Impact of Aromatherapy Massage on Postoperative Emotional Status and Sleep Pattern among Women Undergoing Cervical Cancer

Zainab Abd El-Rahim Ali [1], Safa Mohamed Amin Mohamed[2], Omaima Ezzat Mahmoud[3] Zeinab Ali Baraia[4],
[1] Lecturer of Obstetrics and Gynecology Nursing, Faculty of Nursing, Sohag University, Egypt
[2] Lecturer of Psychiatric Mental Health Nursing Department, Beni-Suef University, Egypt
[3]Assistant prof. of Psychiatric Mental Health Nursing Department, Beni-Suef University, Egypt
[4]Lecturer of Maternity, Obstetric and Gynecological Nursing; Faculty of Nursing, Suez Canal University, Ismailia Egypt

Abstract:

Background: Cervical cancer is preventable; it is a major gynecological disorder among women currently. Cervical cancer treatment is associated with several physical challenges, including impaired sleep which can impair patients' immune systems, and cognitive abilities which is associated with depression, anxiety, and decreased cognitive function. Therefore, **the current study aimed** to determine the impact of aromatherapy massage on postoperative emotional status and sleep patterns among women undergoing cervical cancer. **Design**: A quasi-experimental design was used to achieve this study. **Setting:** The study was conducted at the inpatient and outpatient clinics in Sohag Oncology institution. **Subject**: A purposive sampling technique was used to select The sample of this study consisted of 100 cervical cancer women who were divided into two groups an experimental group and a control group including 50 patients in each one. **Tools:** Three tools were used (I) the cervical cancer women personal data sheet, (II) and Depression, Anxiety, and Stress Scale (DASS), and (III) the Richards-Campbell Sleep Questionnaire (RCSQ). **Results:** The present study revealed that cervical cancer women's postoperative emotional status (stress, depression, and anxiety levels) in both experimental groups was severe before the implementation of the aromatherapy massage while these levels became low after implementation. There were highly statistically significant differences and improvements between cervical cancer women such as depression, anxiety, and stress levels in both experimental and control groups pre and post-implementation of aromatherapy massage at (P= <0.05). Also, the results indicated that the experimental group had improvement in their mean score of 53.80 ± 13.20 and the control group had a mean score of 29.08 ± 9.71 with a statistically significant difference between the mean scores of the groups. **Conclusion**: The study achieved significant improvements in the emotional status and sleep patterns among cervical cancer women. **Recommendations**: Cervical cancer women should understand the aromatherapy massage approach as a straightforward and practical strategy to improve their emotional status and enhance sleep quality.

Keywords: Aromatherapy massage, Cervical cancer women, Emotional status, Sleep pattern.

Introduction:

Cervical cancer, or cervix cancer, is said to be preventable and curable if caught early. In the advanced stages of the disease, women with cervical cancer may not exhibit any symptoms, but researchers have found that they may experience post-menopausal bleeding, foul-smelling vaginal discharge, and bleeding in between menses. The primary organism linked to cervical cancer has been identified as the human papillomavirus **(Beddoe, 2019).**

According to **Serkies K. & Jassem (2018**), up to one-third of cancer patients experience depression and/or anxiety disorders. According to **Brodersen et al. (2018**), there is a significant correlation between the quantity and seriousness of patients' concerns following a diagnosis and the later emergence of anxiety and depression. High degrees of emotional distress have also been connected to the quantity of patient complaints (**Jassim et al., 2018**). Accurate worry identification is crucial if nurses are to effectively serve patients' emotional needs and encourage emotional adjustment **(Sah et al., 2018**).

It is typical to have a variety of challenging thoughts and emotions that may alter, disappear, and reappear throughout time since receiving a cervical cancer diagnosis and undergoing treatment can be a life-changing experience. According to a study, a cervical cancer diagnosis and treatment can cause a wide range of emotions, including fear and anxiety, worry, loneliness or isolation, sadness or melancholy, anger or irritability, guilt, humiliation or self-consciousness, and grief or loss (**Dehkordi et al., 2019**).

These are a few typical emotional triggers. Being told that you have cancer can bring all kinds of emotions and sentiments to arise because you are dealing with a serious condition that you did not anticipate. A cervical cancer diagnosis for certain people may also rule out the possibility of becoming a parent. It can be intimidating to begin treatment for the first time.

Depending on the treatments used, receiving cancer therapy may affect appearance **(Taneja et al., 2021).** Starting to change their appearance may make some people worry about what others will think of them and how they might respond. Some people may feel self-conscious and may find these changes disturbing because the way others look plays a significant role in who these patients are. Our daily lives and routines might be affected by the cancer diagnostic process, treatment's adverse effects, and recovery. Women with cervical cancer undergoing chemotherapy might not be able to engage in some of their pre-cancer activities, such as employment, exercise, or other activities indoors or outside. Women with cervical cancer who are receiving chemotherapy could also require assistance from others (**Kori & Yalcin, 2018).**

Patients with cervical cancer also need to be aware of sleep issues (**Torkzahrani et al., 2019**). Patients with cervical cancer are more prone to experience poor sleep quality due to urodynamic alterations (reduced storage, bladder emptying capacity, and urinary incontinence) brought on by hysterectomy and radiation therapy **(Lin et al., 2020).** Due to a variety of issues, including infertility loss, early menopause, sexual discord, and unfavorable living circumstances, cervical cancer patients frequently experience significant distress both at the time of diagnosis and throughout treatment. Chemotherapy-induced peripheral neurotoxicity can cause pain and sensory discomfort in patients during treatment. Additionally, limited daytime activities and decreased exposure to natural light can alter the regularity of an individual's body's cycles (**Lee et al., 2019).**

Patients receiving cancer treatment run a significant risk of experiencing sleep disturbances. Numerous studies have revealed that sleep disturbances, which include trouble falling and staying asleep, poor sleep efficiency, early awakenings, and excessive daytime sleepiness, are common among cancer patients (30 to 88% of survivors) (**Delsigne, 2018**). Patients' ability to sleep is frequently impacted by side effects from treatment, such as pain, exhaustion, anxiety, and depression. **Theobald, (2019**) and could potentially result in patients experiencing sleep disturbances. Patients' sleep quality is significantly impacted by cancer treatments. Psychological factors (distress, anxiety, and depression) and treatment (chemotherapy-induced and chemotherapy combined with radiotherapy) were the main causes of poor sleep quality (**Lianqi, 2018).**

According to **Burns et al. (2017**), aromatherapy massage is one of the most popular complementary and alternative therapies. One complementary therapy that nurses frequently use is aromatherapy, which has been demonstrated to reduce anxiety and enhance the quality of sleep (**Djenane et al., 2018**). According to studies by **Ejder Apay et al. (2019**), it has sedative, antidepressant, and muscle relaxant properties. It also has favorable effects on sleep quality and overall well-being. By combining the benefits of massage and aromatherapy, aromatherapy massage creates a complementary therapy that is more successful than either technique used alone. The goal of aromatherapy massage treatment is to manage symptoms. Aromatherapy is effective in lowering stress and the onset of disease, improving overall health (**Watt et al., 2018**).

Aromatherapy is used to treat anxiety, depression, insomnia, and other disorders involving stress and sleep. The amygdala was impacted, which has sedative, relaxing, and carminative (smooth muscle relaxing) properties that affect the quality of sleep. It reduced anxiety and improved the quality of sleep. There are two types of treatment for sleep disorders: pharmaceutical and non-pharmacological. Although sedative-hypnotic agents used in pharmaceutical treatments have been shown to have side effects, lead to addiction, and not produce enough sleep, they can significantly improve the quality of sleep (**Özdemir and Öztunç, 2019**).

A nurse's role is crucial in helping parents apply massage techniques and ensuring that the parents are doing so correctly. The severity of sleep patterns must be accurately assessed, emotional status related to sleep patterns and their treatment must be improved, and nurses must be ready to handle the psychosocial experiences that go along with sleep patterns. Nurses must possess knowledge of pertinent research and evidence-based guidelines to assist them in evaluating and managing sleep patterns (**Özdemir, 2019).**

Significance of the study:

Cervical cancer can be life-threatening as well. The morbidity rates of cancer cervix differ widely among studies due to many social, ethnic, and behavioral reasons. In Egypt, Cervical cancer mortality rates are inconsistence. early diagnosis of cancer cervix is crucial for its treatment and could improve the cure and survival rates. The widely-known Papanicolaou test (Pap smear test) is heavily used to screen for cancer (**Mohammed et al., 2018**). This test carries many pros such as low cost, effectiveness, and high sensitivity. Cervical cancer is of public health concern and despite the great

benefits with low cost of screening procedures, their utilization remains very low due to women's lack of awareness which can further influence their screening behavior. And their emotional status **(Gernier et al., 2020 Bülbül et al., 2018).**

Non-pharmacological techniques, which are less risky and have fewer adverse effects than pharmaceutical techniques, must be used. Following the intervention, there was a noticeable difference in the quality of the sleep pattern. One of the complementary therapy fields with the fastest growth is aromatherapy. According to **Browne and Flanigan (2017),** complementary therapies may play a significant part in the holistic management of sleep patterns in pediatrics.

Aim of the study:

This study aimed to determine the impact of aromatherapy massage on postoperative emotional status and sleep patterns among women undergoing cervical cancer through:

- Identifying depression levels among women undergoing cervical cancer.
- Assessing anxiety level among women undergoing cervical cancer
- Assessing Stress level among women undergoing cervical Cancer
- Assessing sleep pattern among women undergoing cervical cancer
- Evaluating the impact of aromatherapy massage on postoperative emotional status and sleep pattern among women undergoing cervical cancer.

Research hypothesis:

Women undergoing cervical cancer who receive aromatherapy massage are expected to experience lower depression, anxiety, and stress levels than those who do not.

Women undergoing cervical cancer who receive aromatherapy massage are expected to experience better sleep patterns than those who do not.

Subjects and Methods:

Research design:

A quasi-experimental design was used to achieve this study. Patients participate in quasi-experimental studies to examine the actual efficacy and safety of non-randomized therapies. Patients can choose to participate or are randomly assigned to one of several treatment groups **(Maciejewski, 2020).**

Setting:

The study was conducted at the inpatient and outpatient clinics in Sohag Oncology institution. It is located on the first floor. Because of its high patient flow rate and ability to serve the most populous region, this setting was selected.

Subjects:

The method of purposive sampling was employed to choose 100 women with cervical cancer who were included in the study's sample; they were split into two groups, one for the experimental group and another for the control group, each with 50 patients.

Randomization:

An approach known as purposive random sampling was used to select the participants. A single piece of paper was given to each woman as part of the randomization procedure. The woman who selects the letter carrying the paper (E) represents the experimental group, while the letter carrying the paper (C) represents the control group. While the control group receives standard care, the experimental group undergoes aromatherapy massage.

Sample size calculation:

Using the power analysis level of significance, 0.95(=1-0.95=0.5), at alpha, the sample size was calculated. The extreme significance threshold was set at 0.001, and the significance level (one-sided) was set at 0.05.

The inclusion criteria were:

- Women undergoing cervical cancer aged 21 years and more.
- Accept to participate in the study.

Exclusion criteria were:

- Cervical cancer women had another chronic disease
- Refuse to participate in the study
- Patients with mental illnesses.

Tools of data collection:

Three tools were used:

Tool (I): Cervical cancer women personal data sheet: It was created by the researchers following an assessment of relevant literature. It contains information on four topics: age, educational level, occupation, and place of residence.

Tool (II):- Tool II: Depression, Anxiety and Stress Scale (DASS-21):

The Depression, Anxiety, and Stress Scale was utilized by the researchers and was adapted from **Lovibond & Lovibond (1995**). The scale, which had 21 items, was made up of three self-report ratings that were intended to measure the signs of

depression, anxiety, and stress. Seven items make up each of the three DASS-21 subscales. The depression scale measures inertia, dysphoria, and devaluation of life, as well as a lack of interest or involvement, self-deprecation, anhedonia, and lack of interest in anything. The anxiety scale assesses situational anxiety, skeletal muscle symptoms, autonomic arousal, and subjective experiences of anxious affect. The chronic non-specific arousal levels are sensitive to the stress scale. It measures nervous arousal, inability to unwind, easiness to become disturbed or irritated, irritability/overreactivity, and impatience. Responses on the rating scale varied from (3) applied to me very much or most of the time to (2) applied to me to a significant extent or a good portion of the time to (1) applied to me occasionally or to some extent, and (zero) did not apply to me at all.

Scoring system for Depression, Anxiety, and Stress Scale (DASS):

The cutoff point used by **Antony et al. (1998)** to classify stress, anxiety, and depression was used to classify the responses. As a result, the severity of the symptoms (very severe, severe, moderate, mild, and no symptoms) was as follows:

Levels of DASS symptoms	Depression	Anxiety	Stress
Normal (no symptoms)	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

Tool (III): Richards-Campbell Sleep Questionnaire (RCSQ):

In 1987, the Richards-Campbell Sleep Questionnaire (RCSQ) was created. In 2010, Karaman Ozlü and Ozer modified the RCSQ for validity and reliability in Turkish, enabling precise assessment of the depth of sleep at night, sleep latency time, waking frequency, awake time, wake-up time, and the impact of noise and ambient levels on sleep quality. Six items on a scale were used to measure these factors. Technical charts that display a visual analog scale from 0 to 100 are used to evaluate each item in between. "0–25" indicates very poor sleep, while "76–100" indicates very good sleep. According to Karaman Ozlu and Ozer (2015), patients' sleep quality improved in direct proportion to increases in scale scores.

Validity of the tools:

The instruments' content validity, clarity, comprehensiveness, appropriateness, and relevance were evaluated by five experts in the domains of obstetric nursing, mental health nursing, and medicine. No alterations were made, in the opinion of the panel, to ensure that the sentences were understandable and pertinent to the situation.

Reliability of the tools:

The reliability of the two scales was assessed in the current study using the internal consistency approach. Both demonstrated high reliability with Cronbach alpha coefficients of 0.96 for the first tool, 0.95 for the DAS scale, and 0.78 for the **RCSQ**.

Field of work:

This study was carried out over six months from the beginning of March (2023) to the end of August (2023). Aromatherapy massage was applied to the experimental group by the researcher who was trained by a therapist and skilled in aromatherapy massage. The researcher received training in massage in the Department of Physical Medicine located on the first floor of the main university hospital 3 days per week (Sunday, Tuesday, and Thursday) for 6 months.

To gather information, the researcher visited the hospital three times a week on Sunday, Monday, and Tuesday. The experimental group received aromatherapy massages on the first, second, and fourth postoperative days after 1-4 hours (when the anesthesia had fully worn off), and the researcher was instructed to collect data once daily for three days. There were two post-tests used to evaluate sleep patterns.

The postoperative improvement of emotional status and sleep pattern was provided to women undergoing cervical cancer treatment through routine hospital care.

Administrative process: -

Official permission to conduct the study was obtained from the director of the previously selected setting to carry out the study and obtain their approval and cooperation during the study.

Ethical Considerations:

The following were among the ethical research considerations in this study: • The faculty of nursing's ethical committee approved the research proposal. • The research subjects were not at risk while it was being applied. • The study adhered to

standard ethical guidelines for clinical research. • After outlining the nature and goals of the study, women who were willing to participate had their written consent obtained. • Anonymity and confidentiality were guaranteed. • Research participants were free to decline participation or to leave the study at any moment, for any reason. • Study participant privacy was taken into account when gathering data.

A pilot study

A pilot study was carried out before starting the data collection. It was done on a sample of 10% of 10 women undergoing cervical cancer to test the clarity, visibility, and applicability of the study tools. This pilot was included in the study.

Implementation of the study included three phases

Assessment phase:

Both the control group and the experimental group took the pretest. In the control group, women with cervical cancer received standard hospital care while the experimental group, which did not receive an aromatherapy massage, had its emotional state and sleep patterns evaluated at the same intervals.

Implementation Phase:

Intervention Aromatherapy massage:

The researchers introduced themselves and described the study's objectives to each cervical cancer woman receiving treatment in the experimental group. Demographic information was subsequently gathered using the aromatherapy massage, the DASS (tool 2), and **RCSQ** (tool 3), the researchers evaluated the depression, anxiety, and stress levels of cervical cancer women and their sleep patterns. Each interview lasted around an hour. 50 cervical cancer women who were receiving aromatherapy massage in the experimental group. The aromatherapy massage was taught using demonstrations, pictures, and group discussions.

In the experimental group:

Women with cervical cancer in the experimental group received hand and foot massages in addition to their regular hospital care. The massages included aromatherapy techniques such as effleurage, petrissage, friction, joint massage, and tapping with mild to moderate pressure. Using the method of massaging the feet and hands, apply one or two drops of essential oil to the reflex point and press all four fingers flat against the skin. Additionally, roll up the fingertips with medium pressure. Roll over the fingernails until you release the pressure and move forward by about 1/4 of an inch. Repeat this motion until the reflex point is covered. Repeat this technique twice a day. Both before and after lavender oil was applied to their skin with gentle, circular hand movements, they were lying in bed. Whole-body massage was the technique used. Massages were performed on the patient's deltoid muscles, arms, back, shoulder, thighs, palms and fingers, front and posterior leg sections, forearms, belly and chest, front and rear foot sections, auxiliaries, and neck muscles. Utilizing tools II and III, the experimental group's outcomes were assessed following the intervention. • Women undergoing cervical cancer in the control group used the same tools to track their emotional state and sleep patterns.

For the control group:

In the control group, every cervical cancer woman had a face-to-face discussion with the researchers for around 30 minutes during which they introduced themselves, discussed the objectives, and obtained their oral consent. After that, without having the women practice the aromatherapy massage, the researchers used DASS and **RCSQ** to gather data from the women and their personal, levels of depression, anxiety, stress, and **RCSQ**. They only received routine care such as taking medication as prescribed.

Evaluation phase:

After four weeks of applying the PMR technique, the researchers reassessed depression, anxiety, and stress levels in both experimental and control groups by using the DASS.

Statistical analysis:

SPSS statistical software, version 20, was used to analyze the data. The mean and standard deviation (SD) of three days' worth of continuous data were calculated before and after the massage. Categorical data were reported using percentages and numbers. The outcomes of each group were compared before and after the intervention using the paired t-test and the independent t-test, respectively. Changes in pain and fatigue levels were examined using the one-way repeated-measures analysis of variance (ANOVA). Variables that did not meet the parametric assumptions were examined using the Mann-Whitney test. The outcomes were examined using chi-square analysis. The connection between two variables was assessed using the chi-square test in the case of noncontiguous data. the association

between the two variables was evaluated using the chi-square test. A lower P value than 0.05 was used to determine statistical significance

Results:

According to **Table 1**, the average age of women undergoing cervical cancer in the experimental group was 44.55 ± 17.33 years, whereas it was 45.27 ± 3.22 years in the control group. Education-wise, it was discovered that women undergoing cervical cancer in the experimental group had a higher percentage of secondary education (62%) than those in the control group (60%). In the experimental group, 70 % of the women undergoing cervical cancer were housewives, compared to 60% in the control group, according to the same data. Both the experimental group's (74%) and the control group's (72%), women undergoing cervical cancer, resided in urban areas. There was no statistically significant difference between the two groups in terms of demographic data.

Concerning women undergoing cervical cancer's total scores of DASS levels, it was observed from **Table (2)** that, there was a highly statistically significant improvement observed in women undergoing cervical cancer's total scores of depression, anxiety, and stress scores (P<0.001) after the aromatherapy massage intervention.

Concerning the women undergoing cervical cancer's total scores of depression, anxiety, and stress, it was noticed from **Table (3**) that, the total women undergoing cervical cancer's depression, anxiety, and stress scores were higher pre-intervention in both groups which reduced in the experimental group post- intervention. Also, there were highly statistically significant improvements and differences observed in the women undergoing cervical cancer's total scores of depression, anxiety, and stress scores in the experimental and control groups pre and post-aromatherapy massage intervention at (P<0.001).

Figure (1) presents that 70% of the studied women undergoing cervical cancer pre-aromatherapy massage implementation had a severe level of stress, (62 %) of them had severe anxiety, and (52%) had severe depression Moreover these percentages decreased to moderate and mild among the studied women undergoing cervical cancer post-aromatherapy massage implementation which reflected the significant effects of aromatherapy massage implementation.

Figure (2) Illustrates that there were highly statistically significant differences and improvements regarding sleep patterns between the control and study group post-surgery and after aromatherapy massage implementation at (P= 0.0001).

The groups' mean scores were compared, and the RCSQ scores are displayed in **Table 4**. RCSS measuring scores averaged 55.99±11.33; the control group score was calculated at 30.09±8.88 and a statistically significant difference regarding sleep pattern between the mean scores of the two groups was detected ($p < 0.001$).

It was clear from **Table (5)** that, there was a highly statistically significant difference between the socio-demographic characteristics especially the age and the residence, and the total mean scores of depression, anxiety, and stress among the studied women undergoing cervical cancer pre-and post-the aromatherapy massage implementation. Additionally, before the aromatherapy massage implementation, the levels of stress, anxiety, and stress among women undergoing cervical cancer who were between the ages of 40 and 50, had only secondary education, were working, and were from rural areas increased; however, these levels fell following the aromatherapy massage implementation.

Table (6) reveals that there was a highly statistically significant correlation between sleep disturbance and depression, anxiety, and stress among the studied women.

Table (1): Demographic data among the studied women undergoing cervical cancer in both groups (N=50 in each group)

Demographic data	The experimental group (n=50)		Control group (n=50)		X2	p-value
	No.	%	No.	%		
Cervical cancer women 's age						
- 21 < 30	12	24.0	10	20.0	3	0.15^{NS}
- 30 <40	18	36.0	19	38.0		
- 40 ≤ 60	20	40.0	21	42.0		
Mean ±Stander deviation	44.55 ± 17.33		45.27 ± 3.22			
Cervical cancer women 's education						
-Primary education	14	28.0	17	28.0	4	0.15^{NS}
-Secondary education	31	62.0	30	60.0		
-University education	10	20.0	11	22.0		
Cervical cancer women's occupation:						
-Working	15	30.0	20	40.0		
-Housewives	35	70.0	30	60.0	3	3.32^{NS}
Cervical cancer women 's residence:						
-Urban	37	74.0	36	72.0	2	1.23^{NS}
-Rural	13	26.0	14	28.0		

NS-non-significant

Table (2): Pre and post-intervention DASS levels among the studied women undergoing cervical cancer (n=50 in each group)

DASS levels	Control group (n=50)	Experimental group (n=50)	T-test	P-value
Depression	25.22 ± 4.22	12.34 ± 1.44	28.44	<0.001*
Anxiety	18.56 ± 1.33	11.56 ± 1.37	99.34	<0.001*
Stress	31.22 ± 2.77	21.22 ± 3.52	67.78	<0.001*

NS=Non-significant, *= significant at p<0.05 level

Table (3): Comparison of total mean scores of women undergoing cervical cancer's emotional status (DASS levels) in the experimental and control groups pre and post-aromatherapy massage intervention

DASS	Control group (n=50)		Experimental group (n=50)		T-test	P-value
	Pre-aromatherapy massage intervention	Post-aromatherapy massage intervention	Pre-aromatherapy massage intervention	Post-aromatherapy massage intervention		
Depression	26.60 ± 2.52	26.60 ± 2.52	26.60 ± 2.52	13.45 ± 1.43	23.319	<0.001*
Anxiety	17.72 ± 1.14	17.72 ± 1.14	17.72 ± 1.14	10.75 ± 1.13	111.834	<0.001*
Stress	32.60 ± 2.73	32.60 ± 2.73	32.60 ± 2.73	21.34 ± 3.68	94.145	<0.001*

P: **: Highly statistically significant at p<0.001 t: paired sample t-test

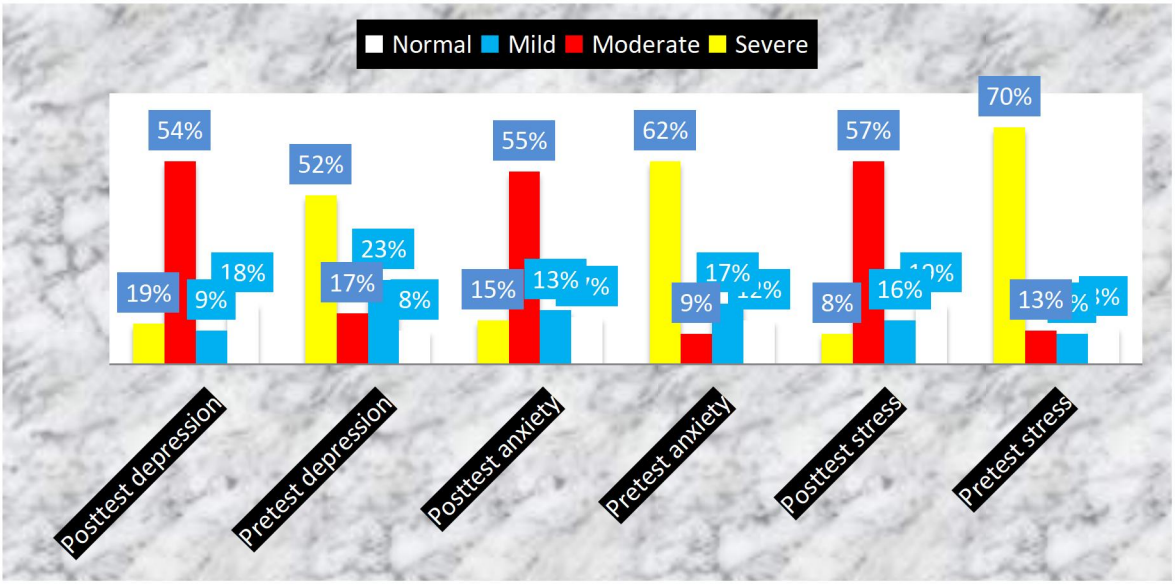

Figure (1): Depression, anxiety, and stress levels pre and post-aromatherapy massage implementation among the studied women undergoing cervical cancer

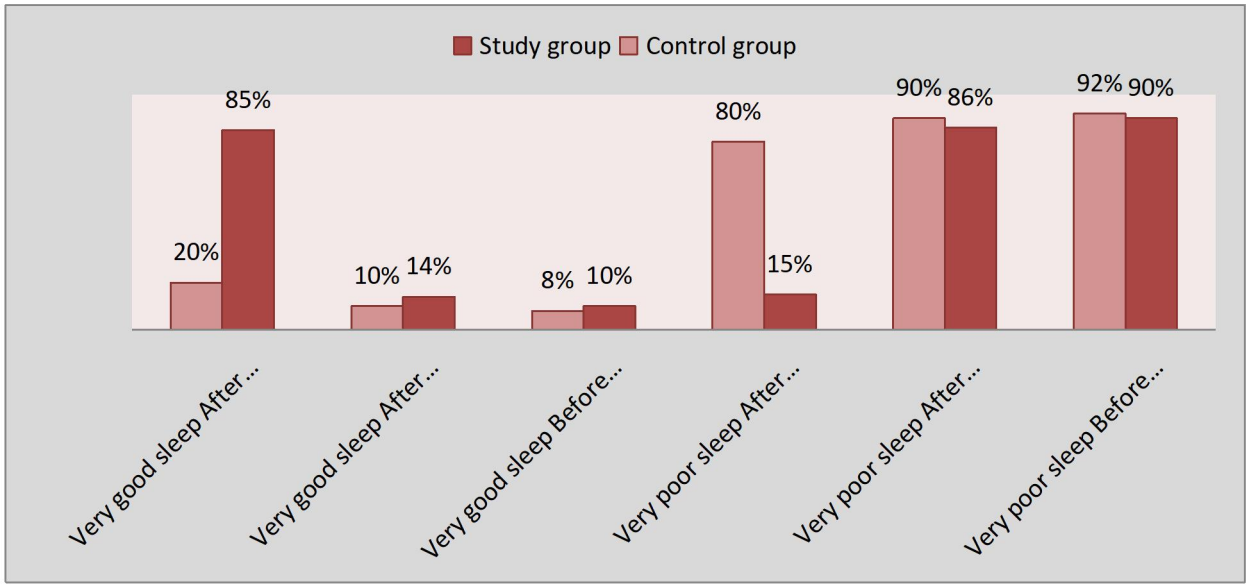

Figure (2): Sleep pattern before, after surgery, and after aromatherapy massage implementation among the studied women undergoing cervical cancer

Table 4: Differences in the Mean RCSQ Scores among women undergoing cervical cancer in both groups

Scale	Groups	Mean and Standard Deviation	Test and p-value
RCSQ	**Experiment**	55.99±11.33	t=12.45
	Control	30.09±8.88	**p<0.001**

Table (5) Association between personal data of the studied women undergoing cervical cancer in the experiment group and their mean scores of DASS pre and post-aromatherapy massage implementation

women's data	DASS						p-value
	Depression		Anxiety		Stress		
	Pre	Post	Pre	Post	Pre	Post	
1-Age(years):							
- 21 < 30	22.55 ± 3.88	11.45 ± 2.85	15.55± 3.99	10.12± 1.75	30.40± 3.57	23.25 ± 3.44	**<0.001***
- 30 – 40	23.70 ± 3.77	13.60 ± 1.65	16.60± 3.66	12.83 ± 1.22	31.50± 2.49	22.30± 3.55	
- 40 ≥ 60	24.70 ± 3.33	12.60 ± 1.45	17.80 ± 1.22	11.83 ± 1.22	32.70 ± 3.98	24.40 ± 3.66	
2-Educational level:							
- Illiterate	23.70 ± 3.60	13.60 ± 1.40	16.80 ± 1.32	12.83 ± 1.13	33.70 ± 3.60	24.40 ± 3.70	**<0.001***
- Read and write	22.55± 3.60	11.45 ± 2.60	15.55± 3.60	10.12± 1.60	30.45± 3.60	21.25 ± 3.60	
- Primary education	21.60 ± 2.60	12.50± 2.60	16.60± 3.60	10.12± 1.60	31.50± 2.60	22.30± 3.60	
- Secondary education	24.70 ± 3.60	12.60 ± 1.40	17.80 ± 1.12	11.83 ± 1.13	32.70 ± 3.60	23.40 ± 3.70	
- University education	20.50± 3.20	12.60 ± 1.40	15.30 ± 1.10	11.43 ± 1.12	30.50 ± 3.50	23.30 ± 3.60	
3- **Working status:**							
- Housewives	21.60 ± 2.77	12.50± 2.70	16.60± 3.70	10.12± 1.73	31.50± 2.72	22.30± 3.46	**<0.001***
- Working	24.70 ± 3.77	12.60 ± 1.50	17.80 ± 1.22	11.83 ± 1.23	32.70 ± 3.54	23.40 ± 3.89	
4- Residence							
- Urban	22.60 ± 3.44	11.50± 2.77	15.60± 3.55	10.12± 2.87	30.50± 3.78	21.30± 3.77	**<0.001***
- Rural	24.70 ± 3.54	12.60 ± 1.55	17.80 ± 1.21	11.83 ± 1.32	32.70 ± 3.89	23.40 ± 3.65	

Table (6) Results of multivariate logistic regression

Factor	B	S.E.	*P* value	OR
RCSQ	0.887	0.382	0.018	3.467
Depression	2.545	1.141	0.027	13.613
Anxiety	1.578	0.721	0.029	5.876
Stress	2.672	1.098	0.019	15.436

Discussion:

All across the world, cancer is a serious issue for public health. In 2020, there will be 10.3 million cancer-related deaths worldwide, according to the International Agency for Research on Cancer (**Sung et al., 2020).** According to estimates, there will be 604,000 new cases and 342,000 fatalities from cervical cancer among women globally in 2020. With 2165 new cases and 1199 fatalities in 2020, cervical cancer will rank second among female cancers behind breast cancer (**Bhatla et al., 2019**). The availability of cervical cancer treatment improved survival rates. There are various cervical cancer treatment options, which are influenced by the patient's age, stage at diagnosis, health, and emotional state (**Kim. et al., 2018**).

Patients who have clinical or disease-related concerns, poor sleep quality, limitations in their post-operative position, or unknown post-operative encounters are known to experience severe surgical pain. For a considerable amount of their waking and sleeping hours, these patients are unable to benefit from the calming effects of sleep. Inadequate sleep has a deleterious impact on an individual's wound-healing ability, immune system, and cognitive abilities. It also raises stress levels, which is harmful to health (**Karaman Ozlu & Ozer, 2019**).

Furthermore, alterations in physiological parameters and elevated stress levels are caused by detrimental impacts on the patient's sleep quality **(Onler, 2018).**

Concerning the women undergoing cervical cancer's total scores of depression, anxiety, and stress, it was noticed that, the total women undergoing cervical cancer's depression, anxiety, and stress scores were higher pre-intervention in both groups which reduced in the experimental group post-intervention with highly statistically significant improvements and differences observed in the women undergoing cervical cancer's total scores of depression, anxiety, and stress scores in the experimental and control groups pre and post-aromatherapy massage intervention.

According to the study's findings, cervical cancer women are prone to depression; therefore, exercise is necessary to lessen depression in these patients. Exercises that incorporate both core movement exercises and relaxation techniques are beneficial for treating sadness and anxiety. The relaxation movement is an intervention that employs a variety of techniques to support the mind's ability to influence physical symptoms and bodily functions that produce harmony in the body and mind, which is believed to facilitate healing for both physical and

psychological disorders like anxiety and depression (**LeMone &Burke et al., 2018**).

According to several studies, relaxing motions during physical activity can lessen chemotherapy's adverse effects as nausea, vomiting, anxiety, and depression (**Kartika et al., 2021**). This is feasible since there are things that are connected among psychological elements (such as anxiety and depression). The effects of exercise on mood, depression, and fitness are all positive. Regular exercise also promotes a quicker recovery from stressors, which reduces the severity of depressive symptoms. According to the study by **Midtgaard et al., (2019)** the exercise intervention group's degree of depression was dramatically reduced.
Generalized anxiety—which includes feelings of concern, apprehension, and dread—can more frequently determine a patient's quality of life and may be less changed by exercise than depression, which is frequently linked to cancer patients (**Chambers et al., 2019**).In cervical cancer patients, exercise has been shown to reduce depression, according to the findings of statistical testing. Since relaxation exercises compare how a person feels when their muscles are relaxed to how they feel when they are tense, they can help people with depression. Patients with cervical cancer who exercise report less stress, despair, and exhaustion. To help patients enhance their quality of life, a nurse or other healthcare professional should use this intervention (**Fatwa et al., 2021**).

Another study on cervical cancer patients revealed that some will have major changes in their sense of self and their ability to recognize their roles after having a hysterectomy. According to **Khalil et al. (2018**), several patients claimed that they experienced considerable unpleasant feelings, felt as though their social or professional status had been negatively impacted by the sickness, and that they had experienced discrimination from others.

Similar to the findings of this study, some researchers have looked into the psychological health status of patients with middle and advanced cervical cancer. Their findings indicate that these patients' somatization, compulsion, interpersonal sensitivity, anxiety, hostility, and other factor scores were significantly reduced, with significant differences before and after the intervention (**Gernier et al., 2021).** In conclusion, **Muzi et al. (2021**) found that implementing psychological intervention can help cervical cancer patients undergoing postoperative chemotherapy feel better both immediately and later.

The results of the current study showed that there was a highly statistically significant improvement observed in women undergoing cervical cancer ' total scores of depression, anxiety, and stress scores after the aromatherapy massage intervention. This can highlight how crucial it is to put the aromatherapy massage into practice so that anxiety might be reduced.

The current study's findings showed that the studied women undergoing cervical cancer pre-aromatherapy massage implementation had extremely high levels of stress, anxiety, and depression, but that after the aromatherapy massage was reduced, these percentages diminished to moderate levels among them, with improvements in the combined scores of depression, anxiety, and stress that were highly statistically significant. According to the researchers, the results supported the claim that aromatherapy massage is beneficial in reducing women with cervical cancer worry and tension while they are receiving chemotherapy. These conclusions are reinforced by a study conducted by **Park et al., (2019**) concerning the use of aromatherapy massage to lessen dental anxiety, which found that it helped ease patients' stress and anxiety (**Li et al., 2018**).

The current study found that post-**aromatherapy massage** implementation, stress, anxiety, and depression levels were decreased and moderate in more than half of the **women undergoing cervical cancer**. This reflected the positive effects of **aromatherapy massage**, which aims to assist women in choosing the best course of action to take to reduce their anxiety, which may be responsible for the program's effectiveness.

Additionally, other findings from the research indicate the advantages of progressive muscle relaxation concerning women's anxiety levels. This is associated with gradual muscular relaxation, which can calm the body, effectively lessen and reduce anxiety, and improve the quality of sleep **(Wilczyska et al., 2019).**

The current study found that there were highly statistically significant differences and improvements regarding sleep patterns between the control and study group post-surgery and after aromatherapy massage implementation. from the researcher's point of view, it confirmed the success of the **aromatherapy massage** implementation and its effectiveness that associated with The study groups' mean scores improvements. The high prevalence of sleep disorder in cancer patients is due to the symptoms associated with the disease or cancer treatment (**Engstrom et al., 2019**),

psychological distress caused by the disease (Sateia & Lang, (2018), and hospitalization and as well as other changes in the sleep place (**Lee et al., 2018**).

In **Frisk & Nordström, (2019**) sleep studies, the experimental group's RCSQ descriptive mean scores were 51.42, while the control group's scores were 45.5. The results of the experiment group's study, which agree with the research's findings, show that the lavender oil used in this investigation had a favorable impact on the participants' sleep quality. One way to find out how touch affects emotions is to withhold touch. It is unclear what happens when activation energy comes into contact with the skin. When used by nurses, touch doesn't require any specific training. A patient experiences the following psychological benefits when they are touched: By lowering blood pressure and pulse rate, touching improves respiration and physiological recovery while also enhancing patient-nurse interaction and reducing physiological and psycho-social issues (**Tracy et al., 2015**).

These results corroborated those of **Moeini et al. (2020) and Cho et al. (2019),** who discovered that children who received aromatherapy massage had better sleep patterns. Additionally, Chien et al. (2019) discovered that a massage using lavender aromatherapy significantly improved sleep patterns. These results were consistent with those of **Marline et al. (2018),** who discovered a significant difference between the mean quality of sleep score on the posttest and the pretest, with the posttest score being significantly lower. This suggests that aromatherapy significantly enhanced the patient's sleep patterns in terms of quality. Also in agreement with **Naja et al. (2020),** who noted that during the study's three nights, children who slept longer nights and went to bed earlier experienced significant increases in their levels of relaxation and sleep duration. This could account for the advantages of massage therapy in enhancing sleep patterns and lowering anxiety, depression, and sensitivity to sleep disruptions.

The results of the current study demonstrated a highly statistically significant correlation between personal characteristics and the total mean scores of depression, anxiety, and stress among the studied women before and after the implementation of the aromatherapy massage. Before the implementation of the aromatherapy massage, the investigated women's mean emotional disturbance scores were much higher where they lived, particularly in rural areas. According to the researcher, rural areas differ in terms of culture, values, and beliefs, and women who live there are more stressed due to a lack of medical protective supplies, a lack of knowledge, and the difficulty of traveling to an urban hospital or health center when complications are suspected. Also, a high level of women's stress was accompanied by working women. This may be explained by the fact that younger, less educated women undergoing cervical cancer had less knowledge of and difficulty understanding the aromatherapy massage than educated women, whereas educated women may have had an easier time understanding the information than uneducated women.

The results of the current study revealed a highly statistically significant correlation between sleep disturbance and depression, anxiety, and stress among the studied women. From the researcher's point of view, it may be due to afraid of the disease and its complications or death which increased depression, anxiety, and stress among the studied women and led to sleep disturbance.

Anxiety and depression are strongly associated with sleep disturbance, according to numerous studies (**Bardwell et al., 2018**). Studies have indicated that higher incidences of depression and anxiety are linked to increased disturbances in sleep quality over time, as demonstrated by a prospective longitudinal study that examined the roles of these two conditions in sleep disturbance among ovarian cancer patients during the first year following diagnosis (**Clevenger et al., 2019)**. Only women with clinically significant depression have an increased risk of developing symptoms of insomnia, according to another study that evaluated the risk factors for insomnia in patients with stage I breast cancer **(Bardwell et al (2018).** Researchers discovered in a case-control study that breast cancer patients had higher levels of anxiety, depression, and trouble sleeping than healthy controls (**Carlson et al., 2017**). Anxiety and depression are also associated with insomnia in both the general population and heterogeneous cancer populations, with low mood predisposing an individual to insomnia. Depression is a significant predictor of insomnia and sleep disturbances, as demonstrated by **Palesh et al. (2016**). According to studies, in patients with stages I and II cervical cancer, anxiety and depression were independent risk factors for poor sleep quality.

Conclusion:

Based on The present study's findings and research hypothesis, the researchers concluded that The study achieved significant improvements in the emotional status and sleep patterns among cervical cancer women. The application of aromatherapy massage increased and enhanced the quality of sleep

Recommendations:

The following recommendations were suggested based on the results of the present study

- Cervical cancer women should understand the aromatherapy massage approach as a straightforward and practical strategy to improve their emotional status and enhance sleep quality.
- In-service educational programs must be designed and implemented for nurses about the importance of massage therapy
- Psychological support should be carried out to help cervical cancer women to help them become less stressed and anxious.
- Simple Arabic booklets and brochures containing sufficient knowledge about cervical cancer should be available to cervical cancer women, printed, and given to them.
- For the results to be generalized, the current study must be replicated with a big sample of women in varied contexts.

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