Effect of self reiki and slow deep breathing on blood pressure of patients with hypertension

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Abstract Hypertension presents a significant challenge in Indonesia, commonly encountered in primary healthcare settings. This study aimed to assess the impact of self-administered reiki and slow, deep breathing techniques on individuals with hypertension. The research comprised 78 participants, split into two groups: 39 in the control group and 39 in the intervention group. The intervention group practiced self-reiki combined with slow, deep breathing for 21 days, while the control group practiced slow, deep breathing for the same duration. Statistical analysis employed the Wilcoxon and Mann–Whitney tests. The Wilcoxon test yielded a P-value of 0.000 for both Systole and Diastole between the Intervention and Control Groups post-treatment, while the Mann–Whitney test showed a P-value of 0.002 for Systole and \( P = 0.000 \) for Diastole between the Intervention and Control Groups after Treatment. Consequently, it can be deduced that a significant disparity in systolic and diastolic blood pressure exists pre- and post-self-reiki and slow, deep breathing exercises in both the intervention and control groups. These practices demonstrate a significant potential to reduce blood pressure among patients dealing with hypertension.

Keywords: self-reiki, slow deep breathing, blood pressure, hypertension

1. Introduction

Hypertension has affected people worldwide; approximately 970 million people in the world have high blood pressure (Bell, 2015). According to data from the World Health Organization (WHO), hypertension is the fourth most prevalent condition in Indonesia and the first most prevalent ailment worldwide (WHO, 2015). The prevalence of hypertension in the Asian region continues to increase (Park, 2015). The prevalence of hypertension in the Yogyakarta area is 26%, and hypertension ranks third in Indonesia (YPHO, 2015). Based on the Integrated Health Center Disease Surveillance in 2015, hypertension was ranked second among the top 10 diseases that often appear in Yogyakarta. Sleman Regency is a regency located in the province of Yogyakarta. Hypertension cases were the highest noncommunicable disease cases in Sleman Regency in 2017, with a prevalence of 12,204 cases per 100,000 population (SDHO, 2017). According to data from the 2014 Sample Registration Survey, hypertension is the fifth highest cause of death in Indonesia (Ministry of Health, 2017).

Hypertension cannot be cured, and sufferers will be diagnosed with hypertension for the rest of their lives. Even though hypertension cannot be cured, its incidence can be controlled with good hypertension management. Uncontrolled blood pressure in hypertension can cause various complications that can cause death. In general, hypertension management is divided into two categories: management with pharmacological and nonpharmacological treatment (Tjay, 2010). Pharmacological therapy for hypertension uses medications called antihypertensive drugs. Hypertensive nonpharmacological therapy involves weight loss, dieting, cholesterol reduction, cessation of smoking, limiting coffee, regular exercise, sufficient rest and sleep, and reducing stress. Relaxation exercises such as yoga, slow deep breathing, meditation, aromatherapy, music therapy, biofeedback, and reiki can be used to lower blood pressure by hypertensive patients (Tjay, 2010). Lifestyle modifications that effectively lower blood pressure include increased physical activity, weight loss, limited alcohol consumption, relaxation techniques of Yoga, Acupuncture, Tai chi, mindfulness-based stress-reduction program, and Transcendental Meditation (Verma, 2020).

One of the nonpharmacological techniques used by hypertensive people in an effort to control hypertension is reiki training. Reiki originates from a spiritual practice to improve and maintain health, cultivate peace of mind, and increase vitality and well-being (Birocco, 2012). Self-reiki can be done to take care of yourself in everyday life. Reiki techniques can help restore and balance energy in the body, which then helps to relax muscles and the body, mind, and emotions (Honervogt, 2017)
Dr. Mikao Usui (1865–1926) is recognized as the founder of the Reiki system. Dr. Mikao Usui found the principles of Reiki after a long search. Searching for Dr. Usui begins with an investigation to understand the healing miracles of God and ends in a deep personal healing transformation. After this experience, Dr. Usui devoted the rest of his life to healing others and passing down Reiki teachings. Dr. Usui used Reiki for himself and his family before it was introduced to the public by him in April 1922. Dr. Usui moved to Tokyo, where he founded ‘Usui Reiki Ryoho Gakkai,’ which translated means ‘Usui Reiki Healing Community,’ and a clinic where he treated his patients and taught Reiki (Gibson, 2012; Bukowski, 2015).

At Reiki level one, individuals are instructed in self-treatment, commonly referred to as self-reiki (Cervila, 2017). The procedure mirrors that of treating others; participants are encouraged to self-administer Reiki at least once daily, with each person assuming responsibility for maintaining their own health (Cervila, 2017). This involves placing the hands through a series of 12 positions, starting from the head and progressing down the body to the feet, while functioning as a conduit for Reiki energy (Cuneo, 2011). Hand placements align with the body’s seven primary chakras, the focal points for absorbing Reiki energy. Each position's duration, typically three to five minutes, may vary among practitioners. A session's duration typically spans from thirty minutes to an hour, with patients assuming a lying, sitting, or standing position. Post-therapy, patients are advised to consume ample water to aid in eliminating toxins from the body (Bukowski, 2015).

Slow deep breathing therapy is another non-pharmacological intervention that may aid in lowering blood pressure. These exercises stimulate the release of endorphins within the autonomic nervous system, inducing vasodilation in blood vessels, thereby reducing mean arterial pressure and enhancing heart rate variability (Mahmood, 2019).

During interviews with attending physicians at Primary Health Care Gamping II Yogyakarta, preliminary investigations revealed that hypertensive patients commonly received pharmacological treatments such as amlodipine. Captopril is prescribed for those unable to tolerate amlodipine’s effects, while nifedipine is specifically recommended for pregnant women with hypertension. Additionally, patients are educated on hypertension management strategies, including adhering to low-sodium, low-cholesterol diets and avoiding triggers to prevent hypertension relapse. Notably, complementary therapies like meditation, relaxation, and spiritual therapy have not been historically employed for hypertensive patients at Primary Health Care Gamping II.

This study aimed to assess the impact of self-reiki and slow deep breathing on blood pressure among hypertensive patients at Primary Health Care Gamping II Yogyakarta.

2. Materials and Methods

A quasi-experimental time series design with a control group was employed in the study. Inclusion criteria encompassed absence of other issues affecting self-reiki and slow deep breathing, such as auditory, visual, or speech impairments. Participants had mild to severe essential hypertension and were under consistent therapy with hypertension medication for at least a year, prescribed by a physician. Patients with dementia, mental disorders, uncooperative behavior due to poor prognosis, hypertensive emergencies or urgency, impaired concentration (e.g., under severe stress), or extreme exhaustion were excluded.

The study targeted the largest population of essential hypertension patients in Banyuraden village, identified through data from Gamping II Primary Health Care in Yogyakarta. Out of 135 eligible hypertensive patients, 85 were respondents. The research sample consisted of 78 individuals, determined through the Slovin and drop-out estimation formula. This sample was divided into intervention (39 respondents) and control (39 respondents) groups. Commencing in January 2018, the research employed simple random sampling.

In the intervention group, participants self-administered reiki once daily and practiced slow deep breathing under family supervision for 21 days, documented in logbooks. The control group performed the slow deep breathing technique under similar supervision and logbook documentation. Blood pressure measurements were conducted pre- and post-therapy on days 1, 7, 14, 21, and 22 by the research team, utilizing manual blood pressure measuring devices. Nonparametric Wilcoxon and Mann–Whitney tests were employed for data analysis due to the abnormal distribution of systolic and diastolic blood pressure data in both intervention and control groups (as indicated by a Shapiro–Wilk test formula yielding a P value of < 0.005 for both). Consequently, it was inferred that the blood pressure data did not conform to a normal distribution.

The Self Reiki Standard Operational Procedure (SOP) was developed in consultation with Reiki experts from Anand Khrisna Yogyakarta and was approved for respondent use. A trial involving six non-research participants evaluated the SOP’s effectiveness. The slow, deep breathing SOP was adapted from materials sourced from the University of Pittsburgh Medical Center. Approval for this research protocol (629/EP-FKIK-UMY/XI/2017) was granted by the Ethical Committee of the Faculty of Medicine, Universitas Muhammadiyah Yogyakarta. Informed consent was obtained from all participants.

3. Results

3.1. Characteristic of Respondents

Based on Table I, the average age of most of the respondents is in the age range of 46 to 55 years. The majority of respondents had a family history of hypertension. The male respondents all had a habit or history of smoking. All
respondents had no history of consuming alcohol. The majority of respondents who suffered from hypertension were in the range of 4-6 years, and all respondents regularly took their hypertension medication.

3.2. Differences in blood pressure in the intervention group

According to Table II, the Wilcoxon test result (P= 0.000), it can be concluded that there is a significant difference in systolic and diastolic blood pressure between before and after self-reiki and slow deep breathing exercises in the intervention group.

3.3. Differences in blood pressure in the control group

According to Table II, the Wilcoxon test results (P = 0.000), it can be concluded that there is a significant difference in systolic and diastolic blood pressure before and after slow deep breathing exercise in the control group.

3.4. Comparison of blood pressure between the intervention and control groups

Based on Table III, by using the Mann–Whitney test, it can be concluded that there was no significant difference in systolic or diastolic blood pressure in the intervention and control groups before treatment, with a P value of 0.167 for systolic and 0.771 for diastolic blood pressure. Furthermore, it can be concluded that there was a significant difference between systolic and diastolic blood pressure in the intervention and control groups after treatment by using the Mann–Whitney test, with a P value of 0.002 for systolic and 0.000 for diastolic blood pressure. Before treatment, the mean systolic value was 151 mmHg for the intervention group and 149 mmHg for the control group, and the mean diastolic value was 90.51 mmHg for the intervention group and 90.15 mmHg for the control group. After treatment, the mean systolic value was reduced to 137.77 mmHg and 142.51 mmHg for diastolic BP in the intervention group, while in the control group, the mean systolic value was reduced to 81.28 mmHg and 84.74 mmHg for diastolic BP. Systolic and diastolic blood pressure values decreased more significantly in the intervention group than in the control group.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Age 36-45 Years Old</td>
<td>11</td>
<td>28.02</td>
<td>5</td>
</tr>
<tr>
<td>Age 46-55 Years Old</td>
<td>19</td>
<td>48.07</td>
<td>27</td>
</tr>
<tr>
<td>Age 56-65 Years Old</td>
<td>9</td>
<td>23.01</td>
<td>7</td>
</tr>
<tr>
<td>Gender Women</td>
<td>32</td>
<td>82.01</td>
<td>29</td>
</tr>
<tr>
<td>Gender Men</td>
<td>7</td>
<td>17.09</td>
<td>10</td>
</tr>
<tr>
<td>Family History of Hypertension Yes</td>
<td>30</td>
<td>76.09.00</td>
<td>27</td>
</tr>
<tr>
<td>Family History of Hypertension No</td>
<td>9</td>
<td>23.01</td>
<td>12</td>
</tr>
<tr>
<td>Duration of Hypertension 1-3 Years</td>
<td>4</td>
<td>10.03</td>
<td>4</td>
</tr>
<tr>
<td>Duration of Hypertension 4-6 Years</td>
<td>29</td>
<td>74.04.00</td>
<td>25</td>
</tr>
<tr>
<td>Duration of Hypertension 7-10 Years</td>
<td>6</td>
<td>15.04</td>
<td>10</td>
</tr>
<tr>
<td>Smoking Yes</td>
<td>7</td>
<td>17.09</td>
<td>10</td>
</tr>
<tr>
<td>Smoking No</td>
<td>32</td>
<td>82.01.00</td>
<td>29</td>
</tr>
<tr>
<td>Alcohol Consumption Yes</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Alcohol Consumption No</td>
<td>39</td>
<td>100</td>
<td>39</td>
</tr>
<tr>
<td>Medication Regularity Yes</td>
<td>39</td>
<td>100</td>
<td>39</td>
</tr>
<tr>
<td>Medication Regularity No</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Endorphine hormones (which make the body comfortable) are released by the brain, and at the same time, the stress hormone cortisol is reduced (Novoa, 2014; Musyaropah, 2023). The Healing touch technique is part of the Reiki application. Healing touch therapy can correct and identify energy imbalances by placing hands on or rubbing hands on the surface of the body's skin or on the affected body part. The brain and skin are very important organs, especially the skin, which is the most important organ in touch therapy activities. When the skin's sensory receptors are stimulated, endorphine hormones (which make the body comfortable) are released by the brain, and at the same time, the stress hormone cortisol is reduced (Novoa, 2014; Musyaropah, 2023).

Reiki is meditation for the soul; meditation aims to train the body to re-examine their emotional responses and release all negative thoughts, concepts, and attitudes and replace them with something positive that gives a feeling of peace and being (Kirshbaum, 2013; Alarcao, 2016) cleanses the body of toxins, harmonizes the entire body's energy, and provides positive health and a feeling of well-being (Kirshbaum, 2016), and stimulation endorphin hormones function as natural sedatives that make the body feel more comfortable. The release of endorphins could reduce blood pressure (Bukowski, 2015). Mentally, Reiki flows into all aspects of a person's way of thinking, which allows them to let go of negative thoughts, concepts, and attitudes and replace them with something positive that gives a feeling of peace and serenity (Gibson, 2012; Novoa, 2014). Reiki provides a deep feeling of relaxation, reducing stress and tension (Orsak, 2015). With a deep sense of relaxation in the body, the blood vessels become more elastic, resulting in smoother blood circulation, the body becoming relaxed and warm, the work of the heart feeling lighter, and a reduction in blood pressure (Bukowski, 2015).

Physically, Reiki supports and accelerates the body's natural ability to heal itself, helping to reduce pain and relieve other symptoms (Kirshbaum, 2016; Marcus, 2013; Alarcao, 2016) cleanses the body of toxins, harmonizes the entire body's energy, and provides positive health and a feeling of well-being (Kirshbaum, 2016), and stimulation endorphin hormones function as natural sedatives that make the body feel more comfortable. The release of endorphins could reduce blood pressure (Bukowski, 2015). Mentally, Reiki flows into all aspects of a person's way of thinking, which allows them to let go of negative thoughts, concepts, and attitudes and replace them with something positive that gives a feeling of peace and serenity (Gibson, 2012; Novoa, 2014). Reiki provides a deep feeling of relaxation, reducing stress and tension (Orsak, 2015). With a deep sense of relaxation in the body, the blood vessels become more elastic, resulting in smoother blood circulation, the body becoming relaxed and warm, the work of the heart feeling lighter, and a reduction in blood pressure (Bukowski, 2015).

Emotionally, Reiki will flow to all levels of emotional energy possessed by a person, which will encourage them to examine their emotional responses and release all negative emotions such as feelings of anger or jealousy and replace them with positive emotions such as feelings of love, care, sharing, and the intention to do good (Gibson, 2012). Increasing positive emotions in hypertension sufferers will help them achieve happiness and life satisfaction, which will help in managing hypertension (Kurebayashi, 2016; Nascimento, 2017; Lange, 2018). Positive emotions can reduce hypothalamic-pituitary adrenal reactivity and accelerate cardiovascular response repair (Liu, 2016).

### Table 2 Comparison of blood pressure before and after self-reiki and slow deep breathing exercise in the intervention and control groups.

<table>
<thead>
<tr>
<th>Blood Pressure Variable</th>
<th>Group</th>
<th>Pre</th>
<th>SD</th>
<th>Max</th>
<th>Min</th>
<th>Z</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sistole</td>
<td>Intervention</td>
<td>151.13</td>
<td>6.787</td>
<td>166</td>
<td>142</td>
<td>-5.451</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>137.77</td>
<td>5.441</td>
<td>150</td>
<td>130</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diastole</td>
<td>Intervention</td>
<td>90.51</td>
<td>4.291</td>
<td>99</td>
<td>84</td>
<td>-5.456</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>81.28</td>
<td>1.959</td>
<td>88</td>
<td>80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 3 Differences in Blood Pressure in the Intervention Group Before and After Self-Reiki and Slow Deep Breathing Exercises and in the Control Group Before and After Slow Deep Breathing Exercises.

<table>
<thead>
<tr>
<th>Blood Pressure Variable</th>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>Mean Rank</th>
<th>Sum Of Ranks</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sistole</td>
<td>Intervention</td>
<td>39</td>
<td>151.13</td>
<td>43.04</td>
<td>1678.50</td>
<td>0.167</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>39</td>
<td>149.05</td>
<td>35.96</td>
<td>1402.50</td>
<td></td>
</tr>
<tr>
<td>Diastole</td>
<td>Intervention</td>
<td>39</td>
<td>90.51</td>
<td>40.24</td>
<td>1569.50</td>
<td>0.771</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>39</td>
<td>90.15</td>
<td>38.76</td>
<td>1511.50</td>
<td></td>
</tr>
<tr>
<td>Sistole</td>
<td>Intervention</td>
<td>39</td>
<td>137.77</td>
<td>31.56</td>
<td>1231.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>39</td>
<td>142.51</td>
<td>47.44</td>
<td>1850.00</td>
<td>0.002</td>
</tr>
<tr>
<td>Diastole</td>
<td>Intervention</td>
<td>39</td>
<td>81.28</td>
<td>28.74</td>
<td>1121.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>39</td>
<td>84.74</td>
<td>50.26</td>
<td>1960.00</td>
<td>0.000</td>
</tr>
</tbody>
</table>

### 4. Discussion

#### 4.1. The effect of self-reiki therapy and slow deep breathing on blood pressure

When doing self-reiki, the respondent gradually touches parts of the body from the side of the head down to the neck, then to the chest, abdomen, groin, back of the shoulder, and back of the waist. Hand placement corresponds to the seven main chakras. This is a healing touch technique that is part of the Reiki application.

The Healing touch technique is part of the Reiki application. Healing touch therapy can correct and identify energy imbalances by placing hands on or rubbing hands on the surface of the body's skin or on the affected body part. The brain and skin are very important organs, especially the skin, which is the most important organ in touch therapy activities. When the skin's sensory receptors are stimulated, endorphine hormones (which make the body comfortable) are released by the brain, and at the same time, the stress hormone cortisol is reduced (Novoa, 2014; Musyaropah, 2023).

Reiki is meditation for the soul; meditation aims to train the body to relax by adjusting the rhythm of breathing properly and correctly. Focusing on thoughts and appreciation of Reiki will speed up healing, relieve stress (depression), or maintain and improve health (Gibson, 2012). According to the National Center for Complementary and Alternative Medicine (NCCAM) in the United States, Reiki is classified as part of bioenergetic therapy and as a healing method that uses life energy (Novoa, 2014).

Physically, Reiki supports and accelerates the body's natural ability to heal itself, helping to reduce pain and relieve other symptoms (Kirshbaum, 2016; Marcus, 2013; Alarcao, 2016) cleanses the body of toxins, harmonizes the entire body's energy, and provides positive health and a feeling of well-being (Kirshbaum, 2016), and stimulation endorphin hormones function as natural sedatives that make the body feel more comfortable. The release of endorphins could reduce blood pressure (Bukowski, 2015). Mentally, Reiki flows into all aspects of a person's way of thinking, which allows them to let go of negative thoughts, concepts, and attitudes and replace them with something positive that gives a feeling of peace and serenity (Gibson, 2012; Novoa, 2014). Reiki provides a deep feeling of relaxation, reducing stress and tension (Orsak, 2015). With a deep sense of relaxation in the body, the blood vessels become more elastic, resulting in smoother blood circulation, the body becoming relaxed and warm, the work of the heart feeling lighter, and a reduction in blood pressure (Bukowski, 2015).

Emotionally, Reiki will flow to all levels of emotional energy possessed by a person, which will encourage them to examine their emotional responses and release all negative emotions such as feelings of anger or jealousy and replace them with positive emotions such as feelings of love, care, sharing, and the intention to do good (Gibson, 2012). Increasing positive emotions in hypertension sufferers will help them achieve happiness and life satisfaction, which will help in managing hypertension (Kurebayashi, 2016; Nascimento, 2017; Lange, 2018). Positive emotions can reduce hypothalamic-pituitary adrenal reactivity and accelerate cardiovascular response repair (Liu, 2016).
The results of this study are in line with previous research conducted by Salles et al. (2014); Fernandez (2017) and Kaewseng et al. (2018), where reiki appears to be a supplemental method for the control of hypertension, as it has a good impact on lowering elevated blood pressure. Reiki has a clinically significant favorable impact on systolic blood pressure levels while being successful at lowering heart rate. Reiki improves the mental component of quality of life statistically significantly without affecting the physical aspect (Salles, 2015; Fernandez, 2017; Kaewseng, 2018).

Slow deep breathing exercises are one of the nonpharmacological techniques available to hypertensive patients. Slow Deep Breathing makes the body relax. The effect of this relaxed state is a decreased heart rate, decreased respiration, and decreased blood pressure (Busch, 2012; Van, 2014).

Slow deep breathing exercises will affect the cerebral cortex and the medulla oblongata, which are associated with the relaxation of the nervous system, which can affect the mechanism of lowering blood pressure (Critchley, 2015). Breathing activity slowly and deeply will stimulate neurotransmitters to secrete endorphine hormones, which will help in vasodilatation of blood vessels (Thorion, 2012; Zunhammer, 2013; Jones, 2015; Mahtani, 2016; Fadli et al., 2021; Amir, 2023).

Slow deep breathing can affect the baroreceptors to stimulate the parasympathetic nervous system more actively than the sympathetic nervous system, so that it will affect the smooth muscle of blood vessels and cause the blood vessels to widen or vasodilate, which will reduce peripheral resistance and reduce blood pressure (Harada, 2014; Reis, 2014). In this study, it was found that the results of self-reiki and slow deep breathing exercises in the intervention group had a more significant effect on decreasing blood pressure, both systolic and diastolic, compared to the control group, which only performed slow deep breathing exercises. Previous research has showed that Reiki has a positive effect on reducing abnormal blood pressure, suggesting that it is a complementary technique for the control of hypertension (Salles, 2014).

It is hoped that future research would be able to monitor factors such as physical activity, stress level, anxiety, BMI, and blood cholesterol serum values that may have an impact on blood pressure values but were not in this study.

5. Conclusions

Self-Reiki and slow deep breathing have a significant effect on reducing blood pressure in patients with hypertension. Implication for health: Self-reiki is a nonpharmacological alternative for hypertensive patients without drug dependence. This alternative is also easy to perform at home without having to be consulted and supervised.

Acknowledgment

Thank you to the Primary Health Care Gamping II Yogyakarta Head Office for granting research permits in their area.

Ethical considerations

The Ethical Committee of the Faculty Of Medicine Universitas Muhammadiyah Yogyakarta approved this research protocol (629/EP-FKIK-UMY/XI/2017). Informed consent was obtained from all the participants.

Conflict of Interest

The authors declare that they have no conflicts of interest.

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