Jurnal Vokasi Kesehatan Volume 12 Number 1, pp. 18-24 (2026)
doi: 10.30602/jvk.v12i1.1807

JVK
JURNAL VOKASI KESEHATAN
http://ejournal.poltekkes-pontianak.ac.id/index.php/JVK

THE EFFECT OF A COMBINATION OF ACUPRESSURE AND BERGAMOT AROMATHERAPY ON MATERNAL ANXIETY LEVELS AFTER ABORTION

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Article Info

Article History:
Received : 16-05-2025
Approved: 18-01-2026
Published : 31-01-2026

Keywords:
Abortion, Anxiety, Acupressure, Bergamot Aromatherapy.

Abstract

Post-abortion mothers are vulnerable to psychological disorders such as anxiety, depression, guilt, decreased self-esteem, and sleep disorders, which impact their quality of life and subsequent pregnancies. Non-pharmacological interventions such as acupressure combined with bergamot aromatherapy have the potential to reduce anxiety levels. This study aimed to analyze the effect of a combination of acupressure and bergamot aromatherapy on post-abortion maternal anxiety levels. Design of this research is quasi-experimental especially pretest and posttest with control group design, involving 34 respondents selected through consecutive sampling and divided into an intervention group (n=17) and a control group (n=17). The intervention group received Communication, Information, and Education (CIE) accompanied by acupressure at points SP-5, KI-1, HT-7, LI-4, GB-20, and Yintang with bergamot oil, while the control group received only CIE. Data were analyzed using the Wilcoxon intragroup and Mann-Whitney intergroup tests. Result said that therapy in the control group significantly reduced anxiety (p=0.046), while it was not significant in the intervention group (p=0.244). The Mann-Whitney test confirmed the difference between groups (p=0.016), with the control group experiencing a greater decline. Conclusion of this reseach is the combination of bergamot acupressure-aromatherapy and CIE was no more effective than CIE alone in reducing anxiety. However, this intervention demonstrated a clinically significant reduction in anxiety scores.

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ISSN 2442-5478

Introduction

Abortion is the expulsion of the products of conception before the fetus is capable of survival outside the womb. Abortion is defined as a gestational age of less than 20 weeks or a fetal weight of less than 500 grams, when the fetus is not yet capable of survival outside the womb. (Fatmasari, 2023).

The prevalence of abortion cases in the world is quite significant, according to the World Health Organization (WHO), where unsafe abortions are one of the causes of maternal death (World Health Organization, 2019). As many as 75% of abortion cases occur in early pregnancy at less than 16 weeks and as many as 80% occur in pregnancy at <12 weeks (Konar, 2018). It is estimated that 1 in 4 women who have ever been pregnant have experienced an abortion (Kurniati et al., 2020). In

Mamuju Regency, West Sulawesi Province, in 2021, there were 64 recorded cases of abortion at the Regional General Hospital of West Sulawesi Province. Although these cases did not result in direct maternal deaths, abortion still requires special attention because it has impacts on the physical and mental health of the mother.

The psychological effects of medical abortion are often underestimated (Wijaya & Erawan, 2018). Psychologically, women who experience abortion feel sadness due to the loss of their fetus, consider themselves failures as parents, feel regret, and even fear that they may not be able to become pregnant again (Rahayu & Wahyuni, 2020). Abortion is an indicator of reduced life expectancy. Women who experience abortion are twice as likely to die compared to women who give birth, and the higher mortality rate is due to suicide, which is caused by anxiety (Reardon, 2018).

Anxiety is an excessive and non-objective feeling of worry that produces emotional, cognitive, behavioral, and physical symptoms, and it is also an individual's response to internal and external stimuli (I Gusti Ayu Putu Wulan Budisetyani et all, 2016). It was found that women who experience recurrent abortion show higher levels of psychological distress in the form of anxiety, which significantly affects their quality of life at a lower level across all health domains, such as physical role, general health, vitality, social functioning, emotional role, and mental health (Tavoli et al., 2018).

Non-pharmacological therapies such as acupressure and bergamot aromatherapy are widely used to manage anxiety because they are safe, easy to apply, and have minimal side effects (Tola et al., 2021; Wang et al., 2022). Acupressure is a part of traditional Chinese medicine that aims to regulate life energy by creating a harmonious balance. Acupressure helps prevent, treat, restore, and boost immunity, as well as have a calming effect. Pressing acupoints stimulates life energy centers to create balance in the body (Ikhsan, 2019). Acupressure can reduce cortisol levels, decrease heart rate, decrease anxiety symptom scores and fatigue (Kuo et al., 2016) And can improve cognitive function and mood (Zhang et al., 2025).

Aromatherapy, also known as essential oils, has benefits for cognitive function, improving mood and well-being (Farrar & Farrar, 2020). The aroma produced by aromatherapy molecules when inhaled stimulates the olfactory nerves which then influence the limbic system which is related to and responsible for emotions, feelings and motivational impulses (Gnatta et al., 2016). This stimulation produces immediate changes in blood pressure, heart rate, pulse, muscle tension, body temperature, brain activity and others (Kamkaen et al., 2015).

Bergamot aromatherapy contains linalool and linalyl acetate, the main active ingredients that play a role in reducing anxiety. Linalool has a sedative effect, and linalyl acetate has an analgesic effect and can increase euphoria, well-being, or happiness (Navarra et al., 2015). Psychological effects of bergamot oil as an antidepressant, relaxation, sedative and anxiety agent (Wakui et al., 2023).

The potential benefits of acupressure and aromatherapy are the basis for this study, which provides complementary therapy after a curettage as part of quality post-abortion care. This study aimed to analyze the effect of acupressure combined with bergamot aromatherapy on maternal anxiety levels after abortion.

Method

This study used a quasi-experimental method with a pre-test and post-test with two groups. This design aimed to compare changes in anxiety levels between the intervention group given Communication, Information, and Education (CIE) using a combination of acupressure and bergamot aromatherapy and the control group given CIE alone.

The population in this study was all post-abortion mothers treated at four hospitals in Mamuju Regency, West Sulawesi: West Sulawesi Provincial Hospital, Mamuju Regency Hospital, Bhayangkara Hospital, and Mitra Manakarra Hospital. The sample was selected using consecutive sampling, namely all post-abortion mothers who met the inclusion criteria and were willing to participate during the study period of January–April 2023. The sample size was 34 respondents, consisting of 17 respondents in the intervention group and 17 respondents in the control group.

Inclusion criteria included post-abortion mothers who experienced mild to severe anxiety based on HARS screening results; had undergone a curettage; and preferred the scent of bergamot oil. Exclusion criteria included: mothers with obstetric emergency complications; allergies to aromatherapy; or those who had not completed post-abortion medical care.

Prior to the intervention, respondents were given an explanation of the study's purpose and procedures and then signed an informed consent

form. The intervention group received CIE and acupressure therapy combined with bergamot aromatherapy, while the control group received only CIE according to hospital standards.

The researcher then provided acupressure intervention (SP-5, KI-1, LI-4, HT-7, GB-20, Yintang) in combination with Bergamot aromatherapy oil with cosmetic grade quality level to the skin surface with a dose of 3-5 drops, namely 2x/day in the morning and evening for a duration of 2 minutes per acupoint or with a time span of 15-20 minutes for 2 days. Meanwhile, the control group received treatment in the form of providing post-abortion care CIE based on the Hospital standard operating prosedures for post-abortion mothers, namely 2x/day for a duration of 10-20 minutes for 2 consecutive days every morning and evening.

Anxiety levels were measured using the Hamilton Anxiety Rating Scale (HARS) which consists of 14 items with a scale of 0–4 for each item. The HARS score categorizes anxiety levels into 5 levels, namely no anxiety (0-13), mild anxiety (14-20), moderate anxiety (21-27), severe anxiety (28-41) and very severe anxiety (42-56) (Giatika Chrisnawati1, 2019).

The data were then analyzed univariately and bivariately. Univariate analysis was used to describe the frequency distribution of respondents and their anxiety levels. Bivariate analyses were conducted to determine the effect of the intervention on changes in anxiety levels using the Wilcoxon test (pre–post within groups) and the Mann–Whitney test (between groups). All analyses were conducted at a 95% significance level (α = 0.05).

This research received ethical approval from the Health Research Ethics Committee of the Ministry of Health Polytechnic of Semarang with Number: 028/EA/KEPK/2023.

Results and Discussion

Data collection was carried out in January-April 2023, collecting primary data in the form of anxiety scores from interviews and direct observations using the HARS measuring tool.

Table 1. Respondent Characteristics

Characteristics	Intervention n (%)	Control n (%)	*p-value*
Age			0,704[1]
<20 years	1 (5,9)	2 (11,8)	
21-35 years	11 (64,7)	12(70,6)	
>35 years	5 (29,4)	3 (17,6)	
Gravida			0,090[1]
Primigravida	12 (70,6)	10(58,7)	
Multigravida	5 (29,4)	7(41.2)	

Source: Primary Data

Table 1 shows that out of 34 respondents, based on the age variable, p-value = 0.704 (>0.05) there is no significant relationship between age and anxiety. For gravida, p-value = 0.090 (>0.05) there is no significant relationship between the gravida category and anxiety.

Table 2. Frequency of Anxiety Levels in Mothers After Abortion

Anxiety Level	HARS Score	Intervention n (%)	Control n (%)
Pre-test			
No anxiety	0-13	-	-
Mild anxiety	14-20	1 (5,9)	3 (17,6)
Moderate anxiety	21-27	11 (64,7)	12 (70,6)
Severe anxiety	28-41	5 (29,4)	2 (11,8)
Very severe anxiety	42-56	-	-
Post-test			
No anxiety	0-13	-	1(5,9)
Mild anxiety	14-20	3 (17,6)	6 (35,5)
Moderate anxiety	21-27	11 (64,7)	9 (52,9)
Severe anxiety	28-41	3 (17,6)	1 (5,9)
Very severe anxiety	42-56	-	-
Total		17	100

Source: Primary Data

Table 2 shows that after the intervention, there was a decrease in the proportion of respondents with severe anxiety in both groups. However, the decrease in anxiety levels was greater in the control group.

Table 3. Difference in Anxiety Scores Before and After Intervention

Group	Mean Pre-test ±SD	Mean Post-test ±SD	^Mean ±SD	p-value (Wilcoxon)
Intervention	30,35 ± 7,65	28,06± 4,07	-1,65±8,51	0,244
Control	24,12± 6,37	20,41± 3,00	-7,65 ± 3,41	0,046
Mann-Whitney (^between groups)				0,016

Source: Primary Data

The analysis results in Table 3 show that anxiety scores decreased in both groups. A significant decrease occurred only in the control group (p = 0.046), while the intervention group did not show a significant decrease (p = 0.244). The Mann–Whitney test showed a significant difference between the groups (p = 0.016), with a greater decrease in anxiety in the control group.

This study showed that both the intervention group (CIE combined with acupressure and bergamot aromatherapy) and the control group (CIE) experienced a decrease in anxiety levels after treatment. However, statistically, only the control group showed a significant decrease ($p = 0.046$), while the intervention group did not ($p = 0.244$). The Mann–Whitney test results showed a significant difference between the two groups ($p = 0.016$), where the control group experienced a greater decrease in anxiety than the intervention group.

The decrease in anxiety in the control group indicates that the educational intervention and therapeutic communication in CIE had a strong influence on the emotional state of post-abortion mothers. Meanwhile, the insignificant results in the intervention group do not mean that combination therapy is not beneficial, but rather indicate that the effect has not reached a statistically significant level, despite clinical improvements in HARS scores. This may be due to the short duration of the intervention (Novianti & Safitri Muchtar, 2021). And it can also be influenced by the frequency and regularity of acupressure administration (Yang et al., 2021).

Significant results from applying acupressure in the form of facial massage to postpartum mothers over three days were found to reduce anxiety. This difference may be due to the shorter intervention duration in this study, which was only two days, and also to higher initial anxiety levels in the intervention group (Zulfiana & Umriaty, 2024).

The physiological effects of acupressure on the SP-5, KI-1, HT-7, LI-4, GB-20, and Yintang acupuncture points combined with bergamot aromatherapy were not yet apparent within a short intervention period (two days). This was because it did not induce significant neurochemical changes. Furthermore, post-abortion maternal anxiety is multifactorial, influenced by emotional trauma, loss, and concerns about the future, so short-term physical therapy did not produce significant changes.

An interesting aspect of this study is that the CIE provided to the control group proved effective in reducing anxiety due to its personalized nature and focus on patient empowerment. CIE provided mothers with the opportunity to express their feelings, obtain clear information, and reduce fears about post-abortion conditions. This CIE will be even more effective if provided regularly and over a longer period (Gong et al., 2022; Raphi et al., 2021).

The intervention group in this study also received CIE, but its combination with acupressure and bergamot aromatherapy did not produce a significant impact. Public acceptance of this complementary therapy is still heavily influenced by personal trust and support from healthcare professionals (Farrar & Farrar, 2020; Sukawinaca et al., 2017). In many health facilities in Indonesia, acupressure and aromatherapy therapy are not yet part of the standard of obstetric services, so post-abortion mothers are often unfamiliar with or have little confidence in the effectiveness of this therapy, which affects the motivation and psychological readiness of respondents to accept intervention.

The Indonesian cultural context also plays a big role in creating social stigma, so that post-abortion women tend to suppress their emotions due to guilt and fear of being judged (Wijaya, Genesis Philia; Erawan, 2018). This condition can reduce the positive response to physiological interventions of acupressure and aromatherapy because psychological and spiritual factors have not been fully addressed. Therefore, this study shows that the success of complementary therapies depends not only on physical techniques but also on the respondents' mental readiness and social support.

Neurophysiologically, the effects of acupressure and aromatherapy on anxiety can be explained through two main pathways, namely modulation of the autonomic nervous system (Autonomic Nervous System Modulation) and the limbic-hypothalamic-pituitary-adrenal system (HPA axis). (Caballero-gallardo et al., 2025; Dwi & Werdani, 2019; Lin et al., 2021; Trinh et al., 2023). Stimulation of acupressure points KI-1 (Yongquan), LI-4 (Hegu), GB-20 (Fengchi) can increase parasympathetic activity and suppress sympathetic tone, while stimulation of acupressure points such as HT-7 (Shenmen), and Yintang can suppress HPA Axis activity by decreasing cortisol hormone and increasing gamma-aminobutyric acid (GABA) and β-endorphin. These hormones are responsible for feelings of calm and relaxation. Meanwhile, bergamot aromatherapy inhalation works through the olfactory pathway that projects to the limbic system and hypothalamus, thereby modulating the autonomic nervous system and HPA axis. However, the synergistic effect between acupressure and bergamot aromatherapy should be able to strengthen the relaxation response, but in

this study the results were not significant. This indicates that to achieve the desired effect, the duration of the intervention and the psychological readiness of the respondents are very important factors. The response to complementary therapy is individual, depending on the sensitivity of the autonomic nervous system, the initial level of anxiety, and the respondents' trust and comfort with the therapy.

Conclusion

This study showed a trend toward a decrease in clinical anxiety scores in post-abortion mothers using a combination of acupressure and bergamot aromatherapy, but this did not result in a statistically significant decrease (p=0.244). Conversely, the control group, which only received CIE, showed a significant decrease in anxiety (p=0.046). This confirms that educational interventions and therapeutic communication remain the most effective approaches in reducing post-abortion anxiety. However, CIE therapy combined with acupressure and bergamot aromatherapy still holds great potential as a safe and relatively easy-to-administer non-pharmacological supportive therapy.

These findings align with the Indonesian Ministry of Health's policy direction of developing complementary traditional health services and the SDGs' target of good health and well-being through improving maternal mental health and well-being. To achieve optimal results, further research with longer therapy durations, using a randomized controlled trial (RCT) design, is needed to strengthen causality. This approach integrates qualitative approaches to understand post-abortion mothers' subjective experiences with complementary therapies.

The results of this study are expected to form the basis for the development of evidence-based complementary midwifery care in post-abortion care. The application of acupressure and bergamot aromatherapy as part of complementary health services in both clinics and hospitals ensures that healthcare workers are trained and possess ongoing therapeutic knowledge or certification.

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