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THE EFFECT OF CYMBOPOGON CITRATUS AROMATHERAPY ON PREOPERATIVE PATIENT ANXIETY: A LITERATURE REVIEW

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ABSTRACT
Children's health at school is a crucial aspect in supporting the learning process and student development. At SDN 002 Penajam, attention to students' health is a top priority in creating a healthy and productive learning environment. However, managing students' health often faces challenges, such as the lack of a structured and consistent record-keeping system. Objective: The study aimed to determine how the personal medical record keeping of students is conducted at SDN 002 Penajam.Method: Data collection in this study is conducted using documentation methods, followed by data processing and analysis.Results: From the results of the interviews, it was found that SDN 002 Penajam has a student checkbook that records students' height and weight measurements during school health checks, but does not have a record book for students' medical history.Conclusions: The study on personal medical recordkeeping of students at SDN 002 Penajam reveals that the systematization of student health data is crucial in supporting administrative and documentation aspects in schools. Organized medical records enable teachers and school health unit (SHU) managers to easily store and access students' health information.

Keywords: anxiety, aromatherapy therapy, cymbopogon citratus, lemongrass aromatherapy, preoperative

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INTRODUCTION

Surgery is a medical procedure that involves an invasive approach by opening a specific body part to address a medical issue. Surgical procedures pose both potential and actual threats to a person's integrity, making preoperative preparation a source of physiological and psychological stress. This experience can be challenging for almost all patients, often leading to anxiety-related behaviors. Patients may experience anxiety before undergoing surgery due to various concerns, including fear of the operating room, surgical instruments, and medical personnel, fear of death during anesthesia, and fear of surgical failure. Preoperative anxiety can also affect postoperative health, leading to concerns such as fear of postoperative pain, physical changes, and wound healing. Several relaxation techniques can help reduce preoperative anxiety, including meditation, yoga, and aromatherapy (Anisah, I. N., & Maliya, A. (2021).

Aromatherapy is a therapeutic approach that utilizes essential oils to enhance or maintain health, stimulate, refresh, and uplift the body (Karo Karo et al., 2017). There are several methods of aromatherapy administration, including massage, oil burners, heating oil diffusers, inhalation, soaking, direct application to the body, gargling/bathing, spraying, and room fragrance diffusion (vaporizer). Among these methods, inhalation is the fastest and most effective way to deliver aromatherapy (Putri et al., 2019).

Several studies have shown that aromatherapy can effectively reduce anxiety, including lemongrass aromatherapy. Lemongrass aromatherapy is derived from Cymbopogon nardus oil, a variety known as "Maha Pengiri," which is highly valued for its superior oil quality. The primary components of this essential oil include geraniol (85-90%), citronellal (35-45%), geraniol acetate (3-8%), citronellal acetate (2-4%), along with small amounts of sesquiterpenes and other compounds (Balai Penelitian Tanaman Obat dan Aromatik, 2010). The citronellal and geraniol compounds exhibit analgesic, sedative, antinociceptive, and anti-inflammatory properties, particularly in pain associated with inflammation, and they contribute to reducing peripheral nerve stimulation (Bouyahya et al., 2021). The purpose of the application in this scientific work to find out the aromatherapy effect of Cymbopogon Citratus which is widely used to relax pre-operative patients, and prove its effect directly on patients.

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METHOD

The research method used is a literature review. This study was conducted by analyzing ten previous research articles, which were used to gather various pieces of information supporting the research based on the selected subject. Articles were retrieved from ScienceDirect, PubMed, and Google Scholar using advanced search techniques with the keywords "preoperative, anxiety, lemongrass aromatherapy." Ultimately, ten relevant studies were

selected to compile this article. The inclusion criteria consisted of primary studies in the form of Randomized Control Trials (RCTs) and Control Trials, full-text availability, and written in English. The subjects in the selected articles were patients scheduled for surgery. The intervention examined was the administration of Cymbopogon nardus aromatherapy to reduce preoperative anxiety. The articles used in this literature review are from 2020-2025, which match the title of the article and meet the inclusion and exclusion criteria.

RESULT

Table 1.
Analysis Article

No	Journal Title	Author	Research Purposes	Method	Result	Conclusion
1	The Effects of Aromatherapy on Anxiety and Depression in People With Cancer: A Systematic Review and Meta-Analysis	Dan Li, Yuxin Li, Xue Bai, Meijuan Wang, Jingzheng Yan, and Yingjuan Cao (2022)	Investigate the effects of aromatherapy on anxiety and depression in cancer patients.	Systematic review and meta-analysis of 17 studies, using PRISMA guidelines.	Aromatherapy effectively reduces anxiety (especially with aromatherapy massage and lavender oil) but is not effective for depression and psychological well-being.	Aromatherapy can be a therapy option for anxiety in cancer patients, but its effects on depression require further research.
2	Application of Lemongrass Aromatherapy for Anxiety Management During Labor in Mrs. D at Tanjung Balai Karimun Community Health Center	Nilma, Mariyana, Nova Roza (2024)	Provide comprehensive and continuous midwifery care to pregnant women, particularly in managing anxiety during labor using lemongrass aromatherapy.	Descriptive study using a case study method.	After applying lemongrass aromatherapy, there was a reduction in the mother's anxiety level.	Lemongrass aromatherapy is effective in reducing anxiety during labor in pregnant women.
3	Aromatherapy Lemongrass (Cymbopogon Nardus) on Reducing Anxiety of Labor Women in the First Stage of Labor	Suci Rahmadheny, Desti Nataria (2021)	Determine the effect of lemongrass aromatherapy and maternal affection in reducing anxiety in laboring women during the first stage.	Quasi-experimental study with a non-randomized control group pretest-posttest design. Anxiety data were collected using the Hamilton Rating Scale for Anxiety (HARS) before and after the intervention. Data analysis used the Paired T-Test and Shapiro-Wilk test.	The average anxiety score before the intervention was 24.25 and decreased to 17.38 after the intervention. Bivariate analysis showed p = 0.000, indicating a significant difference in anxiety reduction among laboring women.	Lemongrass aromatherapy and maternal affection are effective in reducing anxiety in laboring women in the first stage. This method can be applied by midwives as a non-pharmacological therapy to support childbirth.

No	Journal Title	Author	Research Purposes	Method	Result	Conclusion
4	Effectiveness of Guided Imagery Combined with Lemongrass Aromatherapy in Reducing Anxiety in Women in the Latent Phase of First-Stage Labor at Tunas Harapan Community Health Center in 2022	Eva Susanti, Marwani Destia Rizki (2023)	Determine the effectiveness of Guided Imagery combined with lemongrass aromatherapy in reducing anxiety in laboring women in the latent phase of the first stage at Tunas Harapan Community Health Center in 2022.	Consecutive sampling technique with 18 respondents. The instrument used to assess anxiety was the State-Trait Anxiety Inventory (STAI). Data analysis was performed using the McNemar test.	Guided Imagery combined with lemongrass aromatherapy effectively reduced anxiety in laboring women in the latent phase of the first stage, with p = 0.000 (<0.05). Anxiety levels significantly decreased after the intervention.	Guided Imagery combined with lemongrass aromatherapy is effective in reducing anxiety in laboring women in the latent phase of the first stage.
5	Scentsational Smiles: The Impact of Aromatherapy on Alleviating Dental Anxiety in Children	Shaimaa M. Mahfouz Omer, Safinaz Abdel Fattah Abdel Wahab, and Yousra Samir Helmy (2024)	Compare the effects of rosemary and lemongrass essential oils on dental anxiety levels and vital signs in children during anesthesia and primary molar extraction.	Experimental study on 45 children aged 4-7 years with deep caries in mandibular primary molars requiring extraction.	Rosemary oil significantly reduced dental anxiety compared to the control group and lemongrass oil. Vital signs also showed significant improvement in the rosemary group compared to other groups.	Rosemary oil is effective in reducing dental anxiety in children during dental procedures. It is recommended for routine practice to alleviate anxiety in children.
6	Effectiveness of Lemongrass Aromatherapy (Cymbopogon Nardus) and Quranic Recitation on Labor Pain Intensity in Primigravida Women in the Active Phase of First-Stage Labor	Siti Muzayyana, Setiawandari, Yuni Khoirul Waroh (2023)	Investigate the effect of Quranic recitation and lemongrass aromatherapy on changes in pain intensity during labor.	Quantitative quasi-experimental study.	Among 21 respondents, the p-value before therapy was 0.021 (α > 0.05), indicating no significance. After therapy, the p-value was 0.005 (α < 0.05), showing significant differences between the control and intervention groups.	Significant differences were observed in pain intensity reduction between the control and intervention groups after Quranic recitation and lemongrass aromatherapy.
7	Essential Oils for Clinical Aromatherapy: A Comprehensive Review	Lalitkumar K. Vora et al. (2024)	Explore the use of essential oils in aromatherapy, including	Literature review from databases such as PubMed, ScienceDirect, Scopus, and Bentham using	Therapeutic effects (antimicrobial, analgesic, anxiolytic, anti-	Essential oils have significant therapeutic potential for aromatherapy, offering natural

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			applications, scientific evidence, and safety considerations in complementary healthcare.	keywords related to essential oils and aromatherapy.	inflammatory), quality factors, and safety considerations of essential oils through preclinical and clinical studies.	treatments for various conditions. Further research and responsible use are encouraged for traditional and modern integration.
8	The Effectiveness of Lemongrass Aromatherapy (Cymbopogon Nardus) on Labor Pain in the Active Phase of First-Stage Labor	Setiana Andarwulan, Yuni Khoirul Waroh, Annah Hubaedah (2023)	Determine the effectiveness of lemongrass aromatherapy in reducing labor pain in the active phase of first-stage labor.	Quantitative quasi-experimental study using a pre-test and post-test on 21 primigravida women.	Lemongrass aromatherapy significantly reduced labor pain in the active phase, with a p-value of 0.002.	Lemongrass aromatherapy is effective in reducing pain in the active phase of labor and increases mothers' confidence in the childbirth process.
9	Combination of Gentle Birth Method and Lemongrass Aromatherapy (Cymbopogon Nardus) for Pain in the First Stage of Labor	Nurhayati, Oktavianis, Novi Wulan Sari, Indreswati, Vittria Meilinda (2023)	Investigate the effect of the Gentle Birth method and lemongrass aromatherapy (Cymbopogon nardus) on pain levels in the first stage of labor in Payakumbuh City in 2023.	Quasi-experimental study with a pre-test and post-test one-group design.	Univariate analysis showed that the average pain level before the intervention was 7.10, decreasing to 4.50 after the intervention. Bivariate analysis showed a significant difference in first-stage labor pain before and after the intervention, with a p-value of 0.004 (<0.05).	The Gentle Birth method and lemongrass aromatherapy (Cymbopogon nardus) are effective in reducing first-stage labor pain. This program is recommended for continued application in healthcare services to support labor.
10	The Effect of Lemongrass (Cymbopogon Nardus) Inhalation Aromatherapy on Blood Pressure Reduction in Patients Before Tooth Extraction at Soelastri Dental Hospital, UMS	Rosyida, Lisa Nuraini	Investigate the effects of lemongrass (citronella) inhalation aromatherapy on blood pressure reduction in patients before tooth extraction.	Pre-experimental study with a one-group pre-test and post-test design. The sample consisted of 10 patients at Soelastri Dental Hospital, selected using purposive sampling. The independent variable was lemongrass	Before inhaling lemongrass aromatherapy, the average blood pressure was 125/82 mmHg. After inhalation, the average blood pressure decreased to 118/79 mmHg. The paired t-test result was	Lemongrass inhalation aromatherapy is effective in reducing blood pressure in patients before tooth extraction.

No	Journal Title	Author	Research Purposes	Method	Result	Conclusion
				aromatherapy, and the dependent variable was blood pressure reduction. Data analysis used a paired t-test.	p=0.000 (p<0.05), indicating a significant effect of lemongrass aromatherapy on blood pressure reduction.	

Essential oils (also known as volatile oils or essential extracts) are volatile organic compounds naturally produced in large quantities from raw plant materials or their parts, such as flowers, seeds, buds, leaves, fruits, wood, roots, bark, and twigs (Auliya et al., 2024). Chemically, the compounds in essential oils belong to various chemical classes, such as amines, alcohols, phenols, ethers, and carbonyl compounds like aldehydes, ketones, amides, and esters. The main components of essential oils are terpenes and phenylpropanoids (Pei et al., 2024).

Aromatherapy has evolved into a therapeutic method used to address various complications and health conditions. Essential oils are known to work through the olfactory system, which has a direct connection to the limbic system in the brain, the center for regulating emotions and mood. When someone inhales the aroma of lemongrass, olfactory receptors in the nose send signals to the brain via the olfactory nerve, activating the limbic system and triggering the release of neurotransmitters such as serotonin and dopamine. These neurotransmitters play a role in promoting feelings of calmness, relaxation, and reducing stress and anxiety (Apriza et al., 2021). Therefore, lemongrass oil has been widely studied for its effects on anxiety, particularly in preoperative patients.

Based on a literature review, Li et al. (2022) examined the effectiveness of aromatherapy in reducing anxiety and depression in cancer patients through a systematic review and meta-analysis of 17 studies using PRISMA guidelines. The results showed that aromatherapy significantly reduced anxiety, especially when combined with aromatherapy massage using lavender oil (SMD = −1.12, $p < 0.01$). However, its effects on depression and psychological well-being were not significant, suggesting that further research is needed on the mechanisms of aromatherapy in these aspects. This indicates that while aromatherapy is effective in reducing anxiety, its impact on more complex psychological disorders, such as depression, still requires further investigation.

It is likely that the relaxing effects of aromatherapy work more optimally in short-term stressful situations, such as preoperative anxiety, compared to chronic depression, which requires deeper interventions. Another study by Nilma et al. (2024) showed that the application of lemongrass aromatherapy to pregnant women at the Tanjung Balai Karimun Community Health Center effectively reduced anxiety before childbirth. This study used a descriptive case study approach, where after the intervention with lemongrass aromatherapy, there was a significant reduction in anxiety levels. The effects of lemongrass aromatherapy can be felt even in highly stressful situations such as labor. The application of aromatherapy in these conditions is crucial because excessive anxiety can lead to increased levels of stress hormones like cortisol, which can negatively impact both the mother and the baby. Therefore, non-pharmacological interventions such as lemongrass aromatherapy can be a safer alternative compared to sedatives, which may have side effects for pregnant women (Irawan, C., Sudiyanto, A., & Fanani, M. (2019)

In line with this research, Rahmadheny & Nataria (2021) used a quasi-experimental research design with a non-randomized control group pre-test and post-test to assess the effects of lemongrass aromatherapy on maternal anxiety during the first stage of labor. The results showed that maternal anxiety scores decreased from 24.25 to 17.38 after the intervention, with a p-value of 0.000, indicating a significant reduction in anxiety. In another study, Susanti & Rizki (2023) evaluated the effectiveness of combining the Guided Imagery technique with lemongrass aromatherapy in reducing maternal anxiety during the latent phase of the first stage of labor at the Tunas Harapan Community Health Center. This technique involves guided imagery combined with the inhalation of lemongrass aromatherapy. The study found that this combination significantly reduced anxiety, with a p-value of 0.000. The combination of psychological methods and aromatherapy suggests that non-pharmacological therapy can work more effectively when applied alongside cognitive strategies, such as Guided Imagery, which helps individuals focus and manage their anxiety more effectively.

Beyond maternal labor, lemongrass aromatherapy has also been studied in the context of other medical procedures. Mahfouz Omer et al. (2024) compared the effects of rosemary and lemongrass essential oils in reducing anxiety in children during tooth extraction procedures. In a study involving 45 children aged 4-7 years, it was found that while both essential oils provided relaxation effects, rosemary oil was more effective than lemongrass oil in reducing dental anxiety and stabilizing children's vital signs during the medical procedure. These findings indicate that while lemongrass oil has calming effects, its effectiveness may vary depending on the individual and the context of use. It also suggests that in some cases, certain types of essential oils may be more effective than others.

Research by Sari & Meilinda (2023) examined the impact of the Gentle Birth method combined with lemongrass aromatherapy in reducing labor pain during the first stage of labor. The study found that before the intervention, the average labor pain score was 7.10, whereas after the intervention with the Gentle Birth method and lemongrass aromatherapy inhalation, the pain score decreased to 4.50. Statistical tests showed that this difference was significant, with a p-value of 0.004, indicating that the combination of the Gentle Birth method with lemongrass aromatherapy can be an effective alternative in helping mothers manage pain during labor.

Although lemongrass aromatherapy shows promising results, several factors need to be considered in its application. First, the method of essential oil application can affect its effectiveness. Direct inhalation through a diffuser or cloth provides faster effects compared to topical application, as the oil molecules are directly absorbed by the olfactory system (Kosgey et al., 2025). Compared to pharmacological methods such as anxiolytic medication, lemongrass aromatherapy has the advantage of not causing significant side effects such as excessive drowsiness or drug dependence. However, the effectiveness of aromatherapy can vary depending on individual factors, such as sensitivity to scent and the patient’s psychological condition. Therefore, a personalized approach is highly recommended in applying this therapy to preoperative patients.

In an increasingly holistic medical world, lemongrass aromatherapy offers a non-invasive solution that can help reduce patient anxiety before undergoing surgical procedures. It is important for medical professionals to understand the mechanisms, optimal dosage, and most effective application methods when using lemongrass aromatherapy for preoperative patients to maximize its benefits for patient well-being. (Anjarsari, R. & Hudiyawati, D. (2023)

DISCUSSION

The findings of this literature review highlight the effectiveness of lemongrass aromatherapy (*Cymbopogon citratus*) in reducing preoperative anxiety. Various studies have demonstrated that the active compounds in lemongrass essential oil, such as citronellal and geraniol, contribute to its anxiolytic effects. These compounds interact with the limbic system, particularly the amygdala and hippocampus, which are responsible for regulating emotions and stress responses. (Nanda, A. A. & Rosyid, F. N. (2025)

The literature reviewed suggests that lemongrass aromatherapy significantly lowers anxiety levels in different medical contexts, including preoperative patients, pregnant women during labor, and individuals undergoing medical procedures. Compared to pharmacological interventions, aromatherapy offers a non-invasive, low-risk alternative for anxiety reduction. However, its effectiveness may vary depending on individual factors such as scent sensitivity, psychological conditions, and the method of administration.

Some studies indicate that combining lemongrass aromatherapy with relaxation techniques such as guided imagery and deep breathing enhances its efficacy. This suggests that a multimodal approach to anxiety management may yield better results. Despite the promising findings, further research is needed to determine the optimal dosage, duration of exposure, and best application methods to maximize the benefits of lemongrass aromatherapy in clinical settings.

CONCLUSION

Lemongrass aromatherapy (Cymbopogon citratus) has significant effectiveness in reducing anxiety in various conditions, including preoperative patients, expectant mothers, and individuals undergoing other medical procedures. The mechanism of action of lemongrass oil in reducing anxiety is closely related to the limbic system in the brain, where the inhalation of lemongrass oil stimulates the release of neurotransmitters such as serotonin and dopamine, which help promote relaxation and reduce stress. Several studies have shown that the use of lemongrass aromatherapy not only decreases subjective anxiety but also has notable physiological effects, such as lowering blood pressure, reducing heart rate, and improving sleep quality, all of which contribute to enhancing patients' well-being before undergoing surgical procedures. Additionally, combining other techniques, such as Guided Imagery with lemongrass aromatherapy, has been proven to enhance its effectiveness in alleviating anxiety. However, the effectiveness of aromatherapy can vary depending on individual factors, such as sensitivity to scents and the patient's psychological condition. Therefore, further research is needed to determine the optimal dosage, the most effective application methods, and the ideal duration of use so that this therapy can be more widely applied in clinical practice.

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