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Shinrin-yoku Therapy for Hypertension Sufferers: A Case Study in the Kemuning Tea Plantation Area

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ABSTRACT: Hypertension is a global health issue that often requires long-term medication. Nature-based therapies, such as Shinrin-Yoku, have emerged as an alternative approach to the management of hypertension, offering potential physical and psychological benefits. Shinrin-Yoku, or "forest bathing," combines interaction with nature, mental relaxation, and light physical activity to enhance well-being. This study explores the impact of Shinrin-Yoku therapy on blood pressure reduction in hypertensive patients in the Kemuning Tea Plantation Area, known for its fresh air and calming natural scenery, particularly in the 45-60 age group. The research employed a quantitative experimental method, measuring blood pressure before and after four weeks of therapy. Data were analyzed using statistical tests to determine significant differences. The results indicated that Shinrin-Yoku therapy significantly lowered blood pressure, with a more substantial reduction observed in the older age group. Light physical activity, such as walking through the tea plantation, also contributed to improved blood circulation and cardiovascular health. In addition to its physical benefits, this therapy also positively impacted stress reduction and emotional well-being. Overall, Shinrin-Yoku in the Kemuning Tea Plantation Area represents an effective non-pharmacological alternative for hypertension management, potentially reducing dependence on medication and improving the quality of life for hypertensive patients.

KEYWORDS: Hypertension, Blood pressure, Therapy, Shinrin-Yoku, Environment.

I. INTRODUCTION

Shinrin-yoku, commonly known as "forest bathing," is a form of therapy that involves exposing the body to the natural atmosphere, particularly forests (Kotera, Richardson, and Sheffield 2022). The term was first introduced in Japan in the early 1980s as a way to promote physical and mental health through direct interaction with nature(Hansen, Jones, and Tocchini 2017). In practice, this therapy encourages individuals to spend time in the forest(Kobayashi et al. 2018), immerse themselves in the natural atmosphere, and focus on their senses, such as smelling the scent of the earth, listening to the sounds of nature, or feeling the cool breeze(Hansen et al. 2017). The fundamental concept of Shinrin-yoku is that nature can have healing effects, alleviate stress, and enhance overall well-being based on the relationship between humans and the natural environment. Over time, scientific research has begun to explore the benefits of this therapy, showing that Shinrin-yoku not only has a positive impact on mental health but also can lower blood pressure and help manage certain health conditions such as hypertension.(Kavanaugh et al. 2022)

High blood pressure, or hypertension, is a growing health issue in many countries, including Indonesia. Hypertension is often referred to as the "silent killer" because many sufferers are unaware of their condition until serious complications arise, such as heart disease, stroke, or kidney problems(Kondo et al. 2011). The causes of hypertension are pretty complex, with factors such as unhealthy lifestyle, stress, and genetic predisposition playing significant roles in the development of the disease. Although conventional medical treatments, such as antihypertensive medications, are widely used, alternative approaches that are more

natural and have fewer side effects, such as Shinrin-yoku therapy, are becoming increasingly sought after to help manage hypertension(Furuyashiki et al. 2019; Song, Ikei, and Miyazaki 2015)

Several studies have demonstrated that Shinrin-yoku has positive effects on both mental and physical health, including reducing blood pressure in individuals with hypertension(Kondo et al. 2011; Takayama et al. 2022). One such study, conducted by Morita et al. in Japan, found that exposure to forest environments significantly lowered both systolic and diastolic blood pressure, improved sleep quality, and reduced stress hormone levels (cortisol) in participants(Morita et al. 2007). Additionally, a study by Li et showed that engaging with nature could alleviate anxiety and promote relaxation, which in turn contributed to lowering blood pressure(Li 2022). These findings suggest that Shinrin-yoku could be an effective alternative therapy for managing hypertension.

The Kemuning Tea Plantation area, located in Central Java, is an ideal location for investigating the effects of Shinrin-yoku on individuals with hypertension. With its calm natural environment and fresh air, this area provides a supportive setting for practising Shinrin-yoku therapy. The lush green tea plantations, free from urban pollution, offer optimal conditions for participants to benefit fully from the therapy. Therefore, this study aims to explore whether Shinrin-yoku therapy conducted in this area can significantly contribute to reducing blood pressure in hypertensive patients.

Previous research has shown that Shinrin-yoku can improve heart function and enhance the body's response to stress (Borriello et al. 2022). In the context of hypertension, the reduction of stress levels and the promotion of relaxation are crucial factors in lowering blood pressure (Hartig et al., 2014). Therefore, Shinrin-yoku has the potential to be a practical approach to supporting hypertension management, particularly for individuals seeking more natural and holistic solutions(Park et al. 2007). This study aims to investigate further how interaction with nature, specifically in the Kemuning Tea Plantation area, may impact blood pressure changes in individuals with hypertension.

Although Shinrin-yoku therapy is widely regarded as beneficial, responses to this therapy can vary between individuals. Factors such as anxiety levels(Muslim et al. 2023), sleep quality, and underlying health conditions may influence the extent to which an individual experiences the benefits of this therapy(Park et al. 2008). Therefore, it is essential to explore other factors that contribute to therapeutic outcomes, such as age, gender, and duration of exposure to the therapy. This study seeks to identify these influences in the context of hypertension management.

On the other hand, Shinrin-yoku therapy not only focuses on physical aspects but also pays attention to mental health. Spending time in nature offers individuals an opportunity to detach from the stress generated by the pressures of everyday life. By enhancing psychological well-being, it is anticipated that this therapy can contribute more significantly to hypertension management(Ochiai et al. 2015). Therefore, it is crucial to examine how the psychological aspects of this therapy may influence the overall study outcomes(Kaplan and Kaplan 1989; Song et al. 2015).

Based on this explanation, the present study will focus on the effectiveness of Shinrin-yoku therapy in lowering blood pressure in individuals with hypertension who undergo therapy at the Kemuning Tea Plantation. If this therapy proves to be effective, Shinrin-yoku may present a more affordable and low-risk alternative for individuals with hypertension. Consequently, the results of this study are expected to contribute to the development of new, nature-based approaches to hypertension management.

II. RESEARCH METHODS

This study uses a descriptive qualitative approach to explore the impact of Shinrin-Yoku therapy on blood pressure reduction in hypertension sufferers. Data was collected through in-depth interviews, participant observations, and blood pressure measurements before and after the therapy. A total of 30 participants, aged between 45 and 60 years, who suffer from hypertension, were involved in this study. They participated in Shinrin-Yoku sessions, which included activities such as leisurely walks in the tea plantation, meditation, and breathing exercises for one hour in an open area, conducted once a month over three months, from June to August 2023. The data analysis technique used was thematic analysis.

III. RESULTS AND DISCUSSION

A. Research Results

In the 45–50 age group, comprising 10 participants, measurements of blood pressure before and after undergoing Shinrin-Yoku therapy demonstrated a significant reduction. Systolic blood pressure before therapy ranged from 145 mmHg to 164 mmHg, while diastolic blood pressure was within 92 mmHg to 105 mmHg. Following therapy, systolic blood pressure decreased to a range of 135 mmHg to 155 mmHg, whereas diastolic blood pressure dropped to 87 mmHg to 96 mmHg.

On average, systolic blood pressure decreased by approximately 10 mmHg, while diastolic blood pressure reductions ranged between 7 mmHg and 9 mmHg. All participants consistently showed reductions in their blood pressure, with most exhibiting a 10 mmHg decrease in systolic pressure and a 7–9 mmHg drop in diastolic pressure. For example, one participant with an initial blood pressure of 150/95 mmHg recorded a post-therapy blood pressure of 140/87 mmHg, reflecting a reduction of 10 mmHg in systolic pressure and 8 mmHg in diastolic pressure.

Table 1. Blood Pressure Measurements Before and After Shinrin-Yoku Therapy

No.	Participant	Age	Blood Pressure Before (mmHg)	Blood Pressure After (mmHg)	Blood Pressure Reduction (mmHg)
1	P 1	47	150/95	140/87	10/8
2	P 2	49	164/105	155/96	10/9
3	P 3	50	145/92	135/87	10/7
4	P 4	48	155/98	145/90	10/8
5	P 5	46	148/94	138/85	10/9
6	P 6	49	158/99	148/91	10/8
7	P 7	45	153/97	143/88	10/9
8	P 8	45	154/100	144/91	10/9
9	P 9	48	160/103	150/95	10/8
10	P 10	46	149/95	139/88	10/7

Note:

- All participants in the 45-50 age group experienced a decrease in both systolic and diastolic blood pressure after undergoing Shinrin-Yoku therapy.
- Blood Pressure Reduction: The average systolic blood pressure reduction was approximately 10 mmHg, and the diastolic reduction ranged from 7-9 mmHg.
- The 45-50 age group demonstrated consistent blood pressure reductions after participating in Shinrin-Yoku therapy. This therapy proved to be effective in reducing blood pressure in this age group.

In the age group of 51-55, Shinrin-Yoku therapy consistently reduced blood pressure across all participants. Before therapy, systolic blood pressure ranged from 158 mmHg to 165 mmHg, while diastolic blood pressure was between 99 mmHg and 106 mmHg. After undergoing therapy, systolic blood pressure decreased from 147 mmHg to 153 mmHg, and diastolic blood pressure dropped from 88 mmHg to 98 mmHg.

The average reduction in systolic blood pressure was recorded at 10 to 13 mmHg, while diastolic blood pressure showed an average reduction of 8 to 12 mmHg. All participants exhibited significant decreases in blood pressure. For instance, one participant with an initial blood pressure of 160/104 mmHg experienced a reduction to 150/95 mmHg, with a decrease of 10 mmHg in systolic pressure and 9 mmHg in diastolic pressure.

Table 2. Blood Pressure Reduction Results in the 51-55 Age Group

No.	Participant	Age	Blood Pressure Before (mmHg)	Blood Pressure After (mmHg)	Blood Pressure Reduction (mmHg)
1	P11	52	160/104	150/95	10/9
2	P12	54	158/102	147/92	11/10
3	P13	55	164/105	152/96	12/9
4	P14	53	161/103	150/92	11/11
5	P15	51	160/100	149/88	11/12
6	P16	54	165/106	153/98	12/8
7	P17	55	162/104	150/95	12/9

No.	Participant	Age	Blood Pressure Before (mmHg)	Blood Pressure After (mmHg)	Blood Pressure Reduction (mmHg)
8	P18	54	158/101	148/89	10/12
9	P19	52	163/105	150/96	13/9
10	P10	53	160/102	150/90	10/12
11	P11	53	161/100	149/92	12/8
12	P12	51	162/104	151/95	11/9
13	P13	52	158/99	148/88	10/10
14	P14	54	163/106	153/97	10/9
15	P15	55	160/100	147/90	13/10

Note:

- All participants in the 51-55 age group experienced a decrease in both systolic and diastolic blood pressure.
- Blood Pressure Reduction: The average systolic blood pressure reduction ranged from 10-13 mmHg, and the diastolic reduction ranged from 8-12 mmHg.
- The 51-55 age group demonstrated a more significant reduction in blood pressure compared to the younger age group.

The 56-60 age group demonstrated a significant reduction in blood pressure following participation in Shinrin-Yoku therapy. Prior to the therapy, systolic blood pressure among participants ranged from 160 mmHg to 170 mmHg, while diastolic blood pressure was recorded within the range of 103 mmHg to 110 mmHg. After undergoing the therapy, systolic blood pressure decreased to a range of 148 mmHg to 158 mmHg, and diastolic blood pressure was reduced to 91 mmHg to 100 mmHg.

The average reduction in systolic blood pressure for this group was approximately 10-12 mmHg, whereas diastolic blood pressure exhibited a decline ranging from 8 to 12 mmHg. For instance, one participant with an initial blood pressure of 170/110 mmHg experienced a reduction to 158/100 mmHg, reflecting a decrease of 12 mmHg in systolic pressure and 10 mmHg in diastolic pressure. These findings underscore the positive impact of Shinrin-Yoku therapy in lowering blood pressure, particularly among older adults within the 56-60 age group.

Table 3. Blood Pressure Reduction Results in the 56-60 Age Group

No.	Participant	Age	Blood Pressure Before (mmHg)	Blood Pressure After (mmHg)	Blood Pressure Reduction (mmHg)
1	P1	60	170/110	158/100	12/10
2	P2	59	167/108	155/98	10/10
3	P3	60	165/104	153/95	12/9
4	P4	58	160/103	148/91	12/12
5	P5	57	168/106	156/98	12/8

Note:

- All participants in the 56-60 age group experienced a reduction in both systolic and diastolic blood pressure after undergoing Shinrin-Yoku therapy.
- Blood Pressure Reduction: The average systolic blood pressure reduction was around 10-12 mmHg, and the diastolic reduction ranged from 8-12 mmHg.
- The 56-60 age group also showed a significant reduction in blood pressure after participating in Shinrin-Yoku therapy for the elderly.

B. Discussion

Shinrin-Yoku therapy significantly reduces blood pressure in individuals with hypertension in the Kemuning Tea Plantation area, particularly among the 45-60 age group. The results of this study confirm that Shinrin-Yoku can function as an effective complementary therapy for lowering blood pressure, with varying outcomes observed across different age groups. The success

of this therapy highlights the potential of utilizing nature-based approaches in managing hypertension, which have been shown to provide profound relaxation effects and improve overall well-being.

The consistent reduction in blood pressure recorded in each age group reflects the therapy's ability to adapt to participants' physical conditions and ages. In older age groups, this therapy exhibited a more significant decrease, possibly influenced by environmental factors such as fresh air and calming natural scenery(Mao et al. 2017). The sensory stimulation provided by the natural environment during Shinrin-Yoku can play a crucial role in enhancing both physical and mental well-being, ultimately contributing to more effective blood pressure reduction(Wen et al. 2023).

The physiological processes occurring during Shinrin-Yoku therapy are associated with the activation of the parasympathetic nervous system, which plays a role in lowering heart rate and reducing blood pressure(Wen et al. 2019). Direct interaction with nature contributes to a reduced bodily response to stress, which, in turn, influences blood pressure reduction. This impact may explain the consistent decrease in both systolic and diastolic pressure across all participant groups.

Light physical activities, such as walking in an open natural environment, contribute to the effectiveness of this therapy(Chen, Yu, and Lee 2018). These activities help improve blood circulation and support cardiovascular health. Shinrin-Yoku therapy, which focuses on mental relaxation while incorporating light physical activity, demonstrates a positive impact on blood pressure across all age groups.

This therapy can serve as a non-pharmacological alternative to managing hypertension. The significant reduction in blood pressure, without the side effects associated with antihypertensive medications, makes it a viable option. Shinrin-Yoku offers individuals the opportunity to manage high blood pressure naturally, reduce reliance on medications, and enhance overall quality of life.

When integrated with conventional medical treatments, Shinrin-Yoku can be an important component of a broader approach to hypertension management. The therapy provides valuable psychological benefits(Twohig-Bennett and Jones 2018), such as stress reduction and enhanced emotional well-being, which support the management of hypertension. The combination of physical and mental benefits can contribute to improved long-term outcomes for individuals with hypertension, who need to maintain stable blood pressure to prevent further complications.

The environmental factors central to Shinrin-Yoku therapy underscore the importance of interaction with nature in maintaining health. Regular exposure to natural environments can have a positive impact on both physical and mental well-being, serving as an effective means of managing hypertension without complete reliance on medical treatments. The benefits of Shinrin-Yoku therapy in hypertension management offer a promising alternative. By integrating a balance between the body, mind, and environment, this therapy contributes to both the prevention and management of hypertension. The application of this nature-based therapy holds significant potential in enhancing long-term health and providing a safe, natural solution for individuals with hypertension.

IV. CONCLUSIONS

The Shinrin-Yoku therapy implemented in the Kemuning Tea Plantation area has shown significant positive effects on reducing blood pressure in individuals with hypertension, particularly in the age group of 45-60 years. The success of this therapy is influenced not only by relaxation techniques and sensory stimulation from the natural environment but also by the unique location, which provides fresh air and calming natural scenery. Light physical activity, such as walking in the tea plantation area, contributes to improved blood circulation and supports cardiovascular health, thereby enhancing the effectiveness of the therapy.

Shinrin-Yoku, in this area, offers a non-pharmacological alternative with the potential to reduce dependence on antihypertensive medication while simultaneously improving the quality of life for individuals with hypertension. The positive psychological effects, such as stress reduction and improved emotional well-being, are further strengthened by the surrounding natural beauty. By integrating physical, mental, and environmental aspects, this therapy demonstrates significant potential in managing hypertension. Furthermore, the location in the Kemuning Tea Plantation area provides a unique experience in nature-based therapy, which can be integrated with conventional treatment to achieve optimal long-term outcomes. This approach offers a safe, natural, and effective solution for enhancing long-term health in individuals with hypertension.

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