

LAVENDER AROMATHERAPY TO REDUCE ANXIETY AMONG ELDERLY RESIDENTS AT A NURSING HOME IN INDRAMAYU

Indra Ruswadi¹ , Jummai Wennie² , Masliha³ 

¹Department of Health, Politeknik Negeri Indramayu, Indonesia

²Department of Nursing, Babcock University of Nigeria

³Department of Nursing, STIKes Aksari Indramayu, Indonesia

ARTICLE INFO

Article history

Submitted : 2025-04-10

Revised : 2026-05-13

Accepted : 2026-08-22

Keywords:

Lavender aromatherapy;
Anxiety; Elderly; Nursing
home; Complementary
Therapy

ABSTRACT

Anxiety among older adults is an increasingly common mental health problem, particularly among elderly individuals living in nursing homes. Long-term use of pharmacological therapy may lead to various side effects, making non-pharmacological approaches an important alternative in geriatric care. Lavender aromatherapy has been recognized as a complementary intervention that may help reduce anxiety symptoms. This study aimed to analyze the effectiveness of lavender aromatherapy in reducing anxiety levels among elderly residents at a nursing home in Indramayu Regency. Methods: This study employed a pre-experimental approach using a one-group pre-test–post-test design conducted from June to December 2024 at a nursing home in Indramayu Regency. A total of 30 elderly participants were selected purposively based on inclusion criteria, including mild to moderate anxiety levels, the ability to communicate effectively, and willingness to participate in the intervention sessions. Anxiety levels were assessed using a questionnaire that had been tested for validity and reliability (Cronbach's alpha = 0.706). Prior to analysis using the paired t-test, data normality was assessed and confirmed to meet the normal distribution assumption. Results: The findings showed a statistically significant reduction in anxiety levels following the lavender aromatherapy intervention ($p < 0.05$). Before the intervention, 13.3% of participants experienced severe anxiety, 60.0% had moderate anxiety, and 26.7% had mild anxiety. After the intervention, 66.7% of participants were categorized as having mild anxiety, 33.3% experienced moderate anxiety, and no participants remained in the severe anxiety category. These results indicate an improvement in anxiety levels among elderly participants after the intervention. Conclusion: Lavender aromatherapy may serve as a complementary non-pharmacological intervention that can help reduce anxiety levels among elderly individuals living in nursing homes. This intervention may be considered as part of psychological support programs in geriatric care, although further studies using more rigorous research designs are needed to confirm its effectiveness.

ABSTRAK

Kecemasan pada lansia merupakan masalah kesehatan mental yang semakin meningkat, terutama pada individu yang tinggal di panti wreda. Penggunaan terapi farmakologis dalam jangka panjang berpotensi menimbulkan berbagai efek samping, sehingga pendekatan non-farmakologis menjadi alternatif yang penting dalam pelayanan geriatri. Aromaterapi lavender dikenal sebagai salah satu terapi komplementer yang berpotensi membantu mengurangi kecemasan. Penelitian ini bertujuan untuk menganalisis efektivitas aromaterapi lavender dalam menurunkan tingkat kecemasan pada lansia di panti wreda Kabupaten Indramayu. Metode: Penelitian ini menggunakan desain pre-eksperimental dengan pendekatan one-group pre-test–post-test design yang dilaksanakan pada Juni hingga Desember 2024 di salah satu panti wreda di Kabupaten Indramayu. Sampel penelitian berjumlah 30 lansia yang dipilih secara purposive berdasarkan kriteria inklusi, yaitu mengalami kecemasan ringan hingga sedang, mampu berkomunikasi dengan baik, dan bersedia mengikuti seluruh rangkaian intervensi. Tingkat kecemasan diukur menggunakan kuesioner yang telah diuji validitas dan reliabilitasnya (Cronbach's alpha = 0,706). Sebelum dilakukan analisis menggunakan uji t berpasangan, data terlebih dahulu diuji normalitasnya dan menunjukkan distribusi normal. Hasil: Penelitian menunjukkan adanya penurunan tingkat kecemasan yang signifikan setelah pemberian intervensi aromaterapi lavender ($p < 0,05$). Sebelum intervensi, sebanyak 13,3% responden mengalami kecemasan berat, 60,0% mengalami kecemasan sedang, dan 26,7% mengalami kecemasan ringan. Setelah intervensi, sebanyak 66,7% responden

Kata Kunci:

Aromaterapi lavender;
Kecemasan; Lansia;
Panti wreda; Terapi
komplementer

This is an open access
article under the **CC BY-
SA** license:



berada pada kategori kecemasan ringan, 33,3% mengalami kecemasan sedang, dan tidak terdapat responden dengan kecemasan berat. Hasil tersebut menunjukkan adanya perbaikan tingkat kecemasan pada lansia setelah diberikan intervensi. Kesimpulan: Aromaterapi lavender berpotensi menjadi terapi komplementer non-farmakologis yang dapat membantu menurunkan tingkat kecemasan pada lansia di panti wreda. Intervensi ini dapat dipertimbangkan sebagai bagian dari dukungan psikologis dalam pelayanan geriatri, meskipun penelitian lebih lanjut dengan desain yang lebih kuat masih diperlukan untuk mengonfirmasi efektivitasnya.

✉ **Corresponding Author:**

Indra Ruswadi

Email: indra@polindra.ac.id

INTRODUCTION

Aging is a natural and irreversible process characterized by the progressive decline of physiological, psychological, and social functions (Li et al., 2021). As individuals grow older, they experience various degenerative changes that increase vulnerability to both physical and mental health problems (Suryani & Lestari, 2018)(Prudena et al., 2026). According to the World Health Organization, there are currently more than 1 billion people aged 60 years and above worldwide, and this number is projected to reach approximately 2.1 billion by 2050 (Gianfredi et al., 2025). This rapid demographic transition has increased the burden of geriatric healthcare services, particularly in the areas of mental health care, long-term care, and psychosocial support for older adults (Reynolds et al., 2022)(Mangunsong et al., 2025). Older individuals are more likely to experience psychological problems such as anxiety, depression, loneliness, and emotional stress due to declining physical function, social isolation, and reduced independence (Donovan & Blazer, 2020)(Upasen et al., 2025). These conditions present significant challenges for health systems, especially in countries facing rapid population aging without sufficient healthcare infrastructure and policy preparedness (Mangunsong et al., 2025).

In Indonesia, the aging population has also been increasing significantly. Based on data from the Indonesian Central Bureau of Statistics (BPS), the proportion of older adults reached 11.75% in 2023 and is projected to rise to 19.2% by 2045 (OCDE, 2024). This demographic transition reflects Indonesia's progression toward an aging society and increases the demand for comprehensive geriatric healthcare services (Yon et al., 2017)(Upasen et al., 2025). In West Java Province alone, approximately 4.6 million individuals are categorized as elderly, making it the province with the largest older adult population in Indonesia (Asian Development Bank, 2024). At the regional level, Indramayu Regency recorded around 340,000 older adults in 2023, representing approximately 12.6% of its total population (Indramayu Regency Population: 1.95 Million (2024 Data), n.d.). A considerable number of these older adults live in institutional care settings such as nursing homes (panti wreda), where they may be more vulnerable to physical deterioration, social isolation, loneliness, and psychological disorders, including anxiety and depression, due to reduced family interaction and limited social engagement (Guarnera et al., 2023)(Azizah et al., 2026).

Among the various mental health problems experienced by older adults, anxiety is recognized as one of the most common and debilitating conditions (WHO, 2017)(Whitmore et al., 2024). Globally, the World Health Organization estimates that approximately 14% of adults aged 60 years and older live with a mental disorder, with anxiety disorders contributing substantially to this burden (Islam et al., 2025). In Indonesia, several studies have also reported a high prevalence of anxiety among elderly populations, particularly among those living in institutional care settings. Anxiety in older adults may arise from multiple factors, including chronic illness, functional decline, bereavement, loneliness, reduced autonomy, and fear of death (Widiani et al., 2023)(Grajeda-León et al., 2025). Despite its prevalence, anxiety symptoms in the elderly are frequently overlooked or underreported, especially in nursing homes where healthcare services tend to focus more on physical conditions than psychological well-being (Manungkalit & Sari, 2020)(Shafiee et al., 2025). Previous studies have shown that anxiety can significantly reduce quality of life by disrupting sleep patterns, appetite, emotional stability, cognitive functioning, and social interaction (Morin et al., 2021)(Y. Wang et al., 2023). In institutional

environments, limited family interaction, feelings of abandonment, and monotonous daily routines may further intensify these psychological disturbances (Chistell et al., 2023)(Surendran & Karibeeran, 2025).

Previous studies reported that a considerable proportion of elderly individuals living in Indonesian institutional care facilities experience moderate to severe anxiety (Handajani et al., 2022)(Pusvita et al., 2025). Despite its high prevalence, anxiety among older adults remains an underrecognized issue in geriatric nursing practice, with many nursing homes lacking trained mental health personnel and structured psychological support programs (Jalali et al., 2024). The most common clinical approach to managing anxiety involves pharmacological therapies, particularly benzodiazepines and selective serotonin reuptake inhibitors (SSRIs) (Garakani et al., 2020)(L. Ren et al., 2024). Although these medications may provide temporary relief of anxiety symptoms, prolonged use in elderly patients is associated with several adverse effects, including sedation, increased risk of falls, drug dependency, and complications related to polypharmacy, especially among those with multiple comorbidities (Ngcobo, 2025)(Jonathan et al., 2025). These limitations highlight the importance of exploring complementary and non-pharmacological interventions that are safer, more holistic, and better suited to the long-term psychological care needs of older adults in institutional settings (Md Hussin et al., 2023)(Jonathan et al., 2025).

In response to these challenges, there has been increasing interest in safe, cost-effective, and non-pharmacological interventions that align with the holistic principles of gerontological nursing (Tsegaye et al., 2023)(Sutanto, 2025). One complementary approach that has received considerable attention is lavender aromatherapy (*Lavandula angustifolia*), which is widely recognized for its anxiolytic, sedative, and mood-enhancing properties (Hedigan et al., 2023)(Manzoor et al., 2025). Lavender essential oil can be administered through several methods, including inhalation, diffusion, massage, or topical application, with inhalation being the most commonly used technique for anxiety management (Donelli et al., 2019)(Yoo & Park, 2023). Lavender contains active compounds such as linalool and linalyl acetate, which are believed to influence the central nervous system through olfactory stimulation and activation of the limbic system, thereby reducing sympathetic nervous system activity (Bavarsad et al., 2023)(Batiha et al., 2023). Previous studies have shown that inhalation of lavender essential oil may reduce cortisol levels, heart rate, and subjective anxiety scores in various populations, including postoperative patients, pregnant women, and individuals with generalized anxiety disorder (Yoo & Park, 2023).

Although the benefits of lavender aromatherapy have been reported in several international studies, empirical evidence within the Indonesian context, particularly among elderly individuals living in institutional care settings, remains limited (Hedigan et al., 2023)(Maddocks, 2023). Existing studies in Indonesia are generally constrained by methodological limitations, including small sample sizes, short intervention durations, the absence of control groups, and limited evaluation of long-term outcomes (Ilmaskal et al., 2026)(Naria et al., 2026). These limitations reduce the generalizability of the findings and make it difficult to systematically implement lavender aromatherapy in geriatric care practice (Y. R. Wang et al., 2025)(Shen et al., 2025). In addition, most previous studies have not specifically examined elderly populations in regions such as West Java or Indramayu, where demographic characteristics, cultural perspectives, and healthcare resources may differ from those in other areas of Indonesia (Nandi et al., 2025). Therefore, context-specific research is needed to further evaluate the feasibility, effectiveness, and practical applicability of complementary therapies in real-world elderly care settings (Coles et al., 2020)(Ahn et al., 2025).

The implementation of lavender aromatherapy in nursing homes represents a promising strategy to improve psychological well-being among older adults while potentially reducing dependence on pharmacological therapies and improving the quality of geriatric care (Coles et al., 2020)(Mehrabian et al., 2022). As a low-cost, non-invasive, and relatively simple intervention, lavender aromatherapy can be incorporated into daily care routines without requiring sophisticated equipment (Mehrabian et al., 2022). Nevertheless, several practical barriers may influence its implementation in institutional care settings, including limited caregiver training, variations in staff readiness, and differences in acceptance among elderly residents due to personal preferences or sensitivity to certain aromas (Pich, 2018)(Suvish et al., 2025). Despite these challenges, lavender aromatherapy remains consistent with the person-centered care approach promoted by international geriatric organizations, which emphasizes individualized, respectful, and holistic care for older adults (Mortada, 2024)(Suvish et al., 2025).

Therefore, this study was conducted to examine the effectiveness of lavender aromatherapy in reducing anxiety among elderly individuals living in institutional care settings in Indramayu. The findings are expected to strengthen the evidence supporting integrative nursing practices and encourage the broader adoption of complementary interventions within Indonesia's elderly care system. In addition, this study seeks to address the limited evidence regarding aromatherapy use among institutionalized older adults in Indonesia. Using a pre-experimental one-group pretest–posttest design, this research provides context-specific findings that may contribute to the development of innovative and holistic mental health interventions for the elderly population.

METHOD

Type of Research

This study employed a pre-experimental one-group pretest–posttest design to evaluate changes in anxiety levels among elderly participants before and after receiving the lavender aromatherapy intervention. This design was selected due to the limited number of eligible elderly residents in the nursing home and ethical considerations related to withholding potentially beneficial non-pharmacological interventions from vulnerable older adults. By comparing anxiety levels before and after the intervention within the same group, the study aimed to assess the potential effectiveness of lavender aromatherapy in a real-world geriatric care setting.

Place and Time of Research

The research was conducted at a nursing home (Panti Wreda) in Indramayu Regency, West Java, Indonesia, from June to December 2024. The facility is a government-supported elderly care institution that accommodates approximately 45 older adults with varying levels of physical dependence and psychosocial needs. Most residents are aged 60 years and above and require assistance with daily activities, social adaptation, and emotional support. The nursing home was selected as the study site because anxiety-related symptoms and psychosocial adjustment problems are commonly observed among its residents.

Population and Sample

The population of this study consisted of elderly residents living in the selected nursing home. Participants were recruited using purposive sampling based on the following inclusion criteria: (1) aged 60 years and above, (2) able to communicate effectively, (3) experiencing mild to moderate anxiety based on the initial screening assessment, and (4) willing to participate in the study. The exclusion criteria included elderly individuals with severe cognitive impairment, hearing disorders that could interfere with the intervention process, severe psychiatric conditions, or unstable medical conditions requiring intensive treatment. A total of 30 participants who met the eligibility criteria were included in the study. The sample size was determined based on the availability of eligible participants within the facility during the study period and the feasibility of conducting repeated intervention sessions among elderly residents. Prior to data collection, ethical approval was obtained from the institutional ethics committee, and all participants received an explanation regarding the study objectives, procedures, potential benefits, and their rights as participants. Written informed consent was obtained from all respondents before participation.

Data Collection

Data were collected using a standardized anxiety questionnaire that had been tested for validity and reliability. The questionnaire was adapted from the Geriatric Anxiety Scale and had a Cronbach's alpha coefficient of 0.706, indicating acceptable internal consistency. The questionnaire was administered before and after the aromatherapy intervention to measure changes in anxiety levels.

Data Analysis and Processing

The data analysis involved both descriptive and inferential statistical methods. Descriptive analysis was used to present the distribution, means, and standard deviations of demographic variables and anxiety levels. To evaluate the effectiveness of lavender aromatherapy, a paired samples t-test was applied using SPSS version 25, with a p-value of less than 0.05 considered statistically significant.

RESULT

Table 1. Distribution of Respondents by Age Group (n=30)

Age Group (years)	Frequency (n)	Percentage (%)
60–69	12	40.0
70–79	14	46.7
≥80	4	13.3
Total	30	100.0

Table 1 shows that the majority of participants (46.7%) were aged between 70 and 79 years, followed by the 60–69 age group (40.0%). Only 13.3% were aged 80 years or older. This distribution indicates that most elderly residents were within the younger to older elderly age groups.

Table 2. Distribution of Respondents by Gender and Length of Stay (n=30)

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	10	33.3
	Female	20	66.7
Length of Stay	<1 year	6	20.0
	1–3 years	15	50.0
	>3 years	9	30.0

Table 2 describes demographic details related to gender and length of stay in the nursing home. The majority of respondents were female (66.7%). Most participants had been residing in the facility for 1–3 years (50%), indicating moderate exposure and adaptation to the institutional environment.

Table 3. Respondents' Anxiety Level Before and After Lavender Aromatherapy (n=30)

Anxiety Level	Before Intervention (n/%)	After Intervention (n/%)
Mild Anxiety	8 (26.7%)	20 (66.7%)
Moderate Anxiety	18 (60.0%)	10 (33.3%)
Severe Anxiety	4 (13.3%)	0 (0.0%)
Total	30 (100%)	30 (100%)

Table 3 presents the anxiety levels of participants before and after the lavender aromatherapy intervention. Before the intervention, most respondents experienced moderate anxiety (60%). After the intervention, the majority had mild anxiety (66.7%), and none experienced severe anxiety. This suggests a positive trend toward reduced anxiety levels after the intervention.

Table 4. Paired t-Test Results of Anxiety Scores Before and After Intervention

Variable	Mean ± SD (Pre)	Mean ± SD (Post)	Mean Difference	p-value
Anxiety Score (0–100 scale)	65.47 ± 8.15	48.23 ± 7.92	17.24	0.000***

Table 4 shows the results of the paired t-test comparing anxiety scores before and after the intervention. The mean anxiety score decreased from 65.47 to 48.23, with a mean reduction of 17.24 points, and the result was statistically significant ($p < 0.05$). These findings indicate that lavender aromatherapy was associated with a significant reduction in anxiety levels among elderly individuals.

DISCUSSION

The data presented in this study show a dominant age group between 70–79 years, highlighting a critical phase where anxiety is often amplified due to the natural process of aging. Aging is not merely a biological progression, but a multifactorial experience encompassing physical, psychological, and social transitions. The reduction in cognitive functions, physical limitations, declining independence, and social isolation are commonly reported triggers of anxiety in the elderly population (Guarnera et al.,

2023). These changes may be subtle at first but can significantly impact emotional health, especially when individuals are placed in unfamiliar environments like Panti Werda (nursing homes).

The transition from independent living to institutional care is often associated with considerable psychological stress among older adults (Polacsek & Woolford, 2022)(Scott et al., 2024). Yuan et al. reported that more than 60% of nursing home residents experienced elevated anxiety levels during the first two years of residence (Yuan et al., 2022). This condition is commonly related to feelings of abandonment, disruption of daily routines, reduced autonomy, and difficulties adapting to a new social environment (Faridha & Widiasih, 2024). In addition to age-related physiological changes, these environmental and psychosocial stressors may worsen emotional vulnerability among elderly individuals (Uchino & Rook, 2020)(Minton et al., 2023). Therefore, effective supportive interventions are needed to help reduce anxiety and improve psychological well-being in this population (Chowdhury & Chakraborty, 2017)(Kubzansky et al., 2023). One promising approach is the use of non-pharmacological complementary therapies, including lavender aromatherapy, which offers a simple and minimally invasive strategy for anxiety management in elderly care settings (Istifada et al., 2026)(Caballero-Gallardo et al., 2025).

Furthermore, Indonesia is currently experiencing a rapid increase in its elderly population, making geriatric mental health programs increasingly important (Basrowi et al., 2021)(Hariastuti et al., 2024). The Indonesian Central Bureau of Statistics (BPS) projects that by 2045, approximately one in five Indonesians will be aged over 60 years (Mas'ul, 2023). This demographic trend highlights the need for healthcare policies that support healthy and dignified aging, including the use of non-pharmacological interventions such as aromatherapy (Sui et al., 2025).

In this study, 66.7% of respondents were female, reflecting the global pattern of higher life expectancy among women. Previous studies have shown that women tend to live longer than men and are more likely to utilize healthcare services or reside in long-term care facilities (Carmel, 2019)(Golinelli et al., 2025). However, increased longevity does not necessarily indicate better psychological well-being. Older women often experience additional emotional stress related to widowhood, separation from family members, and caregiving burdens accumulated earlier in life (Recksiedler et al., 2022)(Mu et al., 2025).

In this study, most participants had lived in the nursing home for 1 to 3 years, which represents an important adjustment period for elderly residents. During this stage, psychological stress may either decrease or become more pronounced depending on the availability of emotional support, social interaction, and therapeutic interventions within the institution (James et al., 2023)(Diny Kristianty Wardany, 2024). Participants who had recently adapted to the institutional environment tended to report moderate levels of anxiety during the pre-intervention assessment, suggesting that the duration of stay may influence emotional well-being among nursing home residents (Bom et al., 2022). Paulus et al. noted that the first three years of institutionalization are particularly critical for psychological adaptation, and inadequate support during this period may contribute to persistent anxiety and reduced quality of life (Paulus et al., 2021). Therefore, introducing supportive and culturally acceptable interventions, such as lavender aromatherapy, during this adaptation phase may help alleviate anxiety symptoms and improve psychological comfort among elderly residents (Mutia Annisa & Dwi Nurviyandari Kusuma Wati, 2024).

The main focus of this study was to evaluate the effectiveness of lavender aromatherapy in reducing anxiety levels among elderly residents in nursing homes. Lavender essential oil, particularly *Lavandula angustifolia*, has been widely recognized in complementary medicine for its anxiolytic and sedative effects (Yoo & Park, 2023)(Cardoso & Da Silva, 2025). In the present study, the proportion of participants experiencing moderate anxiety decreased from 60.0% before the intervention to 33.3% after the intervention, while the percentage of respondents with mild anxiety increased from 26.7% to 66.7%. In addition, severe anxiety, which was initially reported in 13.3% of participants, was no longer observed after the intervention. These findings indicate a notable improvement in anxiety levels following lavender aromatherapy administration.

The anxiolytic effect of lavender is believed to be associated with its influence on neurotransmitter activity, particularly gamma-aminobutyric acid (GABA), which plays an important role in emotional regulation and anxiety reduction (Fung et al., 2021). Previous peer-reviewed studies have also reported that lavender aromatherapy may contribute to relaxation and decreased psychological

distress through modulation of the autonomic nervous system and limbic responses (Fung et al., 2021)(Y. Ren et al., 2026).

A similar pattern was observed in a quasi-experimental study by Rho et al., where lavender aromatherapy reduced anxiety among elderly Korean women (Mehrabian et al., 2022). The authors attributed this to both the biochemical effect of lavender and the sensory stimulation it offers, which creates a calming ambiance. Lavender also engages the olfactory-limbic system, directly affecting mood and emotional response.

In the context of nursing homes, the application of such a method is both practical and scalable. Lavender aromatherapy requires minimal resources, can be administered by trained caregivers, and does not interfere with existing pharmacological regimens (Lin et al., 2023). As such, it provides an accessible adjunct therapy for elderly residents, especially in settings with limited psychiatric support.

The paired t-test analysis showed a significant reduction in anxiety levels after the intervention ($p < 0.001$), indicating a significant difference in anxiety scores before and after lavender aromatherapy administration. The results align with findings by Lee et al., who reported a similar decline in anxiety scores after integrating complementary therapies into geriatric nursing protocols (Stromájer et al., 2023)(Lee et al., 2025). This supports the potential inclusion of aromatherapy in evidence-based practice, especially for elderly populations where pharmacological options carry higher risks due to polypharmacy and comorbidities. It is also important to note that the Cronbach's alpha value of the anxiety questionnaire used in this study was 0.706, indicating acceptable reliability. This enhances the credibility of the findings and provides a replicable foundation for future research.

From a broader perspective, this study addresses a significant gap in Indonesia's gerontological care: the underutilization of complementary health modalities. Despite increasing evidence supporting their use, aromatherapy and other non-pharmacological strategies remain limited in institutional care settings. The promising outcomes of this study suggest that such interventions may be considered not only as alternative approaches, but also as components of holistic elderly care.

CONCLUSION AND SUGGESTION

This study concludes that lavender aromatherapy was associated with a significant reduction in anxiety levels among elderly residents in nursing homes. Most participants experienced a decrease in anxiety severity following the intervention, with anxiety levels shifting predominantly from moderate to mild categories. These findings suggest that lavender essential oil may serve as a promising non-pharmacological complementary approach for helping to manage psychological distress among older adults. However, considering the study limitations, including the relatively small sample size, absence of a control group, and limited intervention observation period, the findings should be interpreted cautiously.

Lavender aromatherapy may provide a practical and non-invasive complementary approach that can be integrated into geriatric care routines, particularly in healthcare settings with limited mental health resources. Its potential effects through the olfactory system and neurochemical pathways related to emotional regulation support its role as part of holistic elderly care. Nevertheless, further studies with more rigorous research designs, larger sample sizes, control groups, and longer follow-up periods are needed to strengthen the evidence regarding its effectiveness and broader applicability in geriatric care settings.

In light of these findings, it is recommended that nursing homes and geriatric care providers consider incorporating lavender aromatherapy as part of psychological support programs for elderly residents. Future research should explore long-term effects, various methods of administration, and combinations with other therapeutic modalities to further evaluate its potential clinical utility. In addition, the development of elderly mental health programs may consider evidence-based complementary approaches as supportive strategies within comprehensive geriatric care services.

REFERENCES

- Ahn, S., Zhou, J., Jiang, D., Kerr, S., Zhu, Y., Song, P., Rudan, I., Hammerschlag, R., Skoetz, N., Savrikar, S., Fong, H. H. S., Shaoping, L., Akarasereenont, P., Cramer, H., Salih, S. J., Wang, M., Smith, C., Masiero, S., Jong, M., ... Mo, H. (2025). WHO global research priorities for traditional, complementary, and integrative (TCI) medicine: an international consensus and comparisons with

- LLMs. *Journal of Global Health*, 15, 1–16. <https://doi.org/10.7189/jogh.15.04336>
- Asian Development Bank. (2024). Indonesia longitudinal aging survey 2023. In *ADB Publications*. (Issue September).
- Azizah, L. M., Akbar, A., Zainuri, I., & Khotijah, S. (2026). *Original Article How Do Older Adults Experience Depression and Social Isolation in Nursing Homes ? A Descriptive Phenomenological Study Implications for Practice : Implications for Practice* : 8(1), 885–896.
- Basrowi, R. W., Rahayu, E. M., Khoe, L. C., Wasito, E., & Sundjaya, T. (2021). The road to healthy ageing: What has indonesia achieved so far? *Nutrients*, 13(10), 1–11. <https://doi.org/10.3390/nu13103441>
- Batiha, G. E. S., Teibo, J. O., Wasef, L., Shaheen, H. M., Akomolafe, A. P., Teibo, T. K. A., Al-kuraishy, H. M., Al-Garbeeb, A. I., Alexiou, A., & Papadakis, M. (2023). A review of the bioactive components and pharmacological properties of *Lavandula* species. *Naunyn-Schmiedeberg's Archives of Pharmacology*, 396(5), 877–900. <https://doi.org/10.1007/s00210-023-02392-x>
- Bavarsad, N. H., Bagheri, S., Kourosh-Armani, M., & Komaki, A. (2023). Aromatherapy for the brain: Lavender's healing effect on epilepsy, depression, anxiety, migraine, and Alzheimer's disease: A review article. *Heliyon*, 9(8), e18492. <https://doi.org/10.1016/j.heliyon.2023.e18492>
- Bom, J., Bakx, P., & Rellstab, S. (2022). Well-being right before and after a permanent nursing home admission. *Health Economics (United Kingdom)*, 31(12), 2558–2574. <https://doi.org/10.1002/hec.4595>
- Caballero-Gallardo, K., Quintero-Rincón, P., & Olivero-Verbel, J. (2025). Aromatherapy and Essential Oils: Holistic Strategies in Complementary and Alternative Medicine for Integral Wellbeing. *Plants*, 14(3), 1–24. <https://doi.org/10.3390/plants14030400>
- Cardoso, C. C., & Da Silva, F. R. O. (2025). The Impact of Lavender Essential Oil on the Human Nervous System: A Review. *Brazilian Journal of Health Aromatherapy and Essential Oil*, 2(1), bjhae22. <https://doi.org/10.62435/2965-7253.bjhae.2025.bjhae22>
- Carmel, S. (2019). Health and Well-Being in Late Life: Gender Differences Worldwide. *Frontiers in Medicine*, 6(October), 3–6. <https://doi.org/10.3389/fmed.2019.00218>
- Chistell, F., Stängle, S., & Fringer, A. (2023). “Loneliness is a monotonous thing”: descriptive qualitative research on the loneliness of caring relatives. *BMC Nursing*, 22(1), 1–12. <https://doi.org/10.1186/s12912-023-01327-4>
- Chowdhury, S., & Chakraborty, P. pratim. (2017). Universal health coverage - There is more to it than meets the eye. *Journal of Family Medicine and Primary Care*, 6(2), 169–170. <https://doi.org/10.4103/jfmpe.jfmpe>
- Coles, E., Anderson, J., Maxwell, M., Harris, F. M., Gray, N. M., Milner, G., & MacGillivray, S. (2020). The influence of contextual factors on healthcare quality improvement initiatives: A realist review. *Systematic Reviews*, 9(1), 1–22. <https://doi.org/10.1186/s13643-020-01344-3>
- Diny Kristianty Wardany. (2024). Early Intervention Strategies to Support Mental Health and Social Development in Children. *International Journal of Education and Humanities*, 4(3), 256–265. <https://doi.org/10.58557/ijeh.v4i3.238>
- Donelli, D., Antonelli, M., Bellinazzi, C., Gensini, G. F., & Firenzuoli, F. (2019). Effects of lavender on anxiety: A systematic review and meta-analysis. *Phytomedicine*, 65(July), 153099. <https://doi.org/10.1016/j.phymed.2019.153099>
- Donovan, N. J., & Blazer, D. (2020). Social Isolation and Loneliness in Older Adults: Review and Commentary of a National Academies Report. *American Journal of Geriatric Psychiatry*, 28(12), 1233–1244. <https://doi.org/10.1016/j.jagp.2020.08.005>
- Faridha, E. N., & Widiastih, P. A. (2024). Overseas Student Experience of Homesickness. *Psikoislamika: Jurnal Psikologi Dan Psikologi Islam*, 21(2), 336–346.
- Fung, T. K. H., Lau, B. W. M., Ngai, S. P. C., & Tsang, H. W. H. (2021). Therapeutic effect and mechanisms of essential oils in mood disorders: Interaction between the nervous and respiratory systems. *International Journal of Molecular Sciences*, 22(9). <https://doi.org/10.3390/ijms22094844>
- Garakani, A., Murrough, J. W., Freire, R. C., Thom, R. P., Larkin, K., Buono, F. D., & Iosifescu, D. V. (2020). Pharmacotherapy of Anxiety Disorders: Current and Emerging Treatment Options. *Frontiers in Psychiatry*, 11(December), 1–21. <https://doi.org/10.3389/fpsy.2020.595584>

- Gianfredi, V., Nucci, D., Pennisi, F., Maggi, S., Veronese, N., & Soysal, P. (2025). Aging, longevity, and healthy aging: the public health approach. *Aging Clinical and Experimental Research*, 37(1), 1–12. <https://doi.org/10.1007/s40520-025-03021-8>
- Golinelli, D., Sanmarchi, F., Guarducci, G., Palombarini, J., Benetti, P., Rosa, S., & Lenzi, J. (2025). Gender differences in healthcare utilization across Europe: Evidence from the European Health Interview Survey. *Health Policy*, 162(April), 105448. <https://doi.org/10.1016/j.healthpol.2025.105448>
- Grajeda-León, G., Azurin-Gonzales, V., Mamani-Condori, Z., Ñaña-Cordova, A. M., Bustamante-Ordoñez, M. A., Neyra-Cordova, F., Parodi, J. F., & Runzer Colmenares, F. M. (2025). Factors Associated With Anxiety Symptoms in Older Adults Attending an Outpatient Geriatric Service: A Cross-Sectional Study. *Aging Medicine*, 8(2), 99–106. <https://doi.org/10.1002/agm2.70018>
- Guarnera, J., Yuen, E., & Macpherson, H. (2023). The Impact of Loneliness and Social Isolation on Cognitive Aging: A Narrative Review. *Journal of Alzheimer's Disease Reports*, 7(1), 699. <https://doi.org/10.3233/ADR-230011>
- Handajani, Y. S., Schröder-Butterfill, E., Hogervorst, E., Turana, Y., & Hengky, A. (2022). Depression among Older Adults in Indonesia: Prevalence, Role of Chronic Conditions and Other Associated Factors. *Clinical Practice & Epidemiology in Mental Health*, 18(1), 1–10. <https://doi.org/10.2174/17450179-v18-e2207010>
- Hariastuti, I., Dawam, M., Sugiharti, S., Suratmi, T., Kurniasih, D. E., Budiningsari, D., Utomo, W., Muthmainnah, M., & Devi, Y. P. (2024). Elderly Golden Age School (EGAS): a strategy to promote health and prosperity elderly in Indonesia. *Humanities and Social Sciences Communications*, 11(1). <https://doi.org/10.1057/s41599-024-03571-8>
- Hedigan, F., Sheridan, H., & Sasse, A. (2023). Benefit of inhalation aromatherapy as a complementary treatment for stress and anxiety in a clinical setting – A systematic review. *Complementary Therapies in Clinical Practice*, 52(February), 101750. <https://doi.org/10.1016/j.ctcp.2023.101750>
- Ilmaskal, R., Prabandari, Y. S., & Oktaria, V. (2026). Development and evaluation of a mobile health (mHealth) application for smoking cessation among adolescents in Indonesia: a mixed methods randomised controlled trial study protocol. *BMJ Open*, 16(2), e112178. <https://doi.org/10.1136/bmjopen-2025-112178>
- Indramayu Regency Population: 1.95 Million (2024 data). (n.d.).
- Islam, M. S., Patel, J. V., Ahmed, H. U., Naheed, A., & Gill, P. (2025). Burden of anxiety, depression and stress among older adults living in South-East Asia: Protocol for a systematic review and meta-analysis. *BMJ Open*, 15(11), 1–6. <https://doi.org/10.1136/bmjopen-2025-106812>
- Istifada, R., Asih, N., & Ati, L. (2026). *Lavender Aromatherapy as a Complementary Nursing Intervention for Anxiety in an Institutionalized Older Adult with Post-Fracture Mobility Limitation : A Case Report*. 1(1), 21–29.
- Jalali, A., Ziapour, A., Karimi, Z., Rezaei, M., Emami, B., Kalhori, R. P., Khosravi, F., Sameni, J. S., & Kazemini, M. (2024). Global prevalence of depression, anxiety, and stress in the elderly population: a systematic review and meta-analysis. *BMC Geriatrics*, 24(1), 809. <https://doi.org/10.1186/S12877-024-05311-8/TABLES/3>
- James, K. A., Stromin, J. I., Steenkamp, N., & Combrinck, M. I. (2023). Understanding the relationships between physiological and psychosocial stress, cortisol and cognition. *Frontiers in Endocrinology*, 14(March), 1–20. <https://doi.org/10.3389/fendo.2023.1085950>
- Jonathan, S., Ayu, R., Kuswardhani, T., Division, G., Regional, W., & Hospital, G. (2025). *Polypharmacy and Anxiety in Elderly : A Narrative*. 9, 9823–9830.
- Kubzansky, L. D., Kim, E. S., Boehm, J. K., Davidson, R. J., Huffman, J. C., Loucks, E. B., Lyubomirsky, S., Picard, R. W., Schueller, S. M., Trudel-Fitzgerald, C., VanderWeele, T. J., Warran, K., Yeager, D. S., Yeh, C. S., & Moskowitz, J. T. (2023). Interventions to Modify Psychological Well-Being: Progress, Promises, and an Agenda for Future Research. *Affective Science*, 4(1), 174–184. <https://doi.org/10.1007/s42761-022-00167-w>
- Lee, J. L., Chen, S. Y., Wickham, R. E., Wang, P., Wu, M. S., Varra, A. A., Chen, C. E., & Lungu, A. (2025). Clinical outcomes from blended care therapy for anxiety and depression in the year after treatment. *Internet Interventions*, 39, 100798. <https://doi.org/10.1016/J.INVENT.2024.100798>
- Li, Z., Zhang, Z., Ren, Y., Wang, Y., Fang, J., Yue, H., Ma, S., & Guan, F. (2021). Aging and age-

- related diseases: from mechanisms to therapeutic strategies. *Biogerontology*, 22(2), 165–187. <https://doi.org/10.1007/s10522-021-09910-5>
- Lin, Y., Zhou, Y., & Chen, C. (2023). Interventions and practices using Comfort Theory of Kolcaba to promote adults' comfort: an evidence and gap map protocol of international effectiveness studies. *Systematic Reviews*, 12(1), 1–10. <https://doi.org/10.1186/s13643-023-02202-8>
- Maddocks, W. (2023). Aromatherapy in Nursing and Midwifery Practice: A Scoping Review of Published Studies Since 2005. *Journal of Holistic Nursing*, 41(1), 62–89. <https://doi.org/10.1177/08980101221078736>
- Mangunsong, F., Jirapramukpitak, T., & Hastuti, S. (2025). Ageing Population Policy in Indonesia: A Narrative Review. *Jurnal Kebijakan Kesehatan Indonesia*, 14(3), 94–103.
- Manungkalit, M., & Sari, N. P. W. P. (2020). The Influence of Anxiety and Stress toward Depression in Institutionalized Elderly. *Journal of Educational, Health and Community Psychology*, 9(1), 65–76. <https://doi.org/10.12928/jehcp.v9i1.13917>
- Manzoor, S., Rakha, A., Rasheed, H., Bhat, Z. F., Khan, M. S. A., Abdi, G., & Aadil, R. M. (2025). A Comprehensive Review on Anxiolytic Effect of *Lavandula Angustifolia* Mill. in Clinical Studies. *Food Science and Nutrition*, 13(9), 1–13. <https://doi.org/10.1002/fsn3.70993>
- Mas'ul, Z. (2023). Projecting the Future Ageing Population in Post-2045: The Today's Millennials Perspectives. *Jurnal Jamsostek*, 1(1), 1–31. <https://doi.org/10.61626/jamsostek.v1i1.4>
- Md Hussin, N. S., Karuppannan, M., Gopalan, Y., Tan, K. M., & Gnanasan, S. (2023). Exploration of non-pharmacological interventions in the management of behavioural and psychological symptoms of dementia. *Singapore Medical Journal*, 64(8), 497–502. <https://doi.org/10.11622/smedj.2021125>
- Mehrabian, S., Tirgari, B., Forouzi, M. A., Tajadini, H., & Jahani, Y. (2022). Effect of Aromatherapy Massage on Depression and Anxiety of Elderly Adults: a Randomized Controlled Trial. *International Journal of Therapeutic Massage & Bodywork*, 15(1), 37. <https://doi.org/10.3822/IJTMB.V15I1.645>
- Minton, A. R., Waugh, C. E., Snyder, J. S., Charles, S. T., Haase, C. M., & Mikels, J. A. (2023). Falling Hard, But Recovering Resoundingly: Age Differences in Stressor Reactivity and Recovery. *Psychology and Aging*, 38(6), 573–585. <https://doi.org/10.1037/pag0000761>
- Morin, C. M., Bjorvatn, B., Chung, F., Holzinger, B., Partinen, M., Penzel, T., Ivers, H., Wing, Y. K., Chan, N. Y., Merikanto, I., Mota-Rolim, S., Macêdo, T., De Gennaro, L., Léger, D., Dauvilliers, Y., Plazzi, G., Nadorff, M. R., Bolstad, C. J., Sieminski, M., ... Espie, C. A. (2021). Insomnia, anxiety, and depression during the COVID-19 pandemic: an international collaborative study. *Sleep Medicine*, 87, 38–45. <https://doi.org/10.1016/j.sleep.2021.07.035>
- Mortada, E. M. (2024). Evidence-Based Complementary and Alternative Medicine in Current Medical Practice. *Cureus*, 16(1), 1–8. <https://doi.org/10.7759/cureus.52041>
- Mu, Y., Lu, P., & Liu, Q. (2025). Intergenerational support and depressive symptoms: Moderating effects of community services and smart health devices. *Journal of Affective Disorders*, 388, 119602. <https://doi.org/10.1016/J.JAD.2025.119602>
- Mutia Annisa, & Dwi Nurviyandari Kusuma Wati. (2024). Independent-Nursing Activities: Aromatherapy, Hand Massage, and Music Therapy for Insomnia Elderly. *Indonesian Red Crescent Humanitarian Journal*, 3(1), 20–30. <https://doi.org/10.56744/irchum.v3i1.33>
- Nandi, N., Greve, K., Ismail, A., Setiawardani, W., Rahmawati, Y. D., Omonovich, K. D., & Eraliyevich, N. S. (2025). Mapping the Information of Social Vulnerability of Covid-19 Pandemic in Bandung City, Indonesia. *Forum Geografi*, 39(3), 292–306. <https://doi.org/10.23917/forgeo.v39i3.10775>
- Naria, E., Chahaya, I., Hamzah, D. F., Adjani, T. S., & Utara, U. S. (2026). *Improving Environmental Health Awareness through the PHAST Method for Household Sanitation Intervention in the Belawan Coastal Region*.
- Ngcobo, N. N. (2025). Influence of Ageing on the Pharmacodynamics and Pharmacokinetics of Chronically Administered Medicines in Geriatric Patients: A Review. In *Clinical Pharmacokinetics* (Vol. 64, Issue 3). Springer International Publishing. <https://doi.org/10.1007/s40262-024-01466-0>
- OCDE. (2024). OECD Economic Outlook. In *Rapport final* (Issue 1).

- Paulus, F. W., Ohmann, S., Möhler, E., Plener, P., & Popow, C. (2021). Emotional Dysregulation in Children and Adolescents With Psychiatric Disorders. A Narrative Review. *Frontiers in Psychiatry*, 12(October). <https://doi.org/10.3389/fpsyt.2021.628252>
- Pich, J. (2018). Preventing occupational stress in healthcare workers. *Research in Nursing and Health*, 41(4), 408–409. <https://doi.org/10.1002/nur.21899>
- Polacsek, M., & Woolford, M. (2022). Strategies to support older adults' mental health during the transition into residential aged care: a qualitative study of multiple stakeholder perspectives. *BMC Geriatrics*, 22(1), 1–10. <https://doi.org/10.1186/s12877-022-02859-1>
- Prudena, B., Pambudi, K., Senna, C. B., & Rafly, M. (2026). *Mental and Emotional Changes in the Elderly : A Literature Review*. 5(2), 275–285.
- Pusvita, A. A., Setiawan, M. R., & Tati, B. (2025). *Work Burden , Depression , and Anxiety Among Elderly Caregivers : a Cross-Sectional Study in Pelkris Retirement Home , Semarang , Indonesia*. 9, 7540–7547.
- Recksiedler, C., Cheval, B., Sieber, S., Orsholits, D., Stawski, R. S., & Cullati, S. (2022). Linking widowhood and later-life depressive symptoms: Do childhood socioeconomic circumstances matter? *Aging and Mental Health*, 26(11), 2159–2169. <https://doi.org/10.1080/13607863.2021.1972930>
- Ren, L., Fan, Y., Wu, W., Qian, Y., He, M., Li, X., Wang, Y., Yang, Y., Wen, X., Zhang, R., Li, C., Chen, X., & Hu, J. (2024). Anxiety disorders: Treatments, models, and circuitry mechanisms. *European Journal of Pharmacology*, 983(September), 176994. <https://doi.org/10.1016/j.ejphar.2024.176994>
- Ren, Y., Yan, G., Gao, J., Chu, W., Yang, X., Xie, J., Hui, P., Su, X., Ma, W., Hou, Y., & Shao, Y. (2026). Biological mechanisms of lavender essential oil in anxiolytic, antidepressant, and hypnotic functions. *Chinese Herbal Medicines*, xxxx. <https://doi.org/10.1016/j.chmed.2026.03.005>
- Reynolds, C. F., Jeste, D. V., Sachdev, P. S., & Blazer, D. G. (2022). Mental health care for older adults: recent advances and new directions in clinical practice and research. *World Psychiatry*, 21(3), 336. <https://doi.org/10.1002/WPS.20996>
- Scott, S., Raynor, A., Dare, J., Grieve, J., & Costello, L. (2024). Improving the Transition of Older Adults into Residential Aged Care: A Scoping Review. *Clinical Gerontologist*, 47(5), 746–759. <https://doi.org/10.1080/07317115.2023.2274042>
- Shafiee, A., Mohammadi, I., Rajai, S., Jafarabady, K., & Abdollahi, A. (2025). Global prevalence of anxiety symptoms and its associated factors in older adults: A systematic review and meta-analysis. *Journal of General and Family Medicine*, 26(2), 116–127. <https://doi.org/10.1002/jgf2.750>
- Shen, H., Zhang, L. J., & Zhu, W. Y. (2025). The Sleep-Enhancing Effect of Lavender Essential Oil in Adults: A Systematic Review and Meta-Analysis. *Holistic Nursing Practice*, 105–118. <https://doi.org/10.1097/HNP.0000000000000734>
- Stromájer, G. P., Csima, M., Iváncsik, R., Varga, B., Takács, K., & Stromájer-Rácz, T. (2023). Stress and Anxiety among High School Adolescents: Correlations between Physiological and Psychological Indicators in a Longitudinal Follow-Up Study. *Children*, 10(9). <https://doi.org/10.3390/children10091548>
- Sui, S., Bao, L., Zhu, L., Tang, Y., Su Gu, Mi, Y., Han, X., & Li, L. (2025). Nonpharmacological Management of Preoperative Anxiety in Adults: A Systematic Review. *Journal of Perianesthesia Nursing*, 41, 446–456. <https://doi.org/10.1016/j.jopan.2025.06.009>
- Surendran, S., & Karibeeran, S. (2025). *Life After Home: Elders' Experiences of Abandonment and Institutional Living*. 30(7), 14–21. <https://doi.org/10.9790/0837-3007051421>
- Suryani, E., & Lestari, T. (2018). Hubungan mutu pelayanan makanan dengan kepuasan pasien rawat inap. *Jurnal Kesehatan Masyarakat*, 13(3), 210–218.
- Sutanto, H. (2025). Tackling polypharmacy in geriatric patients: Is increasing physicians' awareness adequate? *Archives of Gerontology and Geriatrics Plus*, 2(3), 100185. <https://doi.org/10.1016/j.aggp.2025.100185>
- Suvish, Ghamari, M., & Sundaram, S. (2025). Digital Dementia: Smart Technologies, mHealth Applications and IoT Devices, for Dementia-Friendly Environments. *Journal of Sensor and Actuator Networks* 2025, Vol. 14, Page 112, 14(6), 112. <https://doi.org/10.3390/JSAN14060112>

- Tsegaye, D., Yazew, A., Gedfew, M., Yilak, G., & Yalew, Z. M. (2023). Non-Pharmacological Pain Management Practice and Associated Factors Among Nurses Working at Comprehensive Specialized Hospitals. *SAGE Open Nursing*, 9, 23779608231158980. <https://doi.org/10.1177/23779608231158979>
- Uchino, B. N., & Rook, K. S. (2020). Emotions, relationships, health and illness into old age. *Maturitas*, 139, 42–48. <https://doi.org/10.1016/j.maturitas.2020.05.014>
- Upasen, R., Saengpanya, W., Awae, W., Prasitvej, P., & Stithyudhakarn, S. (2025). Understanding how older adults sustain mental well-being when facing challenging in later life. *Acta Psychologica*, 259(April), 105293. <https://doi.org/10.1016/j.actpsy.2025.105293>
- Wang, Y., Guang, Z., Zhang, J., Han, L., Zhang, R., Chen, Y., Chen, Q., Liu, Z., Gao, Y., Wu, R., & Wang, S. (2023). Effect of Sleep Quality on Anxiety and Depression Symptoms among College Students in China's Xizang Region: The Mediating Effect of Cognitive Emotion Regulation. *Behavioral Sciences*, 13(10). <https://doi.org/10.3390/bs13100861>
- Wang, Y. R., Ho, Y. C., & Yeh, Y. C. (2025). Short- and long-term effects of inhaled lavender essential oil on anxiety, fatigue, blood pressure, and sleep quality in middle-aged adults with hypertension: A randomized placebo-controlled pilot study. *Complementary Therapies in Medicine*, 95(October), 103296. <https://doi.org/10.1016/j.ctim.2025.103296>
- Whitmore, C., Neil-Sztramko, S., Grenier, S., Gough, A., Goodarzi, Z., Weir, E., Niculescu, I., Suthakaran, A., Adedeji, I., Akram, M., Mojgani, J., Chan, T., Flint, A. J., Juola, H., Reynolds, K., Trenaman, S., Van Amerigen, M., Yeung, A., Levy, A. M., & Iaboni, A. (2024). Factors associated with anxiety and fear of falling in older adults: A rapid systematic review of reviews. *PLOS ONE*, 19(12), 1–17. <https://doi.org/10.1371/journal.pone.0315185>
- WHO. (2017). *Mental Health of Older Adults*. World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/mental-health-of-older-adults>
- Widiani, E., Hidayah, N., & Hanan, A. (2023). Anxiety, Depression, Loneliness, Spirituality, and Social Support in Older People During the COVID-19 Pandemic. *Jurnal Keperawatan Indonesia*, 26(2), 79–88. <https://doi.org/10.7454/JKI.V26I2.1093>
- Yon, Y., Mikton, C. R., Gassoumis, Z. D., & Wilber, K. H. (2017). Elder abuse prevalence in community settings: a systematic review and meta-analysis. *The Lancet Global Health*, 5(2), e147–e156. [https://doi.org/10.1016/S2214-109X\(17\)30006-2](https://doi.org/10.1016/S2214-109X(17)30006-2)
- Yoo, O., & Park, S. A. (2023). Anxiety-Reducing Effects of Lavender Essential Oil Inhalation: A Systematic Review. *Healthcare*, 11(22), 2978. <https://doi.org/10.3390/HEALTHCARE11222978>
- Yuan, Y., Lapane, K. L., Tjia, J., Baek, J., Liu, S. H., & Ulbricht, C. M. (2022). Trajectories of physical frailty and cognitive impairment in older adults in United States nursing homes. *BMC Geriatrics*, 22(1), 1–13. <https://doi.org/10.1186/s12877-022-03012-8>