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Warm Foot Bath Therapy and Jasmine Aromatherapy to Treat Insomnia in the Elderly

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Abstract:
Lack of sleep can harm the physical, mental, and emotional health, quality of life, cognitive function, and memory function of the elderly. Poor sleep quality can also directly affect health, with the risk of various problems such as hypertension, diabetes mellitus, stroke, obesity, heart disease, and several other conditions. Therefore, the need for effective non-pharmacological pain and symptom management strategies during sleep disorders is increasing. One recommended approach is relaxation therapy involving soaking the feet in warm water and jasmine aromatherapy before bedtime. This study aims to evaluate the effects of warm foot baths combined with jasmine aromatherapy on sleep quality and vital signs in older adults with insomnia. Using a case study design, the intervention was given to one participant, an 81-year-old woman diagnosed with moderate insomnia. The participant reported difficulty falling asleep, frequent waking during the night, dissatisfaction with her sleep quality, significant changes in sleep patterns, and insufficient rest. The therapy consisted of warm foot baths with jasmine aromatherapy, performed every night for five consecutive days before bedtime. To assess the effectiveness of the intervention, measurements were taken of changes in the Insomnia Severity Index (ISI) score, detailed observations of sleep patterns, and general monitoring of vital signs. The study showed a significant decrease in the ISI score from 19 (moderate insomnia) to 8 (mild insomnia). In addition, participants experienced improved sleep quality, characterized by sleeping through the night without waking up, increased sleep satisfaction, and adequate rest. Vital signs showed stabilization during the intervention period, indicating better physiological relaxation. These findings support using warm foot baths and jasmine aromatherapy as an effective nursing intervention to treat insomnia and improve sleep quality in the elderly.

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INTRODUCTION

Aging represents an inevitable and universal biological process, characterized by progressive physiological alterations across the human lifespan. This natural trajectory encompasses distinct developmental stages—childhood, adulthood, and old age—each marked by unique biological and psychosocial features (Rovira et al., 2025). As individuals transition into the geriatric phase, a constellation of age-related declines becomes increasingly evident, particularly within critical physiological systems. These cumulative changes, inherent to the aging process, significantly impact overall health resilience and functional capacity, setting the stage for a heightened vulnerability to various health challenges in later life (Khan et al., 2024).

Among the most pervasive and detrimental health concerns affecting older adults is the disruption of standard sleep patterns, with insomnia emerging as a pervasive and burdensome sleep

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disorder within this demographic. Insomnia in the elderly is frequently characterized by difficulties initiating sleep, maintaining sleep throughout the night, or experiencing non-restorative sleep despite having adequate opportunity (Tobias & Pisani, 2025; Antony et al., 2025). This condition extends beyond mere nighttime inconvenience, exerting profound negative consequences across multiple domains of well-being. Chronic sleep deprivation in older adults is strongly associated with deteriorated physical health, impaired cognitive function (including memory and executive processes), heightened emotional distress, diminished quality of life, and an increased susceptibility to falls and accidents (Mukherjee et al., 2024).

The etiology of insomnia in the elderly is multifactorial, extending beyond simple stress or lifestyle factors. Key physiological contributors include age-related declines in motor performance and coordination, which can lead to discomfort and restlessness; progressive deterioration in cognitive function impacting sleep regulation; significant hormonal shifts, particularly the well-documented reduction in nocturnal melatonin secretion crucial for circadian rhythm synchronization; and altered thermoregulation, where unexpected fluctuations in core body temperature disrupt the natural sleep-wake cycle (Van Someren, 2021). These intertwined biological changes create a complex pathophysiological landscape that contributes to the prevalence and persistence of insomnia in geriatric populations (Gao et al., 2025).

Current management strategies for insomnia traditionally encompass both pharmacological and non-pharmacological interventions. However, the use of sedative-hypnotic medications in older adults is fraught with significant limitations and risks. These include heightened sensitivity to side effects (such as dizziness, confusion, and daytime sedation), increased potential for drug interactions due to polypharmacy, the risk of dependence and tolerance, and concerns regarding long-term cognitive impairment and fall risk (Wu et al., 2025). Consequently, pharmacological approaches are often discouraged as first-line or long-term solutions for elderly patients, creating a critical gap in safe and sustainable treatment options (Riemann et al., 2023).

This therapeutic gap underscores the imperative for effective, evidence-based non-pharmacological strategies to manage insomnia in the elderly. Among the promising holistic approaches gaining attention is relaxation therapy, specifically the combination of a warm foot bath administered before bedtime alongside jasmine (Jasminum spp.) aromatherapy. Warm foot baths are theorized to promote vasodilation in the lower extremities, facilitating a rapid decline in core body temperature—a physiological signal conducive to sleep onset—while simultaneously inducing deep muscle relaxation and activating the parasympathetic nervous system (Jiang et al., 2024). Concurrently, jasmine aroma, known for its traditionally calming and mood-elevating properties, is believed to exert its effects via the olfactory-limbic pathway, potentially reducing anxiety and promoting a state of serene readiness for sleep through neurochemical modulation (Judith & Antonio, 2025).

The proposed synergistic effect of combining these two modalities holds significant theoretical promise for enhancing sleep quality in older adults. While individual studies have documented the potential benefits of warm foot baths for improving sleep parameters and the anxiolytic/sleep-promoting properties of jasmine scent in various populations, the scientific literature lacks rigorous investigation into the combined efficacy of this specific dual-therapy protocol within the geriatric population (Kuderer et al., 2022; Eissa, 2024). Existing evidence often examines these interventions in isolation or younger cohorts, failing to account for the unique physiological context and heightened vulnerability of the elderly. Understanding whether the physiological effects of thermoregulation and the neurochemical effects of aromatherapy interact additively or synergistically in older adults is crucial for optimizing the design of interventions.

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Therefore, given the high prevalence and severe consequences of insomnia in the elderly, the significant limitations of pharmacological treatments, and the compelling yet underexplored potential of combined warm foot bath therapy and jasmine aromatherapy, there exists an urgent need for targeted research. A robust scientific evaluation of this integrated non-pharmacological approach is essential to establish its efficacy, safety, and practical applicability specifically for older adults (Kwon et al., 2021). Such evidence is fundamental for advancing holistic, patient-centered nursing care, empowering clinicians with safe, effective, and sustainable tools to improve sleep quality and, consequently, the overall health and well-being of the rapidly growing geriatric population. This study directly addresses this critical gap in knowledge and practice.

STUDY DESIGN

Study setting and Timeline

This study was conducted at the PSTW Jember Technical Implementation Unit, specifically at the Seruni guesthouse. It involved elderly people over the age of 65 who had insomnia with sleep pattern disorders. The intervention consisted of warm foot bath therapy and jasmine aromatherapy, administered every night before bedtime for five consecutive days, from March 21 to 25, 2025. During this period, participants underwent therapy in a comfortable and quiet room to support relaxation. Sleep patterns and quality were evaluated each morning using a predetermined instrument, the ISI (Insomnia Severity Index).

Data Collection Procedures

Data was collected by observing sleep patterns and insomnia severity at two points: before the intervention (day one) and on the last day of the intervention (day five). Assessments were made using the Insomnia Severity Index (ISI) to measure changes in participants' insomnia scores after undergoing warm foot bath therapy and jasmine aromatherapy for 5 days. Additionally, participants were asked to record their sleep experiences and opinions about their surroundings during the intervention period to complement the qualitative data. All data were collected systematically and analyzed to evaluate the effectiveness of therapy on sleep pattern disorders in the elderly.

Ethical Considerations

This study received ethical approval from the Faculty of Nursing, University of Jember. The research was conducted in accordance with the ethical guidelines for studies involving human participants. This study involved one elderly patient suffering from insomnia, who gave their informed consent after receiving a full explanation of the purpose, procedure, benefits, and potential risks of the therapy. The confidentiality of the patient's personal data was strictly maintained, and the study results were used solely for scientific purposes. The patient was free to withdraw from participation without any consequences. During the therapy, the researcher ensured the patient's safety and comfort and monitored for any side effects or discomfort that might arise.

CLINICAL FINDINGS

The researcher conducted interviews and direct observations of one participant, an 81-year-old woman with insomnia. The patient complained of difficulty falling asleep at night, frequent waking in the early hours of the morning to urinate, and being unable to fall back asleep until morning, resulting in restless and unsatisfactory sleep. These complaints caused her to feel easily fatigued when performing activities in the morning. The patient's attempt to overcome her sleep problems

was to change her sleeping position between lying on her right and left sides, but this has not been effective.

Functional assessment revealed that the elderly individual had irregular nutritional patterns, consuming 2-3 meals a day, an elimination pattern characterized by 4-6 urinations per day, including at night, and limited activity due to fatigue and difficulty balancing her body when standing up from a squatting position. However, based on the Katz and Barthel scores, the patient remains independent in her daily activities. The patient's rest and sleep patterns are irregular, characterized by short and interrupted nighttime sleep, as well as long daytime naps, which serve as compensation.

The physical examination reveals that the older adult is in good general condition, with stable vital signs and a clear, alert consciousness. A special gerontological examination revealed intact cognitive function (SPMSQ = 1, MMSE = 27), adequate family support (APGAR = 8), no depression (GDS), and a low risk of falling (Morse Fall Scale = 50). An Insomnia Severity Index (ISI) score of 19 indicates that the older adult has moderate insomnia.

THERAPEUTIC INTERVENTION

Types of Therapeutic Intervention

The nursing interventions included non-pharmacological complementary therapies, such as warm foot baths and aromatherapy using jasmine essential oil.

Administration of Therapeutic Intervention

This study employed a single-case study design to evaluate the effects of warm foot baths combined with jasmine aromatherapy on older adults with insomnia. The study sample consisted of one participant, an 81-year-old woman who met the inclusion criteria as an older adult with moderate insomnia, as determined by her Insomnia Severity Index (ISI) score. Inclusion criteria included being 60 years or older, experiencing sleep pattern disturbances, having good hearing, experiencing short-term insomnia, having no wounds around the foot area, being non-allergic to the scent of jasmine, and being willing to participate in the intervention during the study period. The intervention was carried out by soaking the feet in warm water at a temperature of 39-40°C. A basin was filled with 2-3 liters of water, and the bowl of the aromatherapy burner was then filled with 3/4 of the container with water. Five drops of jasmine essential oil were added. The foot soak lasted 15-20 minutes per session, performed once a day, 30 minutes before bedtime, for five consecutive days. Data were collected using the Insomnia Severity Index (ISI) to measure the level of insomnia before and after the intervention. Additionally, daily sleep patterns were observed during the intervention period, and general vital signs were monitored daily to ensure the stability of the participants' physiological conditions.

Result

The results obtained over five days showed a significant improvement in the participants' sleep patterns after undergoing warm foot bath therapy with jasmine aromatherapy. The Insomnia Severity Index (ISI) score decreased from 19 to 8. This decrease in ISI score reflects a quantitative improvement in sleep quality and quantity. In addition, qualitative observations of sleep patterns revealed reduced complaints of difficulty falling asleep, a decrease in the frequency of waking up at night, and a decrease in dissatisfaction with sleep. Monitoring vital signs during the intervention period showed stability in physiological parameters, supporting a better state of relaxation. This quantitative and qualitative data is presented systematically to clarify the effectiveness of the

therapy. The following table shows changes in ISI scores and a summary of sleep pattern observations from the first to the fifth day, consistently showing improvement.

Table 1. Outcome

Measurement Day	Score ISI	Insomnia Category
Day 1	19	Moderate insomnia
Day 5	8	Mild insomnia

From the table above, the participants' Insomnia Severity Index (ISI) scores decreased significantly from 19 on the first day (moderate insomnia category) to 8 on the fifth day (mild insomnia category). This suggests that warm foot bath therapy, combined with jasmine aromatherapy, effectively improves sleep quality and reduces the severity of insomnia in the elderly during a five-day intervention period. This decrease in ISI scores indicates a marked improvement in the participants' sleep patterns, supporting this non-pharmacological therapy as an alternative for managing sleep disorders in the elderly.

DISCUSSION

This discussion explains the nursing care process for participants experiencing sleep pattern disorders in the form of insomnia. The primary focus is to answer research questions regarding the effectiveness of warm foot bath therapy and jasmine aromatherapy in improving sleep quality in the elderly. Based on the assessment results, participants experienced difficulty falling asleep, woke up frequently during the night, and were dissatisfied with their sleep quality. This condition is consistent with the theory that sleep pattern disorders in the elderly are caused by a decline in physiological function. Research indicates that age has a direct impact on sleep quality in the elderly. The aging process causes a decline in organ function, particularly in the central nervous system and melatonin production, making the elderly more susceptible to insomnia, poor sleep quality, and early morning wakening (Cardinali et al., 2022). Older adults aged 65 years and above experience a decline in sleep quality, characterized by shorter sleep duration, frequent nighttime awakenings, and changes in sleep patterns due to age-related physiological changes (Casagrande et al., 2021).

Sleep pattern disturbances in participants are caused by a decline in sleep control due to aging, which affects sleep regulation. Deep sleep phases (NREM 3 and 4) become shorter, making it easier for older adults to wake up and more difficult for them to fall back asleep. Degeneration of the suprachiasmatic nucleus in the hypothalamus reduces melatonin production, which disrupts the sleep-wake cycle (Kayabekir, 2021). A decrease in GABA-producing neurons also makes it difficult to relax for sound sleep. Sensitivity to external stimuli such as sound and light increases, leading to sleep fragmentation (Maxwell et al., 2025). Overall, these physical changes due to aging affect the sleep regulatory system, and researchers' findings align with existing theories.

The interventions applied were warm foot bath therapy and jasmine aromatherapy per the Indonesian Nursing Intervention Standards for sleep support. This therapy aims to facilitate a regular sleep cycle and reduce stress before bedtime. This therapy procedure follows the standard operating procedure (SOP) for sleep support, utilizing non-pharmacological therapies, including warm water foot baths and jasmine aromatherapy with an aromatherapy burner. Jasmine aroma contains linalool compounds, which physiologically stimulate the release of calming substances such as endorphins and serotonin (Xiong et al., 2023). This approach is an innovation in nursing practice because it combines two non-pharmacological therapies that are easily accessible and can be done independently at home, providing a safe alternative for the elderly who are vulnerable to the side

effects of sleeping pills, a five-day evaluation showed a significant improvement in sleep patterns, with the Insomnia Severity Index (ISI) score decreasing from 19 (moderate insomnia) to 8 (mild insomnia). This indicates the therapy's effectiveness in improving sleep quality and quantity, as well as reducing complaints of difficulty sleeping, frequent awakenings, and dissatisfaction with sleep. These findings are consistent with previous theories and research, which suggest that warm foot bath therapy and aromatherapy can enhance relaxation and improve sleep quality (Uslu et al., 2024; Imam et al., 2024).

The advantages of this therapy lie in its ease of implementation, high patient acceptance, and minimal risk of side effects. However, the study's limitations include the relatively short duration of the intervention and the subjective nature of outcome measurements. Communication challenges with the elderly during therapy education must also be addressed using simple language and repeating information. Individual variability in response to aromatherapy is also a factor that should be considered in the broader application of this therapy. The contribution of this study to health science is to provide additional evidence on the effectiveness of a non-pharmacological combination therapy, consisting of warm foot baths and jasmine aromatherapy, in managing insomnia in the elderly. This approach can reduce dependence on sleeping pills and enhance the overall quality of life for the elderly. Overall, this therapy is an effective, safe, and easy-to-implement nursing intervention for addressing sleep pattern disorders in the elderly, and it can be a sustainable and patient-friendly option. The participant reported feeling more relaxed and comfortable after therapy, sleeping more soundly, and waking up feeling refreshed. The ease of performing the therapy at home and the absence of disturbing side effects made the participant hope that this therapy could become part of her bedtime routine to maintain her sleep quality.

CONCLUSION

Warm foot bath therapy combined with jasmine aromatherapy shows potential as an effective non-pharmacological method for managing sleep pattern disorders in the elderly. This approach is simple, easy to perform, and low-cost, making it a safe and comfortable alternative to sleeping medications. Based on the significant results in improving sleep quality and patterns, this therapy should be integrated into routine nursing practice as part of holistic elderly care. Furthermore, further research with larger samples is needed to strengthen the evidence of its effectiveness and expand its application by adding participants and evaluating nap patterns and morning-to-noon activities.

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