



# Lavender Aromatherapy as a Complementary Nursing Intervention for Anxiety in an Institutionalized Older Adult with Post-Fracture Mobility Limitation: A Case Report

Sya'roni<sup>1,3</sup>, Rizkiyani Istifada<sup>1</sup>, Niken Asih Laras Ati<sup>1</sup>, Suprayitno<sup>2</sup>

<sup>1</sup>Faculty of Nursing, Jember University, Indonesia

<sup>2</sup>Jember Health office, Indonesia

<sup>3</sup>Anwar Medika General Hospital, Sidoarjo, East Java, Indonesia

**Correspondence:** Rizkiyani Istifada

Faculty of Nursing, Jember University, Indonesia ([istifada@unej.co.id](mailto:istifada@unej.co.id))

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## ABSTRACT

**Background:** Aging is accompanied by physical changes that can impact health and decrease overall well-being, often leading to psychological issues such as anxiety and depression. Non-pharmacological interventions like aromatherapy are believed to provide a calming effect, reduce stress, and improve mood in the elderly. **Objective:** This study aims to describe nursing care for anxiety in older adults using lavender aromatherapy and relaxation techniques. **Method:** This case study employed a descriptive-analytical approach with a pre-test and post-test design involving a single participant, an older adult residing at UPT PSTW Bondowoso. The intervention involved administering lavender aromatherapy for 10–15 minutes daily over seven consecutive days via inhalation of three drops of lavender essential oil placed on a cotton pad. **Results:** After seven sessions of lavender aromatherapy, there was a noticeable decrease in verbal expressions of worry and confusion. Behavioral indicators of restlessness were reduced, and sleep patterns improved. The Geriatric Depression Scale (GDS) score decreased from 9 on the first day to 6 on the final day. **Conclusion:** Lavender aromatherapy was effective in reducing anxiety and depression levels in the elderly. The results suggest that aromatherapy can be considered a complementary nursing intervention to enhance mental well-being in older adults.

## KEYWORDS

Elderly; Depression; Anxiety; Aromatherapy; Lavender

## How to cite

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## 1 | Background

The aging process is a natural, lifelong process that begins in childhood, continues through adulthood, and progresses into old age. These three stages differ both biologically and psychologically. Entering old age may involve various declines, such as physical deterioration characterized by sagging skin, graying hair, tooth loss, reduced hearing clarity, worsening vision, slower movements, and disproportionate body posture (Akhriansyah, 2024). At this stage, aging is marked by various changes and declines. Older adults experience changes and reductions in psychological, physical, cognitive, emotional, and

social aspects (Wijoyo, 2022). Elderly individuals are vulnerable to depression due to various declines, such as physical and psychological deterioration, which can affect health conditions and reduce levels of well-being, thereby increasing the risk of anxiety problems (Hartutik & Nurrohmah, 2021). Anxiety disorders involve uncontrollable worry that can lead to restlessness, difficulty sleeping, negative impacts on quality of life and social relationships, and unrealistic emotional responses to everyday situations. Factors contributing to anxiety among older adults include feelings of loneliness, living alone, illness-related factors, irritability, economic

difficulties, and limited time spent with family (Pratiwi et al., 2025).

The prevalence of anxiety among older adults ranges on average from 2.9% to 6.3% across countries worldwide (WHO, 2018). In Indonesia, depressive disorders are most prevalent among individuals aged 15–24 years (2%). Among those aged 55–64 years, 65–74 years (1.6%), and over 75 years (1.9%), the prevalence rates are slightly lower (Kemenkes, 2024). Other data show that among 9,821 older adults with comorbid conditions, the prevalence of anxiety was 26.83%, depression 10.33%, and 6.88% experienced both conditions simultaneously (Sare et al., 2021). Older adults who experience depression accompanied by anxiety have a higher risk compared to those who experience only one of these conditions (Zhao et al., 2025).

During an assessment conducted at UPT PSTW Bondowoso, it was found that 22 older adults (24.7%) experienced depression, while 67 older adults (75.3%) did not show symptoms of depression. Anxiety and depression experienced by elderly individuals in nursing homes generally occur due to being separated from their families, having strained relationships with other residents—characterized by feelings of fear and discomfort—and feelings of helplessness (Stuart, 2023). Management of anxiety in older adults is not limited to pharmacological treatment or psychological therapy, but can also be carried out through complementary and alternative therapies. Various types of therapy may be used to reduce levels of anxiety or depression in older adults, including aromatherapy (Arjuna & Rekawati, 2020).

Aromatherapy is an alternative therapy that uses essential oils derived from plants to support physical health and emotional balance (Jafari-Koulaee et al., 2020). Aromatherapy is believed to provide relaxation effects, reduce stress and depression levels, and improve anxiety. Several studies have shown that aromatherapy can influence the limbic system, which plays an important role in emotional regulation (Soep & Agussalim, 2024).

Lavender aromatherapy is effective in reducing depressive symptoms among older adults because its main essential oil components, linalool and linalyl acetate, can stimulate the central nervous system and promote relaxation. These compounds stimulate the cilia receptors in the olfactory epithelium, which then transmit

calming aroma signals to the olfactory bulb via the olfactory nerve pathway (Maharianingsih, 2022). Lavender aromatherapy is widely used to reduce anxiety levels because it has sedative, antiseptic, calming, antispasmodic, analgesic, and healing properties. Other studies have reported that lavender aromatherapy has effects on stress, depression, and anxiety levels by reducing stress, depression, and feelings of anxiety (Ebrahimi, 2022).

Considering its potential benefits, it is important to identify further the effects of aromatherapy on depression levels among older adults. This study paper aims to describe nursing care for elderly individuals with anxiety nursing problems through relaxation management techniques, specifically the administration of aromatherapy, at PSTW Bondowoso.

## 2 | Case Presentation

### 2.1 Assessment

Mrs. Y is a 60-year-old female patient, an elderly resident at UPT PSTW Bondowoso. She is of Javanese ethnicity, practices Islam, did not complete elementary school, and is originally from Tuban, East Java. To meet her daily needs, an older female resident uses the facilities provided by UPT PSTW Bondowoso and receives assistance from staff or nurses in the Special Care Unit. Her daily activities at PSTW include bathing, eating meals delivered to her bedside, and walking around the Special Care Unit area. An older female resident rarely participates in routine activities at PSTW, such as exercise sessions, congregational prayers, and games, due to difficulty walking since experiencing a femoral fracture in October 2024. In carrying out her daily activities, an older female resident uses a cane to assist her with walking.

During the assessment, an older female resident reported difficulty moving her right leg since undergoing postoperative surgery on her right thigh. She also complained of frequent pain in her right thigh (P: pain worsens with movement; Q: feels like being stabbed with a blunt object; R: located in the right thigh; S: pain scale 3; T: intermittent pain). The patient appeared grimacing and restless. Muscle strength assessment showed: right upper extremity 5555, left upper extremity 5555, right lower extremity 2222, and left lower extremity 5555, and a 25 cm surgical scar was observed on the right thigh area.

An older female resident expressed concern that her condition has not improved, particularly regarding her difficulty in walking, and she reported having no family members to assist her with daily activities. She feels helpless because she must depend on others for assistance, and she appears visibly anxious and restless.

The results of the examination conducted on an older female resident were as follows: Blood Pressure: 130/80 mmHg; Temperature: 36.5°C; Pulse: 80 beats per minute; Respiratory Rate (RR): 21 breaths per minute; Body Weight: 80 kg; Height: 180 cm; Body Mass Index (BMI): 24.7 (overweight). The Barthel Index assessment yielded a score of 17, indicating that an older female resident has mild dependency in performing eight activities, including eating, bathing, personal grooming, dressing, urination, defecation, toileting, and transferring. The Pittsburgh Sleep Quality Index (PSQI) yielded a score of 10, indicating poor sleep quality. Poor sleep quality is associated with higher levels of anxiety. In nursing practice, poor sleep quality is commonly recognized as a related factor in the nursing diagnosis of anxiety, according to the Indonesian Nursing Diagnosis Standards (SDKI). Consequently, a comprehensive assessment of patients experiencing anxiety should incorporate an evaluation of both sleep patterns and sleep quality. The Mini-Mental State Examination (MMSE) score was 30, indicating no cognitive impairment. Assessment of social status using the Family APGAR resulted in a score of 2, indicating severe family dysfunction. The Geriatric Depression Scale (GDS) assessment yielded a score of 9, indicating mild depression. Depression often coexists with or is correlated with anxiety. Individuals who experience chronic anxiety are at greater risk of developing depressive symptoms due to prolonged psychological distress. In older adults, depression may trigger sleep disturbances and exacerbate anxiety (Thiarany Elisavira, Subhannur Rahman, 2025). Therefore, the assessment of depression using the Geriatric Depression Scale (GDS) can be utilized to evaluate the psychological impact associated with anxiety, particularly among the elderly population. The Morse Fall Scale (MFS) score was 35, indicating a low risk of falling. The Timed Up and Go Test (TUGT) showed a time of 24 seconds to walk and return, indicating a predicted risk of falling within the next 6 months. The Mini Nutritional Assessment–Screening Form (MNA-SF) score was 13, indicating normal nutritional status.

## 2.2 Nursing Diagnose

Based on the assessment that was conducted, the nursing diagnoses identified were impaired physical mobility, acute pain, risk of falls, and anxiety. This study focuses on the nursing problem of anxiety related to unmet needs, as evidenced by an older female resident expressing concern about her condition, feeling helpless, experiencing difficulty sleeping, appearing restless, a PSQI score of 10 (poor sleep quality), and a Geriatric Depression Scale (GDS) score of 9, indicating mild depression (D.0080). Nurses in Indonesia use the Indonesian Nursing Diagnosis Standards (SDKI) to formulate nursing diagnoses, defined as clinical judgments concerning the responses of individuals, families, or communities to existing health problems or conditions that place them at risk of developing health problems (Tim Pokja SDKI DPP PPNI, 2016).

## 2.3 Nursing Intervention

After seven nursing interventions, each lasting 10–15 minutes, the level of anxiety decreased in accordance with the expected outcome criteria, namely reduced verbalization of worry, decreased restless and tense behavior, and improved sleep patterns (Tim Pokja SLKI DPP PPNI, 2018). The primary nursing intervention provided was relaxation therapy (I.09326) (Tim Pokja SIKI DPP PPNI, 2018). The Indonesian Nursing Intervention Standards (SIKI) consist of standardized nursing interventions designed to manage identified nursing diagnoses. These standards guide nurses in selecting evidence-based, appropriate interventions based on the patient's health condition and nursing care needs. The Indonesian Nursing Outcomes Standards (SLKI) provide a framework for defining the expected outcomes of nursing interventions. These outcomes must be observable and measurable, enabling nurses to evaluate the achievement of care goals and the effectiveness of the interventions provided (Tim Pokja SLKI DPP PPNI, 2019).

## 2.4 Implementation

The implementation included: (1) conducting assessments by identifying symptoms that interfere with cognitive abilities, administering the Geriatric Depression Scale (GDS), and assessing signs and symptoms of anxiety; (2) providing therapeutic services in the form of

lavender aromatherapy relaxation; and (3) providing education regarding the purpose and benefits of lavender aromatherapy, as well as demonstrating and training relaxation techniques. Lavender aromatherapy was implemented over seven consecutive days through the inhalation of three drops of lavender essential oil on a cotton pad, combined with a deep-breathing relaxation technique. Each aromatherapy session lasted approximately 10–15 minutes, with the patient positioned in a semi-

Fowler's position and in a quiet environment. Following each session, an evaluation was conducted to monitor for potential adverse effects of lavender aromatherapy, including shortness of breath, sneezing, dizziness, and nausea. To address anxiety in an older female resident, lavender aromatherapy relaxation was provided as the sole therapeutic intervention, without the administration of any additional therapeutic measures.

### 2.5 Evaluation and Outcomes

**Table 1.** Evaluation of Nursing Care Outcomes Based on Pre- and Post-Intervention SLKI Scores

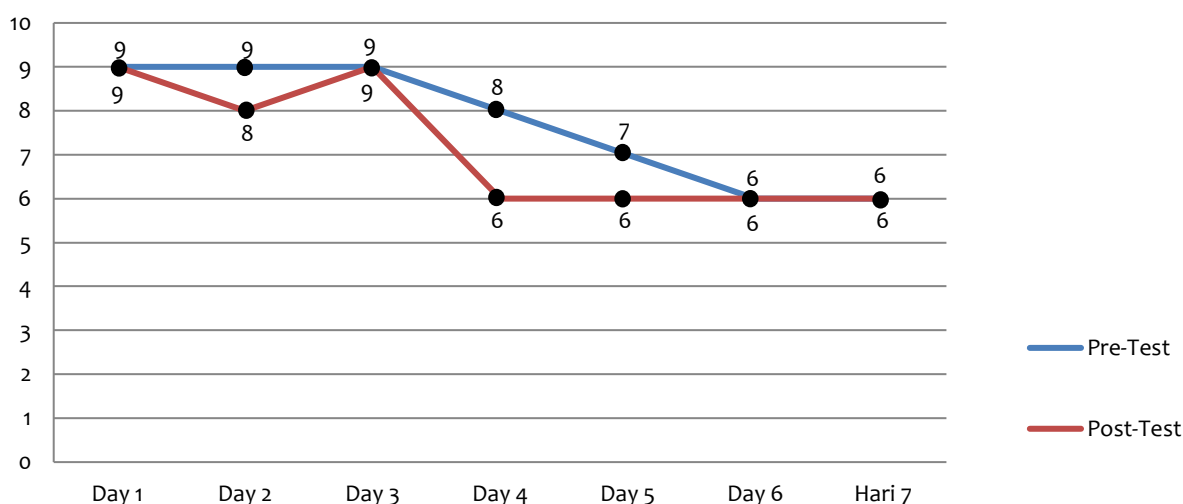
EVALUATION OF NURSING CARE SLKI SCORE			
Outcome Criteria	PRE	POST	Description
Verbalization of Worry	3	4	Decreased
Restless Behavior	3	5	Decreased
Verbalization of Confusion	3	4	Decreased
PSQI	10	6	Decreased
Sleep Pattern	3	5	Improved

**Score Interpretation:** 1 = Increased; 2 = Moderately Increased; 3 = Moderate; 4 = Moderately Decreased; 5 = Decreased.

**Score Interpretation:** 1 = Worsened; 2 = Moderately Worsened; 3 = Moderate; 4 = Moderately Improved; 5 = Improved.

Table 1 presents the results of the evaluation of nursing care after the administration of lavender aromatherapy seven times to an older female resident. For the outcome criteria of verbalization of worry and verbalization of confusion, an older female resident showed a moderate decrease. For the restless behavior outcome criterion, the

evaluation showed a decrease. Meanwhile, for the sleep pattern criterion, an older female resident demonstrated improvement, with an initial PSQI score of 10 (poor sleep quality). After 7 sessions of lavender aromatherapy over 7 days, the PSQI score decreased to 6 (still in the poor sleep quality range).



**Figure 1.** Pre- and Post-Intervention Geriatric Depression Scale (GDS) Scores

Figure 1 presents the results of the differences in the Geriatric Depression Scale (GDS) scores before and after the administration of lavender aromatherapy to an older female resident. The

average Geriatric Depression Scale (GDS) score in the pre-implementation phase was 7,71, while in the post-implementation phase it was 7,14. The highest pre-test score was 9, and the lowest was

6; in the post-test, the highest was 9, and the lowest was 6. On the second day of therapy (20 February 2025), the pre-test score was 9, and the post-test score was 8, resulting in a difference of 1 point. On the fourth day of therapy (22 February 2025), the pre-test score was 8, and the post-test score was 6, resulting in a difference of 2 points. On the fifth day of therapy (23 February 2025), the pre-test score was 7, and the post-test score was 6, resulting in a difference of 1 point. On the first day of therapy (19 February 2025), the pre-test and post-test scores were the same, both scoring 9. On the third day of therapy (21 February 2025), the pre-test and post-test scores were identical, both scoring 9. Meanwhile, on the sixth day (24 February 2025) and the seventh day (25 February 2025) of therapy, both the pre-test and post-test scores were 6. The most significant decrease occurred at the fourth session, with a difference of 2 points.

The quantitative or objective evaluation after the administration of lavender aromatherapy showed a reduction in anxiety levels. An older female resident no longer appeared restless or tense, and her sleep pattern improved, with a PSQI score of 6. The qualitative or subjective evaluation indicated that an older female resident felt her sleep was more comfortable. She stated that she felt calmer, although she occasionally remained worried about her leg condition, which is still impaired, and was concerned that she might not be able to participate in Tarawih prayers. Both the objective and subjective evaluations obtained from an older female resident were consistent with the expected outcome criteria following the implementation of lavender aromatherapy.

### 3 | Discussion

The respondent in this study is a 60-year-old female resident. She experiences impaired physical mobility following a right femoral fracture (post-fracture of the right femur). Currently, an older female resident still feels difficulty in carrying out daily activities. After assessment, she was found to have mild depression with a nursing diagnosis of anxiety. Older adults who experience physical problems or a decline in bodily function may develop anxiety and even depression, as they are unable to perform activities and fulfill their basic needs (Miller, 2023). Individuals who experience disability due to illness or injury are at risk of developing depression, which may result in

symptoms such as shock, anger, denial, and anxiety (ICOPE, 2023). Based on this, the author assumes that individuals with physical limitations are highly vulnerable to experiencing anxiety regarding their condition.

An older female resident has been residing at UPT PSTW Bondowoso for only one month and occasionally has conflicts with other residents. In addition to physical problems, psychological issues also play a significant role in the health of older adults. Elderly individuals who lack support from family members or close relatives tend to feel depressed, as they may perceive that no one cares about them (Azari et al., 2021). Based on this, the researcher believes that close relatives or surrounding individuals greatly influence the occurrence of anxiety in older adults, as they are the people who are consistently present in the older adult's daily environment.

According to research by Arjuna (2020), several therapies can be used to reduce depression levels in older adults, including aromatherapy, laughter therapy, acupressure, religious therapy, music therapy, and Reiki. Research by Maharianingsih (2022) indicates that lavender aromatherapy is effective in reducing depressive symptoms among older adults because its main essential oil components, linalool and linalyl acetate, stimulate the central nervous system, producing a relaxation effect. These compounds stimulate the cilia receptors of the olfactory nerve located in the olfactory epithelium, which then transmit calming aroma signals to the olfactory bulb through the olfactory nerve pathway. The author believes that administering lavender aromatherapy to older adults with depression and a nursing diagnosis of anxiety is highly effective in reducing both depression and anxiety levels. Therefore, the author chose this intervention for an older female resident who experiences mild depression with a nursing diagnosis of anxiety.

The administration of this aromatherapy is consistent with the study by Ramadhani (2020), which provided lavender aromatherapy once daily for seven consecutive days via inhalation of three drops of lavender oil for 10 minutes and found it effective in reducing anxiety. Research by Kyeonga Cho (2023) also explains that implementing aromatherapy for patients with depression routinely for 5–30 minutes per day over a period of 7–30 days provides a rapid and consistent response in reducing depression levels. The author concludes that the success of

lavender aromatherapy relaxation therapy for an older female resident was due to the consistent daily administration and the appropriate delivery method, namely inhalation.

The evaluation results showed that an older female resident's anxiety level decreased after receiving lavender aromatherapy seven times, along with a reduction in her level of depression. Before lavender aromatherapy, an older female resident felt helpless because she constantly needed assistance with her daily activities. She felt confused about what she should do at PSTW, appeared restless and anxious, and had poor sleep quality, with a PSQI questionnaire score of 10. After receiving lavender aromatherapy seven times within one week, an older female resident's anxiety level decreased. Her feelings of worry were reduced, her confusion moderately decreased, she no longer appeared restless, and her sleep pattern improved, as indicated by a PSQI score of 6. These findings are consistent with the study by Biahimo (2025), which demonstrated that lavender aromatherapy is effective in reducing anxiety levels. This was indicated by a decrease in the mean score from 2.64 (SD = 0.505) before the intervention to 1.82 (SD = 0.405) after the intervention, with a mean difference of 0.82 between pre- and post-intervention scores.

In the study conducted by Mehrabian (2022), the administration of lavender aromatherapy was found to be effective in reducing anxiety and depression among older adults living in nursing homes. The results showed that the mean anxiety score in the intervention group decreased from 11,94 to 6,26 ( $p < 0.0001$ ), and the mean depression score decreased from 9,94 to 4,15. The study by Sati Can (2024) found that inhaling lavender aromatherapy reduced anxiety levels, improved cognitive function, and enhanced sleep quality in older adults. The author concludes that lavender aromatherapy is highly recommended as a therapeutic intervention for older adults experiencing anxiety and even depression, given the substantial scientific evidence demonstrating its effectiveness.

The results of the difference in the Geriatric Depression Scale (GDS) scores before and after the administration of lavender aromatherapy showed a decrease in the level of depression in an older female resident. The GDS score on the first day was 9, while the score on the last day was 6. This finding is consistent with the study conducted by Putri (2021), which reported that

aromatherapy can reduce depression levels in older adults, where the average depression score before lavender aromatherapy was 10.69 and decreased to 5.54 after the intervention. Similarly, the study by Xiao Jun Yin (2024) showed that inhalation aromatherapy with lavender essential oil can help reduce depression and improve sleep quality in patients with PSD ( $p\text{-value} \leq 0.01$ ). Lavender is one of the most commonly used essential oils in aromatherapy for various clinical purposes, such as nervousness, insomnia, seizures, pain, headaches, depression, and anxiety. Inhalation of lavender aromatherapy can influence mood and behavior because essential oils interact with neurotransmission pathways that affect emotions and stimulate the brain to release chemicals such as serotonin and dopamine, which regulate mood (Yoo & Park, 2023). The author concludes that the administration of lavender aromatherapy is very helpful in reducing levels of depression and anxiety among older adults. This is supported by the findings in this Final Professional Nursing Scientific Paper, which show a difference in the GDS scores between the first day and the last day after the administration of lavender aromatherapy.

The results of this case study indicate that lavender aromatherapy may help reduce anxiety levels in older adults. Therefore, this intervention has the potential to be integrated into routine geriatric nursing practice as a simple, safe, easy-to-implement, and relatively low-cost non-pharmacological therapy. In practice, nurses may incorporate lavender aromatherapy as part of nursing interventions to manage anxiety after conducting a comprehensive assessment of the older adult's physical and psychological condition and ensuring there are no contraindications or a history of allergy to lavender essential oil.

### Limitations

This study has limitations in the research instruments used, as it only utilized the Geriatric Depression Scale (GDS) questionnaire and indicators based on the Nursing Care Outcome Based (SLKI), without using other supporting instruments such as the Depression Anxiety Stress Scale (DASS) and the Visual Analog Scale for Anxiety (VAS-A). In addition, this study is descriptive in nature, using a pre-test and post-test design with only a single sample. Therefore, it can only present results from the application of

lavender aromatherapy in one older adult, without comparison with other groups, such as a control group.

#### 4 | Conclusions

The assessment results showed that a 60-year-old female resident is a 60-year-old older adult residing in the Special Nursing Care Unit with a total care status. An older female resident has a history of a femoral fracture that occurred in October 2024. The assessment indicated that an older female resident experienced mild depression with a Geriatric Depression Scale (GDS) score of 9 before the administration of lavender aromatherapy. An older female resident reported feeling worried about her condition, feeling helpless, appearing restless, and experiencing difficulty sleeping, with a PSQI score of 10 (poor sleep quality). The nursing intervention provided to an older female resident was lavender aromatherapy for relaxation. The results of the nursing evaluation after the relaxation therapy showed a decrease in the anxiety level of an older female resident, as well as a reduction in her depression level. The initial Geriatric Depression Scale (GDS) score was 9, and after receiving lavender aromatherapy for seven days, the score decreased to 6.

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#### Author Contributions

**S:** Conceptualization, Data curation, Writing – Original draft. **RI:** Principal supervision, manuscript review, and editing. **NALA:** Co-supervision, manuscript review. **SS:** Co-supervision

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#### Ethics Statement

The data supporting this case report are not publicly available due to patient confidentiality, but can be obtained from the corresponding author upon reasonable request and with appropriate ethical approval.

**Conflicts of Interest**

The authors declare that there are no conflicts of interest regarding the publication of this case report.

**Data Availability Statement**

All data generated or analysed during this study are included within this published article. Further details are available from the corresponding author upon reasonable request, subject to patient confidentiality considerations.