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Scraping Therapy is Effective in Improving Hemodynamic Status in Hypertensive Patients

Terapi Kerokan Efektif Meningkatkan Status Hemodinamik Pada Pasien Hipertensi

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ABSTRACT
Background: The number of hypertensive patients is increasing and is one of the highest causes of death. Non-pharmacotherapeutic treatment of hypertension can use complementary therapies, one of which is scraping therapy. **Objective:** Aim of the study was to determine the effect of scraping therapy on pulse and blood pressure in hypertensive patients. **Methods:** This method was a quasi-experimental study with pretest and posttest control group design. The sample consisted of control and intervention groups, each of which was 40 people taken by consecutive sampling. **Results:** The control group experienced an increase in pulse, systolic and diastolic (1.05 beats/minute and 1.00 mmHg, 1.775 mmHg), the intervention group experienced a decrease in pulse, systolic and diastolic (1,525 beats/minute; 7.70 mmHg; and 5, 05 mm Hg). The control group bivariate test on pulse, systolic, and diastolic variables showed p=0.113; p=0.748; and p=0.267. Bivariate test of intervention group on pulse, systolic, and diastolic variables showed p=0.0035; p<0.001; and p<0.001. Different test of pulse, systolic, and diastolic variables showed p=0.001; p<0.001; and p<0.001. **Conclusion:** Scraping therapy is effective in reducing pulse and blood pressure of hypertensive patients so that it can be used as an inexpensive alternative therapy option.

ABSTRAK
Latar Belakang: Jumlah penderita hipertensi semakin meningkat dan merupakan salah satu penyebab kematian tertinggi. Penatalaksanaan nonfarmakoterapi hipertensi dapat menggunakan terapi komplementer salah satunya terapi kerokan. **Tujuan:** Penelitian ini bertujuan untuk mengetahui pengaruh terapi kerokan terhadap denyut nadi dan tekanan darah pada pasien hipertensi. **Metode:** Metode ini merupakan penelitian eksperimen semu dengan desain pretest and posttest control group design. Sampel terdiri dari kelompok kontrol dan intervensi yang masing-masing berjumlah 40 orang yang diambil secara consecutive sampling. **Hasil:** Kelompok kontrol mengalami peningkatan denyut nadi, sistolik dan diastolik (1,05 denyut/menit dan 1,00 mmHg, 1,775 mmHg), kelompok intervensi mengalami penurunan denyut nadi, sistolik dan diastolik (1.525 denyut/menit; 7,70 mmHg; dan 5,05 denyut/menit; mmhg). Uji bivariat kelompok kontrol pada variabel nadi, sistolik, dan diastolik menunjukkan p=0,113; p=0,748; dan p=0,267. Uji bivariat kelompok intervensi pada variabel nadi, sistolik, dan diastolik menunjukkan p=0,0035; p<0,001; dan p<0,001. Uji beda variabel nadi, sistolik, dan diastolik menunjukkan p=0,001; p<0,001; dan p<0,001. **Kesimpulan:** Terapi kerokan efektif menurunkan denyut nadi dan tekanan darah pasien hipertensi sehingga dapat dijadikan sebagai pilihan terapi alternatif yang murah

INTRODUCTION

Hypertension, also known as high blood pressure, is a condition in which the patient's arterial blood pressure increases above 140/90 mmHg.[1] Blood pressure is created by the force of the blood pushing against the walls of the blood vessels (arteries) when pumped by the heart. The higher the pressure, the harder the heart has to pump. This condition can increase the risk of heart, brain, kidney, and other diseases. It is the leading cause of premature death worldwide. More than 1.13 billion people worldwide have hypertension. 1 in 4 men and more than 1 in 5 women had hypertension in 2015.[2] Indonesia's 2018 basic health research data shows an increase in the incidence of hypertension aged 18 years from 25.8% in 2013 to 34.1% in 2018.[3]

Management of hypertension is done by controlling the patient's blood pressure. Blood pressure management can be done with pharmacological or non-pharmacological therapy. In addition, lifestyle modification can also be the main choice in controlling blood pressure.[4] Non-pharmacological management for hypertension can use food ingredients. The results of previous studies have shown that fruits are effective in lowering blood pressure. The fruits used are watermelon, papaya, coconut water,[5] tomatoes and cucumbers.[6] Other herbal plants such as roselle flower and bay leaf are also effective for lowering blood pressure.[7]

Other non pharmacological management that can be done with complementary therapy. Currently, many complementary therapies are being developed in the world of nursing. Non-invasive complementary therapies such as warm water baths and breath relaxation, aromatherapy are effective in lowering blood pressure.[8] Hydroson therapy and benson relaxation, meditation and foot massage are also effective in lowering blood pressure.[9,10,11] Another complementary therapy that can be given is scraping therapy. Scraping is a therapeutic method by rubbing a coin or metal on an area of the body that was previously given a lubricant, such as eucalyptus oil, lotion, balm, etc., so that red spots appear.

Several studies have been conducted with regard to scrapings. Scrapings have the effect of providing a feeling of warmth due to friction. This effect can widen the peripheral blood vessels from vasoconstriction to vasodilation so that the flow of peripheral blood vessels becomes smooth.[12,13] Rizki and Suryani's research did not discuss the direct effect of scrapings on hemodynamic status, both blood vessels and blood pressure. In addition, the research method used is a qualitative descriptive study approach.

Scraping therapy also has the effect of reducing the exertion scale score issued and reducing heart rate variability in athletes so that it can be used as an alternative for recovery from sports training.[14] Wang et al's research only examined the exertion variable

and heart rate variability. While this study examines the effect of scrapings on pulse and blood pressure with a larger sample size than the research of Wang et al, namely 80 respondents.

Complementary scraping therapy has been widely known in Indonesian society, especially in Java. This research was carried out as a forum to introduce one of the non-pharmacological treatment methods that can be used for the treatment of hypertension. Based on the background description, this study aims to determine the effect of scraping therapy on the hemodynamic status (pulse and blood pressure) of hypertensive patients in Dukuh Cupuwatu Kalasan Sleman Yogyakarta.

METHODS

This research is a quasi-experimental study with a *pretest and posttest control group design*. Data collection was carried out in Cupuwatu Kalasan, Sleman, Yogyakarta in June - August 2022. Based on the minimum sample calculation, it is known that the minimum number of samples to be taken is 30 people. However, to increase the level of accuracy of the data, the number of samples was increased to 10 people for each group. The sample of this study was calculated using the two-mean difference formula in paired groups, obtained a sample of 40 respondents in each group. The research sample taken with the inclusion criteria agreed as respondents, aged 26-65 years, normal BMI (18.5-25). Exclusion criteria for this study were patients who did strenuous activities, smoked, and consumed alcohol. Sampling technique used *consecutive sampling*.

The data collection process was assisted by 4 research assistants. Prior to data collection, the researcher explained the entire research process to the research assistants. The intervention group received scraping therapy by a research assistant. The scraping therapy technique is done by rubbing a coin or metal on the back and neck area that was previously given a lubricant such as olive oil or eucalyptus oil. The lubricant is applied to the back and neck followed by a light massage to relax the muscles to be scraped for about 5 minutes. The scraping technique is carried out in one direction and not back and forth to adjust the Langer line and is carried out between the costal bones (intercostals). Scraping is done repeatedly about 20-30 times until a red rash appears. Scraping was done once to see the direct effect on hemodynamic status, namely pulse and blood pressure.

Hemodynamic status measurements were performed before and after scraping therapy. Measurements were taken in the supine position on the left arm, and 5 minutes before and after the procedure. Hemodynamic status *pretest* in the control group were performed after a 15-minute interval. The instrument used is a digital sphygmomanometer to measure systolic and diastolic blood pressure. Pulse measurement uses *digital stopwatch* that has been

calibrated, standard operational cupping procedures, blood pressure checks, and pulse checks that have been tested by expert panels, as well as observation sheets to document research results.

All respondents who will be used as research samples are given an explanation of the entire research process, their rights and obligations. Respondents signed an *informed consent* as consent to participate in the study. The data collection process was carried out after obtaining *ethical clearance* from the Health Research Ethics Commission, Faculty of Health Sciences, Universitas Respati Yogyakarta number 071.3/FIKES/PL/VI/2021 and research permit number 101/PPPMPL-Eks/V/2022. The normality test of the data used Kolmogorov Smirnov because the number of samples was > 50 people. The results of the pulse normality test showed normal results (>0.05), while both systolic and diastolic blood pressures showed abnormal results (<0.05). Bivariate test of variables that show results are normally distributed using the *Paired T-Test*, while those that are not normal use the Wilcoxon Test. Differences between control and intervention groups were tested using *Independent T-Test* for normally distributed variables and Mann Whitney test for abnormally distributed variables.

RESULTS AND DISCUSSION

Table 1 Frequency Distribution of Respondents Research intervention and control groups in Dusun Cupuwatu Kalasan Sleman DIY

Characteristics	Control		Intervention		Total	
	n	%	n	%	N	%
Age						
Early Adult	8	10.0	10	12.5	18	22.5
Late Adult	10	12.5	5	6.3	15	18.8
Early Elderly	14	17.5	8	10.0	22	27.5
Late	8	10.0	11	13 ,8	19	23.8
Elderly	0	0.0	6	7.5	6	7.5
Gender						
Male	7	8.8	19	23.8	26	32.5
Female	33	41.3	21	26.3	54	67.5
Education						
Basic	3	3.8	2	2.5	5	6.3
Intermediate	19	23.8	33	41.3	52	65.0
PT	18	22.5	5	6.3	23	28.8

Table 1 shows an overview of the frequency distribution for most age groups including the category of early elderly as many as 22 respondents (27.5%), female sex as many as 54 respondents (67.5%) and most of secondary education as many as 52 respondents (65%). The incidence of hypertension can occur in all age groups from

adults to the elderly. Several factors that influence the incidence of hypertension include age, gender, obesity from drugs.[15] Age as a factor in the incidence of hypertension. This happens because of changes in the cardiovascular system. The older a person is, the more at risk of developing hypertension. Structurally and functionally there are changes in the ventricular wall, changes in the less elastic heart valves, dilation of veins and incompetent elasticity of the arterial walls.[16]

The results also show that there are more women than men. Gender as a risk factor for hypertension.[15] This is in line with the results of research conducted by Siwi et al (2020) which shows that the female gender has more hypertension than men. The results are different from previous studies where the number of male hypertension patients is more than female. Women tend to suffer from hypertension than men. In this study, 27.5% of women had hypertension, while for men it was only 5.8%. Women will experience an increased risk of high blood pressure (hypertension) after menopause, namely age over 45 years. Women who have not menopause are protected by the hormone estrogen which plays a role in increasing HDL *(High Density Lipoprotein).*[16,15]

Modifiable factors that can cause hypertension include education and work. A person's education affects knowledge about a disease and his lifestyle. Work is related to activities that indirectly affect a person's blood pressure.[17] This result is in line with previous research which states that education and work are associated with risk factors for hypertension.[18]

Table 2 Effect of Scraping Therapy on Pulse in Hypertensive Patients in Dusun Cupuwatu Kalasan Sleman

group	(times/minute)			p*	
	Min	Max	Mean±SD	D mean	
Control					
Pretest	62.00	80.68	104.00±10.62	1.05	0.113
Posttest	62.00	102.00	81.73±10.49		
Intervention					
Pretest	62.00	97.00	78.93±9.28	-1.52	0.0035
Posttest	63.00	90.00	77.40±7.27		

Table 2 shows that in the control group there was an increase in pulse rate at the *posttest* of 1.05 times/minute. On the other hand, in the intervention group, the pulse decreased by 1.52 beats/minute. The results of the bivariate test in the control and intervention groups obtained *p-value* 0.113 and *p-value* <0.0035. Pulse rates *pretest* and *posttest*. The results in the intervention group showed that there was a significant effect of scraping therapy on the pulse rate of hypertensive patients.

The results of the study in the control and intervention groups showed that there was a difference in the pulse difference between the *pretest* and *posttest*. The difference results in the control group showed an increase in pulse rate while the intervention group showed a decrease in pulse rate. Pulse

rates *pretest* and *posttest* in the control group. Increased pulse rate is not a good condition because there is an increase in pulse rate without being given a stimulus or response to the patient. Meanwhile, the intervention group showed negative results, which means that there was a decrease in pulse rate after the intervention. The decrease in pulse rate in the intervention group indicates a more relaxed body condition that has an impact on the work of the heart pump. These results are in accordance with research conducted by Desstya et al (2019) who explained that the effect of scrapings can relieve pain through endorphins which can provide a comfortable and fresh feeling in the body.[19] Activation of endorphins occurs due to stimulation of keratinocytes and endothelium (inner lining of blood vessels) which will react with *propiomelanocortin (POMC).* This substance is a polypeptide that will be broken down with the final product one of which is beta endorphins.[12] The effect of increasing the amount of endorphins in the body can significantly make patients feel comfortable, fresher, and relieve pain.[12,20] The results in the control group that there was no difference in pulse between the control and intervention groups could also be because the results of the pretest homogeneity test in the two groups were not homogeneous.

Table 3 Effect of Scraping Therapy on Blood Pressure of Hypertensive Patients in Dusun Cupuwatu Kalasan Sleman Yogyakarta

Group	(mmHg)				P#
	Min	Max	Mean±SD	D mean	
Control					
systolic *Pretest*	121.00	179.00	138.10±17.49	0.10	0.748
systolic *Posttest*	120.00	178.00	*138.20*±17.89		
Diastolik *Pretest*	50.00	119.00	84.08 ±14.23	1 ,77	0.267
Diastolic *Posttest*	50.00	155.00	*85.85*±18.17		
Intervention					
Systolic *Pretest*	121.00	194.00	143.33±18.27	-7.70	0.001
Systolic	106.00	181.00	*135.63*±16.62		
Diastolic *Pretest*	74.00	109.00	88.73±8.93	-5.05	0.001
Diastolic *Posttest*	69.00	100.00	83.68±8.23		

Table 3 shows that in the control group at the posttest there was an increase in systolic and diastolic blood pressure by 0.1 mmHg and 1.77, respectively. In contrast to the intervention group, where there was a decrease in both systolic and diastolic blood pressure, namely 7.70 mmHg and 5.05 mmHg. Control group showed no difference in systolic and diastolic blood pressure *pretest-posttest* (*p-value* 0.748 and *p-value* 0.267). In the intervention group, there was an effect of scraping on systolic and diastolic blood pressure (*p-value* 0.001 and *p-value* 0.001).

The process of scraping therapy in principle is a method or therapeutic technique by rubbing a coin or metal on an area of the body that was previously given a lubricant,

such as olive oil, eucalyptus, balm, lotion, etc. so that redness or rash appears on the skin. The reddish patches caused by the scraping effect trigger an inflammatory reaction or inflammation of the skin. The impact of the inflammatory reaction results in the dilation of blood vessels which will facilitate the patient's blood flow. Dilation of blood vessels (vasodilation) will cause a lot of blood to collect in the blood vessels that experience dilation so that it will cause a decrease in blood pressure.[12] In addition, the inflammatory effect caused by scraping therapy can also facilitate the flow of blood vessels, resulting in a lot of oxygen and nutrients entering the muscle tissue. This causes the soreness to be immediately carried by the bloodstream to be removed or neutralized. In addition, the principle of scraping is based on the science of physics which applies the principle of pressure and friction between two objects so that it causes heat or a feeling of warmth in the body. This effect will also cause vasodilation of blood vessels which will facilitate the patient's blood flow. This will cause a decrease in blood pressure in the patient.[12]

The principle of scrapings with acupuncture is not much different. The principle of scraping is to increase the temperature and energy of the scraped body, while in acupuncture, needles are inserted into the body. This energy increase is done by stimulating the outer body skin. Nerves that receive stimuli in the brain will convey stimuli that have the effect of repairing organs at the meridian points of the body that are pierced or scraped. This will also cause blood flow to be smoother and cause the immune system to also increase.[21] In addition, the dilation of blood vessels due to scrapings will cause the volume of blood flow to also increase. Scraping or scraping can increase the local temperature in the area being scraped. The increase in body temperature ranges from 0.5 – 1 C. Increased body temperature Heat can dilate capillaries, improve local blood circulation, increase blood and oxygen supply and strengthen local tissue metabolism.[19]

In this study, therapy was administered once and blood pressure was measured directly during *pretest* and *posttest*. This is done to minimize the bias that may arise due to other factors that can affect blood pressure and the weakness of the researchers to control it. This study has several weaknesses, including the researcher did not control for the history of other diseases suffered by the patient and the consumption of antihypertensive drugs. Researchers took this decision because the therapy was carried out once so that changes in pulse and blood pressure could be seen immediately before and after therapy. Despite all its limitations, this study has advantages with a large enough number of respondents which can describe the results better.

CONCLUSION

The results showed a decrease in pulse and blood pressure occurred in the

intervention group. This proves that scraping therapy has an effect on reducing pulse and blood pressure. The public can use scraping therapy as an alternative treatment for hypertension. Scraping therapy can be done with low cost and minimal side effects. Further research can examine the effect of scrapings on hemodynamic status by giving more than one intervention.

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