GENIUS JOURNAL
general nursing science journal
e-ISSN: 2723-7729
Vol. 8 No. 1 PP. 7-14 E-ISSN 2723-7729

The Effect of Lavender Aromatherapy on Insomnia among the Elderly at Al-Maun Muhammadiyah Elderly Center

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DOI: https://doi.org/10.56359/gj.v8i1.858

ABSTRACT

Introduction: Insomnia is a sleep disorder characterized by difficulty falling asleep, difficulty maintaining sleep, and sleep that does not provide a feeling of refreshment or adequate rest, especially if it lasts for a month or more. At the Al-Maun Muhammadiyah elderly care center, there are 10 elderly people experiencing insomnia.
Objective: This study aims to determine the effect of lavender aromatherapy on elderly people with insomnia at the Al-Maun Muhammadiyah elderly care center in Belitung Regency, Tanjungpandan District, in 2025.
Method: This study was conducted using a pre-experimental design, namely with a one-group pretest and posttest model and Shapiro-Wilk with the results in the form of univariate and bivariate analysis. The population in this study were elderly aged 60-90 years who lived in the Al-Maun Muhammadiyah elderly home, Belitung Regency, Tanjungpandan District in 2025. The sample in this study was a portion of the research population, totaling 10
Result: The results of this study showed an average insomnia score before treatment of 26.10 ± 1.449, which decreased to 17.60 ± 2.271 after treatment. A p-value of 0.005 indicates statistical significance ($p<0.05$).
Conclusion: The conclusion of this study is that lavender aromatherapy has an effect on elderly people with insomnia at the Al-Maun Muhammadiyah Elderly Home in Belitung Regency, Tanjungpandan District, in 2025.

Keywords: elderly, insomnia, lavender

Introduction

Elderly (senior age) is a period of decline. This can be seen in the significant decline in cognitive abilities that accompany the aging process, such as decreased language skills, memory, and attention deficits. Elderly is defined as the final stage of human life, namely those who have reached the age of 60 (Syafyu Sari & Afnuhazi, 2022).

According to Geriatrics (2023), in 2020, the global population was aging rapidly, with 1 billion people globally being elderly, and the number of older adults worldwide is estimated to reach 1.4 billion by 2030. By 2025, the population of older adults aged 60 and over will double to 2.1 billion. Meanwhile, the population aged 80 and over will reach 426 million between 2020 and 2025.

According to Sari et al. (2023), Indonesia has now entered a phase of an aging population structure, and this transition began in 2021. Over a ten-year period, from 2010 to 2022, the proportion of elderly people increased by approximately 4 percent, reaching 11.75 percent. Based on the results of the 2023 National Socioeconomic Survey (Susenas), the number of people aged 60 and over was recorded at 12.3 percent of the total national population. This figure is estimated to increase dramatically to nearly 22 percent by 2025.

According to data from the Central Statistics Agency (BPS) and the Population and Civil Registration Office, the total population of the Bangka Belitung Islands Province in 2022 was recorded at 1,470,405 people. This figure represents an increase compared to the previous year, 2021, when the population was 1,463,735. Meanwhile, the elderly population aged 60 years and over was recorded at 126,443 (Health Profile of the Bangka Belitung Islands Provincial Health Office, 2022). Based on estimated 2020 data, the number of elderly residents in the Belitung region reached approximately 16,682, representing approximately 9.6% of the total population (Belitung Health Office, 2020).

As older adults, seniors will experience various physical and psychological changes. Some of these changes in physical appearance are a natural part of the aging process, such as decreased sensory function, reduced immunity, and lack of sleep. Yet, sleep is crucial and essential for maintaining or improving health, enhancing memory, restoring the body, and reducing stress, anxiety, and depression (Fauziah & Suib, 2024).

Insomnia is the most common condition in older adults. If a person's sleep needs are not optimally met, this can impact central nervous system function and trigger persistent anxiety and even lead to abnormal behavior. The effects of insomnia can lead to depression, heart disease, nausea, headaches, and dizziness. Insomnia often occurs in the elderly, characterized by an inability to fall asleep, frequent nighttime awakenings, waking too early, or restless sleep. The prevalence of insomnia in the elderly is relatively high, around 67 percent annually (Syafyu Sari & Afnuhazi, 2022). In Indonesia, only seven percent of people aged 40 and over complain of insomnia, while 22% of those aged 70 and over complain of sleep disturbances at night (Bastiar & Lawang, 2023).

Insomnia is a sleep disorder characterized by difficulty falling asleep, difficulty maintaining sleep, and sleep that does not provide a feeling of refreshment or adequate rest, especially if it lasts for a month or more. This problem is common in developing countries. Generally, the main triggers of insomnia are anxiety and mood disorders such as depression. This disorder is the most common type of sleep disorder experienced by the elderly, with a prevalence of around 67%. Furthermore, approximately 18% of the global population has experienced insomnia. In 2014, the prevalence of sleep disorders in Indonesia was around 10%, meaning 30% of Indonesians over 50 years old suffered from insomnia, or approximately 28 million of Indonesia's 238 million population (Mindayani et al., 2021).

Improving sleep quality in the elderly can be achieved through pharmacological and non-pharmacological approaches. Non-pharmacological therapy is an alternative with minimal side effects. One example is aromatherapy, which refers to a non-conventional form of treatment that uses volatile plant fluids, such as essential oils and other natural aromatic substances. Its primary goal is to impact a person's emotional and physical health (Melina Firda Andani & Arif, 2023).

Symptoms of insomnia in the elderly can be treated with fragrant essential oils from flowers, such as lavender oil aromatherapy, obtained from the distillation of flowers. One function of lavender essential oil is to facilitate recovery from insomnia. The gentle aroma of lavender is due to the effects of linalool acetate in lavender vapor, which helps relax and unwind tense nervous and muscle systems. Inhaling lavender aroma increases alpha wave frequency, which can promote relaxation and reduce insomnia. Lavender aromatherapy can also aid in body health adjustments and is effective for treating headaches, stress, muscle cramps, and heart regulation (Mufarrohatul Amanah et al., 2022).

Aromatherapy affects the olfactory system by stimulating the nerve endings located at the back of the nose, which then transmit these stimuli to the brain. One frequently used aromatherapy is lavender (Lavandula angustifolia). This is because its main ingredient, lavender aromatherapy, has an anti-anxiety effect. This is very helpful for people suffering from insomnia and improving sleep quality. Lavender aromatherapy can also be used by inhalation to experience the benefits of improved sleep quality (Fauziah & Suib, 2024).

Various studies have shown that aromatherapy oils have multiple benefits, and medical research also reveals that inhaled aromas can significantly influence feelings. Scents have a direct influence on brain stimulation. Inhaling lavender increases the frequency of alpha waves, resulting in a relaxed body. Inhaling lavender aromatherapy is also useful for calming feelings of comfort, openness, stress, anxiety, and can even treat insomnia and sleep disorders (Bastiar & Lawang, 2023).

Based on the results of a researcher survey on December 12, 2024 at the Al-Maun Muhammadiyah elderly home. There were 12 elderly people and 10 people experienced insomnia. Respondents said they had difficulty starting to sleep, often woke up at night and did not sleep soundly. On January 8, 2025, researchers conducted a second survey to find out how many elderly people liked and disliked the scent of lavender. The results of the survey that researchers obtained were that all elderly people liked the scent of lavender, researchers used eucalyptus oil with lavender aroma as an example of lavender aroma. And researchers have also checked the nerve function related to the intervention of the olfactory sensory nerve by closing the respondents' eyes and asking respondents to distinguish between the aroma of coffee and the aroma of tea. The results obtained by all respondents could distinguish the aroma, which means all respondents still have a good sense of smell. Based on the data obtained, the researcher is interested in conducting further research on "The Effect of Lavender Aromatherapy on the Elderly with Insomnia at the Maun Muhammadiyah Elderly Home, Belitung Regency" Tanjungpandan District in 2025". To get a real picture of how "The Effect of Lavender Aromatherapy on the Elderly with Insomnia at the Maun Muhammadiyah Elderly Home, Belitung Regency" Tanjungpandan District in 2025".

Objective

Insomnia is a sleep disorder characterized by difficulty falling asleep, difficulty maintaining sleep, and sleep that does not provide a feeling of refreshment or adequate rest, especially if it lasts for a month or more. At the Al-Maun Muhammadiyah elderly care center, there are 10 elderly people experiencing insomnia. This study aims to determine the effect of lavender aromatherapy on elderly people with insomnia at the Al-Maun Muhammadiyah elderly care center in Belitung Regency, Tanjungpandan District, in 2025.

Method

This study employed a quantitative research approach using a pre-experimental one-group pretest and posttest design to determine the effect of lavender aromatherapy on insomnia among older adults. The study was conducted at the Al-Maun Muhammadiyah Elderly Center in 2025.

The population consisted of all elderly residents aged 60–90 years living at the elderly center who experienced insomnia symptoms. The total population and sample in this study were 10 respondents selected using a total sampling technique. Inclusion criteria included elderly individuals aged 60 years and above, experiencing insomnia, able to communicate well, having a normal olfactory function, and willing to participate in the study. Respondents with severe cognitive impairment, severe illness, or allergies to lavender aromatherapy were excluded from the study.

Prior to the intervention, respondents' insomnia levels were measured using an insomnia assessment questionnaire as a pretest. The intervention was conducted by administering lavender aromatherapy through inhalation using lavender spray 5 minutes before bedtime according to the standard operating procedure. The aromatherapy intervention was provided regularly during the intervention period under the supervision of the researcher and nursing home staff. After completion of the intervention, respondents' insomnia levels were reassessed using the same questionnaire as a posttest.

Data analysis was performed using univariate and bivariate analyses. Univariate analysis was used to describe respondent characteristics and the mean insomnia scores before and after the intervention. Normality testing was conducted using the Shapiro, Wilk test. Since the data were normally distributed, bivariate analysis was conducted using the Paired Sample t-test to determine the effect of lavender aromatherapy on insomnia levels among the elderly. Statistical significance was determined at a p-value <0.05 with a 95% confidence interval.

Result

Paired t-test before and after lavender aromatherapy intervention for elderly with insomnia at the Al-Maun Muhammadiyah Nursing Home, Belitung Regency, Tanjungpandan District, 2025

Table 1. Pretest and Posttest Insomnia Scores Among Elderly After Lavender Aromatherapy

Aromatherapy	Mean ± SD	P
Pretest	26.10 ±1.449	0.005
Postest	17.60±2.271	

Table above shows a significant difference in insomnia levels before and after aromatherapy administration. The average insomnia score before treatment was 26.10 ± 1.449 and after treatment decreased to 17.60 ± 2.271. The p-value of 0.005 indicates statistical significance ($p < 0.05$), indicating that lavender aromatherapy is effective in reducing insomnia levels in the elderly. So Ho is rejected and Ha is accepted, which means there is an effect of lavender aromatherapy on the elderly with insomnia at the Al-Maun Muhammadiyah elderly home, Belitung Regency, Tanjungpandan District in 2025.

Discussion

Based on the results of the study using paired t-test, the results showed that there was a significant difference in the level of insomnia before and after the administration of aromatherapy, with an average insomnia score before treatment of 26.10 ± 1.449 and after treatment decreased to 17.60 ± 2.271. The p value = 0.005 indicates that the condition is statistically significant ($p <0.05$), which indicates that lavender aromatherapy is effective in reducing the level of insomnia in the elderly. Therefore, Ho is rejected and Ha is accepted, which means there is an effect of lavender aromatherapy on elderly people with insomnia at the Al-Maun Muhammadiyah elderly care center, Belitung Regency, Tanjungpandan District in 2025.

This study is also in line with the study conducted by Lia Effi Noviri & Yuniati Yuniati, (2024) entitled lavender aromatherapy as a non-pharmacological intervention for insomnia in the elderly, which showed results with a paired t-test obtained a significant difference in the level of insomnia before and after the administration of aromatherapy with an average insomnia score before the intervention of 25.47 ± 3.67 and after the intervention decreased to 24.37 ± 3.86 with a p value = 0.001 indicating that this condition is statistically significant with ($p = 0.05$) which identifies that lavender aromatherapy is effective in reducing the level of insomnia in the elderly and aromatherapy can be an alternative in improving sleep quality in the elderly.

This is also supported by research conducted by Damayanti & Hadiati (2019), entitled "The Effect of Lavender Aromatherapy on Insomnia in the Elderly." The paired t-test showed an average score of 20.87±8.744 before treatment and 29.47±6.606 after treatment, with a significance level of 0.000. A significant value of $p<0.05$ indicates that lavender aromatherapy has an effect on insomnia in the elderly.

These results are supported by research conducted by Syafyu Sari & Afnuhazi (2022). Regarding the effect of lavender aromatherapy on sleep quality in the elderly, they found that before lavender aromatherapy, 21.5 patients had poor sleep quality with a standard deviation of 0.632, while after lavender aromatherapy, sleep quality improved, with an average decrease of 18.38. This demonstrates the potential for lavender aromatherapy to treat insomnia in the elderly.

This research aligns with research conducted by Mufarrohatul Amanah et al. (2022) on the reduction of insomnia in the elderly. The results showed a p-value of 0.017, indicating

that the level of insomnia in the elderly before the lavender aromatherapy intervention was severe, while after the lavender aromatherapy intervention, the majority of the elderly experienced moderate insomnia. This indicates that lavender aromatherapy is very effective in reducing insomnia in the elderly.

This research is also supported by research conducted by Junita et al. (2020), entitled "The Effect of Lavender Aromatherapy on Insomnia in the Elderly." The results showed that the mean before lavender aromatherapy was 48.50 and after lavender aromatherapy was 43.29. The p-value was 0.01 < α = 0.05, indicating a statistically significant difference in the reduction of insomnia before and after lavender aromatherapy in the elderly.

This research is also supported by Beno et al. (2022). The results of the study showed that there was a decrease in the level of insomnia in the elderly by using the lavender aromatherapy spray method compared to candles, with the results obtained in the spray group being p-value 0.00 < α = 0.05, so it was concluded that there was effectiveness in providing lavender aromatherapy with the spray method in reducing insomnia in the elderly.

According to the researcher's assumption, the quality of sleep in the elderly after being given lavender aroma was generally good. By giving the lavender aroma, it can provide comfort to the elderly, making them more relaxed, calm, and making them fall asleep faster. For the elderly who experienced an effect after being given lavender aroma, this was due to the seriousness and orderliness of the elderly in carrying out this therapy, or the therapy was carried out in accordance with the SOP (standard operating procedures) that had been implemented. The researcher arrived at the nursing home at a maximum of 6:30 PM WIB. In this study, the implementation given to the elderly was lavender aromatherapy which was given one intervention (2-3 sprays) 5 minutes before the elderly went to bed (the elderly slept at a minimum of 7:00 PM and a maximum of 8:30 PM). After all the elderly had received the lavender aromatherapy intervention, the researcher returned home. The researcher did not monitor directly at the nursing home but asked for assistance from the nursing home administrator.

Conclusion

The study found that factors such as age, gender, education, occupation, and cognitive impairment were associated with the incidence of insomnia among elderly individuals before the administration of lavender aromatherapy at the Al-Maun Muhammadiyah Elderly Home in 2025. In addition, there were significant differences in insomnia levels before and after the administration of lavender aromatherapy, indicating that lavender aromatherapy had an effect on reducing insomnia among the elderly residents.

Authors' contribution

Each author contributed equally in all the parts of the research. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

Conflict of interest

The researchers stated that there is no conflict of interest related to the implementation and publication of the results of this research. The entire research process, from planning, data collection, analysis, to report preparation, was carried out independently without any influence or pressure from any third party. A commitment to research ethics is upheld throughout the research process, ensuring transparency, accuracy and honesty in

reporting results. Respondents' participation was voluntary with informed consent, and their confidentiality and privacy were maintained in accordance with applicable research ethics standards. With this statement, researchers hope that the research results can be trusted and used as a valid reference for the development of science and health practices related to ethnomedicine and reproductive health.

Funding

This research is not funded by any party and is not intended for any financial gain.

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