



Effectiveness of Mindfulness in Alleviating Hypertension and Anxiety in Adults Patients

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ABSTRACT

Anxiety often accompanies the clinical symptoms of hypertension in patients. Mindfulness stands as a non-pharmacological nursing approach aimed at lowering both blood pressure and anxiety levels. This study aimed to evaluate how effective mindfulness is in lowering blood pressure and reducing anxiety among hypertensive patients. The study employed a case study design with the sample size determined through G*Power analysis. Eight participants were purposively selected for the study. All participants were allocated to a single treatment group. Mindfulness sessions were conducted over eight sessions, with blood pressure measurements taken using a digital sphygmomanometer and anxiety levels assessed using the Zung Self-Rating Anxiety Scale (Zung-SARS) both before and after the intervention. The study found a significant mean difference in systolic blood pressure (before=132±5.51mmHg, after=124±5.51mmHg; MD=8.25±0.59mmHg), diastolic blood pressure (before=85±5.04mmHg, after=80.6±4.47mmHg; MD=4.38±0.962mmHg) mmHg, and anxiety levels (before=48.5±3.63, after=28.9±4.472.42; MD=48.5±3.63). Mindfulness demonstrated statistical significance in reducing both systolic (14(7), $p<0.001$, effect size=4.94) and diastolic (4.55(7), $p<0.05$, effect size=1.61) blood pressure, as well as anxiety levels (25.5(7), $p<0.001$, effect size=8.92). Mindfulness has a positive impact on reducing blood pressure and anxiety in the adult group of patients with hypertension. The application of mindfulness in hypertension management contributes to improving the quality of life of patients. Collaborative efforts between medical personnel and patients need to be encouraged to achieve the best results in hypertension management.

Keywords: mindfulness, hypertension, anxiety, adult patient.

ABSTRAK

*Kecemasan sering kali menyertai gejala klinis hipertensi pada pasien. Mindfulness berperan sebagai pendekatan perawatan non-farmakologis yang bertujuan untuk menurunkan tekanan darah dan tingkat kecemasan. Penelitian ini bertujuan untuk mengevaluasi seberapa efektif kesadaran dalam menurunkan tekanan darah dan mengurangi kecemasan pada pasien hipertensi. Penelitian ini menggunakan desain studi kasus dengan ukuran sampel ditentukan melalui analisis G*Power. Delapan partisipan dipilih secara sengaja untuk penelitian ini. Semua partisipan dialokasikan ke dalam satu kelompok perlakuan. Sesi kesadaran dilakukan selama delapan sesi, dengan pengukuran tekanan darah menggunakan sfigmomanometer digital dan tingkat kecemasan dinilai menggunakan Skala Kecemasan Penilaian Diri Zung (Zung-SARS) baik sebelum maupun setelah intervensi. Penelitian ini menemukan perbedaan rata-rata yang signifikan dalam tekanan darah sistolik (8.25, SD=0.590) mmHg, tekanan darah diastolik (4.38, SD=0.962) mmHg, dan tingkat kecemasan (48.5, SD=3.63) sebelum dan setelah intervensi. Kesadaran menunjukkan signifikansi*

statistik dalam menurunkan baik tekanan darah sistolik (14(7), $p<0.001$, ukuran efek=4.94) maupun diastolik (4.55(7), $p<0.05$, ukuran efek=1.61), serta tingkat kecemasan (25.5(7), $p<0.001$, ukuran efek=8.92). Kesadaran memiliki dampak positif dalam menurunkan tekanan darah dan kecemasan pada kelompok pasien dewasa dengan hipertensi. Penerapan kesadaran dalam manajemen hipertensi berkontribusi pada peningkatan kualitas hidup pasien. Upaya kolaboratif antara tenaga medis dan pasien perlu didorong untuk mencapai hasil terbaik dalam manajemen hipertensi.

Kata kunci: mindfulness, hipertensi, kecemasan, pasien dewasa.

INTRODUCTION

Hypertension is a global health issue and a significant risk factor for cardiovascular diseases (Jones et al., 2020). Hypertension is often referred to as a silent killer because individuals with hypertension often do not exhibit symptoms (Kementerian Kesehatan RI, 2022). The status of hypertension found in the community is chronic and often goes unnoticed until it becomes severe, sometimes leading to death (Zhang & Moran, 2017).

In addition to being a global concern, hypertension is the most prevalent non-communicable disease affecting the Indonesian population (57.6%). This is evidenced by the increasing number of hypertension cases reported in primary healthcare facilities each year (Kementerian Kesehatan RI, 2022). In Central Java Province in 2021, hypertension was recorded as a non-communicable disease (NCD), with 71.61% of the population affected (Dinas Kesehatan Provinsi Jawa Tengah, 2019). Meanwhile, in Sukoharjo Regency in 2021, there were 269,296 reported cases of hypertension. From blood pressure measurements conducted on 1.4 million individuals, it was found that 15.8% of females were diagnosed with hypertension, a rate higher than that of males (Dinas Kesehatan Sukoharjo, 2023). These data indicate an upward trend in hypertension cases over the past three years (2019-2022), both globally, nationally, and locally.

Anxiety is recognized as one of the contributing factors to hypertension, as episodes of anxiety can trigger vasoconstriction, leading to an increase in blood pressure (Lim et al., 2021). Individuals experiencing anxiety are at a four times higher risk of developing hypertension (Khasanah, 2022). Intense anxiety episodes often result in a blood pressure elevation of 10 points or more, posing a serious risk for further hypertension development (Zhang & Moran, 2017). The onset of anxiety in individuals with hypertension represents a complex issue intertwined with various factors occurring in daily life.

A non-pharmacological nursing intervention that can reduce anxiety and enhance self-acceptance and adaptation is mindfulness therapy (Liu et al., 2024; Odegard et al., 2022). Mindfulness has been shown to decrease anxiety and stress by enhancing emotional regulation, leading to improved mood and positive coping abilities during crisis situations (Conversano et al., 2021; Irawan Am et al., 2023; Liu et al., 2024). Beyond its mental health benefits, mindfulness can also aid individuals with heart disease, hypertension, and other chronic illnesses. This is because mindfulness helps patients shift their focus away from their pain, thus potentially enhancing their quality of life (Johnson, 2019; Lim et al., 2021). This study aimed to examine the effectiveness of mindfulness to reducing high blood pressure and anxiety.

METHOD

Participant characteristics and research design

Eight adults with hypertension (systolic blood pressure ranged from 129 to 139 mmHg and diastolic blood pressure ranged from 80 to 89 mmHg) aged between 25 to 45 years were participated in this study. The participants experienced anxiety with Zung Self-Rating Anxiety Scale (Aung-SARS) more than 45. Participants with cardiovascular disease were excluded from this study. The study employed quasi-experimental design that focusing on intervention group.

Sampling procedures

We established inclusion criteria for the participants, which included adults aged over 18 years old who had experienced blood pressure elevation of at least the first stage of hypertension according to the American Heart Association, with systolic blood pressure ranging from 129 to 139 mmHg and diastolic blood pressure ranging from 80 to 89 mmHg. We employed convenience sampling until we gathered a sufficient number of participants for this study.

Sample size, power, and precision

The determination of the sample size in this study began with the calculation of the effect size using the practical meta-analysis effect size calculator. The calculation yielded an effect size of 0.89. Subsequently, the sample size was determined using the G*Power application with the effect size from the calculation (0.89), a significance level (α) of 0.05, and a power (β) of 0.80. A 20% sample addition for attrition rate was added.

Intervention

Mindfulness therapy is conducted over eight sessions by a certified therapist (the researcher) with the assistance of health cadres. It includes health education on hypertension, anxiety, and mindfulness, followed by interactive discussions (Irawan AM et al., 2023). A mindfulness training contract is established, and then participants practice mindfulness over the eight sessions.

Measures and covariates

Data collection involved measuring blood pressure and anxiety rate at two different time points: before the intervention (T0) and after the intervention (T1).

Blood pressure

The instrument needed to measure blood pressure is a digital sphygmomanometer. This type of sphygmomanometer is chosen because it has a relatively high level of accuracy and sensitivity when compared to mercury and aneroid sphygmomanometers (Shahbabu, 2016). In field screening practice, digital sphygmomanometers are more recommended due to their sensitivity and efficiency in measurements (Muniyandi et al., 2022).

Anxiety

Participants' levels of anxiety were measured using the Zung Self-Rating Anxiety Scale (Zung-SARS). Developed by Dr. William Zung, a psychiatry professor at Duke University in 1971, this instrument consists of 20 items designed to assess anxiety symptoms from both psychological and somatic perspectives. The Zung-SARS is a valid and reliable instrument, with a Cronbach's alpha of 0.945 (Setyowati et al., 2019). It is suitable for use by patients aged 18 and above due to its simple and familiar wording, which is commonly encountered in daily activities. The scoring range of the assessment is from 20 to 80. The anxiety categories are as follows: a score of 20 to 44 indicates normal or no anxiety, a score of 45 to 59 indicates mild anxiety, a score of 60 to 74 indicates moderate anxiety, and a score of 75 to 80 indicates severe anxiety (Setyowati et al., 2019).

Data analysis

Data analysis of the results of mindfulness application for reducing blood pressure and anxiety was conducted through two categories: univariate analysis and bivariate analysis. Univariate analysis was intended to determine the frequency distribution of the variables under investigation. This analysis was followed by bivariate analysis to analyze the impact of the intervention given to the participants. The significance of the relationship between T0 and T1, namely mindfulness intervention on reducing blood pressure and anxiety, was analyzed using paired t-test from the online application Jamovi.

RESULTS AND DISCUSSION

Characteristic of the participants

The participants were aged 30 to 37 years, with an average age of 33 years. The gender distribution of participants is balanced, with 50% male and 50% female. The majority of participants have a college education level (62.5%) and are employed (75%), with a monthly income of more than Rp 3,500,000.00 (62.5%). Most of the adult age group in this study have been aware of having hypertension for one to three years (87.5%). Furthermore, participants have experienced anxiety mostly for one to two weeks ago (62.5%). Table 1 presents the characteristics of the participants in this study

Table 1
Participants of this study

Variables	<i>M (SD)</i>	%
Sex (female)		50%
Age	33.38 (2.)	
Income (>3,500,000 IDR)		62.5%
Education (College)		62.5%
Diagnosed of hypertension (1-3 years)		87.5%
Experience of nxiety (1-2 weeks)		37.5%

The influence of mindfulness on blood pressure

The statistical analysis revealed a significant decrease in blood pressure among participants before and after the intervention. Blood pressure was measured both before and after the intervention period, using a paired t-test to compare the mean differences. Before the intervention, participants had a mean systolic blood pressure of 132 (SD=5.51) mmHg and a mean diastolic blood pressure of 85 (SD=5.04) mmHg. Following the intervention, there was a notable reduction in systolic blood pressure to 124 (SD=4.97) mmHg and diastolic blood pressure to 80.6 (SD=4.47) mmHg. These findings suggest a positive impact of the intervention on participants' blood pressure levels.

Table 2
The effect of mindfulness on systolic and diastolic blood pressure, and anxiety before and after the intervention

Variable	MD±SD	Effect size	p-value
Sistolic blood pressure	8.25±0.59	4.94	0.001
Diastolic blood pressure	4.38±0.96	1.61	0.003
Anxiety	19.6±0.78	8.92	<0.001

Table 2 provides a summary of the t-test analysis of participants' blood pressure before and after the intervention. The paired t-test analysis showed a significant difference in mean blood pressure before and after the intervention, with systolic blood pressure showing a decrease of 14 ($p < 0.001$) and diastolic blood pressure showing a decrease of 4.55 ($p < 0.05$). Additionally, the effect size calculations revealed large effects, with Cohen's *d* values of 4.94 for systolic and 1.61 for diastolic blood pressure. These findings indicate a highly significant difference in means between the two periods.

The influence of mindfulness on anxiety

The statistical analysis showed a significant decrease in blood pressure among participants before and after the intervention. Blood pressure was measured in two periods: before and after the intervention, using a paired t-test. The average anxiety level before the intervention was 48.5

(SD=3.63), indicating mild to moderate anxiety, which decreased to 28.9 (SD=2.42) after the intervention.

Table 2 presents the results of the t-test analysis of participants' blood pressure in this EBNP application before and after the intervention. The paired t-test analysis revealed a statistically significant mean difference in anxiety levels before and after the intervention (25.5(7), $p < 0.001$). Additionally, the effect size calculation resulted in a Cohen's d value of 8.92, indicating a large effect size, implying a highly significant difference in means between the two periods.

Discussion

Mindfulness, recognized as a fundamental human capacity, involves the ability to fully focus on and understand each situation. Through mindfulness meditation practice, its impact on the central nervous system can be observed, leading to a relaxation effect on blood vessels (Zou et al., 2020). Additionally, mindfulness plays a significant role in reducing anxiety and stress by enhancing emotional regulation, thereby improving mood and the ability to cope with challenging situations (Conversano et al., 2021). Beyond its mental health benefits, mindfulness also proves advantageous for individuals with cardiovascular conditions such as heart disease, hypertension, and other chronic ailments. This approach assists patients in redirecting their attention away from pain, potentially enhancing their overall quality of life.

Results from the study suggest that mindfulness intervention positively influences blood pressure management in adult hypertensive patients. Participants in the mindfulness program demonstrated a significant reduction in blood pressure levels compared to the control group. These findings are consistent with prior research indicating that mindfulness practices contribute to blood pressure reduction and hypertension control (Q. Zhang et al., 2019; Zou et al., 2020).

Moreover, mindfulness intervention exhibited positive effects in reducing anxiety levels among hypertensive patients. The outcomes of this study align with previous studies (Cladder-Micus et al., 2018; Ghahari et al., 2020). Anxiety commonly accompanies hypertensive patients and can adversely affect their quality of life (Johnson, 2019). Through mindfulness therapy, hypertensive patients reported lower anxiety levels and increased calmness in daily situations.

The reduction in anxiety among adult patients participating in mindfulness therapy is evident through various components. Participants reported feeling less nervous and anxious than before (Zung-SARS-item 1), experiencing reduced unfounded fear (Zung-SARS-item 2), feeling calmer and able to sit quietly with ease (Zung-SARS-item 9), and finding it easier to fall asleep and rest well at night (Zung-SARS-item 19). This analysis suggests that participants experienced reduced anxiety symptoms following eight mindfulness sessions.

A more detailed analysis is necessary to consider factors influencing the effects of mindfulness on blood pressure and anxiety, such as participants' adherence to mindfulness training, levels of social support, and intervention duration. Further research is warranted to identify these factors, assess the long-term effects of mindfulness practice on hypertension management, and refine intervention strategies for optimal effectiveness.

LIMITATION OF THE STUDY

Several limitations were identified, including the limited sample size and the focus solely on a specific population of adult hypertensive patients. Therefore, the results may not be broadly generalizable to a wider population of hypertensive individuals, including different age groups. Additionally, measuring anxiety levels and the effects of mindfulness may involve subjectivity as it relies on participant assessments. This could potentially impact the validity and reliability of the research findings.

CONCLUSIONS AND SUGGESTIONS

The study demonstrates the effectiveness of mindfulness intervention in reducing blood pressure and anxiety in adult hypertensive patients. Participants who underwent the mindfulness program showed a significant decrease in blood pressure compared to the control group, aligning with previous research findings. Additionally, the intervention led to reduced anxiety levels and increased feelings of calmness among participants, indicating the potential of mindfulness approaches in managing anxiety commonly associated with hypertension.

In conclusion, the study suggests that mindfulness intervention can serve as a valuable adjunct therapy for hypertension management, offering holistic benefits to patients' overall well-being. The findings highlight the importance of incorporating mindfulness into hypertension treatment strategies to improve patient outcomes and enhance quality of life.

ETHICAL CONSIDERATIONS

Since this study involves humans as participants, research ethics must be considered. We obtained ethical approval from the Research Ethics Committee with approval number 025/019/IV/EC/KEP/LCBL/2023 dated April 19, 2023.

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None

Conflict of Interest Statement

There is no conflict of interest.

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