NANOEMULSION AROMATHERAPY CUPPING REDUCES ANXIETY IN HYPERTENSION PATIENTS

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ABSTRACT

Hypertension is a chronic condition that is often accompanied by psychological issues, such as anxiety, which can affect blood pressure control and the quality of life of patients. Various complementary therapies have been developed to help reduce anxiety, including cupping therapy and nanoemulsion aromatherapy. This study aims to analyse the effect of nanoemulsion aromatherapy cupping on anxiety levels in hypertension patients and compare it with cupping therapy. This study employed a quasi-experimental design with a pretest-posttest control group. The sample consisted of 30 hypertension patients, divided into two groups: cupping therapy and nanoemulsion aromatherapy cupping, with 15 respondents in each group. Anxiety levels were measured before and after the intervention using an anxiety questionnaire. Data analysis was performed using paired t-tests to examine the difference in anxiety within each group and an independent t-test to compare the reduction in anxiety between the two groups. The results showed a significant reduction in anxiety levels in both the cupping therapy group ($p = 0.002$) and the nanoemulsion aromatherapy cupping group ($p = 0.000$). However, the independent t-test revealed no significant difference in anxiety reduction between the two groups ($p = 0.215$). Both cupping therapy and nanoemulsion aromatherapy cupping were effective in reducing anxiety levels in hypertension patients, with no significant difference in effectiveness between the two therapies. Nanoemulsion aromatherapy cupping has the potential to be a complementary therapy in managing anxiety in hypertension patients.

Keywords: anxiety; cupping therapy; hypertension; nanoemulsion aromatherapy

INTRODUCTION

Hypertension is one of the cardiovascular diseases affecting many individuals worldwide and is often referred to as the "silent killer" because it can develop without clear symptoms, yet has a significant impact on long-term health and can be life-threatening. According to the Indonesian Ministry of Health data in 2018, the prevalence of hypertension increased by 8.2% compared to the previous year. In the Special Region of Yogyakarta (DIY), the prevalence of hypertension reached 34.1%, and in Bantul Regency, it was 29.89% (Bantul District Health Office, 2019). Hypertension not only affects physical health but is also closely related to psychological issues, particularly anxiety. Anxiety in hypertension patients can exacerbate their condition, as it can increase stress hormones such as cortisol, which contributes to elevated blood pressure (Sherwood, 2014)

Anxiety in hypertension patients is an uncontrolled worry, characterized by feelings of tension and fear, accompanied by physiological changes such as increased heart rate, breathing, and blood pressure. Anxiety in hypertension patients can stimulate the secretion of stress hormones like cortisol, leading to further increases in blood pressure (Stuart, 2019). Therefore, proper management of anxiety is crucial in hypertension management to avoid worsening the patient's condition.

Hypertension therapy typically uses pharmacological and non-pharmacological approaches to address anxiety. One increasingly popular non-pharmacological therapy is wet cupping. Cupping

is a treatment method where capillary blood is drawn through suction, followed by light needling and re-suctioning (Al-Bedah et al., 2019; Aris Setyawan, 2022; Siregar et al., 2021). Cupping therapy can stimulate the secretion of β-endorphin hormones, providing analgesic and anxiolytic (anti-anxiety) effects (Benli & Sunay, n.d.). Previous research has shown that cupping therapy can reduce anxiety in hypertension patients (Setyawan et al., 2020).

However, although cupping is effective, the absorption of active compounds from essential oils used in aromatherapy therapy may be limited by the skin's permeability. Innovation in active compound delivery is necessary to enhance the effectiveness of aromatherapy. One innovative solution is the use of nanoemulsion, a drug delivery system based on nanoparticles that can improve the stability and bioavailability of essential oils. Nanoemulsion can dissolve lipophilic compounds that are difficult to dissolve in water, enabling better penetration through the skin and improving the therapeutic effects of aromatherapy (Al-Hussaniy et al., 2023)

Cupping can enhance transdermal permeability by breaking down the lipid structure between cells in the stratum corneum, while nanoemulsion aromatherapy therapy can improve the penetration effectiveness of essential oils. This study aims to explore the effect of combining nanoemulsion aromatherapy cupping in reducing anxiety in hypertension patients. It is expected that the combination of cupping therapy and nanoemulsion aromatherapy can provide synergistic benefits, offering a safer and more effective complementary therapy alternative in managing anxiety in hypertension patients.

METHOD

This study used a quasi-experimental design with a pretest-posttest control group design approach. The research was conducted at Rumah Sehat Holistik Islami and Integrative Care (RSH In Care) Yogyakarta, with subjects being hypertension patients who met the inclusion and exclusion criteria. Sampling was performed using simple random sampling, with 30 respondents. The respondents were divided into two groups: the intervention group and the control group, each consisting of 15 participants. The intervention group received cupping therapy combined with nanoemulsion aromatherapy, while the control group received cupping therapy without nanoemulsion aromatherapy.

The intervention consisted of two parts. First, cupping therapy was performed using the Cupping–Puncture–Cupping (CPC) method at the Al-Kaahil, Azh-Zahrul A'la, and Al-Akhda'ain points. This procedure was carried out by trained professionals following sterile procedure standards to ensure safety and reduce the risk of infection. Afterward, the intervention group received the application of nanoemulsion aromatherapy containing essential oils of *Lavandula angustifolia* (lavender), *Mentha piperita* (peppermint), and *Zingiber officinale* (ginger). The nanoemulsion aromatherapy was topically applied to the designated points after the cupping therapy to enhance the penetration of active compounds into the skin and improve therapeutic effects.

Pretest data collection was performed 5-10 minutes before the intervention. The intervention was conducted once for each respondent, with a duration of 15-30 minutes per participant. Posttest data collection was performed 15-20 minutes after the intervention was given. The dependent variable in this study was anxiety level, measured using the Zung-Self Anxiety Rating Scale (ZSAS) before and after the intervention. The data obtained from the ZSAS questionnaire were analyzed to see the difference in anxiety levels before and after the intervention within each group using paired

sample t-test. To compare changes in anxiety between the intervention and control groups, an independent sample t-test was used, with a significance level of $p < 0.05$.

RESULT AND DISCUSSION

Respondent Characteristics

The descriptive analysis of 30 respondents, categorized by antihypertensive drug use and age group, is presented in Table 1. The analysis showed that the majority of respondents did not take antihypertensive medications, with 20 people (66.7%) not using medication, while 10 respondents (33.3%) took antihypertensive drugs. In terms of age categories, most respondents were in the 46–55 years age range, comprising 22 people (73.3%). Respondents aged 36–45 years and 56–65 years each numbered 4 (13.3%). In terms of gender, the majority of respondents were female, totaling 18 people (60%), while males accounted for 12 people (40%).

Table 1.
Respondent characteristics (n= 30)

Characteristic	f	%
Age (Years)		
26 – 35 Years	-	-
36 – 45 Years	4	13.3
46 – 55 Years	22	73.3
56 – 65 Years	4	13.3
Gender		
Female	18	60
Male	12	40
Antihypertensive Medication		
Yes	10	33.3
No	20	66.7

Based on the results of the study, most respondents were in the 46-55 age range. This finding aligns with the theory stating that the risk of hypertension increases with age due to physiological changes in the cardiovascular system, such as reduced arterial elasticity, increased arterial stiffness, and higher peripheral vascular resistance, which directly affect blood pressure (Kapuku, 2022; Labarthe, 2012). The dominance of respondents in this age range indicates that late adulthood is a critical period for blood pressure regulation disorders. In this phase, the adaptability of blood vessels to hemodynamic changes begins to decline, making individuals more vulnerable to increased blood pressure and cardiovascular complications. This condition explains why both pharmacological and non-pharmacological nursing interventions are crucial for this age group.

The age distribution of respondents in this study is also consistent with epidemiological data showing that the prevalence of hypertension significantly increases in late adulthood and the elderly. Data from Riskesdas and the Ministry of Health of the Republic of Indonesia show that those over the age of 45 have a higher prevalence of hypertension compared to the productive age group, making this group a priority for hypertension prevention and control interventions (Bantul District Health Office, 2019; Ministry of Health Republic of Indonesia., 2018).

The high prevalence of hypertension in this age group is influenced not only by biological factors but also by lifestyle factors such as low physical activity, high sodium intake, and increased stress exposure. Therefore, hypertension control strategies for this age group should combine medical and complementary nursing approaches focusing on both the physiological and psychological improvement of the patient.

In this study, the majority of respondents were female (60%), while 40% were male. The high number of women in this sample may be related to hormonal factors affecting blood pressure

regulation in women, particularly after menopause, which often leads to increased blood pressure. The decrease in estrogen levels after menopause can affect the elasticity of blood vessels and increase vascular resistance, contributing to elevated blood pressure (Kapuku, 2022). Additionally, women are more vulnerable to psychological conditions such as anxiety, which is related to hypertension. Previous studies have shown that women tend to be more susceptible to anxiety, which can exacerbate their hypertension (Sherwood, 2014). Therefore, a psychological approach is essential in managing hypertension in female patients, with complementary therapies such as aromatherapy or relaxation therapy offering an alternative to help reduce anxiety and improve the quality of life.

Effectiveness of Cupping and Nanoemulsion Aromatherapy Cupping in Reducing Anxiety in Hypertension Patients

Table 2 shows the results of the normality test using the Shapiro-Wilk test, where the p-value for both groups was > 0.05, indicating that the data in this study followed a normal distribution. Thus, subsequent statistical testing will use parametric tests (Paired T-test).

Table 2.
Normality Test Results Using Shapiro-Wilk Test (n=30)

Group	*Shaphiro-Wilk*		
	Statistic	Df	Sig.
Intervention	.149	15	.190
Control	.965	15	.774

Table 3 shows significant differences in anxiety levels before and after the intervention in both groups. In the control group, which received cupping therapy, the average anxiety score decreased by 9.467, with a p-value of 0.002 ($p < 0.05$), indicating that cupping therapy was effective in reducing anxiety in hypertension patients. On the other hand, in the intervention group, which received a combination of cupping and nanoemulsion aromatherapy cupping, the average anxiety score decreased by 13.400, with a p-value of 0.000 ($p < 0.05$). This also shows that the combination therapy of cupping and nanoemulsion aromatherapy was effective in reducing anxiety in hypertension patients.Thus, both therapies, cupping and the combination of cupping with nanoemulsion aromatherapy, significantly impacted the reduction of anxiety in hypertension patients.

Table 3
Paired T-test Results for Control and Intervention Groups

Group	Mean Pre ± SD	Mean Post ± SD	ΔMean	t	df	P Value
Control (cupping)	43.20 ± 8.334	33.73 ± 5.946	9,467	3.835	14	0.002
Intervention (nanoemulsion aromatherapy cupping)	45,20 ± 7.849	31,80 ± 6.428	13,400	7.160	14	0.000

Table 4 shows the results of the independent t-test used to compare the changes in anxiety between the control group (cupping) and the intervention group (nanoemulsion aromatherapy cupping). The results of the test showed a p-value of 0.215 ($p > 0.05$), meaning there was no significant difference between the two groups in terms of the change in anxiety scores. Although the intervention group showed a larger reduction in anxiety, this difference was not statistically significant.

Table 4
Independent T-test Results for Control and Intervention Groups

Group	Mean ± SD	ΔMean	t	df	P Value
Control (cupping)	9,47 ± 9,56	-3.933	1,270	28	0,215
Intervention (nanoemulsion aromatherapy cupping)	13,40 ± 7,25				

In this study, the effectiveness of cupping and nanoemulsion aromatherapy cupping therapy in reducing anxiety in hypertension patients was analyzed using the Zung-Self Anxiety Rating Scale (ZSAS) before and after the intervention. The results of the study show that both therapies were effective in reducing anxiety levels in hypertension patients, both in the control group receiving cupping therapy and in the intervention group receiving the combination of cupping and nanoemulsion aromatherapy.

In the control group, which received only cupping therapy, there was a reduction in the average anxiety score by 9.47, indicating that cupping therapy can have a positive effect in reducing anxiety in hypertension patients. Cupping therapy is known to stimulate the secretion of β-endorphin hormones, which have an anti-anxiety effect, and also promote physical and psychological relaxation in patients (Ahmedi, 2014; Benli & Sunay, n.d.)Previous research by Setyawan (2020) also supports this finding, where cupping therapy was proven to be effective in reducing anxiety in hypertension patients, with significant results observed in post-therapy anxiety levels. According to the researcher, this may occur because cupping therapy not only functions as physical relaxation but also stimulates the nervous system to release endorphins, which have the ability to relieve anxiety and improve patients' psychological well-being.

In the intervention group, which received the combination of cupping and nanoemulsion aromatherapy cupping, the average anxiety score decreased by a larger amount, 13.40. Nanoemulsion aromatherapy, which involves using essential oils such as lavender, peppermint, and ginger, works to calm the nervous system and provide a deeper relaxation effect through topical application formulated in nanoemulsions. The essential oils used in aromatherapy contain bioactive compounds that can selectively bind with specific targets in the body, affecting physiological processes (Koyama & Heinbockel, 2020). Aromatherapy using essential oils (EO) has also been shown to have various therapeutic uses, including relieving depression (Setyawan et al., n.d., 2022), pain (Reyes et al., 2020) and hypertension (Mohamadinasab et al., 2019).

According to a systematic review by Alves-Silva et al. (2021), several essential oils, such as lavender, ginger, and peppermint, have antihypertensive effects. Ginger oil, especially the active compound 6-gingerol, also shows significant therapeutic potential in alleviating anxiety. Research conducted by Song et al. (2024) showed that transdermal patches containing ginger oil could reduce PTSD and anxiety symptoms by decreasing levels of TNF-α and IL-6 (pro-inflammatory cytokines) in the brain while increasing BDNF (brain-derived neurotrophic factor) and melatonin. This indicates that ginger oil can provide neuroprotective effects, reduce inflammation, and address psychological disorders, including anxiety. The use of nanoemulsions allows better penetration of essential oils through the skin, as nanoemulsions have very small particles (usually between 50–500 nm), making it easier for essential oils to pass through the skin barrier (stratum corneum), which was previously difficult to penetrate with conventional aromatherapy. Nanoemulsion improves the bioavailability of essential oils, enhances the effectiveness of aromatherapy, and extends the duration of therapeutic effects experienced by patients (Al-Hussaniy et al., 2023; Wilson et al., 2022).

CONCLUSION

This study shows that both conventional cupping therapy and cupping therapy combined with nanoemulsion aromatherapy are effective in reducing anxiety in hypertension patients. Although the intervention group that received the combination of cupping and nanoemulsion aromatherapy showed a larger reduction in anxiety compared to the control group, the statistical test did not show a significant difference between the two therapies ($p = 0.215$). Thus, both therapies have similar effectiveness in relieving anxiety and can be considered safe and effective alternative therapies to help hypertension patients manage their anxiety. Cupping therapy, both independently and with the addition of nanoemulsion aromatherapy, can be an important part of a holistic approach to hypertension management, considering the often overlooked psychological aspects in conventional medical care. The results of this study support the use of complementary therapies as part of hypertension management, especially in relieving anxiety related to this condition. An approach that combines cupping therapy with other non-pharmacological therapies, such as aromatherapy, can improve the overall quality of life for hypertension patients.

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