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Article

The Effect of Acupuncture Therapy on Blood Pressure Changes in Hypertensive Patients with Middle Jiao Dampness-Phlegm Accumulation Syndrome

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ABSTRACT

Hypertension is a primary cause of global premature mortality, with a significant burden in low- and middle-income countries where treatment access remains limited. This pre-experimental quantitative study investigated the effect of acupuncture therapy on blood pressure in hypertensive patients diagnosed with Middle Jiao dampness-phlegm accumulation syndrome. Employing a one-group pretest-posttest design, 20 subjects aged 30-40 were selected via purposive sampling at the Sumber Sehat Acupuncture Foundation in Bandung (March-June 2025). The intervention consisted of daily acupuncture sessions over six days. Blood pressure measurements were taken pre- and post-intervention. Pre-test results showed the highest systolic pressure was 139 mmHg and the lowest was 130 mmHg. Post-intervention, the highest systolic pressure decreased to 130 mmHg and the lowest to 120 mmHg. Diastolic pressure also declined from a pre-intervention high of 89 mmHg to a post-intervention high of 85 mmHg. Statistical analysis using the Paired Sample T-Test confirmed a significant difference between pre- and post-intervention measurements (p-value < 0.05), with a mean systolic reduction of 9.50 mmHg and a mean diastolic reduction of 4.55 mmHg. It is concluded that acupuncture therapy significantly influences blood pressure, demonstrating a statistically meaningful effect in patients with this specific syndrome.

I. INTRODUCTION

Hypertension is a non-communicable disease (NCD) that ranks among the leading causes of mortality worldwide. The World Health Organization (WHO) reported that approximately 1.28 billion adults aged 30–79 years worldwide are living with hypertension, and less than one-fifth have their blood pressure under control [(1,2)].

The global burden of high blood pressure is substantial, affecting around one in three people worldwide. Nearly two-thirds of those affected live in low- and middle-income countries. It is estimated

that 1.4 billion people globally have hypertension, yet only 14% achieve adequate blood pressure control. Approximately 46% of adults with hypertension are unaware of their condition, and four out of five do not receive adequate treatment. However, if countries scale up effective treatment coverage, an estimated 76 million deaths could be prevented between 2023 and 2050 [1,3].

In Indonesia, the estimated number of hypertension cases has reached 63,309,620, with related mortality of 427,218 cases. The prevalence of hypertension has continued to rise, from 25.8% in 2013 to 34.1% in 2018. National survey data indicate that only three out of ten individuals with non-communicable diseases are aware of their condition, while the majority remain undiagnosed. Data from the 2018 Basic Health Research confirmed that hypertension is one of the NCDs with steadily increasing prevalence in Indonesia [4,5].

According to Open Data Jabar, the number of people with hypertension in West Java reached 3,212,072 in 2023, representing a 39.09% increase compared with the previous year. In Bandung Regency alone, the number of hypertension cases reached 192,787. As part of West Java Province, Bandung has a high prevalence of hypertension [6,7].

Among hypertension cases, treatment adherence remains low. Only around half of diagnosed patients take medication regularly, while the absence of symptoms is one of the main reasons for non-adherence. If left unmanaged, hypertension can lead to severe complications such as stroke, coronary heart disease, and kidney disorders [4,8].

Lifestyle modification, including exercise and dietary adjustment, is recommended for hypertension prevention and management. However, effectiveness often depends on individual adherence. High consumption of junk food, excessive sodium intake, and inadequate fruit and vegetable consumption contribute to obesity and increase the risk of hypertension. Studies have shown that obesity, as measured by Body Mass Index (BMI), is significantly associated with hypertension incidence 9–11. Foods high in sodium, fat, sugar, and monosodium glutamate (MSG), but low in fiber, may indirectly trigger hypertension through lipid accumulation in blood vessel walls, leading to vascular resistance and elevated blood pressure [9,10].

Given the complications of hypertension and the limitations or side effects of long-term antihypertensive medication, many patients seek complementary therapies such as acupuncture, moxibustion, tuina, cupping, and guasha. Acupuncture is one of the oldest traditional therapies and has been widely used in the management of cardiovascular diseases, including hypertension. Functional Magnetic Resonance Imaging (fMRI) studies have demonstrated that acupuncture stimulation can modulate brain activity [12,13].

According to Traditional Chinese Medicine (TCM), hypertension can be classified into several syndromes, includeing Liver Fire Blazing, Dampness Accumulation, Yin Deficiency with Yang Hyperactivity, and Deficiency of both Yin and Yang. Etiological factors include emotional disturbance, poor dietary habits, stagnation of liver qi, and dysfunction of spleen and kidney systems. Hypertension with dampness-phlegm retention syndrome is clinically recognized as Tan Shi Zhong Zu syndrome [13,14].

Therefore, this study aims to investigate the effect of acupuncture therapy on blood pressure among hypertensive patients with Middle Jiao dampness-phlegm accumulation syndrome at the Sumber Sehat Acupuncture Foundation in Bandung.

II. METHODS

This study employed a quantitative approach with a pre-experimental design using a one-group pretest–posttest design.

This design was selected to evaluate changes in blood pressure before and after the administration of acupuncture therapy in a single group of participants without a control group. Baseline measurements (pretest) were conducted prior to the intervention to assess participants' blood pressure status. Following the acupuncture treatment, blood pressure was measured again as the posttest to determine the effect of the intervention. The quantitative approach enabled objective and systematic measurement of variables, as well as statistical analysis of the changes observed after treatment. Participants were selected using a purposive sampling technique, a non-probability sampling method in which subjects were recruited based on predetermined inclusion criteria and their suitability with the objectives of the study. This method ensured that all selected participants met the characteristics relevant to the research focus.

III. RESULT

This study involved 20 hypertensive patients who met the inclusion criteria and received acupuncture therapy. Data analysis included descriptive statistics to summarize participants' characteristics and blood pressure values before and after the intervention, followed by inferential analysis to test the effect of treatment.

Table 1. Characteristics of Respondents

Characteristics	n	%
Sex		
Male	12	60.0
Female	8	40.0
Age (years)		
30-35	12	60.0
36-40	8	40.0
Occupation		
Employee	7	35.0
Entrepreneur	5	25.0
Housewife	5	25.0
Teacher	3	15.0

Table 1 shows that most respondents were male (60.0%). The most common ages were 31, 34, and 37 years, with 3 respondents each (15.0%). Based on occupation, employees were the largest group (35.0%).

Table 2. Blood Pressure Before and After Acupuncture Therapy

Variable	Mean ± SD	Min–Max
Pre-test Systolic (mmHg)	135.25 ± 3.02	130–139
Post-test Systolic (mmHg)	124.00 ± 2.58	120–128
Pre-test Diastolic (mmHg)	84.75 ± 2.57	81–89
Post-test Diastolic (mmHg)	78.15 ± 3.15	74–84

Table 2 indicates a reduction in both systolic and diastolic blood pressure after acupuncture therapy. The mean systolic blood pressure decreased from 135.25 mmHg to 124.00 mmHg, while the mean diastolic blood pressure decreased from 84.75 mmHg to 78.15 mmHg.

Table 3. Normality Test

Variable	n	p
Pre-test Systolic	20	0.077
Post-test Systolic	20	0.253
Pre-test Diastolic	20	0.186
Post-test Diastolic	20	0.233

Based on Table 3, all variables had $p>0.050$, indicating that the data were normally distributed. Therefore, parametric analysis using the paired sample t-test was applied.

Table 4. Normality Test

Variable	MD	95% CI	p
Systolic (Pre–Post)	11.25	10.57 to 11.93	<0.001
Diastolic (Pre–Post)	6.60	5.99 to 7.22	<0.001

Table 4 demonstrates statistically significant reductions in both systolic and diastolic blood pressure after acupuncture therapy ($p< 0.001$). The mean decrease in systolic blood pressure was 11.25 mmHg,

while the mean decrease in diastolic blood pressure was 6.60 mmHg.

IV. DISCUSSION

The present study demonstrated that acupuncture therapy significantly reduced blood pressure among hypertensive patients with Middle Jiao dampness-phlegm accumulation syndrome. Following the intervention, the mean systolic blood pressure decreased from (Mean=135.25; SD= 3.02 mmHg) to (Mean=124.00; SD= 2.58 mmHg, while the mean diastolic blood pressure decreased from (Mean= 84.75; SD= 2.57 mmHg) to (Mean= 78.15; SD= 3.15 mmHg). Statistical analysis confirmed that these reductions were significant ($p < 0.001$). These findings indicate that acupuncture may serve as an effective complementary therapy for blood pressure control.

The decrease in blood pressure observed in this study may be explained through several physiological mechanisms. Acupuncture stimulation has been reported to regulate autonomic nervous system activity by suppressing sympathetic overactivity and enhancing parasympathetic responses. This mechanism contributes to vasodilation, reduced peripheral vascular resistance, and stabilization of cardiac output, ultimately lowering blood pressure. In addition, acupuncture may influence the renin–angiotensin–aldosterone system, endothelial function, and release of neurotransmitters such as endorphins and serotonin, which further support cardiovascular regulation [1,12].

Another possible explanation involves the stress-reducing effect of acupuncture. Psychological stress is a well-recognized contributor to elevated blood pressure through activation of the hypothalamic–pituitary–adrenal axis and increased catecholamine secretion. Acupuncture has been associated with relaxation effects, improved sleep quality, and reduced anxiety, which may indirectly contribute to improved blood pressure control. Therefore, the therapeutic effect of acupuncture is likely multifactorial, involving both physiological and psychosocial pathways [8].

The findings of this study are consistent with previous evidence showing the beneficial effect of acupuncture on hypertension. Yang et al. reported in a systematic review and meta-analysis that Chinese massage (tuina) and related traditional interventions, including acupuncture-based approaches, were associated with significant reductions in blood pressure among patients with essential hypertension [15]. Likewise, Wijayanti et al. found that acupuncture therapy effectively reduced blood pressure in hypertensive patients, supporting its role as a non-pharmacological intervention [16]. Similar results were also reported by Ulfa et al., who demonstrated that acupuncture combined with herbal therapy improved blood pressure outcomes [17]. These consistent findings strengthen the potential use of acupuncture as adjunctive management for hypertension.

From the perspective of Traditional Chinese Medicine (TCM), hypertension with dampness-phlegm accumulation syndrome is associated with dysfunction of the spleen in transforming and transporting fluids, resulting in phlegm retention and obstruction of qi circulation. This condition may generate internal stagnation and contribute to rising blood pressure. Acupuncture treatment aims to restore the balance of organ systems, resolve dampness and phlegm, regulate qi movement,

and harmonize the Middle Jiao. Improvement in blood pressure after therapy in this study suggests that syndrome-based acupuncture intervention may provide measurable clinical benefits [13,14].

Clinically, the results of this study are relevant because many hypertensive patients require long-term management and may experience poor adherence to medication or concerns regarding side effects. Acupuncture may be considered as a complementary strategy alongside lifestyle modification and standard antihypertensive treatment. Integrative approaches that combine pharmacological and non-pharmacological interventions may improve patient-centered care and long-term blood pressure control [5].

However, several limitations should be acknowledged. First, this study used a one-group pretest–posttest design without a control group, limiting the ability to exclude placebo effects, regression to the mean, or external influences. Second, the sample size was relatively small and drawn using purposive sampling, which may reduce generalizability. Third, the study evaluated short-term outcomes only; therefore, the long-term sustainability of blood pressure reduction remains uncertain. Future studies employing randomized controlled trial designs, larger samples, and longer follow-up periods are recommended to provide stronger evidence regarding the effectiveness of acupuncture therapy for hypertension.

V. CONCLUSION

Acupuncture therapy demonstrated a significant effect on the blood pressure of hypertensive patients with Middle Jiao dampness-phlegm accumulation syndrome. The mean systolic blood pressure decreased from 135.25 mmHg to 125.85 mmHg post-intervention, and the mean diastolic blood pressure decreased from 84.75 mmHg to 80.20 mmHg. The mean reduction was 9.50 mmHg (7.02%) for systolic and 4.55 mmHg (5.36%) for diastolic pressure. The significance value (Sig. 2-tailed) was <0.001, which is < 0.050, This confirms a statistically significant difference in blood pressure before and after the intervention.

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