

Effectiveness of Aromatherapy in Early Palliative Care for Oncology Patients: Blind Controlled Study

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Abstract

Background: Palliative care is the active holistic treatment of people of all ages who have serious health-related suffering as a result of severe illness, and especially of those who are close to the end of life. Palliative care is provided to cancer patients who experience serious suffering that cannot be relieved without professional intervention and that compromises physical, social, spiritual, and emotional functioning. A straightforward, low-risk, and affordable palliative care approach may be provided through aromatherapy, a type of complementary and alternative medicine. The study objective is to assess the comparative effectiveness of massage, aromatherapy massage, and massage combined with aromatherapy inhalation on cancer patients receiving palliative care. **Methods:** A total of 100 participants who were divided into four groups at random. The first group, designated as the control group, received standard hospital nursing care, the second group received massage only (using the odorless almond carrier oil), the third group received massage with lavender oil, and the fourth group received combined (inhalation and massage) aromatherapy. The Rotterdam Symptom Checklist (RSCL), given two weeks after aromatherapy, was used to examine participants' perspectives of care. **Results:** On the RSCL, combined aromatherapy performed best. In terms of reported physical symptoms, psychological symptoms, and activities, there were statistically significant differences between the scores of the control group and each of the experimental groups. Nonetheless, the total quality of life score showed no significant difference between the control group and the massage only group ($t = 0.529$, $p = 0.60$). **Conclusions:** When paired with aromatherapy inhalation, massage has a positive effect on physical, psychological symptoms, activities, and overall quality of life for cancer patients receiving early palliative care. Nurses and other healthcare providers are recommended to support programs that provide massage therapy to reduce reported bodily symptoms, psychological problems, and limited activities among cancer patients.

Keywords: Aromatherapy- cancer- early palliative care- quality of life

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Introduction

Cancer incidence rates have been substantially growing worldwide. In 2018, there were 18.1 million new instances of cancer and 9.6 million cancer-related deaths, according to GLOBOCAN 2018, an online database that offers incidence and mortality rates for 36 different forms of cancer (Bray et al., 2018). A rise in the number of cancer patients who experience cancer-related complaints and issues goes hand in hand with this growing burden. Palliative care, in this context, focuses on the care of patients with life-limiting illnesses in order to enhance their quality of life and lessen negative impacts (Männle

et al., 2020).

Providing patients and their families with medical, emotional, and spiritual care as they deal with the difficulties brought on by serious and life-threatening disease is the multidisciplinary specialty known as palliative care (World Health Organization, 2022).

Early palliative care delivery lowers the need for unnecessary hospital hospitalizations and medical services (World Health Organization, 2020). Early palliative care strives to improve the quality of life for patients, their families, and caregivers by providing active, holistic care for people who are experiencing significant health-related suffering as a result of a serious illness (Jacobsen et al.,

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2011; The International Association for Hospices and Palliative Care, 2018). Palliative care services include a wide spectrum of services, including bereavement support, practical nursing care, counseling on symptom management, and specialist nursing management (Wotman et al., 2017; Baumgardner, 2020).

Among the other obstacles to palliative treatment are lack of knowledge about palliative care and the advantages it can provide patients and healthcare systems among policymakers, health care providers, and the general public; impediments in society and culture, such as attitudes toward death and dying; and false beliefs regarding palliative care, such as those that it is only for cancer patients or for those in their final weeks of life (World Health Organization, 2020).

Quality of life is a broad and multifaceted concept that considers a person's physical, emotional, social, and spiritual health. Several cancer survivors report a lower quality of life as a result of physical issues such as pain, fatigue, and poor sleep quality, which impair their ability to perform daily tasks. Others report emotional issues such as anxiety, depression, and memory and concentration difficulties. Family and friend relationships, including intimacy and sexuality, are central to social well-being. Money, insurance, and employment concerns all have an impact on social well-being (Kent et al., 2015; American Cancer Society, 2022; Misiąg et al., 2022).

According to the National Center for Complementary and Alternative Medicine (NCCAM), complementary treatments include techniques for prevention, promotion, treatment, and recovery that aim to integrate the physical, mental, and spiritual dimensions of the human being. The NCCAM divides them into three categories: use of natural products, body and mind practices, and body-based manipulation practices (National Center for Complementary and Alternative Medicine, 2021). Massage is a complementary therapy that is widely used in palliative care. It has been shown to be physically and psychologically beneficial in reducing anxiety and tension, as well as lowering heart rate and blood pressure (Michalak, 2018; Rafii et al., 2020).

Aromatherapy is a complementary and alternative medicine therapy that is well-accepted not only by patients with advanced diseases, but also by their caregivers. Aromatherapy is practiced in many cultures and societies, frequently in conjunction with conventional medicine (Abadi et al., 2013; Candy et al., 2020). Aromatherapy combines the physiological effects of massage with the use of specialized oils to cure and balance the mind, body, and spirit. It involves using the essential oils of fragrant plants (Abadi et al., 2013). Aromatic oils can be used in palliative care to relieve symptoms such as anxiety, shortness of breath, nausea, ascites tension, pain, coughing, nausea, tiredness, improved smell, and restlessness, or simply to improve well-being (Candy et al., 2020). The therapeutic use of essential oils from plants (flowers, herbs, or trees) to treat illness and promote physical, emotional, and spiritual well-being is known as aromatherapy (Brennan et al., 2022).

The name "aromatherapy" suggests that the olfactory system is used to provide therapies either directly or

indirectly, and that "aroma" is essential to the therapeutic process. There are, however, a number of delivery methods, such as medications that work by coming into touch with the skin or by being inhaled into the lungs (International Federation of Professional Aromatherapists, 2023). Direct inhalation, massage, and diffusion are a few of the simple and practical methods that aromatherapy can be used to relieve stress (Cho et al., 2013; Rafii et al., 2020).

According to how aromatherapy works, the molecules of the essential oils are released and inhaled by the nose, where they reach the brain and stimulate and activate the parasympathetic nervous system (World Health Organization, 2022). Oils are administered topically by massaging, gently rubbing, or spraying. Essential oils exhibit their effects throughout this period by being absorbed by the circulatory and neurological systems (Singh and Chaturvedi, 2015). The inhalation of aromatherapy begins when volatile chemicals engage olfactory receptors. This stimulation travels through the olfactory nerve axon, a crucial component of the limbic system involved in behavior and emotions (Karadag et al., 2017; Gaeta and Wilson, 2022).

The most popular essential oil in use today is lavender, which has been used for ages in both beauty and therapeutic applications. Lavender's health benefits were actually identified more than 2,500 years ago. Lavender was utilized by the Egyptians as a perfume and for mummification. Lavandula oils from flower heads dramatically boost antioxidant enzyme activities and reduce lipid peroxidation, as well as antibacterial, sedative, relaxing, and anti-depressive qualities (Seifi et al., 2014; Ali et al., 2015; Yap et al., 2019; AlMohammed et al., 2022).

When used to treat neurological conditions like migraines, stress, sleep disturbances, anxiety, and depression, lavender oil can prevent brain damage (Silva et al., 2015; Dobrek and Głowacka, 2023). In addition, it is one of the most often used essential oils for pain relief. It is a harmless plant with no known side effects (Olapour et al., 2013; Osaili et al., 2023). Aromatherapy has drawn nursing's attention and is employed in healthcare settings all over the world; it is a complimentary tool to nursing care, encourages a comprehensive approach to the individual, and provides the opportunity to use nursing theories in clinical practice (Gnatta et al., 2016).

Significance of the Study

Several studies have been undertaken to evaluate the effect of aromatherapy on cancer patients' mood, quality of life, and physical symptoms (Blackburn et al., 2017; Tamaki et al., 2017). Despite the fact that direct inhalation of essential oils is a common aromatherapy technique, few scientific studies have been conducted to assess the effectiveness of combining inhalation and massage therapy in managing early complications of chemotherapy or radiotherapy with the start of cancer treatment as early palliative nursing management for oncology patients. A few research, on the other hand, have investigated the efficacy of lavender oil in early palliative care in the nursing treatment of oncology patients.

Aim of the Study

This study examined at early palliative care for cancer patients and compared the effects of massage, aromatherapy massage, and massage combined with aromatherapy inhalation.

Hypotheses of the Study

The study was carried out with these hypotheses: (a) In early palliative care, cancer patients who receive standard hospital intervention have higher quality of life scores; (b) In early palliative care, cancer patients who receive hand massage with carrier oil have higher quality of life scores; (c) In early palliative care, cancer patients who receive lavender oil hand massage have higher quality of life scores; and (d) In early palliative care, cancer patients who receive combined aromatherapy inhalation and massage have higher quality of life scores.

Materials and Methods

Design

The purpose of the current investigation was achieved using a true experimental, pretest-posttest group design.

Setting and Sampling

This study was conducted at an oncology center in Egypt that offers free international standard services to cancer patients who cannot afford treatment. Approximately 6,000 patients are served each month.

The study comprised a sample of 100 participants who were attending an oncology center. Participants were invited to an appointment where they were provided verbal and written information about the study before being requested to provide written informed consent. Each willing patient was randomized into one of four groups, with 25 people in each group, and received the intervention for two weeks in a row. A computer-generated random table was used for the randomization.

Inclusion criteria

Participants between the ages of 20 and 60 who have second- or third-stage cancer, are receiving chemotherapy or radiation therapy more than a month following surgery, and may also be receiving hormone therapy are eligible to participate.

Exclusion criteria

Participants who have experienced a cancer recurrence are excluded.

Instruments

The researchers used a modified Rotterdam Symptom Checklist (RSCL). It was divided into two parts. The first section contains sociodemographic and clinical data, and the second section focuses on quantifying the symptoms reported by cancer patients participating in clinical research. The RSCL is a self-report measure to assess the quality of life of cancer patients. The RSCL was designed to cover, originally, 4 domains: physical symptom distress, psychological distress, self-care activity level and overall global life quality.

Response categories for items are given on 4-point Likert type scales. For the patients' symptom experience of both physical and psychological distress responses range from 'not at all' to 'very much'. For the activity level scale responses range from being 'unable' to perform an activity up to being able to do so 'without help'. The overall valuation of life is assessed on a seven-point Likert-type scale. Answers range from 'excellent' to 'extremely poor'. Evidence of its reliability and validity has been found in a number of research settings.

The psychological symptom subscale contains 8 symptoms. Respondents are asked to indicate the frequency with which they have experienced each symptom in the past week on a 4-point scale, ranging from 'not at all' (0) to 'very much' (3). Possible scores on this scale therefore range from 0 to 24.

The physical symptom subscale contains 22 symptoms; scores on this scale range from 0 to 66. The third subscale assesses whether respondents are able to perform eight activities, given their condition in the past week. Responses range from 'unable' (0) to 'without help' (3) and the possible range of scores on this subscale is from 0 to 24 (De Haes et al., 1996).

The level of quality of life's impairment in the different scales can be compared more easily by systematically transforming raw scores into scores on a 100-point scale. In such a scale, (0) denotes a level of no impairment, and (100) implies the highest level of impairment. The way to transform scores is given in the following formula:

$$\frac{\text{Raw Scale Score} - \text{Minimum Score}}{\text{maximum Score} - \text{Minimum Score}} \times 100 = \text{Transformed Score}$$

Ethical considerations

The present study was approved by the ethical committee of Nursing Faculty at Modern University for Information and Technology granted permission to conduct the study (Registration No. 15). Further, official permission was also obtained from the participating oncology center located in Alexandria Governorate, Egypt, to collect the data.

Before beginning the study, all participants provided informed consent after explaining the goals of the study by the researchers. The confidentiality, anonymity, and privacy of the participants were guaranteed. Participation was entirely voluntary. All participants had the right to withdraw from the study at any time, with no consequences. The data were collected between January and August of 2021.

Procedures

The study tool has been translated into Arabic. The content validity was determined by a jury of five experts' professors from medical-surgical nursing and oncology physicians, and necessary changes were made. A pilot study was conducted on about 10% of the sample (n=10) to assess the tool's usability, clarity, and applicability. As a result, the required changes were implemented. Cronbach's alpha has been 0.929, indicating high reliability.

The Faculty of Agriculture provided the sweet almond carrier oil and lavender oil. The oils were stored in a dark-

colored, light-resistant dropper glass bottle. Massage technique was performed by nurses with recognized massage diplomas, and guidelines for the massage technique used were developed to ensure that all patients received the same technique.

A. Assessment Phase

An initial assessment of all patients was performed immediately prior to the start of Intervention implementation using the tool "RSCL" to collect baseline data.

B. Implementation Phase

For two weeks, each group received the following intervention:

- Participants in Group 1 received standard hospital care.
- Participants in Group 2 received a hand massage with a carrier (almond) oil.
- Participants in Group 3 received a hand massage with lavender oil.
- Participants in Group 4 received aromatherapy through lavender's inhalation and massage.

Procedure of Massage

The massage was the same for every participant. These massages primarily involve stroking and rubbing. The entire body is massaged with 5 ml of plant oil for 30 minutes, three times a week for two weeks (six times in total). Because it is a light, nonvolatile vegetable oil that is easily absorbed by the skin and has hardly any flavor of its own, sweet almond carrier oil has been chosen. Tocopherols (vitamin E) found in it are beneficial for treating skin conditions (Michalak, 2018). Lavender oil was chosen for the aromatherapy massage because of its comforting, pleasant scent, as well as its anti-inflammatory, antibacterial, nontoxic, and nonirritating characteristics. It has also been shown to be effective in relieving anxiety and pain (Cho et al., 2013).

Procedure of Aromatherapy Inhalation

Three drops of lavender oil were added to 200 ml of boiling water, which was then put into a bowl. The participants then inhaled the mixture for five minutes while standing 30 cm away from the bowl. A cloth was used to totally cover the participants. The participants were instructed to take a deep breath and to completely close their eyes in the interim. Furthermore, lavender oil was sprayed into the participant's room four times per day. When the participant's symptoms were severe, 10 drops of lavender oil were placed on a sniff stick for to smell.

C. Evaluation Phase

This phase was completed after two months after the implementation phase. The efficacy of interventions on participants' quality of life was reevaluated using the RSCL tool. Comparisons between intervention groups and control groups as well as pre- and post-intervention comparisons were done.

Statistical analysis

The data were entered into the computer and analyzed with IBM SPSS software package version 26 (Armonk, NY: IBM Corp). Range (minimum and maximum), mean, and standard deviation were used to describe quantitative data. The obtained results were determined to be significant at the 5% level. Paired t-tests were used to compare the control group and each intervention group, and F-tests (ANOVA) were used to compare more than two groups.

Results

Table 1 depicts the sociodemographic distribution of cancer participating patients into four groups. It was clear that nearly half of the studied groups (52%) belonged to the age group (50-60). More than half of the participants in the study (54%) were female. In terms of education, nearly one-third (37%) of the four groups had finished high school. Breast cancer was diagnosed in approximately one-third (31%) of the participants. Furthermore, 40% received radiotherapy and 60% received chemotherapy. Analgesics and painkillers were given to 95% of the participants.

The frequency of physical symptoms in each group before and after interventions is shown in Table 2 for the four groups. It shows that the participants' conditions have improved in massage only group, massage with lavender oil group, and the combined aromatherapy group. Regarding lack of appetite, the majority of participants in the four groups suffered from it to 'very much' prior to interventions (84%, 72%, 64%, and 76%). After two weeks of interventions, the percentage worsened to (96%) for control group, but improved to (52%) for massage only group, (8%) for massage with lavender oil group, and none (0%) among the combined aromatherapy group.

The majority of participants in all four groups reported having 'very much' low back pain. After two weeks of interventions, the majority of the control group (96%) experienced very much level pain, while both massage alone and massage with lavender oil groups (36% and 8%, respectively) experienced 'very much' pain. The combined aromatherapy group, on the other hand, had improved and none reported 'very much' low back. Similarly, after receiving combined aromatherapy therapy, no participants reported 'very much' of nausea and vomiting, or tingling in hands or feet. However, complaints of 'very much' shortness of breath, acid indigestion, sore mouth/painful swallowing, and burning/sore eyes were 16%, 8%, 4%, and 16%, respectively.

Before receiving therapy, the majority of participants experienced severe psychological side effects. In terms of anxiety, the majority of the control group (80%) experienced 'very high' levels of anxiety after two weeks of interventions, whereas only 32% of participants receiving massage therapy, and 12% of participants receiving massage therapy with lavender oil experienced 'very much' levels of anxiety. Similarly, only 4% of participants receiving combined aromatherapy experienced 'very much' low levels of anxiety. In terms of irritability after interventions, the majority (76%) of

Table 1. Frequency Distribution of Cancer Patients of Four Groups According to Sociodemographic Characteristics

Sociodemographic Characteristics	Control Group n (%)	Massage Only Group n %	Massage with Lavender Oil Group n %	Combined Aromatherapy Group n %	Total n %
Age (years)					
20 –9	0 (0)	2 (8)	2 (8)	1 (4)	5 (5)
30 –9	3 (12)	5 (20)	5 (20)	3 (12)	16 (16)
40 –9	11 (44)	5 (20)	5 (20)	6 (24)	27 (27)
50-60	11 (44)	13 (52)	13 (52)	15 (60)	52 (52)
X ± SD	48.16 ± 6.980	48.24 ± 10.694	47.56 ± 11.255	50.16 ± 8.924	
Sex					
Male	11 (44)	14 (56)	10 (40)	11 (44)	46 (46)
Female	14 (56)	11 (44)	15 (60)	14 (56)	54 (54)
Level of education					
Illiterate	3 (12)	2 (8)	3 (12)	5 (20)	13 (13)
Read& write	2 (8)	3 (12)	2 (8)	5 (20)	12 (12)
Primary	7 (28)	7 (28)	6 (24)	3 (12)	23 (23)
Preparatory	2 (8)	2 (8)	3 (12)	3 (12)	10 (10)
Secondary	11 (44)	9 (36)	9 (36)	8 (32)	37 (37)
Higher education	0 (0)	2 (8)	2 (8)	1 (4)	5 (5)
Diagnosis					
Breast cancer	8 (32)	7 (28)	9 (36)	7 (28)	31 (31)
Prostate cancer	3 (12)	6 (24)	2 (8)	3 (12)	14 (14)
Gastrointestinal cancer	4 (16)	7 (28)	9 (36)	9 (36)	29 (29)
Head and neck cancer	5 (20)	5 (20)	5 (20)	6 (24)	21 (21)
Urinary tract cancer	1 (4)	0 (0)	0 (0)	0 (0)	1 (1)
Lung cancer	2 (8)	8 (32)	0 (0)	0 (0)	0 (0)
Uterine and ovarian cancer	2 (8)	0 (0)	0 (0)	0 (0)	2 (2)
Treatment					
Chemotherapy	16 (64)	17 (68)	19 (76)	8 (32)	60 (60)
Radiotherapy	8 (32)	13 (52)	15 (60)	4 (16)	40 (40)
Hormonal	3 (12)	3 (12)	4 (16)	4 (16)	14 (14)
Combined therapy	3 (12)	5 (20)	1 (4)	8 (32)	17 (17)
Sedation	1 (4)	1 (4)	2 (8)	2 (8)	6 (6)
Analgesics & Painkillers	25 (100)	25 (100)	25 (100)	25 (100)	100 (100)

the control group was irritable, compared to 28% for massage alone, 16% for massage with lavender oil, and 0% for combined aromatherapy groups. There was also an improvement in the percentage of other psychological symptoms after using combined aromatherapy, with about one-third (32%) of participants reporting no concentration issues, 20% reporting no difficulty sleeping, and 12% reporting no depressed mood (Table 3).

Concerning self-care, the majority of the four groups were unable to do so on their own before intervention. Whereas after interventions, improvements were noticed. For instance, two-thirds (64%) of the control group, around half (52%) of the massage only group, a little more than a third of participants (36%) who received massage with lavender oil, and only 8% of the combined aromatherapy group were unable to do so. Regarding the ability to go to work, the majority of participants in the control, massage only, and massage with lavender oil groups

(respectively, 80%, 64%, and 68%) were unable to do so following interventions. Whereas (24%) of participants in the combined aromatherapy group had a little difficulty to go to work. Concerning light housework, more than half (60%, 52%) of the control and massage only groups, respectively, were unable to do light housework after interventions. 28% of participants receiving essential oil massage found light housework difficult, while (16%) of participants receiving combined aromatherapy found light housework easy.

As shown in Table 4, the majority of cancer participants reported having very low quality of life. After two weeks of interventions, 16% of participants in the control group had ‘extremely poor’ quality of life. However, two-thirds (72%) of the participants in the massage-only group had quality of life scores ranging from ‘rather poor’ to ‘neither good nor bad’. Furthermore, 52% of those who received a lavender oil massage reported that their quality of life

Table 2. Percentage of Occurrence of Physical Symptoms before and after Interventions in the Four Groups

	Control Group		Massage Only Group		Massage with Lavender Oil Group		Combined Aromatherapy Group	
	Before	After	Before	After	Before	After	Before	After
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
PHYSICAL SYMPTOMS								
Lack of appetite								
Not at all	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4 (16)
A little	0 (0)	0 (0)	0 (0)	1 (4)	0 (0)	5 (20)	0 (0)	16 (64)
Quite a bit	4 (16)	1 (4)	7 (28)	11 (44)	9 (36)	18 (72)	6 (24)	5 (20)
Very much	21 (84)	24 (96)	18 (72)	13 (52)	16 (64)	2 (8)	19 (76)	0 (0)
Low back pain								
Not at all	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (4)
A little	0 (0)	0 (0)	0 (0)	1 (4)	0 (0)	6 (24)	0 (0)	19 (76)
Quite a bit	5 (20)	1 (4)	5 (20)	15 (60)	8 (32)	17 (68)	6 (24)	5 (20)
Very much	20 (80)	24 (96)	20 (80)	9 (36)	17 (68)	2 (8)	19 (76)	0 (0)
Nausea and vomiting								
Not at all	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	8 (32)
A little	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (8)	0 (0)	13 (52)
Quite a bit	6 (24)	0 (0)	0 (0)	11 (44)	5 (20)	17 (68)	8 (32)	4 (16)
Very much	19 (76)	25 (100)	25 (100)	14 (56)	20 (80)	8 (32)	17 (68)	0 (0)
Tingling in hands or feet								
Not at all	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	8 (32)
A little	7 (28)	4 (16)	0 (0)	1 (4)	0 (0)	6 (24)	0 (0)	15 (60)
Quite a bit	13 (52)	10 (40)	11 (44)	17 (68)	10 (40)	13 (52)	12 (48)	2 (8)
Very much	5 (20)	11 (44)	14 (56)	7 (28)	15 (60)	6 (24)	13 (52)	0 (0)
Shortness breath								
Not at all	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (4)
A little	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (12)	0 (0)	15 (60)
Quite a bit	9 (36)	6 (24)	11 (44)	16 (64)	10 (40)	19 (76)	8 (32)	5 (20)
Very much	16 (64)	19 (76)	14 (56)	9 (36)	15 (60)	3 (12)	17 (58)	4 (16)
Acid indigestion								
Not at all	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	10 (40)
A little	0 (0)	0 (0)	0 (0)	1 (4)	0 (0)	4 (16)	0 (0)	10 (40)
Quite a bit	20 (80)	5 (20)	9 (36)	10 (40)	10 (40)	20 (80)	10 (40)	3 (12)
Very much	5 (20)	20 (80)	16 (64)	14 (56)	15 (60)	1 (4)	15 (60)	2 (8)
Sore mouth (painful swallowing)								
Not at all	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
A little	0 (0)	0 (0)	0 (0)	1 (4)	0 (0)	2 (8)	0 (0)	0 (10)
Quite a bit	0 (0)	0 (0)	0 (0)	5 (20)	3 (12)	10 (40)	5 (20)	5 (10)
Very much	25 (100)	25 (100)	25 (100)	19 (76)	22 (88)	13 (52)	20 (80)	20 (4)
Burning/sore eyes								
Not at all	0 (0)	0 (0)	1 (4)	2 (8)	0 (0)	3 (12)	0 (0)	4 (16)
A little	6 (24)	1 (4)	5 (20)	5 (20)	3 (12)	8 (32)	4 (16)	10 (40)
Quite a bit	12 (48)	11 (44)	12 (48)	10 (40)	13 (52)	8 (32)	13 (52)	7 (28)
Very much	7 (28)	13 (52)	7 (28)	8 (32)	9 (36)	6 (24)	8 (32)	4 (16)

was 'neither good nor bad'. On the other hand, after receiving combined aromatherapy, 40% of participants said their quality of life was 'moderately good', and 20% said it was 'good'.

Table 5 compares total quality of life domain scores before and after interventions for four groups. After 2 weeks of interventions, the physical domain scores were

(68.80 ± 1.658) for the control group, (65.36 ± 2.596) for the massage only group, (53.88 ± 2.571) for massage with lavender oil, and (39.92 ± 2.971) for combined aromatherapy. Scores differed significantly from before intervention, with p = 0.000, for all the groups. Total scores for psychological domains for control group (41.68 ± 1.701), massage only group (36.00 ± 1.658),

Table 3. Percentage of Occurrence of Psychological Symptoms and Self-Care Activities before and after Interventions in the Four Groups

	Control Group		Massage Only Group		Massage with Lavender Oil Group		Combined Aromatherapy Group	
	Before n (%)	After n (%)	Before n (%)	After n (%)	Before n (%)	After n (%)	Before n (%)	After n (%)
PSYCHOLOGICAL SYMPTOMS								
Anxiety								
Not at all	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (4)
A little	0 (0)	0 (0)	0 (0)	3 (12)	0 (0)	4 (16)	0 (0)	13 (52)
Quite a bit	8 (32)	5 (20)	5 (20)	14 (56)	4 (16)	18 (72)	6 (36)	10 (40)
Very much	17 (68)	20 (80)	20 (80)	8 (32)	21 (84)	3 (12)	19 (76)	1 (4)
Irritability								
Not at all	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4 (16)
A little	0 (0)	0 (0)	2 (8)	5 (20)	0 (0)	3 (12)	0 (0)	19 (76)
Quite a bit	15 (60)	6 (24)	11 (44)	13 (52)	8 (32)	18 (72)	10 (40)	2 (8)
Very much	10 (40)	19 (76)	12 (48)	7 (28)	17 (68)	4 (16)	15 (60)	0 (0)
Difficulty concentrating								
Not at all	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	8 (32)
A little	0 (0)	0 (0)	0 (0)	3 (12)	0 (0)	5 (20)	1 (4)	12 (48)
Quite a bit	14 (56)	7 (28)	5 (20)	13 (52)	5 (20)	19 (76)	9 (36)	3 (12)
Very much	11 (44)	18 (72)	20 (80)	9 (36)	20 (80)	1 (4)	15 (60)	2 (8)
Difficulty to sleep								
Not at all	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (4)	0 (0)	5 (20)
A little	0 (0)	0 (0)	0 (0)	4 (16)	0 (0)	5 (20)	0 (0)	15 (60)
Quite a bit	14 (56)	7 (28)	6 (24)	15 (60)	7 (28)	14 (56)	7 (28)	3 (12)
Very much	11 (44)	18 (64)	19 (76)	6 (24)	18 (72)	5 (20)	18 (72)	2 (8)
Depressed mood								
Not at all	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (12)
A little	0 (0)	0 (0)	0 (0)	4 (16)	0 (0)	4 (16)	0 (0)	16 (64)
Quite a bit	17 (68)	9 (36)	9 (36)	13 (52)	12 (48)	20 (80)	10 (40)	6 (24)
Very much	8 (32)	16 (64)	16 (64)	8 (32)	13 (52)	1 (4)	15 (60)	0 (0)
SELF-CARE ACTIVITIES								
Care of myself								
Not at all	16 (64)	16 (64)	16 (64)	13 (52)	15 (60)	9 (36)	12 (48)	2 (8)
A little	5 (20)	4 (16)	9 (36)	9 (36)	10 (40)	9 (36)	13 (52)	5 (20)
Quite a bit	4 (16)	5 (20)	0 (0)	3 (12)	0 (0)	6 (24)	0 (0)	14 (56)
Very much	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (4)	0 (0)	4 (16)
Go to work								
Not at all	24 (96)	20 (80)	21 (84)	16 (64)	21 (84)	17 (68)	22 (88)	10 (40)
A little	1(4)	4 (16)	4 (16)	9 (36)	4 (16)	4 (16)	3 (12)	9 (36)
Quite a bit	0 (0)	1 (4)	0 (0)	0 (0)	0 (0)	4 (16)	0 (0)	6 (24)
Very much	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Light housework								
Not at all	17 (68)	15 (60)	15 (60)	13 (52)	14 (56)	7 (28)	12 (48)	5 (20)
A little	8 (32)	9 (36)	10 (40)	10 (40)	10 (40)	10 (40)	12 (48)	8 (32)
Quite a bit	0 (0)	1 (4)	0 (0)	2 (8)	1 (4)	7 (28)	1 (4)	8 (32)
Very much	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (4)	0 (0)	4 (16)

massage with lavender oil group (33.32 ± 1.701), and (23.04 ± 2.336) after combined aromatherapy group; and they were statistically significant, were $p = 0.000$,

for all the groups. On the other hand, the higher score of activities domains was (21.84 ± 3.848) among combined aromatherapy group after the intervention; and it was

Table 4. Percentage of Quality of life among Cancer Patients before and after Interventions

Quality of Life	Control Group		Massage Only Group		Massage with Lavender Oil Group		Combined Aromatherapy Group	
	Before	After	Before	After	Before	After	Before	After
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Excellent	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Good	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (4)	0 (0)	5 (20)
Moderately good	3 (12)	1 (4)	2 (8)	3 (12)	4 (8)	3 (12)	4 (16)	10 (40)
Neither good nor bad	5 (20)	6 (24)	5 (20)	9 (36)	8 (32)	13 (52)	7 (28)	8 (32)
Rather poor	7 (28)	8 (32)	8 (32)	9 (36)	8 (32)	5 (20)	8 (32)	2 (8)
Poor	8 (32)	6 (24)	8 (32)	4 (16)	3 (12)	2 (8)	4 (16)	0 (0)
Extremely poor	2 (8)	4 (16)	2 (8)	0 (0)	2 (8)	1 (4)	2 (8)	0 (0)

statistically significant, $p = 0.000$. After the interventions, The F score after ANOVA test for quality-of-life total score was 22.382 and it was statistically significant with $p = 0.000$.

Further, Table 6 compares control group to the three intervention groups before and after interventions. The total score of QOL between the control and massage only groups was (5.24 1.128), with no significant differences between the two groups in the two domains, namely, where $p = 0.066$. Regarding the comparison between control and lavender oil massage groups, there were highly significant differences between the two groups, with $p = 0.00$. Finally, the control and combined aromatherapy groups were compared, and there were highly significant differences between the two groups, with $p = 0.00$.

Discussion

Cancer participants look for palliative care therapies to help with anxiety and stress reduction and to boost hope. As a result, the current study was carried out to assess the impact of aromatherapy in early palliative care on the quality of life of cancer participants.

The results of the current study showed that the participants in the four groups had significantly lower quality of life prior to the interventions, and that after the

interventions, massage using a carrier oil (almond oil) had no significant impact on quality of life, whereas massage using an essential oil (lavender oil) had a significantly better quality of life in comparison to massage alone and the control groups.

Surprisingly, combined aromatherapy massage and lavender oil inhalation improved quality of life overall, including physical, psychological symptoms, and activities, on RSCL subscales, much more than other intervention groups. According to Bhadra and Parida (2021), essential oils contain potent anti-inflammatory properties that make them effective at reducing joint and muscular discomfort. There are therapeutic uses for essential oils. These oils can be massaged into the body to lessen joint and muscular discomfort, improve the body's flow of oxygen and nutrients, among other advantages. Massage techniques using fragrant essential oils relax the body's muscles, which lessens pain (Ali et al., 2015; Tan et al., 2023).

This study suggested that lavender oil has bifacial effect on the physical symptoms. Massage and inhalation of lavender oil reduce low back discomfort, tight muscles, and tingling in the hands and feet, which enhances daily activities and self-care. Similarly, Kabiri et al., (2018) reported that there was a substantial decrease in fatigue score in the aromatherapy group when compared to the

Table 5. Comparisons between Quality of Life's Domains Total Scores before and after Interventions for Four Studied Groups

Group		Quality of Life Domain					
		Physical Domain (Total Score)		Psychological Domain (Total Score)		Activities Domain (Total Score)	
		X ± SD	p	X ± SD	p	X ± SD	p
Control Group	Before	62.84 ± 2.824	0.000*	39.4 ± 2.343	0.000*	11.04 ± 3.221	0.000*
	After	68.80 ± 1.658		41.68 ± 1.701		12.28 ± 3.048	
Massage Only Group	Before	65.36 ± 2.596	0.000*	40.88 ± 1.424	0.000*	10.64 ± 1.934	0.000*
	After	60.24 ± 2.650		36.00 ± 1.658		12.28 ± 3.048	
Massage with Lavender Oil Group	Before	63.92 ± 2.613	0.000*	40.20 ± 2.661	0.000*	10.92 ± 2.379	0.000*
	After	53.88 ± 2.571		33.32 ± 1.701		17.72 ± 2.685	
Combined Aromatherapy Group	Before	62.84 ± 2.824	0.000*	39.96 ± 1.904	0.000*	13.84 ± 3.771	0.000*
	After	39.92 ± 2.971		23.04 ± 2.336		21.84 ± 3.848	
Quality Of Life (Total Score)		F = 22.382, p = 0.000*					

F, ANOVA test; *, Statistically significant at $p \leq 0.05$

Table 6. Comparison Control Group with Three Interventions Groups According Total Score of Quality of Life

Variables (Total Score)		Control & Massage Only Groups		Control & Massage with Lavender Oil Groups		Control & Combined Aromatherapy Groups	
		X ± SD	p	X ± SD	p	X ± SD	p
Quality of Life	Before	5.04 ± 1.172	0.6	5.04 ± 1.172	0.232	5.04 ± 1.172	0.93
		5.20 ± 0.957		5.40 ± 0.913		5.56 ± 0.961	
	After	5.24 ± 1.128	0.066	5.24 ± 1.128	0.000*	5.24 ± 1.128	0.000*
		5.24 ± 1.128		4.16 ± 0.746		3.32 ± 0.748	
Physical Symptoms	Before	65 ± 1.128	0.953	65 ± 1.128	0.044	65 ± 1.128	0.001
		65.36 ± 2.596		63.92 ± 2.613		62.84 ± 2.824	
	After	68.80 ± 1.658	0.000*	68.80 ± 1.658	0.000*	68.80 ± 1.658	0.000*
		60.24 ± 2.650		53.88 ± 2.571		39.92 ± 2.971	
Psychological Symptoms	Before	39.64 ± 2.343	0.092	39.64 ± 2.343	0.434	39.64 ± 2.343	0.599
		40.88 ± 1.424		40.20 ± 2.661		39.96 ± 1.904	
	After	41.68 ± 1.701	0.000*	41.68 ± 1.701	0.000*	41.68 ± 1.701	0.000*
		36.00 ± 2.345		33.32 ± 2.810		23.04 ± 2.336	
Self-Care Activities	Before	11.04 ± 3.221	0.597	11.04 ± 3.221	0.882	11.04 ± 3.221	0.07
		10.64 ± 1.934		10.92 ± 2.379		13.84 ± 3.771	
	After	10.76 ± 2.905	0.077	10.76 ± 2.905	0.000*	10.76 ± 2.905	0.000*
		12.28 ± 3.048		17.72 ± 2.685		21.81 ± 3.848	

*, Statistically significant at $p \leq 0.05$

control group. Moreover, Liu et al., (2018) showed that aromatherapy reduced pain levels in cancer participants in their final stages, improved lower extremity edema, and reduced frequency of nausea and vomiting, as reported by participants and their relatives. These findings were also corroborated by Cardia et al., (2018) as well as Guo and Wang (2020) who found that lavender oil had analgesic and anti-inflammatory properties in addition to being efficacious and having no hazardous side effects.

In the same stream, Mardani et al., (2022), in their systematic review, revealed in their systematic review that lavender can be introduced as an alternative and complementary method into routine care for the decrease of cancer complications and related sufferings in cancer patients. This non-pharmacological therapy can be taught to patients and their informal carers to be used in conjunction with other therapeutic methods at home. In contrast Candy et al., (2020), in their systematic review, found no evidence of short-term effects of aromatherapy and massage on quality-of-life, anxiety, and pain for persons with palliative care needs.

When lavender oil is used frequently in daily massages, it has been shown to have a calming effect and to improve certain psychological symptom subscales, such as anxiety and insomnia. Several studies have shown that aromatherapy can reduce anxiety and other psychological symptom in patients receiving palliative care. It has also been shown to have a significant positive impact on all psychological symptoms when massage is combined with inhaling lavender oil essence, which reduces irritability, worry, and difficulty concentrating. Olapour et al., (2013) and Malcolm and Tallian (2017) reported similar findings, claiming that lavender oil has an impact in reducing levels of anxiety and depression. Notably, other research did not confirm the beneficial effects of aromatherapy in lowering

anxiety (Hsu et al., 2019).

According to Shady and Crannell (2019), a lavender aromatherapy patch may be a workable intervention in the hematology-oncology setting. they found that following the application of wearable nightly lavender aromatherapy skin patches, participants reported more mild anxiety symptom scores and felt their sleep was of higher quality overall. It may be simple and affordable to improve outcomes for patients in the hematology-oncology community by including an aromatherapy intervention led by nurses and patients into current care practices.

The results of the current study demonstrated significance of palliative care activities for cancer participants. After massaging with lavender oil, there was an improvement in overall quality of life; however, there was a highly significant improvement after massaging with lavender oil and inhaling the oil at the same time. This is in line with the findings of Tan et al., (2023).

In addition, there was a significant improvement in the physical, psychological, and activities domains of quality of life between and within the groups, before and after interventions; particularly, there was an improvement in symptoms like lack of appetite, low back pain, nausea, vomiting, tingling in hands or feet, anxiety, irritability, difficulty concentrating, sleep disturbance, depression, and self-care total score when compared with the control group. These concur with those of the Cheng et al., (2022) and Liu et al. (2022) findings.

There are some strengths and limitations to our study. Our study sample was recruited from Alexandria, one of the largest governorates in Egypt, and the participating patients were randomized into the groups, increasing the generalizability of the findings. History bias may have influenced our findings. Furthermore, those who participated were cancer patients on a variety of

medications, which may have impacted their response to aromatherapy.

To ensure patient appropriateness screening, proper technique for administering aromatherapy, safe handling of essential oils, and monitoring for adverse events, a competent clinical training is required. For instance, nurses and other healthcare providers should be knowledgeable about the most common complementary therapies and be able to refer patients to reliable sources of information. They are encouraged to attend conferences and in-service training programs/or workshops about message and aromatherapy.

Nurses and other healthcare providers are urged to support initiatives that aim to minimize reported physical symptoms, psychological symptoms, and activities among cancer patients by offering message therapy.

The results of this experimental study can be applied to the routine nursing management of cancer patients from the start of cancer treatment to reduce complications; this is a safe therapy had both physical and psychological effects and improved cancer patients' quality of life; nurses and other healthcare providers can instruct their patients and caregivers to use aromatherapy at home.

To determine the long-term effects of lavender on cancer patients, more research should be done. Studies with larger sample sizes will enable confirmation of potential benefits of the aromatherapy as a complementary therapy.

Author Contribution Statement

All authors contributed to the study equally. All authors read and approved the final manuscript.

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Ethical Declaration

The study was approved by the Ethical Committee of Nursing Faculty at Modern University for Information and Technology (Registration No. 15). Further, the study was conducted in accordance with the principles of the Declaration of Helsinki.

Informed Consent

Before giving their signed agreement to participate in the study, every participant was informed of its goals, research procedures, potential risks, and advantages. They were given the assurance that the study was voluntary and that they could discontinue at any time without suffering any negative consequences.

Approval

The participating oncology center in Egypt's Alexandria Governorate granted official permission for the data to be collected.

Data Availability

Our data is enclosed within this manuscript. Any further inquiries about the data can be sought through the corresponding author.

Conflict of Interest

No conflicts of interest to disclose.

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