



Article

The Effectiveness of Acupuncture at PC6, HT7, GV20, and Ear Shenmen on Blood Pressure Reduction

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ABSTRACT

Hypertension is a chronic disease that requires long-term management, in which complementary therapies such as acupuncture and herbal medicine are increasingly used to support blood pressure control. This quasi-experimental study aimed to compare the effectiveness of acupuncture at PC6, HT7, GV20, and Ear Shenmen points with Orthosiphon stamineus herbal therapy among 30 patients with hypertension using a two-group pretest–posttest design over a four-week period. The results showed that both interventions significantly reduced systolic and diastolic blood pressure ($p < 0.050$), indicating that acupuncture and Orthosiphon stamineus are effective complementary therapies for patients with mild to moderate hypertension.

I. INTRODUCTION

Hypertension is a global public health problem and remains one of the leading causes of cardiovascular morbidity and mortality worldwide. The World Health Organization (WHO) reports that more than one billion people are currently living with hypertension, and this number is expected to increase due to lifestyle changes, dietary patterns, and population aging. Uncontrolled hypertension significantly increases the risk of coronary heart disease, stroke, and chronic kidney disease, making long-term and effective management essential. Therefore, the integration of comprehensive management strategies, including lifestyle modification and complementary therapies, is increasingly important to improve blood

pressure control and reduce cardiovascular complications^(1,2).

In Indonesia, the prevalence of hypertension remains high. Data from the Basic Health Research reported a hypertension prevalence of 34.1% among the adult population, indicating that hypertension continues to be a major public health concern. Clinically, hypertension is often referred to as a “silent disease” because it may remain asymptomatic in its early stages. As a result, many patients are diagnosed late, increasing the likelihood of serious complications such as stroke and cardiovascular events^(3,4).

Conventional management of hypertension primarily involves pharmacological therapy using antihypertensive drugs. Although effective, long-term use of these medications may be associated with

adverse effects, reduced patient adherence, and limitations in achieving optimal blood pressure control. These challenges have encouraged the growing use of complementary and alternative medicine (CAM) approaches as supportive strategies for hypertension management ⁽⁴⁾.

Acupuncture is one of the most widely studied complementary therapies in the management of hypertension. From a physiological perspective, acupuncture is known to modulate the autonomic nervous system, reduce sympathetic activity, enhance parasympathetic tone, promote vasodilation, and induce relaxation responses that contribute to blood pressure reduction. In Traditional Chinese Medicine (TCM), hypertension is commonly associated with patterns such as Liver Yang Rising, Liver Fire, Kidney Yin Deficiency, and Phlegm-Damp accumulation. Acupuncture aims to restore balance between Yin and Yang, regulate Qi and Blood circulation, and calm the Shen ⁽⁵⁻⁹⁾.

In addition to acupuncture, herbal therapy plays an important role in complementary hypertension management. *Orthosiphon stamineus* (Kumis Kucing) is a medicinal plant widely used in Indonesia and other tropical regions. This herb contains bioactive compounds such as flavonoids, sinensetin, and phenolic acids, which exhibit diuretic, anti-inflammatory, and antioxidant properties. These effects may support blood pressure reduction through improved renal function, decreased plasma volume, and reduced vascular inflammation ^(10,11,12).

Although previous studies have demonstrated the antihypertensive potential of acupuncture and *Orthosiphon stamineus* independently, most research has focused on single interventions. Evidence comparing the effectiveness of acupuncture therapy and *Orthosiphon stamineus* herbal therapy within a clinical setting remains limited, particularly in community-based complementary therapy services. Therefore, this study aimed to evaluate

and compare the effectiveness of acupuncture at PC6 (Neiguan), HT7 (Shenmen), GV20 (Baihui), and Ear Shenmen acupoints with *Orthosiphon stamineus* herbal therapy in reducing blood pressure among patients with mild to moderate hypertension at Rumah Terapi Nur Syifa, Fakfak, West Papua.

The general objective of this study was to evaluate the effectiveness of acupuncture therapy at PC6 (Neiguan), HT7 (Shenmen), GV20 (Baihui), and Ear Shenmen, as well as *Orthosiphon stamineus* (Kumis Kucing) herbal therapy, in reducing systolic and diastolic blood pressure among patients with mild to moderate hypertension. Specifically, the study aimed to describe the characteristics of participants based on age, gender, and occupation; to assess systolic and diastolic blood pressure levels before and after acupuncture and herbal interventions; and to analyze changes in blood pressure as well as differences in effectiveness between acupuncture therapy and *Orthosiphon stamineus* herbal therapy in lowering blood pressure in hypertensive patients.

II. METHODS

This study employed a quasi-experimental design using a two-group pretest–posttest approach. This design was selected because full randomization of subjects was not feasible in the clinical setting of a complementary therapy center, while still allowing the evaluation of intervention effectiveness through comparison of blood pressure measurements before and after treatment. The study was conducted at Rumah Terapi Nur Syifa, Fakfak, West Papua. A total of 30 participants diagnosed with mild to moderate hypertension were recruited using purposive sampling based on pre-defined inclusion and exclusion criteria. Eligible participants were adults with systolic and/or diastolic blood pressure above normal limits who agreed to participate and provided informed consent.

Participants were divided into two intervention groups: (1) the acupuncture therapy group and (2) the herbal therapy group. The acupuncture therapy group received acupuncture treatment at PC6 (Neiguan), HT7 (Shenmen), GV20 (Baihui), and Ear Shenmen acupoints. Low-frequency electroacupuncture at 2 Hz was applied for 20 minutes per session. The intervention was administered for a total of 10 sessions over four weeks. The selection of acupoints and stimulation frequency was based on their clinical relevance in regulating the autonomic nervous system, calming the Shen, and supporting blood pressure reduction. The herbal therapy group received *Orthosiphon stamineus* herbal preparation as a single-herb intervention. The herbal therapy was administered according to empirical and clinical practice standards for hypertension management over the same four-week period.

Blood pressure measurements, including systolic and diastolic values, were obtained for all participants before the intervention (pretest) and after completion of the intervention period (posttest). Blood pressure was measured using a standard sphygmomanometer under resting conditions to ensure measurement consistency. Data were analyzed using statistical software. Descriptive analysis was performed to summarize participant characteristics. The Wilcoxon signed-rank test was used to evaluate changes in systolic and diastolic blood pressure before and after the intervention within each group. The Mann–Whitney U test was applied as an additional analysis to compare blood pressure changes between the two groups. A p-value of less than 0.05 was considered statistically significant. This study was conducted in accordance with ethical principles for human research. Ethical clearance was obtained before data collection, and all participants provided informed consent before participating in the study.

III. RESULT

The characteristics of the study participants based on gender, age, and occupation in both intervention groups are presented in Table 1. Overall, female participants predominated in both groups. The age of participants ranged from 45 years to ≥ 60 years, with most participants concentrated in the middle-aged groups. Participants had diverse occupational backgrounds, with civil servants representing the largest proportion in both groups.

Table 1. Characteristics of Respondents

Characteristics	Group I N (%)	Group II N (%)
Gender		
Male	7 (46.7)	6 (40.0)
Female	8 (53.3)	9 (60.0)
Age		
45–49	6 (40.0)	6 (40.0)
50–54	7 (46.7)	6 (40.0)
55–59	2 (13.3)	2 (13.3)
≥ 60	–	1 (6.7)
Occupation		
Civil servant	5 (33.3)	4 (26.7)
Teacher	4 (26.7)	3 (20.0)
Housewife	3 (20.0)	4 (26.7)
Trader	2 (13.3)	1 (6.7)
Self-employed	1 (6.7)	3 (20.0)

Univariate analysis showed that participant characteristics based on gender, age, and occupation were relatively comparable between the two intervention groups and are summarized in a single characteristics table. In both groups, female participants predominated, accounting for 53.3% in the acupuncture group and 60.0% in the herbal *Orthosiphon stamineus* group.

The age of participants ranged from 45 years to ≥ 60 years, with the highest proportion observed in the 50–54-year age group in the acupuncture group (46.7%), while in the herbal group, the highest proportions were equally distributed in the 45–49 and 50–54-year age groups (40.0% each). Regarding occupation, participants had diverse occupational backgrounds, with civil servants (PNS)

representing the largest proportion in both groups, followed by housewives, teachers, traders, and self-employed participants.

Table 2. Blood Pressure Before and After Intervention

Group	Measurement	Mean ± SD (mmHg)
Systolic Blood Pressure		
Acupuncture	Pre-test	147.00 ± 9.60
	Post-test	132.03 ± 8.93
Herbal <i>O. stamineus</i>	Pre-test	147.00 ± 9.60
	Post-test	136.37 ± 8.50
Diastolic Blood Pressure		
Acupuncture	Pre-test	92.60 ± 4.39
	Post-test	82.03 ± 5.31
Herbal <i>O. stamineus</i>	Pre-test	92.60 ± 4.39
	Post-test	85.10 ± 4.85

Changes in systolic and diastolic blood pressure before and after the intervention are presented in a combined table of blood pressure outcomes. In the acupuncture group, mean systolic blood pressure decreased from 147 mmHg at pretest to 132.03 mmHg at posttest, while mean diastolic blood pressure decreased from 92.60 mmHg to 82.03 mmHg. In the herbal *Orthosiphon stamineus* group, mean systolic blood pressure decreased from 147 mmHg to 136.37 mmHg, and mean diastolic blood pressure decreased from 92.60 mmHg to 85.10 mmHg. Overall, both interventions demonstrated reductions in systolic and diastolic blood pressure following the intervention period, with descriptively greater reductions observed in the acupuncture group compared to the herbal therapy group.

Bivariate analysis was conducted to examine the effect of the interventions on changes in systolic and diastolic blood pressure before and after treatment and to compare the effectiveness of acupuncture and *Orthosiphon stamineus* herbal therapy. Data normality was assessed using the Shapiro–Wilk test due to the sample size of fewer than 50 participants (n = 30). The results showed that systolic and diastolic blood pressure values at

both pretest and posttest were normally distributed (p > 0.050). Therefore, the assumption of normality was met, and further statistical analyses were performed using parametric tests, namely the paired sample t-test and the independent sample t-test.

After the data were confirmed to be normally distributed, hypothesis testing was conducted using a Paired Sample t-test to assess differences in blood pressure before and after intervention, and an Independent Sample t-test to compare the effectiveness of acupuncture and *Orthosiphon stamineus* (Java tea) herbal therapy. The paired t-test results demonstrated a significant reduction in both systolic and diastolic blood pressure after intervention across all subjects (p < 0.050). The mean systolic blood pressure decreased by 14.97 mmHg, while the mean diastolic blood pressure decreased by 10.57 mmHg, indicating that the interventions were overall effective in lowering blood pressure.

Table 3. T-Test

Variable	t	p
Systolic Post-Test	2.347	0.019
Diastolic Post-Test	2.28	0.021

To further compare the effectiveness between groups, an independent t-test was performed on post-test values, as presented in Table B. The results revealed significant differences between the acupuncture and herbal groups in both systolic (p= 0.019) and diastolic blood pressure (p= 0.021). These findings confirm that the reduction in blood pressure achieved by the acupuncture intervention was significantly greater than that achieved by herbal *Orthosiphon stamineus* therapy. Therefore, it can be concluded that acupuncture is more effective than herbal *Kumis Kucing* in reducing both systolic and diastolic blood pressure in this study population.

IV. DISCUSSION

This study demonstrated that both acupuncture therapy and *Orthosiphon stamineus* herbal therapy significantly reduced systolic and diastolic blood pressure in patients with mild to moderate hypertension. These findings support the role of complementary therapies as effective non-pharmacological approaches in hypertension management, particularly in community-based clinical settings ^(8,9,12).

The significant reduction in blood pressure observed in the acupuncture group is consistent with previous studies reporting the antihypertensive effects of acupuncture. From a biomedical perspective, acupuncture may reduce blood pressure through modulation of the autonomic nervous system, characterized by decreased sympathetic activity and enhanced parasympathetic tone. This mechanism promotes vasodilation, reduces peripheral vascular resistance, and contributes to improved cardiovascular regulation. In addition, acupuncture stimulation has been shown to increase nitric oxide release, suppress renin-angiotensin-aldosterone system (RAAS) activity, and induce the release of endogenous opioids, which collectively support blood pressure reduction ^(11,12,13).

From a Traditional Chinese Medicine (TCM) perspective, hypertension is commonly associated with patterns such as Liver Yang Rising, Liver Fire, Kidney Yin Deficiency, and Phlegm-Damp accumulation. The selection of PC6 (Neiguan), HT7 (Shenmen), GV20 (Baihui), and Ear Shenmen acupoints in this study was intended to regulate Qi and Blood, calm the Shen, suppress excessive Liver Yang, and restore Yin-Yang balance. The observed reduction in blood pressure supports the

theoretical framework of acupuncture in addressing both physiological and psychosomatic contributors to hypertension ^(14,15,16).

The herbal therapy group receiving *Orthosiphon stamineus* also demonstrated a significant reduction in blood pressure. This finding aligns with previous evidence suggesting that *Orthosiphon stamineus* possesses diuretic, anti-inflammatory, and antioxidant properties. The diuretic effect may reduce plasma volume and cardiac workload, while antioxidant activity may improve endothelial function and reduce vascular inflammation. These combined effects likely contribute to improved blood pressure control in patients with hypertension ^(10,11,12).

The comparison between the two intervention groups revealed no statistically significant difference in post-intervention blood pressure outcomes. This finding suggests that both acupuncture and *Orthosiphon stamineus* herbal therapy are similarly effective as complementary interventions for managing hypertension. In clinical practice, this provides flexibility for healthcare providers and patients in selecting therapeutic options based on patient preference, accessibility, and individual clinical conditions ^(11,12).

Despite its positive findings, this study has several limitations. The sample size was relatively small, and the study was conducted in a single complementary therapy center, which may limit generalizability. In addition, the absence of a pharmacological control group restricts direct comparison with conventional antihypertensive treatment. Future studies with larger sample sizes, randomized controlled designs, and longer follow-up periods are recommended to further strengthen the evidence base.

V. CONCLUSION

Both acupuncture therapy at PC6 (Neiguan), HT7 (Shenmen), GV20 (Baihui), and Ear Shenmen acupoints and Orthosiphon stamineus herbal therapy were effective in reducing systolic and diastolic blood pressure among patients with mild to moderate hypertension. These findings indicate that acupuncture and

Orthosiphon stamineus herbal therapy can be considered effective complementary interventions to support blood pressure management. Further research is recommended to confirm these results in larger populations and to explore the potential benefits of combining acupuncture and herbal therapy in integrative hypertension care.

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