

Section: Medical Surgical Nursing

Aromatherapy using lavender to reduce anxiety in patients at the preoperative stage

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Abstract

Anxiety is a common emotional response experienced by patients prior to undergoing surgical procedures. Preoperative anxiety may lead to various physiological and psychological effects that can worsen the patient's overall condition. Non-pharmacological interventions, such as lavender aromatherapy, are known for their sedative properties, which help reduce anxiety levels through inhalation mechanisms. This study aimed to implement complementary lavender aromatherapy as part of nursing care for preoperative patients experiencing anxiety. A descriptive case study approach was employed, involving one preoperative patient diagnosed with anxiety in Lily 1 Ward at Soerojo Hospital, Magelang. The intervention consisted of inhaling 3–5 drops of lavender essential oil applied to tissue or cotton for 20 minutes, administered over two consecutive days. Anxiety levels were assessed using the Hamilton Anxiety Rating Scale (HARS). The patient's HARS score decreased from 20 (mild anxiety) to 12 (no anxiety) following the intervention. The patient also reported improved sleep quality and a reduction in restlessness and physical tension. These findings indicate that lavender aromatherapy is an effective, simple, safe, and cost-efficient complementary nursing intervention for reducing anxiety in preoperative patients and may be integrated into routine clinical practice.

Keywords: Anxiety, aromatherapy, complementary therapy, preoperative stage, surgery

Introduction

Surgery is a complex form of medical intervention that is often necessary to save lives, prevent disability, and reduce disease-related complications (Diehl et al., 2022). According to the World Health Organization (WHO), an estimated 266–360 million surgical procedures are performed globally each year, with approximately 13% of the global disease burden potentially addressable through surgical interventions. In Indonesia, surgical procedures rank 11th among the 50 most common treatments for disease management (Rizki et al., 2023). At Soerojo Hospital Magelang, a total of 201 surgical procedures were recorded in May 2025, with an average of eight procedures performed daily. However, surgery affects not only patients' physical health but also their psychological well-being, particularly by inducing preoperative anxiety. Anxiety is defined as a subjective emotional state arising from anticipation of potential threats or harm, even if no actual danger is present. This form of anxiety commonly results from concerns about pain, risks of anesthesia, uncertainty about surgical outcomes, and lack of information (Ahsan et al., 2017). Carpenito (2016) reported that up to 90% of patients scheduled for surgery experience varying degrees of anxiety.

Unmanaged preoperative anxiety can have adverse physiological effects, such as increased blood pressure, elevated heart rate, respiratory and digestive disturbances, and prolonged hospitalization (Wotman et al., 2017). Additional complications may include anaesthesia failure, postoperative nausea and vomiting, heightened infection risk, and surgical delays due to emotional unpreparedness (Abate et al., 2020; Merdekawati et al., 2013). Therefore, effective anxiety management is critical in preoperative care. Management strategies for anxiety generally include pharmacological and non-pharmacological approaches. Pharmacological methods often involve the use of sedatives such as benzodiazepines and opioids, which carry potential side effects including fatigue, confusion, and dependency (Guo et al., 2020; Wotman et al., 2017). As an alternative, non-pharmacological interventions, particularly complementary therapies such as aromatherapy, have gained increased attention. Aromatherapy involves the use of essential oils derived from specific plants, which act via the olfactory system and influence the brain's limbic system (Rosalinna, 2019).

Lavender (*Lavandula angustifolia*) is one of the most commonly used essential oils in aromatherapy, primarily due to its high content of linalool and linalyl acetate, compounds known for their sedative and relaxing properties. Studies by Wotman et al. (2017) have demonstrated the effectiveness of lavender inhalation in reducing surgical anxiety. A systematic review by Guo et al. (2020) further supports inhalation-based aromatherapy as a recommended method for alleviating preoperative anxiety. In practice, lavender aromatherapy is administered by applying 3–5 drops of essential oil to a medium such as tissue or cotton, positioned 5–10 cm from the patient's nose and inhaled for

approximately 20 minutes. This method is simple, affordable, minimally invasive, and associated with few side effects (Serdar et al., 2018). Its therapeutic effects occur through activation of the limbic system and suppression of sympathetic nervous activity, physiologically reducing muscle tension, heart rate, and promoting a sense of calm and relaxation (Agusta, 2014; Wang et al., 2022).

In the nursing context, care for patients with preoperative anxiety involves assessment using tools such as the Hamilton Anxiety Rating Scale (HARS), formulation of nursing diagnoses (e.g., D.0080 – Anxiety related to situational crisis), planning and implementing interventions such as aromatherapy, and evaluating outcomes based on changes in HARS scores and clinical manifestations (Siregar, 2019). This approach aligns with the principles of holistic nursing, which address the biological, psychological, social, and spiritual dimensions of patient care. The application of lavender aromatherapy as a complementary therapy in nursing practice is supported by strong scientific evidence and has been shown to effectively reduce anxiety in preoperative patients. Integrating this intervention into clinical nursing care not only enhances patient comfort and readiness but also contributes to surgical safety and procedural efficiency.

Case Description

The patient is a 55-year-old male patient, was admitted to Lily 1 Ward at Soerojo Hospital Magelang on June 23, 2025, with complaints of lower abdominal pain and urinary disturbances. The patient was scheduled to undergo a Transurethral Resection of the Prostate (TURP) procedure due to benign prostatic hyperplasia (BPH), as confirmed by diagnostic assessments including ultrasound and laboratory results. During hospitalization, the patient exhibited signs of anxiety in anticipation of the upcoming surgery. A comprehensive nursing assessment was conducted based on the 13 domains of NANDA. In the domains of Self-Perception and Coping/Stress Tolerance, the patient expressed feelings of anxiety, fear of not waking up after anesthesia, and concerns about the surgical outcome. Clinically, the patient appeared restless, withdrawn, experienced sleep disturbances, and displayed physical tension. An initial assessment using the Hamilton Anxiety Rating Scale (HARS) yielded a score of 20, indicating mild anxiety. The primary nursing diagnosis established was Anxiety related to situational crisis, as evidenced by verbal expressions of anxiety, restlessness, difficulty concentrating, and sleep disturbances. A secondary diagnosis was Acute pain related to physiological injury agent, characterized by suprapubic pain, grimacing facial expression, and a pain score of 4–5 on a numeric scale. The nursing care plan was developed in accordance with the Indonesian Nursing Outcome Standards (SLKI) and the Indonesian Nursing Intervention Standards (SIKI). For the anxiety diagnosis, interventions included: assessing anxiety level using the HARS, providing education on aromatherapy procedures, administering lavender aromatherapy by applying 3–5 drops of lavender essential oil to tissue and instructing the patient to inhale from a distance of 5–10 cm for 20 minutes, monitoring patient response and potential allergic reactions, and teaching self-use techniques for managing recurring anxiety.

For acute pain, interventions included: monitoring vital signs, assessing pain intensity, teaching deep-breathing relaxation techniques, and collaborating with the medical team for analgesic administration. Interventions were implemented over two consecutive days. On the first day (June 23, 2025), prior to aromatherapy administration, the patient appeared anxious and reported difficulty sleeping, with a HARS score of 20. Following the intervention, the patient exhibited a calmer demeanor and improved relaxation, with a reduced HARS score of 14. Additionally, the patient began to engage more openly in communication. On the second day (June 24, 2025), aromatherapy was repeated using the same method and dosage. Before the session, the patient reported feeling more relaxed and having slept better the previous night. After the second session, the HARS score further decreased to 12, indicating no clinically significant anxiety. The patient also began to practice aromatherapy independently during moments of anxiety. Regarding the pain diagnosis, after catheter insertion and administration of analgesics, the patient reported significant pain relief. The deep-breathing technique also contributed to increased comfort. Vital signs returned to normal limits, and pain was reported as resolved. Nursing evaluation showed a progressive decrease in HARS scores from 20, 14, and 12, accompanied by patient-reported improvements in calmness and sleep quality. For acute pain, the issue was effectively managed through both pharmacological and nursing interventions, and was ultimately resolved.

Discussion

The management of preoperative patients with anxiety requires a comprehensive and holistic approach. In this case, the patient exhibited signs of anxiety prior to undergoing surgery for benign prostatic hyperplasia (BPH). The patient's anxiety manifested through verbal expressions of fear—particularly the fear of not waking up after anaesthesia—as well as physical symptoms including restlessness, insomnia, and difficulty concentrating. This aligns with Carpenito (2016), who reported that approximately 90% of surgical patients experience varying degrees of anxiety, often due to uncertainty regarding the procedure and its outcomes. The primary contributing factors to preoperative anxiety include lack of information, first-time surgical experience, and fears related to anaesthesia complications (Ahsan et al., 2017). For this patient, limited knowledge about the surgical process and concerns about postoperative outcomes were identified as the main anxiety triggers. This is consistent with findings by Maheshwari & Ismail (2015), who emphasized that unfamiliarity with anaesthesia type and procedural details can exacerbate preoperative anxiety.

Non-pharmacological interventions serve as effective alternatives in reducing anxiety, particularly during the pre-procedural phase. Aromatherapy is among the most frequently studied complementary interventions. Lavender (*Lavandula angustifolia*) is one of the most commonly used essential oils in this context, containing active compounds such as linalool and linalyl acetate that have well-documented anxiolytic effects. Lavender inhalation significantly reduced anxiety scores in patients awaiting elective surgery. In this case, the patient was administered lavender aromatherapy via inhalation at a dosage of 3–5 drops for 20 minutes. This method reflects that of Serdar et al. (2018), who demonstrated a significant reduction in anxiety scores following lavender inhalation prior to laparoscopic surgery. The sedative effect of lavender is mediated through olfactory receptor stimulation that influences the limbic system—particularly the amygdala and hypothalamus—which are key in regulating emotional and stress responses (Wang et al., 2022). HARS score showed a marked decline, from 20 to 14 on the first day and down to 12 on the second day. The patient also reported improved sleep quality and emotional relaxation. In addition to anxiety management, nursing care in this case also addressed acute pain. The patient reported suprapubic pain related to BPH.

Interventions included pain assessment, deep-breathing techniques, and collaborative analgesic administration. This multimodal approach proved effective. By the second day, the patient began independently applying aromatherapy during moments of anxiety, indicating improved coping capacity. This reflects the success of a nursing approach based on patient education and empowerment. As noted by study educational interventions involving complementary therapies enhance patients' self-control and confidence in managing their symptoms (Wang et al., 2003). From a safety perspective, lavender aromatherapy did not produce any side effects or allergic reactions in the patient, supporting claims by Wotman et al. (2017) that aromatherapy is a non-invasive, affordable, and safe intervention for use in clinical nursing practice. Overall, this case demonstrates that lavender aromatherapy can be effectively integrated into preoperative nursing care as a complementary therapy. The intervention not only contributed to a reduction in anxiety but also enhanced the patient's comfort and preparedness for surgery. Such holistic approaches are in line with modern nursing paradigms that emphasize the biopsychosocial-spiritual model of patient care.

Conclusion

The application of lavender aromatherapy has proven effective as a non-pharmacological intervention for reducing preoperative anxiety. Through a case study involving a single patient in Lily 1 at Soerojo Hospital Magelang, a two-day inhalation intervention using lavender essential oil demonstrated a reduction in anxiety levels from mild to no anxiety, as measured by the HARS. The patient also reported subjective improvements, including better sleep quality, reduced physical tension, and enhanced emotional calmness. This intervention is simple to administer, carries minimal risk of side effects, and can be taught for independent use by patients. The success of this intervention highlights the importance of a holistic approach in nursing practice, addressing psychological as well as physical aspects of patient care. Lavender aromatherapy should be considered as part of complementary nursing care, particularly in managing preoperative anxiety, to enhance patient comfort, mental preparedness, and the overall success of surgical procedures.

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