

## THE IMPLEMENTATION OF LAVENDER AROMATHERAPY TO REDUCE PAIN IN POSTOPERATIVE HUMERUS FRACTURE PATIENTS

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### ABSTRACT

Pain is one of the main complaints in postoperative patients with a sinistra humerus fracture that can hinder the healing process. Pain management is not only through pharmacology, but also supported by non-pharmacological therapies, one of which is lavender aromatherapy. Objective: Describing the implementation of lavender aromatherapy in reducing pain intensity in patients who have undergone surgery for left humerus fractures in the Cendana Ward of Dr. Sardjito General Hospital, Yogyakarta. Methods: This case study was conducted on one patient with a humerus fracture measured the pain scale before and after the intervention using the NRS (Numeric Rating Scale) pain scale by giving lavender aromatherapy for 15 minutes for 3 days with a frequency of administration 2 times a day Results: The results showed that before being given lavender aromatherapy intervention, the pain scale was 6 (moderate pain), after being given lavender aroma therapy for three days with a frequency of twice a day the pain scale dropped to 1 (mild pain). Conclusion: Lavender aromatherapy has a significant psychological and physiological relaxing effect on postoperative patients with humerus fractures from a moderate pain scale to a mild pain scale.



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## INTRODUCTION (Capital, bold, Times new romance 11 pt)

A bone fracture is a partial or complete break of the bone, which can occur spontaneously (due to diseases such as osteoporosis and related chronic conditions) or as a result of falls or trauma (such as traffic accidents, sports injuries, etc.). Fractures are a global public health problem and are associated with significant morbidity, mortality, and healthcare costs (Utari Nurul Ridwan et al., 2019).

According to the World Health Organization (WHO) in 2021, around 40–50 million people worldwide suffer fractures annually, with 20–30% of cases requiring surgical intervention. In Indonesia, based on the Basic Health Research (Riskesdas) data in 2022, the prevalence of injuries leading to fractures reached 9.2% of the total population, with 45% of them requiring medical treatment (Ministry of Health RI, 2022).

Based on the 2020 national Riskesdas report, the incidence of fractures in Yogyakarta reached 10.6%, with injured body parts including: head 11.0%, chest 2.3%, back 9.1%, abdomen 2.4%, upper extremities 33.6%, and lower extremities 64.5% or as many as 1,537 cases (Riskesdas, 2020). Preliminary study results from Dr. Sardjito General Hospital recorded 960 fracture cases between January–December 2024.

Fracture management can be conservative or operative (surgical). One of the main complaints after fracture surgery is pain, which can significantly affect the recovery process. Global reports indicate that postoperative pain following orthopedic surgery is common, ranging from moderate to severe levels. Overall, 70.5% of patients undergoing emergency orthopedic surgery under anesthesia experience moderate to severe pain within the first 24 hours (Arefayne et al., 2020).

Untreated acute pain can develop into chronic pain, which is more difficult to manage due to the absence of the original nociceptive source, requiring more complex treatment. Pain management in fractures involves both pharmacological and non-pharmacological approaches. Therefore, complementary therapies that are effective and safe are necessary to accompany pharmacological treatment.

Aromatherapy is one relaxation technique that can be used to reduce pain and serve as an adjunct to pharmacological therapy (Astuti & Aini, 2020). Aromatherapy is a complementary therapy in nursing practice using essential oils from plants to reduce health problems and improve quality of life. When inhaled, the active substances stimulate the hypothalamus (pituitary gland) to release endorphins. Endorphins are known to produce feelings of calm, relaxation, and happiness.

Lavender aromatherapy provides psychological and physiological effects, such as reducing stress, anxiety, and pain. Psychological effects include decreasing anxiety, creating a sense of calm and happiness, stabilizing mood, and facilitating relaxation. Physiological effects include reducing pain levels, increasing endorphin production, promoting relaxation, and lowering stress. Lavender aromatherapy contains linalool and linalyl acetate, which act as analgesics. Linalool has anxiolytic and relaxing properties. Inhaled aromatherapy interacts with the autonomic nervous system to aid relaxation and reduce stress.

Based on the background and available data, the authors were interested in conducting a scientific study entitled: “The Implementation of Lavender Aromatherapy to Reduce Pain in Postoperative Humerus Fracture Patients in the Cendana Ward of Dr. Sardjito General Hospital.”

## RESEARCH METHODS

This scientific work employed a descriptive case study design with an observational approach, aiming to describe the implementation of lavender aromatherapy in reducing pain in one postoperative humerus fracture patient (Khairunnisa et al., 2024).

The sample was one inpatient who underwent postoperative fracture surgery. Inclusion criteria: willing to receive lavender aromatherapy, no olfactory disorders, no allergies to lavender, no COPD, no asthma, and receiving continuous analgesic therapy. The study was conducted on March 26–28, 2025, in the Cendana Ward, Dr. Sardjito General Hospital, Yogyakarta.

Postoperative fracture pain refers to discomfort in patients on day 0 post-surgery, categorized as mild (1–3), moderate (4–6), or severe (>6) using the Numeric Rating Scale (NRS). Measurements were taken before and 60 minutes after lavender aromatherapy implementation.

Lavender aromatherapy, as a relaxation technique using lavender essential oil, was administered by placing 3–5 drops on tissue and inhaled for 10–15 minutes, twice daily for three days, with the patient’s eyes closed and breathing calmly.

## RESULTS AND DISCUSSION

This study was conducted at Dr. Sardjito General Hospital, a referral hospital located in Mlati, Sleman, Yogyakarta, adjacent to Universitas Gadjah Mada.

The respondent was a 67-year-old male, Mr. T, a businessman with a Diploma III educational background, residing in Kotagede, Yogyakarta. Based on his medical record, he was diagnosed with a distal left humerus fracture and admitted to Cendana Ward on March 25, 2025. (New Romance 11, before and after 0)

Age is a major risk factor for fractures. With aging, bone mineral density decreases, making bones fragile and prone to fractures. Elderly people also experience muscle mass reduction and balance impairment, increasing fall risk. This aligns with Ye et al. (2024), who reported that advanced age significantly increases fracture risk.

Gender also influences fracture incidence, with women at higher risk due to estrogen’s protective role in bone density. Yao et al. (2022) also found higher fracture prevalence in women even after adjusting for age and BMI.

Occupational type also plays a role. Jobs with high physical activity, such as construction, agriculture, and heavy industry, increase fracture risk due to work accidents (Mandagi et al., 2019).

Thus, Mr. T’s fracture reflects multifactorial causes involving age, gender, and occupational risk factors.

This study supports findings from Fariman et al. (2024), which reported that lavender aromatherapy for 10–15 minutes, 1–2 times daily, for three days significantly reduced pain. Similarly, Ashar & Hudiawati (2020) showed that lavender aromatherapy effectively reduced pain in postoperative fracture patients, lowering the mean pain score from 6 to 1.

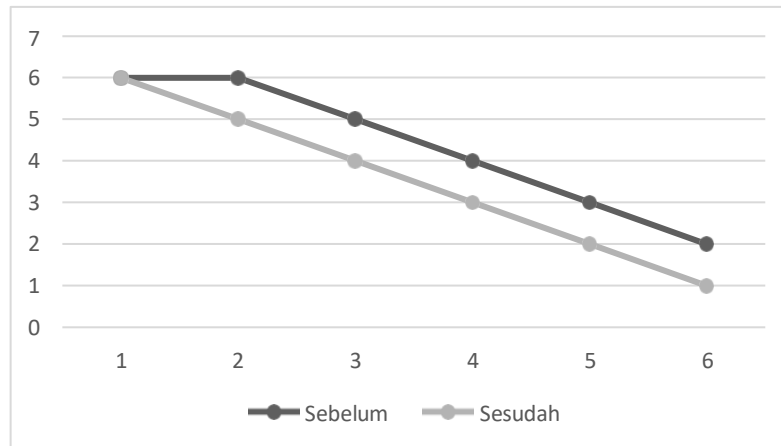
## Table

Lavender aromatherapy was given for 3 consecutive days, twice daily. The pain intensity results were:

**Table 1 Implementation Pain Level**

Implementation	Before	After
First	6	6
Second	6	5
Third	5	4
Fourth	4	3
Fifth	3	2
Sixth	2	1

**Picture**



**Picture 1 Pain Intensity Graph Before and After the Implementation of Lavender Aromatherapy**

The results show a gradual decrease in pain intensity. Initially, the pain was at level 6 (moderate), and after three days of therapy (6 sessions), the pain decreased to level 1 (mild).

**CONCLUSION**

This study describes the implementation of lavender aromatherapy to reduce pain intensity in postoperative fracture patients. Before the intervention, the pain score was 6 (moderate pain). After six lavender aromatherapy sessions over three days, the pain gradually decreased to 1 (mild pain). Thus, it can be concluded that lavender aromatherapy is effective in reducing pain intensity in postoperative humerus fracture patients.

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