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COMPARATIVE ANALYSIS OF ACUPRESSURE AND ACUPUNCTURE FOR BLOOD PRESSURE REDUCTION IN HYPERTENSION

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ABSTRACT
Hypertension is one of the leading causes of cardiovascular disease and premature death worldwide. Non-pharmacological treatments such as acupressure and acupuncture are increasingly used as complementary therapies. Some studies show that both methods can lower blood pressure, but the comparison of their physiological mechanisms is still not widely explored. Acupressure involves manual stimulation of specific points to increase blood flow and stimulate the nervous system. Meanwhile, acupuncture uses needles to stimulate the body's energy points and is believed to trigger the release of neurotransmitters that play a role in regulating blood pressure. This study aimed to compare the effectiveness of acupuncture and acupressure as complementary therapies in reducing systolic and diastolic blood pressure among patients with hypertension using a quasi-experimental pretest–posttest design. This study will use an experimental approach with blood pressure parameter measurements. This study used two groups: an acupuncture group and an acupressure group, with a quasi-experimental research design and a pre-post test design. A total of 80 participants were selected using purposive sampling according to the inclusion and exclusion criteria and assigned into two groups (40 acupuncture and 40 acupressure). Systolic and diastolic blood pressure were measured before and after the intervention. Data analysis was performed using the Mann–Whitney test because the data were not normally distributed. The study results showed a median decrease in systolic blood pressure in the acupressure group = 10.5 mmHg, acupuncture group = 10 mmHg. The median decrease in diastolic blood pressure in both groups = 6.5 mmHg. The Mann–Whitney test showed a significant difference in systolic (p=0.025) and diastolic (p=0.018) blood pressure, with the acupuncture group showing a greater decrease. There is a significant difference between acupressure and acupuncture in lowering blood pressure, with acupuncture being more effective. This therapy can be a complementary intervention in the management of hypertension.

Keywords: acupressure; acupuncture; blood pressure; hypertension

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INTRODUCTION

Hypertension is a silent killer because of its ability to cause various health complications without clear symptoms. In the productive age range of 18 to 64 years, hypertension can hinder a person's capabilities and affect their quality of life. Hypertension in the productive age group is not only a health issue but also a socio-economic one, as it can affect a person's productivity. By recognizing the causes and symptoms, and implementing appropriate preventive measures, we can minimize the risk of hypertension and its complications. It is important for every individual, especially those in their productive years, to have their blood pressure checked regularly and take proactive steps to maintain the health of their heart and blood vessels (Ministry of Health, 2022). Hypertension (high blood pressure) occurs when the pressure in the blood vessels is too high (140/90 mmHg or higher). This condition is common but can be serious if left untreated (World Health Organization, 2023). The WHO strategy for traditional medicine 2002-2005 was prepared over a period of more than three years, with the role of traditional medicine being treated as complementary or alternative medicine (Organization, 2013). Acupressure and acupuncture are traditional Chinese therapies proven to have an effect on the cardiovascular system. Acupuncture lowers systolic blood pressure by 5-10 mmHg after 6 weeks of treatment (Flachskampf et al., 2007). Besides acupuncture,

acupressure therapy is effective in lowering blood pressure. Acupressure therapy at the acupressure points Taichong (LR3), Shenmen (HT7), and Taixi (Kl3) is a good non-pharmacological therapy option to help lower blood pressure in hypertensive patients (Restawan, Sjattar, and Irwan, 2023). The mechanism of action for both involves nerve stimulation, endorphin release, and regulation of the autonomic nervous system. This study aims to identify the differences in physiological mechanisms between acupressure and acupuncture in lowering blood pressure, by analyzing changes in blood pressure and biomarkers related to the autonomic nervous system and the cardiovascular system. Hypertension is caused by several factors, including obesity, fat accumulation that affects blood circulation, excessive salt intake, lack of exercise, stress, smoking, and alcohol consumption (La Ode Alifariki, 2019). A possible alternative to pharmacological antihypertensive therapy in patients with low-risk grade 1 hypertension or those experiencing drug side effects is acupuncture. Taichong (LR3), Quchi (LI11), Zusanli (ST36), Fengchi (GB20), and Hegu (LI4) are the most commonly used acupuncture points. The large intestine meridian is the selected meridian, and most of the extremity acupuncture points, especially those on the lower extremities, are clinically chosen. Association rules indicate that Qu-chi (LI11) and Zu-san-li (ST36) are the dominant combination acupuncture points. Three core association points were obtained after complex network analysis: the first association, Bai-hui (DU20), Tai-xi (KI3), Gan-shu (BL18), Shen-shu (BL23); the second association, Qu-chi (LI11), He-gu (LI4), San-yin-jiao (SP6), Zu-san-li (ST36), Feng-chi (GB20), Tai-chong (LR3); and the third association, Qi-hai (RN6), Guan-yuan (RN4), Zhong-wan (RN12), Zhao-hai (KI6), Tai-yang (EX-HN5), Lie-que (LU7), Yang-ling-quan (GB34), Xing-jian (LR2), Yin-ling-quan (SP9). Cluster analysis yielded treatment principles that nourish Yin and subdue Yang, calm the heart and subdue Yang, strengthen Qi and Blood, and calm the mind and restore pulse, which improved clinical outcomes in patients with hypertension (Li et al., 2024). Acupuncture can lower blood pressure by stimulating specific points that modulate the autonomic nervous system, increase endorphin release, and reduce sympathetic activity (Flachskampf et al., 2007).

Acupuncture significantly lowers systolic blood pressure (SBP) and diastolic blood pressure (DBP) (Migliarese et al., 2023). Acupuncture plus antihypertensive medication is better than antihypertensive medication alone in reducing systolic and diastolic blood pressure (SBP and DBP) (Chen et al., 2018). Acupuncture significantly lowers blood pressure when administered alongside drug therapy (SBP -8 mmHg, DBP -4 mmHg) (Lee et al., 2009). Acupuncture significantly reduces systolic blood pressure (-7.47 mmHg, 95% CI - 10.43 to -4.5, $P<0.00001$) and diastolic blood pressure (-4.22 mmHg, 95% CI - 6.26 to -2.18, $P<0.0001$) (Wang, Xiong and Liu, 2013). Acupressure therapy as a non-medical treatment option is a breakthrough in conventional therapy, alongside acupuncture. Where fingers are used to replace the function of acupuncture needles. Acupressure is rich in benefits, for example, it can treat hypertension (Suryawan, Arneliwati, and Jumaini, 2022). Acupressure at auricular points can lower blood pressure and improve sleep quality in patients with hypertension and insomnia (Zhao et al., 2020). The findings indicate that auricular acupressure can improve blood pressure, stress, and sleep in elderly individuals with essential hypertension (Kim and Park, 2023). Acupressure applied to the Neiguan (PC 6) acupuncture point in individuals with essential hypertension can regulate blood pressure and is effective in managing various symptoms related to hypertension. (Biçer et al., 2021). Acupressure at the Taichong point can lower blood pressure in hypertensive patients (Lin et al., 2016). Systolic and diastolic blood pressure decreased similarly in the acupressure group after an 8-week intervention in hypertensive patients (Jung and Kim, 2023). Although numerous studies have demonstrated that acupuncture and acupressure are individually effective in reducing blood pressure among patients with hypertension, direct comparative studies evaluating the magnitude of blood pressure reduction between these two interventions using the same study population and research protocol remain limited. Furthermore, most previous studies have focused on evaluating each intervention separately rather than comparing their clinical effectiveness under similar conditions. Therefore, evidence regarding which intervention provides greater benefits as a complementary therapy for hypertension is still

insufficient. The novelty of this study lies in the direct comparison of acupuncture and acupressure using the same quasi-experimental protocol, intervention period, outcome measurements, and participant characteristics. This study provides practical evidence regarding the relative effectiveness of these two complementary therapies for blood pressure reduction in patients with hypertension, thereby supporting clinical decision-making in complementary healthcare services.

METHOD

This research uses a quasi-experimental design with a pretest-posttest control group approach. The sample consisted of 40 participants divided into two groups: the acupressure group and the acupuncture group. The purpose of this study is to compare the effectiveness of acupressure and acupuncture in lowering blood pressure based on changes in blood pressure before and after the intervention. The population of respondents aged 40-65 years with mild to moderate hypertension (systolic blood pressure 130–159 mmHg and diastolic 80–99 mmHg). Inclusion criteria are not currently taking antihypertensive medication regularly, no history of heart disease or severe vascular disorders, and willingness to participate in the study during the intervention period. Exclusion criteria are experiencing severe side effects during the intervention and not completing all therapy sessions. Measurement: Systolic and diastolic blood pressure were measured before and after the intervention. Analysis: The Mann-Whitney test was used because the data was not normally distributed. This research has passed the ethical review with No; 106/EC-LPPM/UWHS/VI-2025

RESULT

This study aims to explore the differences in the effects of acupressure and acupuncture on blood pressure. The results of the study showed:

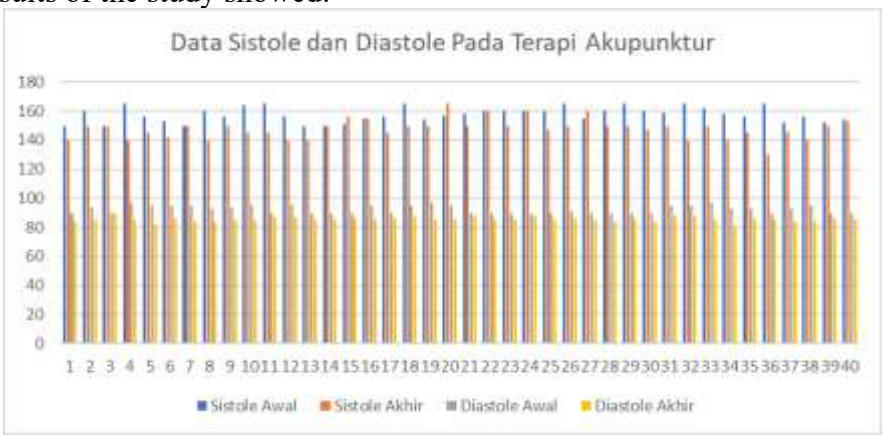

Figure 1. Systolic and Diastolic Data in Acupuncture Therapy

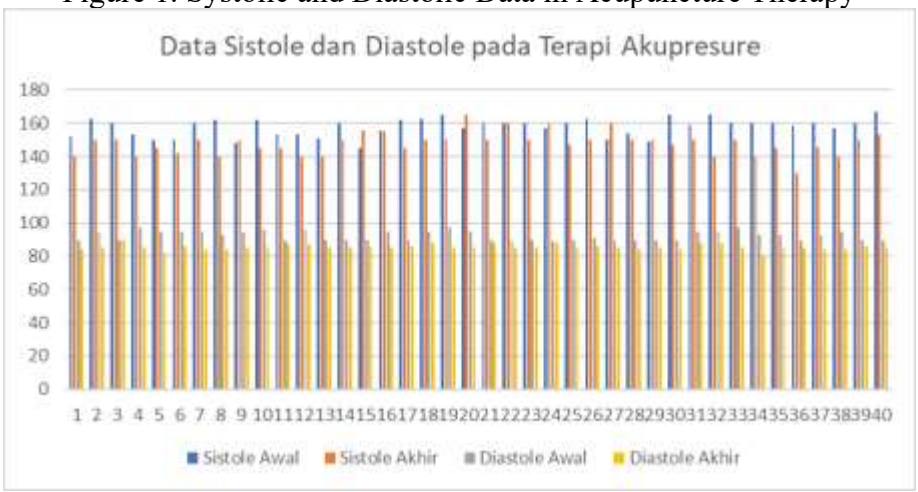

Figure 2. Systolic and Diastolic Data in Acupressure Therapy

The graph in Figure 1.shows the changes in systolic and diastolic blood pressure before and after acupuncture therapy in 40 respondents. It can be seen that almost all respondents experienced a

decrease in blood pressure after the intervention, both systolic and diastolic. Although the magnitude of the decrease varies, the overall trend indicates a positive effect of acupuncture therapy on blood pressure reduction. Stimulation of acupuncture points is believed to modulate the autonomic nervous system, increase the release of neurotransmitters and local mediators such as nitric oxide (NO), and influence vascular regulation through local vasodilation and changes in blood vessel tone (Li et al., 2013).

The graph in Figure 2 shows the changes in systolic and diastolic blood pressure before and after acupressure therapy was administered to 40 respondents. It can be seen that almost all respondents experienced a decrease in both systolic and diastolic blood pressure after the intervention. This decrease varies between individuals, but the general trend indicates the effectiveness of acupressure therapy in lowering blood pressure. This mechanism may also be relevant in acupressure, where manual pressure on acupuncture points can trigger the release of local mediators such as histamine and NO, which then lead to local vasodilation and a decrease in peripheral resistance (Sang Ayu Ketut Candrawati and Ni Komang Sukra Andini, 2024).

Table 1.

The results of the Mann-Whitney data analysis can be seen in the following table:

Category	Group	Number of Respondents	Mean
Systolic blood pressure reduction with acupressure-acupuncture	Acupressure	40	34,70
	Acupuncture	40	46,30
Diastolic blood pressure reduction with acupressure-acupuncture	Acupressure	40	34,44
	Acupuncture	40	46,56

Test Statistic Mann-Whitney		
	Systolic blood pressure reduction with acupressure-acupuncture	Diastolic blood pressure reduction with acupressure-acupuncture
Z	-2.245	-2.366
ASymp.Sig	0,025	0,018

The Mann–Whitney U test is used to compare two independent groups when the data is not normally distributed (Nachar, 2008). From the interpretation of Figure 1.3, it is shown that there is a statistically significant difference between the decrease in systolic blood pressure in the acupressure and acupuncture groups. The acupuncture group had a greater decrease in systolic blood pressure compared to the acupressure group. For the decrease in diastolic blood pressure from Figure 1.3, there was a significant difference in the decrease in diastolic blood pressure between the two groups, where acupuncture showed greater results in the decrease compared to acupressure.

DISCUSSION

Systolic and Diastolic Data in Acupuncture Therapy

The graph in Figure 1.1 shows the changes in systolic and diastolic blood pressure before and after acupuncture therapy in 40 respondents. There were changes in systolic and diastolic blood pressure before and after acupuncture therapy. It is evident that almost all respondents experienced a decrease in blood pressure after the intervention, both systolic and diastolic. This is consistent with research reporting that acupuncture therapy, especially when combined with lifestyle changes, shows a greater reduction in SBP and DBP compared to lifestyle changes alone (MD SBP = –10.48 mmHg; DBP = –10.38 mmHg) (Tan et al., 2019). A systematic review of 30 RCTs (2,107 patients) showed that acupuncture plus medication was more effective in lowering blood pressure than medication alone (Chen et al., 2018). Overall, the findings of this study strengthen the evidence that complementary therapies such as acupuncture can be a promising non-pharmacological intervention

to help control hypertension, especially when combined with medical treatment and lifestyle changes.

Dyastolic and Diastolic Data in Acupressure Therapy

The graph in Figure 1.2 shows the changes in systolic and diastolic blood pressure before and after acupressure therapy was administered to 40 respondents. This result aligns with research findings reporting an average decrease in systolic blood pressure of 24.08 mmHg and diastolic blood pressure of 11.83 mmHg after acupressure was administered to elderly individuals with hypertension ($p<0.05$) (Sang Ayu Ketut Candrawati and Ni Komang Sukra Andini, 2024). Another study also found that combining acupressure with deep breathing relaxation techniques resulted in a significant reduction in systolic and diastolic blood pressure compared to the control group ($p<0.05$) (Murwidi and Muhlis, 2021). This finding strengthens the evidence that acupressure can be an effective complementary therapy to help control blood pressure in hypertensive patients, especially if done regularly and combined with healthy lifestyle modifications such as a low-salt diet, regular exercise, and stress management.

Comparative Analysis

Based on the Mann-Whitney statistical test, no statistically significant difference was found between the two methods in terms of systolic or diastolic blood pressure reduction. This indicates that both methods are equally effective in lowering blood pressure in this study population. This is consistent with research stating that a combination of acupuncture and acupressure is effective in lowering arterial pressure in hypertensive patients (Lu et al., 2000). This study shows a decrease in blood pressure in both groups, both acupressure and acupuncture. The median systolic blood pressure reduction in the acupressure group was 10.5 mmHg, while in the acupuncture group it was 10.0 mmHg. The median diastolic blood pressure reduction was the same in both groups, at 6.5 mmHg. Analysis using the Mann-Whitney test showed a significant difference between the two groups, both in systolic ($p = 0.025$) and diastolic ($p = 0.018$) blood pressure reduction. The acupuncture group showed more consistent improvement compared to acupressure. This is consistent with research reporting that acupuncture is able to lower systolic blood pressure by 5–10 mmHg in hypertensive patients (Flachskampf et al., 2007). Acupuncture is effective in lowering blood pressure; this modality can be used as a single therapy or in conjunction with antihypertensive medication (Sudhakaran, 2021). Acupuncture lowers SBP and DBP in mild hypertension (Liu et al., 2015).

Acupressure has also been proven effective; research results show that applying acupressure to the LR3 (Taichong) point significantly lowers systolic and diastolic blood pressure within 30 minutes (Lin et al., 2016). Acupressure therapy has shown significant effectiveness in lowering blood pressure in hypertensive patients; using the Taichong (LR3), Shenmen (HT7), and Taixi (KL3) points is effective in lowering blood pressure (Restawan, Sjattar, and Irwan, 2023). Thus, this study strengthens the evidence that both methods can be used as complementary therapies for hypertension. However, acupuncture is more recommended for optimal weight loss effects, while acupressure can be a practical alternative for patients who are hesitant to undergo needle insertion.

CONCLUSION

Acupressure and acupuncture are both effective in lowering systolic and diastolic blood pressure. Acupuncture provides a more significant reduction in blood pressure compared to acupressure. The Mann-Whitney test showed significant differences in systolic ($p = 0.025$) and diastolic ($p = 0.018$) blood pressure reduction between the two groups.

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