	***Pre Test***		***Post Test***	
	F	**%**	**F**	**%**
1. Severe pain	2	5	0	0
2. Moderate pain	34	77	1	2
3. Mild pain	8	18	38	87
4. No pain	0	0	5	11
Total	**44**	**100**	**44**	**100**
Paired T-Test	*p-value*= 0,001 (≤ α 0,05)			

Based on table 1 shows that the majority of respondents (77%) had a pain

level in the moderate category before being given pressure point massage intervention, and after being given pressure point massage intervention, there was a decrease in the pain level where almost all respondents (87%) were in the mild pain category.

Discussion

Based on the results of research on the pain levels of hypertension sufferers before pressure point massage, it shows that almost all (77%) of the respondents had pain levels with moderate pain criteria, and there were (5%) respondents with severe pain.

Back neck pain in hypertensive sufferers is caused by several mutual factors, among others: muscle tension, influence of the sympathetic nervous system, increased pressure on blood vessels and psychological stress (Ferdisa & Ernawati, 2021). The research data related to the characteristics of respondents based on blood pressure values, all (100%) of respondents before the intervention had blood pressures in the grade 2 hypertension category, namely 160-179 / 100-109 mmHg. Patients with blood pressure that is more than typical values often have discomfort problems, namely, complaining of pain in the back of the neck area (Rosadi et al., 2023). Factors that can increase blood pressure are the influence of epinephrine and norepinephrine hormone secretion, where the secretion of these hormones will ultimately cause the blood vessels and adrenal glands to work by activating the sympathetic nervous system, resulting in vasoconstriction of the blood vessels and ultimately increasing blood pressure (Y. Sari, 2017). The vasoconstriction that occurs will cause the release of the enzyme renin due to reduced blood flow to the kidneys. There is a change in angiotensin I to angiotensin II because of the renin enzyme so that intravascular volume increases and causes high blood pressure (hypertension). The appearance of pain and discomfort in hypertension sufferers is caused by this process.

The average respondent's systolic blood pressure was 163 mmHg, and the average respondent's diastolic blood pressure was 102 mmHg. This is influenced by several factors, including gender, age, occupation, income level, smoking, salt consumption, coffee consumption and family history, which will have an impact on the respondent's sense of comfort (Rosadi et al., 2023).

One of the factors influencing the respondent's blood pressure is gender. Based on the characteristics of the respondents, most of the respondents (54.6%) were female. The research results that are in line with the results of this research are research conducted (Pebrisiana et al., 2022) stating that the majority of respondents in this study were female. This affects the increasing prevalence of women because, around the age of 40 and above, female hormones begin to decrease. When the amount decreases, the female body's organs lose their function and become uncontrolled. The atrial blood vessels can also harden and become tense so that endothelial cells are destroyed because estrogen levels are depleted. This endothelial damage causes plaque to form in the blood and stimulates an increase in blood pressure (Novendy et al., 2022).

Based on the characteristics of the age factor, it was found that almost half (45.4%) of the respondents were aged 46-50 years. Based on this fact, the risk of experiencing hypertension is faced by someone who is getting older. This is because, with increasing age, the elasticity of blood vessels decreases (Nuari et al., 2023). The research results that are in line with this research are those that were

conducted(Rahmawati & Kasih, 2023), which stated that the number of respondents who experienced hypertension was in the age range of 45-55 years. This is also in accordance with the theory, which states that the incidence of hypertension increases with increasing age because age affects baroreceptors, which play a role in regulating blood pressure and influencing the elasticity of artery walls. Arteries will become less elastic when the pressure through the artery walls increases (Widayati et al., 2022).

General data on job characteristics shows that almost all (81.8%) respondents work as farmers. The level of employment is influential in this study; virtually all respondents in this study are farmers, and farmers often have long-term contact with objects or materials that have an impact on blood pressure, namely chemicals in pesticides. This is supported by the 2013 Riskesdas results showing that 25% of the prevalence of hypertension occurs in groups of farmers and fishermen. In addition, exposure to pesticides for too long can cause hypertension because pesticides that are in the human body will bind the enzyme acetylcholinesterase (AChE), which will increase sympathetic stimulation with clinical manifestations of increased cardiac output, where increased cardiac output influences an increase in blood pressure which causes hypertension.

Judging from the characteristics of income level, it was found that the majority (59.1%) of respondents had a monthly income of IDR 500,000 to IDR 1,000,000. Income level can affect blood pressure, which has an impact on the discomfort of hypertension sufferers because if the income level does not match daily needs, it can cause the body to become stressed, where stress is a risk factor for hypertension (Rahmadhani, 2021). In line with research conducted by (Hidayati, 2022), it is stated that the increase in blood pressure will be more significant in individuals who have a high tendency to stress (Widayati & Nuari, 2020).

Based on smoking characteristics, it was found that the majority (54.6%) of respondents smoked. Based on these facts, respondents who smoke will affect the stability of blood pressure, which ultimately affects the comfort of hypertensive sufferers because the role of tobacco in blood pressure is a complex thing that can cause problems with blood vessels. According to the research conducted (Rahmadhani, 2021) where the results of the study stated that smoking habits are related to the incidence of hypertension because the nicotine in cigarettes can affect blood pressure through the formation of atherosclerotic plaque, the effect on the release of the hormones epinephrine and norepinephrine.

Based on the characteristics of salty food consumption, the results showed that all (100%) respondents consumed salty food. Based on these facts, the consumption of salty food is very influential in this study because respondents consume salty food, which means the respondent does not follow a diet pattern, which causes the respondent to be unable to maintain stable blood pressure. Management of hypertension is one way to regulate diet by reducing the use of salt or sodium (Widayati et al., 2022). The amount of sodium in cells that increases due to excessive salt consumption will disrupt fluid balance, and this can cause the heart to pump blood more forcefully, increasing blood pressure (Widayati et al., 2021).

Based on the characteristics of coffee consumption, the results showed that the majority (68.2%) of respondents consumed coffee. Coffee consumption influences this research because consuming coffee that contains caffeine can increase blood

pressure. This agrees with research conducted (F. Sari et al., 2022) that coffee consumption is a risk factor for hypertension. In caffeine, some substances can bind to adenosine receptors. Adenosine receptors then activate the sympathetic nervous system, and vasoconstriction of blood vessels occurs, ultimately increasing blood pressure.

In addition, based on family history, the majority (59.1%) of family respondents had a history of hypertension. Genetics or heredity is related to this research because it is a risk factor for hypertension, where there is a gene mutation inherited from the family, causing genetics to experience hypertension. This agrees with (Widiharti et al., 2020), stating that primary hypertension patients have a family history of hypertension. This condition may be related to genetics. Genes involving the renin-angiotensin system and others pertaining to vascular tone, renal salt and water transport, and insulin resistance contribute to the development of hypertension.

Several of the factors above can influence blood pressure, which in the end can cause complaints of pain in the back of the neck area in respondents. Apart from the factors above, things that can directly influence pain in respondents include the level of education, length of time suffering from hypertension and information about the interventions provided.

Judging from educational characteristics, it was found that the majority (68.2%) of respondents had elementary school education. Based on these facts, the respondents' education affects the results of the study; most respondents have an elementary school education. At this level of education, respondents do not have much information and knowledge about pain reduction strategies, so in this study, it can be seen that a low level of education will affect a person's knowledge about hypertension management strategies (Nuari & Widayati, 2021). This study is supported by (Maulidina, 2019), who stated that A person with a high level of education will be more receptive to health information and vice versa. This ultimately affects the patient's behaviour in controlling their disease. Lack of reasonable health behaviour control will increase the risk of complications due to the disease (Rohmawati et al., 2019). Based on experience or the length of time they have suffered from hypertension, the majority (72.7%) of respondents have experienced hypertension for 1-5 years. The length of time suffering from hypertension affects a person's ability to manage hypertension. From the results of this study, it was found that the majority of respondents had experienced hypertension for 1-5 years; this time is a new category, so the majority of respondents do not have experience and knowledge about managing hypertension and maintaining patient comfort. Hypertension. This research is in accordance with the theory put forward by (Suciana et al., 2020) that clients with a longer duration of hypertension have a higher hypertension self-management score compared to clients who have a shorter duration of hypertension.

Based on the results of research on the pain levels of hypertension sufferers after pressure point massage it shows that the majority (88%) of respondents had pain levels with mild criteria.

In sufferers, this discomfort or pain is caused by an increase in systolic and diastolic blood pressure. Symptoms of this discomfort disorder include feelings of dissatisfaction, relief and completeness in the physical dimension of the sufferer. This is what makes the comfort of hypertension sufferers unstable. Eliminating the discomfort caused by symptoms

experienced by hypertensive patients is something that must be fulfilled to maintain a good life for hypertensive patients. Efforts to maintain patient comfort include relaxation as a technique to reduce factors that trigger high blood pressure (Basri et al., 2022).

Pressure point massage is carried out by applying massage or pressure to the neck reflex point with the respondent sitting in a relaxed position for ± 10 minutes accompanied by deep and slow breathing with the aim of a relaxation process in vascular smooth muscle. The relaxation of smooth muscles results in a decrease in the hormones epinephrine and norepinephrine, which have an impact on the hypothalamus so that the role of the hypothalamus will suppress the sympathetic nerves, which ultimately results in decreased heart function and blood pressure also decreases. The vasodilator effect on the blood vessels will also make the body more relaxed so that pain decreases and patient comfort is maintained (Retnowati et al., 2021).

Pressure point massage has a mechanism to improve the vasodilator function of blood vessels. The occurrence of vasodilation of blood vessels after pressure point massage will facilitate blood circulation and ultimately have an impact on reducing pain and increasing comfort for the sufferer. Apart from that, this is evidenced by the significant reduction in blood pressure of hypertensive sufferers even though they remain in the blood pressure category of 160-179 / 100-109 mmHg or grade 2 hypertension. The average blood pressure after being given the intervention is systolic blood pressure of 160 mmHg and diastolic 103 mmHg. This is because the hypothalamus suppresses the sympathetic nerves to reduce heart function, and is followed by a decrease in blood pressure.

Pressure point massage can help reduce neck pain in hypertension sufferers through several mechanisms, including (1) Muscle Relaxation and Reducing Tension: pressure point massage on the neck can reduce muscle tension in the neck and shoulders. These areas often become tense in hypertension sufferers. Reducing muscle tension can help reduce pain and increase sufferer comfort. (2) Increased Blood Circulation: Massage techniques on the neck also help increase blood flow to the area being massaged. Good blood circulation can improve the distribution of oxygen and nutrients to tissues and help the recovery process of tense muscles. (3) Nerve Stimulation and Pain Reduction: Reflexology massage can stimulate specific nerves, which will influence the nervous system to release endorphins, natural substances. Body that functions to reduce pain. Apart from that, reflexology massage also helps balance the response of the sympathetic nervous system, thereby providing a calming effect. (4) Reducing Stress and Psychological Pressure: In people with hypertension, stress is often a trigger for neck pain. Reflexology helps activate the body's relaxation response, reduces stress, and stabilizes mood (Girianto et al., 2021). By reducing stress, neck pain associated with this psychological condition can also decrease. (5) Blood Pressure Regulation: Although the effect does not directly reduce blood pressure, pressure point massage done consistently can help keep blood pressure stable through relaxation and management of stress.

Based on the analysis of the Paired T-Test statistical test, it is known that the sig(2-tailed) p-value = 0.000 < α 0.05. This shows that pressure point massage has an influence on the level of pain in the back of the neck area in hypertensive sufferers.

Pressure point massage intervention can be carried out as a non-pharmacological

method of pain management for hypertension sufferers. The focus of this discomfort is on hypertension sufferers by managing pain through pressure point massage on the back of the neck area in a relaxed sitting position for ± 10 minutes over a period of 5 days. The relaxation of blood vessel smooth muscles will ultimately reduce the hormones epinephrine and norepinephrine. It works by stimulating the hypothalamus to suppress the sympathetic nervous system. This pressure on the sympathetic system will make the heart work, which will then reduce blood pressure (Widayati & Hayati, 2017).

Apart from that, the results of this study were also influenced by demographic factors or general data of the respondents, including age, information, salt consumption and length of time suffering from hypertension. However, the most significant influencing factor is the information factor, where hypertension sufferers can carry out hypertension management due to increased knowledge from the information or treatment they receive (Nuari et al., 2022). Apart from that, the reduction in pain levels was also accompanied by changes in the mean blood pressure before and after the intervention. It is hoped that giving pressure point massage according to the procedure can be applied by respondents because it is easy to do. This action is an alternative non-pharmacological pain management and does not have unfavourable side effects for hypertension sufferers.

Conclusion

Pressure point massage can reduce pain levels in patients with hypertension. This intervention can be used as a form of pain management for hypertension sufferers and also as a form of hypertension management in maintaining blood pressure to reach typical values through physical and psychological approaches.

Authors Contributions

Each author can act reasonably according to their role. The first author, as well as the correspondent, is responsible for the data collection process, data analysis, and preparation of research reports. Member writers helped with the data collection and data analysis process. The discussion process occurred well in determining the journal for publication and preparing a manuscript that had adapted to the environmental style of the intended journal.

Conflicts of Interest

There were no problems during the research and publication process of this article. The chief writer and member writers can work together well, from preparation and implementation of research to writing reports.

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