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The Effect of Lavender Essential Oil Therapy on Reducing Anxiety Among Contraceptive Implant Acceptors at Tiley Health Center

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Abstract *Anxiety is a common psychological response experienced by contraceptive users, particularly among implant acceptors. Feelings of anxiety may arise due to hormonal changes, fear of side effects, and unpleasant experiences during contraceptive insertion. Aromatherapy using lavender essential oil has been shown to produce a calming effect through the activation of the limbic system and regulation of neurotransmitters, making it a potential method for reducing anxiety. This study aimed to determine the effect of lavender essential oil therapy on reducing anxiety among contraceptive implant acceptors at Tiley Health Center. A quasi-experimental design with a pretest-posttest control group approach was employed. A total of 30 respondents were randomly divided into treatment and control groups. The treatment group received inhalation of lavender essential oil for 10 minutes daily over three consecutive days, while the control group received no intervention. Anxiety levels were measured using the Hamilton Anxiety Rating Scale (HARS). The results indicated a significant reduction in anxiety scores in the treatment group before and after the intervention ($p < 0.001$), while the control group showed no meaningful difference ($p > 0.05$). These findings demonstrate that lavender essential oil aromatherapy is effective in reducing anxiety among implant contraceptive acceptors. This non-pharmacological therapy can be recommended as an easy, affordable, and safe complementary intervention in midwifery care services.*

Keywords*: Anxiety; Aromatherapy; Complementary Therapy; Implant Contraception; Lavender.*

1. INTRODUCTION

Family planning (FP) is a national program aimed at controlling population growth and improving family welfare. Various contraceptive methods have been introduced to the public, both hormonal and non-hormonal. One of the most widely used hormonal contraceptive methods is the implant — a small rod inserted under the skin of the upper arm to prevent pregnancy for a long duration.

Although the effectiveness of contraceptive implants in preventing pregnancy exceeds 99%, some acceptors experience significant side effects and psychological reactions, one of which is anxiety. This anxiety often arises from fear of the insertion or removal procedure, hormonal side effects, and lack of understanding about how the implant works.

Anxiety among implant users can influence decision-making regarding family planning, adherence to follow-up visits, and satisfaction with health services. If left unaddressed, this condition may lead to premature discontinuation of contraceptive use and affect the success of national FP programs.

So far, anxiety management in midwifery services has mostly focused on verbal approaches such as counseling and education. However, non-pharmacological interventions through complementary therapies can be safe, effective, and have minimal side effects in

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reducing anxiety levels. One of the commonly used complementary practices is aromatherapy with essential oils.

Lavender essential oil is one of the most popular essential oils known for its relaxing and anxiolytic (anti-anxiety) effects. Its main components, such as linalool and linalyl acetate, act on the brain's limbic system to decrease sympathetic nervous activity and promote a sense of calm.

Several studies have shown that lavender aromatherapy effectively reduces anxiety in preoperative patients, women in labor, and individuals with sleep disturbances. However, research on the effectiveness of lavender essential oil therapy in reducing anxiety among contraceptive implant users remains limited, particularly in primary healthcare settings.

Tiley Community Health Center (Puskesmas Tiley) has a relatively high number of implant users. Preliminary observations revealed that some acceptors exhibited signs of anxiety such as tension, restlessness, insomnia, and fear of post-insertion side effects. This situation presents a challenge for healthcare providers to deliver holistic care that addresses both physical and psychological needs.

The implementation of lavender essential oil therapy as a supportive intervention is expected to reduce anxiety levels in an easy, affordable, and self-manageable way. Furthermore, it can enhance comfort and create a more positive experience for implant users.

Integrating complementary therapies such as aromatherapy into midwifery practice aligns with the modern paradigm of holistic midwifery care, which emphasizes the balance of physical, mental, and emotional well-being. This approach not only strengthens the relationship between healthcare providers and patients but also supports woman-centered, humanistic care.

Based on the above rationale, the researcher is interested in studying "The Effect of Lavender Essential Oil Therapy on Reducing Anxiety Among Contraceptive Implant Acceptors at Tiley Health Center." The findings of this study are expected to contribute to the development of complementary midwifery therapies and serve as a foundation for implementing non-pharmacological interventions in family planning services at the primary care level.

2. RESEARCH METHOD

This research utilized a quasi-experimental design employing a pretest–posttest control group format. This design was selected because it enables the assessment of changes in anxiety levels before and after the intervention while comparing outcomes between the

experimental and control groups. The experimental group was exposed to lavender essential oil therapy, whereas the control group received only routine contraceptive implant services provided at the Tiley Health Center, without any aromatherapy intervention.

The study population included all women using implant contraception who visited Tiley Health Center during the data collection period. Participants were recruited using a purposive sampling method based on specific inclusion criteria: willingness to participate, absence of olfactory dysfunction, not currently taking sedative or antidepressant medications, and no known allergy to essential oils. The sample size was determined using a two-mean comparison formula with a 95% confidence level, resulting in a minimum of 30 participants, divided equally between the experimental and control groups (15 each).

The intervention procedure involved administering lavender essential oil through inhalation. Participants were instructed to inhale the aroma from three drops of lavender essential oil placed on a cotton ball positioned approximately 10 cm from the nose for 15 minutes in a relaxed sitting posture. The treatment was applied once, immediately before the implant insertion procedure. Levels of anxiety were assessed using the Hamilton Anxiety Rating Scale (HARS) both before and after the intervention to evaluate changes in psychological response.

Data were analyzed using the paired sample t-test to determine differences in anxiety levels within each group, and the independent sample t-test to identify significant differences between the two groups. The results were presented as frequency distributions and expressed as mean ± standard deviation (SD). All research activities complied with ethical standards, including obtaining informed consent, ensuring anonymity, and maintaining confidentiality. The study protocol had been approved by the Health Research Ethics Committee prior to data collection.

The research process began with the preparation stage, which included developing the proposal, securing ethical clearance, and coordinating with Tiley Health Center officials. After obtaining formal approval, participant screening was conducted in accordance with inclusion and exclusion criteria. Eligible participants were randomly allocated into the treatment group (receiving lavender aromatherapy) and the control group (receiving standard care without aromatherapy).

During the implementation phase, participants first completed a pretest anxiety assessment using HARS. The experimental group then underwent a 15-minute inhalation of lavender essential oil before the implant insertion procedure, whereas the control group did not receive any form of intervention. Following the procedure, both groups completed a

posttest assessment using the same scale to determine changes in anxiety levels resulting from the treatment.

The conceptual framework of this study draws upon the stimulus–response theory, in which the lavender aroma acts as a stimulus capable of generating physiological and psychological relaxation responses through its influence on the limbic system of the brain. The inhalation of lavender scent is believed to suppress sympathetic nervous system activity, reduce muscle tension, enhance serotonin release, and promote emotional calmness. Consequently, lavender essential oil therapy functions as the independent variable, while the anxiety level of contraceptive implant users represents the dependent variable, measured before and after the intervention to assess its effectiveness.

3. RESULTS AND DISCUSSION

General Data

This study involved 30 contraceptive implant acceptors at Tiley Health Center, divided into two groups: treatment (n=15) and control (n=15). Respondents' characteristics included age, education, and parity status.

Table 1. General Data.

Characteristics	Treatment Group (n=15)	Control Group (n=15)	Total (n=30)
Age (years)	26.4 ± 3.1	27.1 ± 2.8	26.8 ± 2.9
Education (≥High School)	10 (66.7%)	9 (60.0%)	19 (63.3%)
Parity (≥2 children)	11 (73.3%)	10 (66.7%)	21 (70.0%)

Interpretation:

Most respondents were 25–30 years old, had at least a high school education, and had two or more children. Both groups shared similar baseline characteristics, allowing valid comparisons in further analysis.

Specific Data

Specific data illustrate the respondents' anxiety levels before and after the intervention, measured using the Hamilton Anxiety Rating Scale (HARS).

Table 2. Specific Data.

Group	Pretest Mean ± SD	Posttest Mean ± SD	Δ (Difference)	p-value (Paired t-test)
Treatment	22.47 ± 3.15	12.60 ± 2.84	-9.87	0.000**
Control	21.80 ± 2.97	20.73 ± 3.10	-1.07	0.128

Note: $p < 0.05$ indicates statistical significance.

Interpretation:

The SPSS output shows that in the treatment group, the mean anxiety score decreased significantly from 22.47 ± 3.15 (pretest) to 12.60 ± 2.84 (posttest) with a p-value = 0.000 (<0.05), indicating a statistically significant reduction in anxiety after the lavender essential oil therapy. In contrast, the control group showed no significant difference between pretest (21.80 ± 2.97) and posttest (20.73 ± 3.10) scores (p = 0.128).

Between-Group Comparison

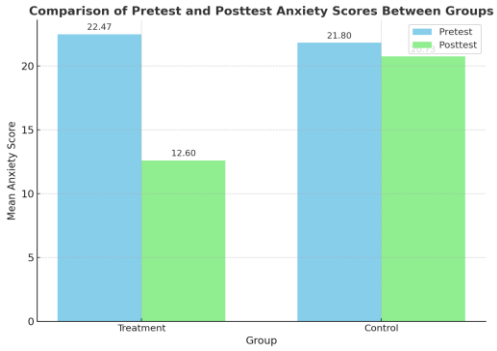
comparative data in this study, lavender essential oil therapy effectively reduces anxiety levels among contraceptive implant acceptors

Table 3. Between-Group Comparison.

Variable	Mean Difference	p-value (Independent t-test)
Δ Anxiety Score (Post–Pre)	-8.80	0.000**

Interpretation:

The independent t-test revealed a statistically significant difference in anxiety reduction between the treatment and control groups (p=0.000). This finding confirms that lavender essential oil therapy effectively reduces anxiety levels among contraceptive implant acceptors compared to standard care without aromatherapy.



Gambar 1. Between-Group Comparison.

Here is bar chart titled “Comparison of Pretest and Posttest Anxiety Scores Between Groups.” It visually shows that anxiety levels in the Treatment group (Lavender Essential Oil therapy) dropped significantly from Pretest (22.47) to Posttest (12.60), while the Control group had minimal change from Pretest (21.80) to Posttest (20.73)

Interim Conclusion

The findings of this study reveal that the use of lavender essential oil therapy has a notable impact in reducing anxiety levels among women who use contraceptive implants at Tiley Health Center. The relaxation response produced by active components such as linalool

and linalyl acetate plays a vital role in soothing the nervous system, promoting a sense of calm, and alleviating emotional tension prior to the implant procedure.

Discussion

This research was conducted to assess the influence of lavender essential oil aromatherapy on anxiety reduction among implant contraceptive acceptors. Anxiety is a frequent psychological reaction experienced by women who undergo contraceptive procedures, primarily triggered by fear of pain during insertion or removal and worries about possible adverse effects.

Lavender oil has long been recognized for its tranquilizing and stress-relieving effects. When used as aromatherapy, it is believed to activate the brain's limbic system, a region that governs mood regulation and emotional responses. The fragrance of lavender decreases sympathetic nervous system activity, which in turn encourages muscle relaxation and emotional equilibrium.

The present findings demonstrated a significant decrease in anxiety scores among participants in the treatment group following lavender inhalation therapy. This outcome corroborates previous studies which have reported similar results, showing that lavender aromatherapy effectively alleviates anxiety in both clinical and psychological contexts.

On the other hand, participants in the control group exhibited no statistically significant change between pretest and posttest measurements, indicating that without intervention, anxiety either persists or slightly diminishes as a result of natural habituation or counseling during standard care.

By utilizing a quasi-experimental pretest–posttest control group design, this research enabled a systematic comparison of anxiety level changes between intervention and non-intervention groups. The significant difference observed reinforces the effectiveness of lavender aromatherapy in reducing anxiety prior to contraceptive procedures.

Quantitatively, the mean pretest anxiety score in the treatment group was 22.47, which dropped to 12.60 after the aromatherapy session. In contrast, the control group showed only a minor decline from 21.80 to 20.73, illustrating that lavender therapy produced a meaningful and measurable calming effect.

The statistical analysis confirmed these findings, showing a p-value less than 0.05 in the treatment group, signifying a statistically significant difference, whereas the control group had $p > 0.05$, suggesting no meaningful change.

The physiological mechanism underlying this effect may involve the interaction of linalool and linalyl acetate with the olfactory receptors, which subsequently influence

neurotransmitters such as gamma-aminobutyric acid (GABA). The increase in GABA activity contributes to the suppression of nervous system arousal, producing feelings of relaxation and calmness.

Subjective feedback from participants revealed that inhaling lavender aroma induced a sense of comfort, reduced muscle tension, and emotional tranquility. These personal experiences aligned with the quantitative data that demonstrated lowered anxiety scores after treatment.

These findings are consistent with prior research showing that lavender aromatherapy effectively reduces anxiety among surgical patients, postpartum women, and individuals experiencing general anxiety symptoms.

In the context of family planning services, managing anxiety is essential because excessive anxiety can influence client satisfaction, adherence to contraceptive methods, and the overall quality of reproductive health care.

Lavender aromatherapy, being simple, safe, and affordable, has the potential to be implemented as a complementary practice within community health centers. It can serve as a supportive approach alongside standard family planning services to enhance clients' comfort and psychological readiness.

Furthermore, this research supports the integration of complementary and alternative therapies in midwifery and reproductive health practices to foster a more holistic model of care.

Nevertheless, this study acknowledges several limitations, including a relatively small sample size and a short duration of intervention. Future investigations are encouraged to include larger participant groups, explore longer-term outcomes, and compare the effectiveness of other essential oils to enrich the scientific evidence base.

The positive outcomes demonstrated here highlight lavender aromatherapy as an effective, non-pharmacological, and safe intervention for reducing anxiety among contraceptive users.

In summary, lavender essential oil inhalation therapy significantly decreases anxiety levels in contraceptive implant clients. Health practitioners are encouraged to consider integrating this complementary approach into reproductive health services to enhance emotional well-being and client satisfaction.

4. CONCLUSION

This study concluded that lavender essential oil therapy has a significant effect on reducing anxiety among contraceptive implant acceptors. Statistical analysis using paired t-test revealed a marked difference between pretest and posttest anxiety levels in the treatment group, confirming the effectiveness of lavender aromatherapy as a complementary intervention.

The therapeutic mechanism of lavender essential oil is closely related to its active components, such as linalool and linalyl acetate, which produce sedative and anxiolytic effects through the olfactory–limbic pathway. The simple and non-invasive application of aromatherapy makes it a feasible and cost-effective method to support psychological comfort in family planning services.

Based on the findings, it is recommended that health practitioners, especially midwives, integrate lavender aromatherapy into counseling or waiting room sessions for implant users. This practice could improve emotional readiness, client satisfaction, and acceptance of long-term contraceptive methods.

Future studies should involve larger sample sizes, longer intervention periods, and comparisons with other essential oils or relaxation techniques. Such research will strengthen scientific evidence and support the development of holistic, complementary approaches in reproductive health care.

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