



Article

**Effect of Acupuncture Therapy and Ear Apex Bloodletting on Blood Pressure in Hypertension Patients at Posyandu Sumberejo Village, Bonang District, Demak Regency**

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**ABSTRACT**

Hypertension is a condition where the measurement results of systolic blood pressure are  $\geq 140$  mmHg and diastolic blood pressure  $\geq 90$  mmHg. The prevalence of hypertension in Demak Regency is 76.7%, the second highest in Central Java. Acupuncture therapy and ear apex bloodletting are nonpharmacological treatments that can be used to treat hypertension. The purpose of this study was to analyze the effect of acupuncture therapy and ear apex bloodletting on hypertension cases at Posyandu Lansia Desa Sumberejo, Bonang District, Demak Regency. This study used a quantitative method with a quasi-experimental design with a two-group pretest-posttest design. This study used 30 samples that met the inclusion and exclusion criteria, which were divided into 15 people per group. The first group of acupuncture therapy, the second group of acupuncture therapy, and ear apex bloodletting. Mann-Whitney test results showed sig.  $< 0.050$  in the acupuncture and bloodletting therapy group on systolic blood pressure. Wilcoxon test results show both groups get sig results.  $< 0.05$ , which indicates that there is an effect on blood pressure from group I and II treatments. In conclusion, acupuncture and ear apex bloodletting are more effective in reducing systolic blood pressure.

**I. INTRODUCTION**

Hypertension is a condition where the measurement of systolic blood pressure is  $\geq 140$  mmHg and diastolic blood pressure  $\geq 90$  mmHg. Hypertension is nicknamed the silent killer because its symptoms are not visible. Hypertension worldwide is a non-communicable disease (NCD) that is the leading cause of premature death <sup>(1)</sup>. Health organizations

estimate that in 2020, the prevalence of hypertension was 22% of the total world population. Based on the prediction of 2025, the incidence of hypertension in the world in adults reached 29.2%. Southeast Asia region with a prevalence of 25% of the total population <sup>(2,3)</sup>.

Hypertension prevalence in 2021 in Indonesia recorded an estimated number of hypertension cases in Indonesia of 63,309,620 people, while the death rate

in Indonesia due to hypertension was 427,218 deaths <sup>(2)</sup>. The prevalence of hypertension in Central Java reached 37.57%. Meanwhile, the number of hypertensive patients in Demak Regency is the second highest in Central Java, with 76.7% hypertensive patients <sup>(3)</sup>.

Acupuncture therapy can lower blood pressure by stimulating acupuncture points to stimulate the regulation of the autonomic nervous system, release endorphins, release prostaglandins in the brain and change changes in plasma angiotensin II, can lower pressure <sup>(4)</sup>. Taichong LV3 point needling resulted in a decrease in plasma angiotensin II and this suggests that the renin-angiotensin system plays an important role in lowering blood pressure with acupuncture<sup>(5)</sup>. KI 3 Taixi, LI 4 Hegu, and PC 6 Neiguan points provide a stimulus that can stimulate sensory nerve cells in the acupuncture area. This is then sent to the spinal cord, midbrain, and hypothalamic-pituitary complex. From there, endorphins are released, which can cause a feeling of calmness. change blood pressure <sup>(6)</sup>.

The ear apex is the point located at the upper end of the helix <sup>(7)</sup>. The blood-letting method can stimulate the production and release of endogenous nitric oxide, which plays a role in vasodilation and increases the supply of nutrients and blood needed by cells and layers of arterial and venous blood vessels, so that they become stronger and more elastic, resulting in decreased blood pressure for patients with high blood pressure <sup>(4)</sup>.

Based on preliminary studies that have been carried out, 35 people with hypertension were found in the Posyandu Lansia of Sumberejo Village, Bonang District, Demak Regency. Of these, 24 people realized that they suffered from hypertension but did not take medicine and chose other alternatives such as consuming celery, cucumber, and dragon fruit, 11 people realized that they suffered from hypertension but did not regularly take medicine. The purpose of this study

was to analyze the effect of acupuncture therapy and ear apex bloodletting on hypertension cases at Posyandu Lansia Desa Sumberejo, Bonang District, Demak Regency.

## II. METHODS

This study employed a quantitative approach with a quasi-experimental design, specifically a two-group pretest–posttest design. The research aimed to determine the effect of acupuncture therapy and a combination of acupuncture therapy with ear apex bloodletting on changes in blood pressure among individuals with hypertension. The first group received acupuncture therapy only, while the second group received acupuncture therapy combined with ear apex blood-letting.

A total of 30 subjects were selected based on predetermined inclusion criteria, including residents of Sumberejo Village, Bonang District, Demak Regency who suffered from hypertension; male or female participants aged 45–65 years; individuals diagnosed with grade 1 hypertension (systolic 140–159 mmHg, diastolic 90–99 mmHg) or grade 2 hypertension (systolic 160–179 mmHg, diastolic 100–109 mmHg); participants who were able to communicate well; willing to undergo 10 therapy sessions at a frequency of twice per week; and had signed informed consent as a statement of participation.

This research was conducted at the Posyandu Lansia (Elderly Integrated Health Post) in Sumberejo Village, Bonang District, Demak Regency. The independent variables in this study were acupuncture therapy and acupuncture therapy combined with ear apex blood-letting, while the dependent variable was the change in blood pressure. Research instruments included an informed consent form, sphygmomanometer, stethoscope, 1 cun acupuncture needles, 70% alcohol swabs, Nierbeken, sterile gloves, stationery, lancet, lancet needle, and used needle container.

The intervention was administered over 10 sessions, with a frequency of twice per week. Blood pressure measurements were taken before and after each intervention to observe changes in systolic and diastolic levels. The acupuncture points used in this study were KI3 (Taixi), LI4 (Hegu), PC6 (Neiguan), and LV3 (Taichong).

Before determining the appropriate statistical analysis technique, data normality was assessed using the Shapiro–Wilk test. If the data were normally distributed, the paired t-test was applied; otherwise, the Wilcoxon signed-rank test was used for paired data that were not normally distributed.

**III. RESULT**

The study was conducted from October 2024 to March 2025. The subjects of this study amounted to 30 people who would be divided into two groups with the first group being treated with acupuncture therapy and the second group being treated with acupuncture and ear apex bloodletting therapy which would be carried out 10 times a week with a frequency of 2 times a week.

**Table 1. Characteristics of Respondents**

Characteristics	Group I	
	N	%
<b>Gender</b>		
Female	4	13.3
Male	26	86.7
<b>Age (years)</b>		
45-50	14	46.7
51-55	9	30.0
56-60	4	13.3
61-65	3	10.0
<b>Occupation</b>		
Farmer	8	26.7
Housewife	12	40.0
Laborer	1	3.3
Employee	1	3.3

Trader	6	20.0
Chef	2	6.7

Based on table 1, it is known that of the 30 research subjects, the highest gender is female, 26 people, the highest age range is 45-50 years, totaling 14 people, the work of housewives is 12 people.

**Table 2. Blood Pressure Before Acupuncture Therapy**

Systolic	N	%	Diastolic	N	%
141	1	1.6	85	1	1.6
145	1	1.6	90	2	3.3
147	1	1.6	91	2	3.3
148	2	3.3	92	2	3.3
150	5	8.2	93	1	1.6
153	1	1.6	94	2	3.3
155	3	4.9	95	2	3.3
170	1	1.6	98	1	1.6
-	-	-	99	1	1.6
-	-	-	110	1	1.6

Based on Table 2, it is known that blood pressure before treatment in the acupuncture group has an average systolic 151.13 mmHg and diastolic 93.93 mmHg.

**Table 3. Blood Pressure After Acupuncture Therapy**

Systolic	N	%	Diastolic	N	%
125	2	3.3	74	1	1.6
127	1	1.6	78	1	1.6
128	1	1.6	82	1	1.6
130	5	8.2	85	2	3.3
132	1	1.6	86	2	3.3
134	1	1.6	87	1	1.6
135	2	3.3	90	5	8.2
145	1	1.6	91	2	3.3
150	1	1.6	-	-	-

Based on Table 3, it is known that blood pressure after treatment in the

acupuncture group has an average systolic of 132.40 mmHg and diastolic of 86.33 mmHg.

**Table 4. Blood Pressure Before Acupuncture and Ear Apex Blood-letting Therapy**

Systolic	N	%	Diastolic	N	%
143	1	1.6	85	1	1.6
144	1	1.6	91	1	1.6
156	1	1.6	94	1	1.6
158	1	1.6	96	1	1.6
162	1	1.6	98	1	1.6
165	1	1.6	99	1	1.6
170	3	4.9	107	2	3.3
176	1	1.6	110	7	11.5
180	5	8.2	-	-	-

Based on Table 4, it is known that blood pressure before treatment in the acupuncture and ear apex bloodletting groups has an average systolic 167.60 mmHg and diastolic 103.13 mmHg.

**Table 5. Blood Pressure After Acupuncture and Ear Apex Blood-letting Therapy**

Systolic	N	%	Diastolic	N	%
120	3	4.9	70	1	1.6
134	1	1.6	80	2	3.3
140	4	6.6	85	2	3.3
144	1	1.6	86	1	1.6
145	1	1.6	90	5	8.2
150	4	6.6	91	1	1.6
155	1	1.6	95	3	4.9

Based on Table 5, it is known that blood pressure after treatment in the acupuncture and ear apex bloodletting groups has an average systolic of 139.87 mmHg and a diastolic of 87.47 mmHg.

Based on Table 6, getting sig results. < 0.050. Therefore, the results of this study

that Ho is rejected and Ha is accepted, which means that there is an effect of acupuncture therapy and ear apex blood-letting on blood pressure in patients with hypertension

**Table 6. The Result of the Wilcoxon Test**

Group		N	p
I	Systolic	15	0.001
	Diastolic	15	
II	Systolic	15	0.001
	Diastolic	15	

Based on table 8 shows the results of sig.<0.050 in the systolic variable and sig. >0.050 in the diastolic variable. The average decrease in systolic blood pressure in group I was 12.20 mmHg and diastolic was 14.37 mmHg, while the decrease in group II was 18.80 mmHg and diastolic was 16.63 mmHg. So group II acupuncture therapy and ear apex bloodletting are more effective in reducing systolic blood pressure.

**Table 3. The Result of Mann-Whitney Test**

Group	Blood Pressure	Mean Rank	p
I	Systolic	12.20	0.039
II		18.80	
I	Diastolic	14.37	0.471
II		16.63	

**IV. DISCUSSION**

In this study, the most common gender was female, totaling 26 people (86.7%). Hypertension occurs in many women after menopause. Estrogen hormones protect women who are not yet menopausal by increasing the level of HDL (High-Density Lipoprotein). Low levels of HDL cholesterol and high levels of LDL cholesterol (Low-Density Lipoprotein) affect atherosclerosis and lead to hypertension<sup>(8)</sup>.

The highest number of ages was around 45-50 years, totaling 14 people

(46.7%). With age, blood pressure generally increases. This is a result of degeneration that occurs with age which causes blood vessels to become thicker and stiffer<sup>(9)</sup>.

The most common occupation is housewife, totaling 12 (40.0%). Stress is a contributing factor to hypertension in housewives<sup>(10)</sup>. Women have a higher chance of experiencing disease than men, related to a decrease in the immune system. The role of a housewife has dense activities that make it vulnerable to a decrease in the immune system, fatigue, and disease<sup>(8)</sup>.

In this study, non-parametric analysis was performed using the Wilcoxon test for paired data, given that the data analyzed were not normally distributed. The results of the Wilcoxon test showed a sig value.  $<0.050$ , which means  $H_0$  is rejected and  $H_a$  is accepted because there is an effect of acupuncture therapy and ear apex bloodletting on blood pressure.

In the Mann-Whitney test, the results show the sig value.  $<0.050$  in the acupuncture and bloodletting therapy group on systolic blood pressure, which means that it can be concluded that group II acupuncture therapy and ear apex bloodletting are more effective in reducing systolic blood pressure. In this study, the average decrease in systolic blood pressure in group I was 12.20 and diastolic was 14.37, smaller than group II systolic 18.80 and diastolic 16.63.

Acupuncture therapy can lower blood pressure by stimulating acupuncture points to regulate the sympathetic and parasympathetic nervous system regulation<sup>(11)</sup>. Acupuncture also stimulates the release of endorphins, releases prostaglandins in the brain, and changes plasma angiotensin II changes, which can lower blood pressure<sup>(4)</sup>. LV 3 Taichong has the effect of lowering blood pressure and decreasing plasma angiotensin II. This shows that the renin angiotensin system plays an important role in lowering

blood pressure<sup>(12)</sup>. KI 3 needling strengthens kidney yin and can weaken heart yang to improve health and lower blood pressure<sup>(13)</sup>.

While the LI 4 point is related to the hyperactive state of the liver, which causes headaches, so it needs to be weakened, by weakening this point, the condition of headaches, one of the symptoms caused by hypertension, is reduced<sup>(14)</sup>. Stabbing the PC 6 point stimulates sensory nerves so that it can stimulate the release of endorphins, which provide a sense of comfort and calm. This affects blood pressure. PC 6 point is often used for heart disease, protecting heart muscle cells, reducing heart rate, blood pressure, balancing oxygen supply, and reducing the risk of cardiac ischemia<sup>(15)</sup>.

The bloodletting method on the ear apex can affect the central system through afferent nerves, so it can affect blood pressure and antihypertensive effects<sup>(16)</sup>. The bloodletting method can stimulate the production and release of endogenous nitric oxide, which plays a role in vasodilation and increases the supply of nutrients and blood required by the cells and vascular layers of arteries and veins, so that they become stronger and more elastic, resulting in a decrease in blood pressure for patients with high blood pressure<sup>(4)</sup>.

The combination of acupuncture therapy with ear apex bloodletting is effective for systolic blood pressure because it is more influenced by heart muscle contraction, while diastolic blood pressure is more influenced by blood vessel elasticity. The combination of these two therapies has more effect on heart muscle contraction and blood volume, so it is more effective in reducing systolic blood pressure<sup>(11)</sup>.

## V. CONCLUSION

The Mann-Whitney test results showed a sig value.  $<0.050$  in the acupuncture and bloodletting therapy groups on systolic blood pressure. Wilcoxon test

results show both groups get sig.  $<0.05$ , which shows that there is an effect on blood pressure from group I and II treatments. Therefore, the results of this study indicate that  $H_0$  is rejected and  $H_a$  is accepted. This study concludes that both therapy groups affect blood pressure, but the combination of acupuncture therapy and ear apex bloodletting is more effective for reducing systolic blood pressure.

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