International Journal of Clinical and Experimental Medicine Research, 2025, 9(4), 423-428
https: //www.hillpublisher.com/journals/ijcemr/
ISSN Online: 2575-7970
ISSN Print: 2575-7989

A Study on the Application of Aromatherapy in the Treatment of Insomnia in Elderly Cancer Patients in Palliative Care

Ping Wang[1], Lei Zhang[1], Yue Lang[2], Enze Wang[2,*]

[1]Beijing No. 6 Hospital, Beijing 100007, China.
[2]Capital Medical University, Beijing 100054, China.

How to cite this paper: Ping Wang, Lei Zhang, Yue Lang, Enze Wang. (2025). A Study on the Application of Aromatherapy in the Treatment of Insomnia in Elderly Cancer Patients in Palliative Care. *International Journal of Clinical and Experimental Medicine Research*, 9(4), 423-428.
DOI: 10.26855/ijcemr.2025.07.006

Received: May 31, 2025
Accepted: June 30, 2025
Published: July 31, 2025

***Corresponding author:** Enze Wang, Capital Medical University, Beijing 100054, China.

Abstract

Objective: This study aims to explore the effects of aromatherapy inhalation combined with massage on sleep quality and quality of life in elderly cancer patients receiving palliative care. **Methods:** From January 2024 to December 2024, elderly patients with advanced cancer in palliative care wards were randomly assigned to either the study group or the control group. Assessments were conducted before treatment and two weeks after treatment using the Athens Insomnia Scale (AIS) and the Quality of Life Questionnaire (EORTC QLQ-C30). **Results:** The study group comprised 41 patients, while the control group had 40. T-test analysis revealed statistically significant differences in insomnia treatment outcomes between the study group and the control group ($p<0.01$), with the study group demonstrating more pronounced therapeutic effects. Additionally, the study group showed significant improvements in patients' quality of life, including emotional functioning, nausea and vomiting, pain, loss of appetite, and constipation. **Conclusion:** Aromatherapy can alleviate insomnia symptoms and enhance the quality of life in elderly cancer patients, serving as a complementary therapy in palliative care.

Keywords

Aromatherapy; Hospice care; Insomnia; Quality of life

1. Introduction

Hospice care is a service provided to patients at the end stage of a disease to improve their quality of life by controlling pain and discomfort symptoms, and offering physical, psychological, and spiritual care and humanistic concern to help them pass away comfortably, peacefully, and with dignity [1]. Insomnia is one of the most common discomfort symptoms in cancer patients, characterized by difficulty falling asleep, early morning awakening, and daytime fatigue. Clinically, sedative hypnotic drugs are commonly used to treat insomnia, but these drugs have certain side effects on the nervous system, digestive system, and circulatory system, including dizziness, fatigue, nausea, vomiting, and decreased blood pressure, which can even lead to respiratory depression and death in severe cases [2]. Aromatherapy, as a complementary therapy, is widely accepted by patients with advanced cancer and caregivers. The essential oils used in aromatherapy are extracted from natural plants, which are safe and have few side effects. The exact mechanism of its therapeutic effects may be related to the alcohols, aldehydes, olefins, phenols, and other chemical components contained in the oils. Aromatherapy can be administered through inhalation, massage, and oral intake. Existing studies mostly test the effects of aromatherapy massage on sleep in palliative care, with relatively small sample sizes. A randomized controlled study in Japan in 2020 concluded that aromatherapy massage did not significantly improve sleep quality [3, 4]. This study added inhalation to aromatherapy massage, so that the essential oils could not only be absorbed through the skin but also stimulate the olfactory bulb through inhalation to transmit signals to the brain, secrete neurotransmitters, and thus exert therapeutic effects. The study divided patients with advanced cancer into an aromatherapy group and a control group, and compared the results of sleep quality and a series of indicators between

the two groups based on reliable scales to evaluate the impact of aromatherapy on the treatment of insomnia in cancer patients.

2. Subjects and Methods

2.1 Subjects

A total of 81 patients with advanced malignant tumors admitted to the hospice care ward of the Sixth Hospital of Beijing from January to December 2024 were selected and randomly divided into a control group (40 cases) and a study group (41 cases). Inclusion criteria: (1) aged over 65 years; (2) meet the admission criteria for hospice care, that is, have a clear cancer diagnosis and no longer receive anti-cancer treatment; (3) be conscious and able to communicate normally; (4) have normal sense of smell; (5) have no skin ulcers, dermatitis, etc.; (6) meet the diagnostic criteria for insomnia based on the insomnia scale score. Exclusion criteria: having consciousness or communication disorders. Termination criteria: 1) death; 2) allergic to essential oils or unable to tolerate them; 3) withdrawal from hospice care to continue cancer treatment.

This study was approved by the Ethics Committee of our hospital (No. KJ (Ethics) 2024-19), and all patients and their families agreed to participate in the study and signed the informed consent form.

2.2 Methods

Treatment methods: The control group received basic nursing and hospice care, which included pain control, relief of physical discomfort symptoms, and psychological and social support. Sedative hypnotic drugs were given as benzodiazepines (eszopiclone, lorazepam, oxazepam) and non-benzodiazepines (zopiclone, zolpidem tartrate). Insomnia scale and quality of life assessments were conducted weekly, with a treatment course of two weeks.

In addition to the treatments given to the control group, the study group received aromatherapy. Specifically, lavender essential oil was selected and used with an aroma lamp. The lamp contained 50 ml of distilled water, with 2 drops of compound essential oil added. The treatment was conducted once daily for 30 minutes before the patient went to sleep. Aromatherapy massage was performed by an aromatherapist, who used the flat part of both hands to massage from the patients' palms to the elbow area and from the soles of the feet to the knee area. The essential oil used was lavender essential oil, mixed with carrier oil (fractionated coconut oil) in a 1:10 ratio. The treatment was carried out in the afternoon and lasted for 30 minutes each time. The therapist who participated in the massage had obtained an international professional aromatherapist certificate. The essential oil used in the treatment was produced by do TERRA and met the CPTG testing standards.

Insomnia scale and quality of life assessments were conducted weekly, with a treatment course of two weeks.

2.3 Assessment Scales

(1) Athens Insomnia Scale (AIS): This scale assesses eight items, including time to fall asleep, nighttime awakenings, waking up earlier than desired, total sleep time, total sleep quality, daytime mood, daytime physical functioning, and daytime sleepiness. Each item is scored on a scale of 0 to 3, with higher scores indicating more severe symptoms. A total score of 6 or above indicates insomnia.

(2) Quality of Life Questionnaire (EORTC QLQ-C30): Developed by the European Organization for Research and Treatment of Cancer (EORTC), this questionnaire consists of 30 items divided into 15 domains. It includes five functional subscales (physical, role, cognitive, emotional, and social functioning), three symptom subscales (fatigue, pain, and nausea, vomiting), one global health status subscale, and six single-item measures (dyspnea, insomnia, appetite loss, constipation, diarrhea, and financial difficulties). The scores are standardized, with higher scores indicating better quality of life.

2.4 Statistical Analysis

The data were analyzed using SPSS 27.0. Count data are presented as percentages (%), and comparisons of proportions were made using the chi-square (χ^2) test. Continuous data are expressed as mean±standard deviation (χ±s), and comparisons between groups were performed using the t-test. A p-value of less than 0.05 was considered statistically significant.

3. Results

3.1 Comparison of General Characteristics Between the Two Groups

A total of 81 patients with advanced cancer were randomly assigned to the study group (41 cases) and the control group (40 cases). Statistical analysis revealed no significant differences between the two groups in terms of age, gender, disease type, marital status, insomnia score, and the use of sedative drugs (Table 1).

Table 1. Comparison of Demographic and Clinical Characteristics

Characteristic	Study Group	Control Group	t/c^2	p
Age (mean ± SD, years)	75.3±9.5	77.6±10.4	1.023	0.309
Gender			0.332	0.565
Male	22	24		
Female	19	16		
Marital Status			0.698	0.404
Married	24	27		
Widowed	17	13		
Tumor Type			23.198	0.143
Pancreatic Cancer	4	4		
Colorectal Cancer	11	8		
Prostate Cancer	0	2		
Breast Cancer	1	3		
Lung Cancer	7	8		
Ovarian Cancer	5	1		
Stomach Cancer	3	6		
Liver Cancer	0	4		
Esophageal Cancer	1	1		
Duodenal Cancer	0	1		
Gallbladder Cancer	0	1		
Bladder Cancer	0	1		
Kidney Cancer	3	0		
Vulvar Cancer	1	0		
Melanoma	1	0		
Cervical Cancer	2	0		
Glioma	1	0		
Cholangiocarcinoma	1	0		
Insomnia Score (mean ± SD)	16.0±3.3	15.7±3.7	0.347	0.729
Sedative Use			0.674	0.879
Eszopiclone	20	22		
Lorazepam	5	3		
Zolpidem Tartrate	10	10		
Zopiclone	6	5		

Notes: The table presents the demographic and clinical characteristics of the study and control groups. Age is expressed as mean ± standard deviation (SD). Gender and marital status are presented as counts. Tumor types are listed with the number of patients in each group. Insomnia scores are mean ± SD. Sedative use is presented as counts. The t/c^2 values and p-values are from statistical tests comparing the two groups.

3.2 Comparison of Insomnia Scale Scores Before and After Treatment

Both the study group and the control group showed statistically significant differences in insomnia scale scores after treatment ($p<0.05$). The differences in the changes of insomnia scale scores before and after treatment between the two groups were also statistically significant ($p<0.05$) (Table 2).

Table 2. Comparison of Insomnia Scale Scores

Insomnia Scale Scores	Before Treatment	After Treatment	t	p
Study Group	15.73±3.67	5.68±3.99	14.143	< 0.01
Control Group	16±3.27	10.38±4.29	7.078	< 0.01
Difference Between Groups	/	/	-4.155	< 0.01

Notes: The scores represent the mean ± standard deviation. The t-values and p-values are from paired t-tests comparing before and after treatment within each group. The difference between groups is calculated by comparing the mean differences between the study group and the control group.

3.3 Comparison of Quality of Life Scores Before and After Treatment

After treatment, the control group showed statistically significant differences in the scores of nausea and vomiting, pain, insomnia, loss of appetite, constipation, and overall health status ($p<0.05$). The study group exhibited statistically significant differences in emotional functioning, fatigue, nausea and vomiting, pain, dyspnea, insomnia, loss of appetite, constipation, diarrhea, and overall health status ($p<0.05$) (Table 3).

Table 3. Comparison of Quality of Life Scores

Domain	Study Group				Control Group			
	Before Treatment	After Treatment	t	p	Before Treatment	After Treatment	t	p
Physical Functioning	25.53±22.36	26.18±23.30	-0.942	0.352	17.67±19.83	17.50±19.72	0.572	0.57
Role Functioning	21.54±21.16	23.17±23.24	-1.432	0.16	16.67±15.81	17.50±16.43	-1.433	0.16
Emotional Functioning	57.72±15.52	62.60±13.71	-3.423	0.001	58.75±13.73	60.00±12.55	-0.924	0.361
Cognitive Functioning	48.78±19.86	50.81±18.99	-1.954	0.058	40.83±13.04	41.67±13.61	-0.895	0.532
Social Functioning	31.71±11.06	31.30±11.30	1	0.323	33.33±11.32	34.17±11.91	1.074	0.274
Global Health Status	16.06±11.55	26.42±15.47	-7.015	< 0.01	17.08±13.20	21.25±14.85	-2.469	0.018
Fatigue	65.58±10.77	61.25±12.20	2.804	0.008	66.94±8.89	66.11±9.40	1.138	0.262
Nausea and Vomiting	30.08±31.23	14.63±19.79	4.814	< 0.01	17.50±22.94	10.00±17.21	3.147	0.003
Pain	57.32±21.10	35.37±17.56	6.522	< 0.01	59.58±22.29	39.17±18.70	5.913	< 0.01
Dyspnea	40.65±25.29	38.21±26.42	2.208	0.033	41.67±24.75	40.83±24.44	0.274	0.785
Insomnia	78.86±16.26	30.89±25.16	12.999	< 0.01	76.67±17.21	53.33±21.08	6.46	< 0.01
Loss of Appetite	56.91±23.86	39.02±24.61	6.806	< 0.01	66.67±18.49	46.67±23.63	6	< 0.01
Constipation	37.40±32.66	25.20±28.66	3.54	0.001	49.17±32.01	39.17±30.09	3.123	0.003
Diarrhea	12.20±25.56	8.13±17.92	2.357	0.023	7.5±21.99	5.83±14.88	1	0.323
Financial Difficulties	30.89±22.84	31.71±22.30	-1.322	0.079	20.83±23.49	19.17±21.19	1.644	0.103

Notes: The scores represent the mean ± standard deviation. The t-values and p-values are from paired t-tests comparing before and after treatment within each group.

4. Discussion

The concept of hospice care in China can be traced back to the Tang Dynasty, when the government established institutions to serve the elderly and disabled and provide funeral services. The modern purpose of hospice care is no longer to cure diseases aggressively but to control the discomfort symptoms of patients, alleviate their pain, and improve their quality of life.

Insomnia is one of the most common discomforts in end-stage cancer patients and severely impacts their quality of life. The causes of insomnia are related to cancer medications, pain, and emotional factors. Sedative-hypnotic drugs are traditional treatments. In this study, the control group used benzodiazepines and non-benzodiazepines to control insomnia symptoms in cancer patients. The insomnia scores before and after treatment showed a statistically significant difference ($P<0.01$), indicating that the palliative care unit in our hospital is effective in controlling insomnia symptoms. However, during follow-up, many patients reported feeling drowsy, dizzy, and fatigued after taking the medication, which was reflected in the fatigue scores of the quality of life assessment, with no statistical difference before and after treatment in the control group ($P>0.05$).

Aromatherapy has a long history of use. It is based on plant essential oils and has diverse application methods, which can be categorized into olfactory, tactile, and oral routes according to the site of action. As a complementary and alternative therapy, aromatherapy is often used in conjunction with traditional therapies and has been adopted by many medical institutions worldwide. Lavender, also known as perfume grass, is a plant from the Lamiaceae family. According to the Compendium of Materia Medica, lavender has a pungent and sweet taste, is neutral in nature, and is associated with the lung and stomach meridians. It is known for its effects of strengthening the spleen, invigorating qi, nourishing blood, calming the mind, and promoting sleep. Lavender is currently one of the most popular essential oils, with a history of use spanning several centuries. The main components of lavender essential oil are terpenes, esters, and alcohols. Modern pharmacological studies have shown that lavender essential oil has anti-anxiety, sedative-hypnotic, antioxidant, antibacterial, anti-inflammatory, and anti-dementia effects.

In this study, elderly cancer patients with insomnia were treated with lavender essential oil inhalation and massage. The insomnia scores significantly decreased before and after treatment, showing a statistically significant difference compared to the control group ($P<0.01$), which is consistent with the findings of Engy Abdel et al. in 2023. The study also found that patients in the experimental group did not experience significant dizziness or fatigue after waking up, as evidenced by the fatigue scores in the quality of life assessment, which showed a statistically significant difference before and after treatment ($P<0.01$). Kabiri et al. [5] similarly pointed out that the fatigue scores in the aromatherapy group significantly decreased compared to the control group. Additionally, we observed that the quality of life of patients in the experimental group was significantly improved after lavender essential oil inhalation and massage. This included improvements in emotional function, nausea and vomiting, pain, loss of appetite, and constipation, all of which were reflected in the quality of life questionnaire (EORTC QLQ-C30). These findings are consistent with the results of Cheng and Liu [6, 7].

The olfactory stimulation of lavender essential oil inhalation is transmitted through the nasal cavity to the olfactory bulb. The signals are processed in the brain, triggering emotional responses in the amygdala and interacting with the cerebral cortex through the limbic system to activate thought and emotion. Lavender essential oil contains two terpenes, linalool and linalyl acetate, which are compounds related to the anxiolytic effects of lavender essential oil [8]. They can produce anxiolytic effects by inhibiting calcium channels, reducing 5-HT1 receptor activity, and increasing parasympathetic tone. Moreover, essential oil massage can relax muscle tissue, and lavender essential oil can alleviate pain through its anti-inflammatory and antioxidant properties when absorbed through the skin. Tan et al. found that essential oil massage can relieve pain [9]. Cardia et al. [10] and Guo, Wang [11] also discovered that lavender essential oil has significant analgesic and anti-inflammatory effects.

It is worth noting that patients in the experimental group showed improvement in dyspnea symptoms in the quality of life assessment. This may be related to the anti-inflammatory effects of lavender essential oil when inhaled into the respiratory tract. Studies suggest that the anti-inflammatory mechanisms of lavender essential oil are related to prostaglandins, pro-inflammatory cytokines, nitric oxide, and histamine. Ueno-Iio et al. [12] found in an asthma mouse model that linalool and linalyl acetate in lavender can inhibit allergic inflammation and mucosal cell proliferation.

Aromatherapy is simple to perform and easy to master. It can be used for home palliative care, with family caregivers administering it as a complementary therapy to routine care to control patients' discomfort symptoms, alleviate suffering, and improve quality of life. Mardani et al. [13] proposed that lavender therapy, as an alternative or complementary regimen to routine care, can reduce complications and associated suffering in cancer patients.

The study subjects in this research were recruited from all over the country and randomly assigned to groups, which enhances the generalizability of the results. On the other hand, the wide variety of cancer types and different treatments received by the subjects may affect their response to essential oil therapy.

The results of this study indicate that aromatherapy is of great significance to cancer patients. After lavender essential oil inhalation and massage, patients' insomnia symptoms were significantly improved, and their overall quality of life was enhanced. As a safe and effective complementary therapy, aromatherapy can alleviate physical and

psychological discomfort in patients. However, further research is needed on its long-term use, and more large-scale studies should be conducted to enhance its therapeutic reliability and explore additional beneficial effects.

References

[1] Mercadante S, Adile C, Ferrera P, et al. Sleep disturbances in patients with advanced cancer in different palliative care settings. J Pain Symptom Manage. 2015;50(6):786-92.

[2] Coelho A, Parola V, Cardoso D, et al. Use of non-pharmacological interventions for comforting patients in palliative care: a scoping review. JBI Database System Rev Implement Rep. 2017;15(7):1867-904.

[3] Yoo O, Park SA. Anxiety-reducing effects of lavender essential oil inhalation: a systematic review. Healthcare (Basel). 2023;11(22):2978. doi:10.3390/healthcare11222978.

[4] Kawabata N, Hata A, Aoki T. Effect of aromatherapy massage on quality of sleep in the palliative care ward: a randomized controlled trial. J Pain Symptom Manage. 2020;59(6):1165-71.

[5] Khamis EAR, Al-Sayed HM, Al-Zahrani FA, et al. Effectiveness of aromatherapy in early palliative care for oncology patients: blind controlled study. Asian Pac J Cancer Prev. 2023;24(8):2729-39.

[6] Cheng H, Li X, Wang Y, et al. Aromatherapy with single essential oils can significantly improve the sleep quality of cancer patients: a meta-analysis. BMC Complement Med Ther. 2022;22(1):187.

[7] Liu T, Zhang Y, Wang L, et al. Aromatherapy with inhalation can effectively improve the anxiety and depression of cancer patients: a meta-analysis. Gen Hosp Psychiatry. 2022;77:118-27.

[8] Linck VM, Silva AL, Figueiró M, et al. Effects of inhaled linalool in anxiety, social interaction and aggressive behavior in mice. Phytomedicine. 2010;17(8-9):679-83.

[9] Tan JXJ, Cai JS, Ignacio J. Effectiveness of aromatherapy on anxiety and sleep quality among adult patients admitted into intensive care units: a systematic review. Intensive Crit Care Nurs. 2023;76:103396.

[10] Cardia GFE, Silva-Filho SE, Silva EL, et al. Effect of lavender (Lavandula angustifolia) essential oil on acute inflammatory response. Evid Based Complement Alternat Med. 2018;2018:1413940.

[11] Guo X, Wang P. Aroma characteristics of lavender extract and essential oil from Lavandula angustifolia Mill. Molecules. 2020;25(23):5653.

[12] Ueno-Iio T, Shibakura M, Tanaka K, et al. Lavender essential oil inhalation suppresses allergic airway inflammation and mucous cell hyperplasia in a murine model of asthma. Life Sci. 2014;108(2):109-15.

[13] Mardani A, Vaismoradi M, Tella S, et al. A systematic review of the effect of lavender on cancer complications. Complement Ther Med. 2022;67:102836.