Original Research

Effect of Acupressure Seven Meridian Points on Blood Pressure Changes in Hypertensive Patients

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Abstract

Introduction: Hypertension is a blood pressure disease affecting physical and psychological changes. This study aims to determine the effect of acupressure therapy on reducing blood pressure in hypertensive patients in the working area of Public Health Centre (Puskesmas) II Negara.

Methods: This study used a Pre-Experimental One Group Pretest Posttest Design. The sample of this study was 30 people with hypertension using a purposive sampling technique. The intervention was given by acupressure therapy at 7 meridian points (points ST 9, PC 6, ST 36, LI 4, DU 16, GB 20, and GB 21). The effect of acupressure therapy on blood pressure was analyzed using the Wilcoxon test because the data were not normally distributed.

Results: The Wilcoxon test showed a p-value of 0.000 (α <0.05), thus indicating the effect of acupressure therapy on blood pressure in hypertensive patients in the working area of Public Health Centre II.

Conclusion: Complementary acupressure therapy on seven meridian points can be an alternative therapy for hypertension sufferers.

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INTRODUCTION

Hypertension is commonly referred to as a silent killer. This disease poses challenges in identification due to the absence of typical symptoms and signs until the onset of severe complications, ultimately resulting in fatality [1]. Individuals diagnosed with hypertension are typically prescribed lifelong medication and advised to adopt a healthy lifestyle in order to effectively manage the condition and prevent potential complications. [2].

The global prevalence of hypertension is estimated to be 22% by the World Health Organization (WHO). The prevalence of hypertension in the African region is 27%. Southeast Asia has the third highest population, accounting for 25% of the total population [3]. The prevalence of hypertension is 35% in developed countries and 40% in developing countries among adults. By 2025, there is a projected 80% increase in the prevalence of hypertension, particularly in developing nations [4], [5].

The prevalence of hypertension in Indonesia, as determined by measurements taken in the population aged 18 years, is 34.1%. South Kalimantan had the highest prevalence rate at 44.1%, whereas Papua had the lowest at 22.2%. The age distribution is as follows: 31-44 years (31.6%), 45-54 years (45.3%), and 55-64 years (55.2%) [6].

Acupressure is a form of complementary therapy that aims to invigorate the body. The techniques used in acupressure and reflexology differ. The acupressure massage technique involves applying pressure or vibration to specific points or areas for a duration of 15-20 seconds [7].

Dermawan et.al conducted a quasi-experimental study employing intervention and control groups. The study included a total of 36 elderly participants, with 18 in the intervention group and 18 in the control group. Data collection involved respondents completing questionnaires, researchers conducting pre-blood pressure checks, researchers administering 30 minutes of guided acupressure, and researchers conducting post-blood pressure checks. Independent acupressure performed by elderly individuals, either alone or with the assistance of their family, has been found to reduce systolic blood pressure by 18.05 mmHg effectively. Acupressure, a non-invasive intervention, involves applying pressure to specific points on the body. It is considered an effective and safe non-pharmacological approach [8].

In a preliminary study conducted on December 20, 2022, researchers examined register data from September to October 2022 in the working area of Puskesmas II Negara. The data revealed that 6,641 individuals with hypertension sought medical care at Puskesmas II. Currently, hypertension patients receive medical treatment at puskesmas, which includes programs specifically designed for hypertension management and mobile health centers known as Pusling care. Out of the 10 respondents interviewed, 80% reported experiencing frequent headaches, while 20% of the respondents mentioned that their headaches were accompanied by difficulty sleeping.

This study aims to assess the impact of acupressure therapy on blood pressure
reduction in hypertensive patients within the working area of Puskesmas II Negara. This research benefit to offer an alternative treatment for individuals with hypertension, particularly those who struggle with medication adherence.

METHODS

This study employed the one group pretest posttest pre-experimental design. The study was conducted at Puskesmas II Negara over a one-month period from February to March 2023. Purposive sampling was employed, with a sample size of 30 participants. Data was collected using the Standard Operating Procedure (SOP) for acupressure therapy and a sphygmomanometer.

Intervention

The acupressure was done for approximately 2 minutes/points with total 15-20 minutes/intervention, 2 times/week, and it was done for 4 weeks (1 month). Massage is done using the thumb or other fingers with 30 times of massage or clockwise rotation (10-10-10) to strengthen and 40-60 times of massage or rotation to the left to weaken. Massage is done on each part of the body (left and right) except for the point which is located in the middle. The details of intervention as follows:

1. Apply olive oil to hands. sufficiently
2. Gently massaging the patient’s feet can help to alleviate muscle stiffness in the legs and promote relaxation.
3. Applying pressure for a duration of 2 minutes at the specific point ST 9, which is situated in the indentation between the cartilage and sternocleidomastoid muscle.
4. Applying acupressure at point PC 6, which is situated on the inner wrist, precisely three fingers’ width from the center. Apply pressure at this point for a duration of two minutes.
5. Applying pressure for a duration of two minutes at the ST 36 point, which is situated four finger-widths below the lateral side of the knee.
6. Applying pressure to the LI 4 point, which is situated in the muscle bulge between the thumb and forefinger. Maintain this pressure for a duration of 2 minutes.
7. Applying pressure at the DU 16 point, which is situated in the central region of the cervical spine (collar bone). It is recommended to maintain this pressure for a duration of two minutes, as it is considered safe.
8. Applying pressure for a duration of 2 minutes at the GB 20 point, which is situated at the posterior aspect of the foramen magnum bone.
9. Applying pressure for a duration of two minutes at the GB 21 point, which is situated three fingers away from the base of the lower neck.

Data analysis

The results of the normality test analysis using the Shapiro-Wilk test showed that both the pre-test and post-test stress conditions had non-normally distributed blood pressure data. The pre-test stress data had a significant value of 0.000, indicating that it was not normally distributed. Similarly, the post-test
blood pressure data also had a significant value of 0.000, indicating non-normal distribution. Therefore, non-parametric statistics, specifically the Wilcoxon test, were used for statistical analysis.

**Ethical considerations**

The research has obtained ethical approval from the ethical commission under the reference number 329/EC - KEPK - SB/IV/2023. Participants were given the opportunity to decline or withdraw from the study at any point during the data collection phase. Prior to commencing the assessment, the participant was provided with the necessary instructions. Furthermore, there is a substantial debate concerning the safeguarding of individuals’ personal information.

**RESULTS**

According to the data presented in Table 1, the analysis revealed that there were 10 male (33.3%) and 20 female (66.7%). The participants consisted of 5 individuals (16.67%) who were civil servants, 7 individuals (23.33%) who worked in the private sector, and 18 individuals (60%) unemployment. The majority of individuals with hypertension fall within the age range of 1-3 years, with a prevalence of up to 11 individuals.

The analysis results from Table 2 indicated that the average age was 58.93 years, with a median of 57 years. The standard deviation was 11.061. The age range spanned from 45 to 80 years. Based on the 95% confidence interval, it was determined that the mean age of the participants fell between 54.80 and 63.06 years.

According to the findings presented in Table 3, the pre-test analysis revealed that 6.7% of the respondents had a blood pressure reading between 120-139 mmHg, while 56.7% had a reading between 140-159 mmHg, and 36.7% had a reading of 160 mmHg or higher. The post-test analysis revealed that 13.3% of individuals had blood pressure below 120 mmHg, 23.3% had blood pressure between 120-139 mmHg, and 19 individuals had blood pressure between 140-159 mmHg (63.3%).

According to the data in Table 4, the mean blood pressure measurement before the intervention was 3.30 (0.596), with a minimum value of 2 (120-139 mmHg) and a maximum value of 4 (≥ 160 mmHg). In contrast, the intervention resulted in a mean blood pressure reading of 2.50 (0.731), with a minimum of 1 (below 120 mmHg) and a maximum of 3 (140-159 mmHg).
**Table 1**
Characteristics of research participants (n=30)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Classification</th>
<th>Frequency(N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Man</td>
<td>10</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td>Woman</td>
<td>20</td>
<td>66.7</td>
</tr>
<tr>
<td>Job</td>
<td>Civil servants</td>
<td>5</td>
<td>16.67</td>
</tr>
<tr>
<td></td>
<td>Private sector</td>
<td>7</td>
<td>23.33</td>
</tr>
<tr>
<td></td>
<td>Unemployment</td>
<td>18</td>
<td>60</td>
</tr>
<tr>
<td>Long suffering of hypertension</td>
<td>&lt; 1 year</td>
<td>9</td>
<td>30.0</td>
</tr>
<tr>
<td></td>
<td>1-3 years</td>
<td>11</td>
<td>36.7</td>
</tr>
<tr>
<td></td>
<td>4-6 years</td>
<td>10</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td>7-10 years</td>
<td>4</td>
<td>13.3</td>
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</table>

**Table 2**
Characteristics of Respondents by Age

<table>
<thead>
<tr>
<th>Variable</th>
<th>Means-median</th>
<th>SD</th>
<th>Min-Max</th>
<th>95% CI</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>58,93-57</td>
<td>11061</td>
<td>45-80</td>
<td>54.80 - 63.06</td>
<td>30</td>
</tr>
</tbody>
</table>

**Table 3**
Pre-Test and Post-Test Results

<table>
<thead>
<tr>
<th>Systolic Blood pressure (mmHg)</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest &lt;120</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>120-139</td>
<td>2</td>
<td>6,7</td>
</tr>
<tr>
<td>140-159</td>
<td>17</td>
<td>56,7</td>
</tr>
<tr>
<td>&gt;=160</td>
<td>11</td>
<td>36,7</td>
</tr>
<tr>
<td>Posttest &lt;120</td>
<td>4</td>
<td>13,3</td>
</tr>
<tr>
<td>120-139</td>
<td>7</td>
<td>23,3</td>
</tr>
<tr>
<td>140-159</td>
<td>19</td>
<td>63,3</td>
</tr>
<tr>
<td>&gt;=160</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table 4**
Patient Pre-test and Post-test Scores Hypertension (n=30)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Min</th>
<th>Max</th>
<th>SD</th>
<th>Z</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>3.30</td>
<td>2</td>
<td>4</td>
<td>0.596</td>
<td>-4.523</td>
<td>0.000</td>
</tr>
<tr>
<td>Posttest</td>
<td>2.50</td>
<td>1</td>
<td>3</td>
<td>0.731</td>
<td></td>
<td></td>
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</table>
DISCUSSION

This study seeks to investigate the impact of acupressure therapy on seven specific meridian points (ST 9, PC 6, ST 36, LI 4, DU 16, GB 20, and GB 21 points) in order to assess its potential for lowering blood pressure in individuals with hypertension. The findings indicated that systolic blood pressure can be decreased by a range of 10-19 mmHg. The mean age of the population was approximately 57-58 years, with a range of 45 to 80 years. The majority of individuals in this age range were women.

Acupressure therapy has a notable impact on the systolic blood pressure of hypertensive patients in the working area of Puskesmas II NTB. The study found that after administering acupressure therapy, 71.42% of the 7 respondents experienced a decrease in blood pressure, while 28.58% showed no change. This study found that acupressure therapy had a significant impact on lowering blood pressure in individuals with hypertension [7].

Acupressure therapy effectively reduces stress by directly stimulating sensory nerve cells in the acupressure points [9]. This stimulation is transmitted to the spinal cord, then to the mesencephalon, and finally to the hypothalamus-pituitary [10]. The pituitary gland in the hypothalamus releases endorphins, which induce relaxation and a sense of well-being [11]. This has positive effects on mood regulation, stress reduction, and blood pressure control [12].

Psychological factors, such as stress, can influence blood pressure, as supported by Rani’s research on the impact of acupressure therapy on stress in individuals with Knee Osteoarthritis. The study found a statistically significant effect (p-value = 0.001). The study involved administering massages at specific points (HT7, ST34, ST35, ST36, SP9, SP10, and GB34) for a duration of 15 minutes, five days a week, over a period of seven days [13]. This study differs from Cho’s research in 2021 by examining the impact of massage on blood pressure control through the stimulation of six specific acupressure points: GV 20, GB12, GB21, LI11, SI3, and KL1. The duration of the massage at each point was 2 minutes and 30 seconds [14].

Suwarini et al. found that acupressure leads to a significant decrease in blood pressure. The average systolic blood pressure decreased from 157.50 mmHg to 147.81 mmHg. Acupressure resulted in a significant decrease in the average diastolic blood pressure, from 96.69 mmHg to 87.94 mmHg. The study revealed that the acupressure technique effectively alleviated the complaints and symptoms experienced by the respondents, although the decrease in blood pressure was not significant [15].

The study’s findings indicate that acupressure therapy effectively reduces blood pressure in hypertensive patients. Therefore, it is recommended as a non-pharmacological alternative therapy that is safe, painless, and easily administered. Additionally, acupressure can be considered as a holistic care because it is not only reducing the blood pressure, but also giving psychological effect. Holistic care are an important to reach patients well-being [16].
LIMITATIONS

Based on the results of the study, it was shown that the majority was women (20 people/66.7%) and all of these women were on average old age, so researchers assumed that changes in women and men cannot be compared. Future research needs to look at the effect of differences between women and men. The larger sample size and limited age are important considerations for further research.

CONCLUSION

Acupressure in seven meridian points effectively reduce blood pressure on hypertensive patients at working area of Puskesmas II Negara. Engaging in a twice-weekly acupressure therapy for a duration of one month has been observed to result in a significant reduction of 10-19mmHg in systolic blood pressure. The results of this study are expected to have benefits as one of the developments in science, and can be used as a reference in conducting scientific studies on acupressure therapy not only for hypertension but also for other diseases.

CONFLICT OF INTEREST

Authors declare no conflict of interest to disclose in this study.

REFERENCES


