Effect of Massage Therapy on Minimizing Fatigue among Elderly Women with Breast Cancer

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Abstract: **Background: Fatigue is a commonly reported debilitating symptom affecting more than 70% of elderly cancer patients, and experienced by up to 90% of breast cancer patients during active treatment. Massage therapy is considered a safe complementary approach that has a great rate of acceptance; therefore, it can be used in elderly women as a supportive care for fatigue management. Aim: Determine the effect of massage therapy on minimizing fatigue among elderly women with breast cancer. Research design: A quasi experimental research design was utilized. Method: The study includes a purposive sample of 72 elderly breast cancer women (≥60 years) attending at radiation unit of the oncology and nuclear medicine department. The study sample were divided into two groups; the study group (n=32) who received twelve Swedish massage sessions, and the control group (n=35) who received only routine care. The revised Piper Fatigue Scale was completed before and after massage intervention to evaluate the level of fatigue. Results: After 6 weeks of massage therapy, fatigue scores improved significantly in the study group (P>0.001) compared to the control group. While within group comparison, there was a significant improvement in post intervention fatigue score compared to pre intervention fatigue scores for study groups at the two time points (at week 3 and at week 6) (P>0.001), while it did not differ in the control group. Conclusion: Massage therapy is an effective approach in reducing fatigue in elderly women with breast cancer. Recommendation: Massage therapy as a noninvasive, cost effective, and easy to applied approach should be involved in routine care for elderly breast cancer patients as a health care services.**

Keywords: **Breast Cancer, Elderly Women, Fatigue, Massage Therapy.**

1. INTRODUCTION

Breast cancer is the most common cancer type affecting middle-aged and elderly women worldwide. In the USA, according to the Surveillance, Epidemiology, and End Results Program, the estimated new cases of breast cancer in 2022 are 287,850 cases representing 15.0% of all new cancer cases, while estimated deaths are 43,25 accounting for 7.1% of all cancer deaths. Approximately 12.9 percent of women will be diagnosed with female breast cancer at some point during their lifetime. The median age at diagnosis is 63 years old making breast cancer the disease of the elderly women especially those who aged 65–74 years old. (**National Cancer Institute, 2022**).

In Egypt, according to the international Agency for Research on Cancer, the estimated number of new cases of breast cancer in 2020 are 22, 038 cases accounting for 32.4% of all new cancer cases, while estimated deaths in both sexes are 9 .148 accounting for 10.3 % of all cancer death **(GLOBOCAN, 2021).**

Cancer-related fatigue (CRF) is one of the most common and distressing symptoms experienced by cancer patients. It is a debilitating symptom affecting all aspects of a patient's quality of life and may alter the patient's compliance with their treatment plan **(Hurria &Muss, 2015)**. According to the National Comprehensive Cancer Network (NCCN), cancer-related fatigue (CRF) is "a distressing, persistent, subjective sense of physical, emotional and/or cognitive tiredness or exhaustion related to cancer or cancer treatment that is not proportional to recent activity and interferes with usual functioning". It is more persistent and severe than common physical or mental tiredness and not relieved by rest and sleep (**National Comprehensive Cancer Network, 2022).**

More than 70% of breast cancer diagnosed in the aging population having 60 years and over, among those, approximately 80% report acute fatigue. Even after completion of cancer treatment, one-third still experiencing long-term fatigue although the majority of patients recover (**Misra et al., 2020**). In women with breast Cancer, fatigue can produce a negative impact on prognosis and disease survival in addition to a deleterious effect on long term health outcomes which manifested by physical, mental, and emotional problems. As a result of these effects, it can hinder the patient's ability to perform daily living activity and engage socially (**Lin et al., 2021**).

Cancer related fatigue can be managed through a number of pharmacological and non-pharmacological approaches. The effectiveness and safety of pharmacological agents in breast cancer patients is still uncertain and unclear. Beside this, the side effects that resulting from the utilization of pharmacological interventions including physical and psychological health problems have impelled patients to turn to complementary and alternative medicine (CAM) as supportive care approaches to help them in managing their fatigue **(Mustian et al., 2017 & Pearson, Morris & McKinstry, 2017)**. More than 80% of breast cancer patients utilized CAM therapies in their regiment of therapy to boost immune response and alleviate cancer-related symptoms including fatigue **(Subramani & Lakshmanaswamy, 2017).**

Massage therapy is one of the most common CAM approaches featuring a safe, in expensive, and easy to use method that can be utilized by breast cancer patients without measurable side effects **(Bahceli, Arslan & Ilik, 2022).** Swedish massage can be implemented through variety of techniques starting with gentle touch with long strokes followed by kneading, stretching, and squeezing of muscles and connective tissue with varying degree of pressure which can modulate body functions to release stress, reduce pain, improve circulation, and promote sense of wellbeing **(Deng and Latte-Naor, 2018 & Wang, Zhai, Liu, Yao & Tan, 2021).**

There is growing evidence supporting and encouraging practicing massage therapy due to its benefits, therefore, this study aimed to determine the effect of massage therapy on minimizing fatigue among elderly women with breast cancer.

Aim of the study

This study aimed to determine the effect of massage therapy on minimizing fatigue among elderly women with breast cancer.

Research hypothesis:

● Elderly women with breast cancer who receive massage therapy will significantly exhibit lower fatigue level than those who do not receive massage therapy.

2. SUBJECTS AND METHOD

Study design:

A quasi-experimental research design was utilized.

Study setting:

The study was conducted in the radiotherapy unit of the Oncology and Nuclear Medicine department at Main Mansoura University Hospital.

Study participants:

A purposive sample included 72 elderly women with breast cancer attending the above-mentioned setting were assigned to either study or control group, thirty-six (36) women for each group. The study group was subjected to massage therapy, while the control group received routine care. During the implementation phase, seven women were excluded; four from the study group and one from the control group due to their absence of more than two consecutive massage sessions. Therefore, the total study sample became 67 elderly women (32 in the study group, and 35 in the control group).

The inclusion criteria:

1. Aged 60 years and above.

2. Diagnosed with stage I-III breast cancer.

3. Undergoing radiotherapy as adjuvant treatment after surgery.

4. Having moderate or severe fatigue according to revised piper fatigue scale.

5. Having ability for communication

6. Willing to be enrolled in the study

The exclusion criteria:

1. Elderly women with metastasis breast cancer.

2. Elderly women diagnosed with a psychiatric or neurological disorder or having debilitating chronic illness that hinder patient's autonomy.

3. Using certain medication as psychiatric drugs, steroids and anticoagulants during the week before the study.

4. Participating in any other form of complementary and alternative medicine.

5. Existence of any edema, wound, purpura, and bleeding during the intervention.

6. Absence for more than two consecutive sessions of massage therapy.

Sample size calculation:

The sample size was estimated through Clin Calc.com sample size calculator software, at 3% ∞ error (97.0% significance) and 10.0 β error (90.0% power of the study), assuming that the average decrease in fatigue score 5.49 ± 2.53 in group receiving massage therapy and it was 3.24 ± 2.57 in group not receiving massage therapy (**Kinkead et al., 2018**). The calculated sample size was 60 and added 20.0% for better quality of collected data, so the required sample size became 72 patients; 36 patients in each group.

Tools of Data Collection:

Two tools were utilized for data collection

Tool I: Demographic and clinical data structured interview schedule: -

It was developed by the researcher, it divided into three parts: -

Part 1: Demographic characteristics of the elderly cancer patients such as age, marital status, level of education

Part 2:   Medical history of the elderly cancer patients such as medical diseases and medication used.

Part 3: Disease related characteristics including cancer stage, duration of illness, duration and type of surgery

Tool II: Revised Piper Fatigue Scale (PFS-R):

Piper fatigue scale was developed and revised by **Piper et al., (1998)**. It is a multidimensional self-report instrument that has been widely used to assess and evaluate cancer related fatigue especially in breast cancer patients. This scale was translated into Arabic language by *Rajjoub, (2012),* The scale consists of 22 questions which are based on a 0-10 numeric range while the higher score represents higher fatigue level.

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Through these 22 questions, four subdomains can be measured. Behavioral affective, sensory and cognitive domain. For calculating the subscale scores, the scores of all items within the specific subscale are added, and this sum is then divided by the number of items within this subscale. This gives a mean subscale score for the domain from 0 to 10. A total mean score of fatigue can be generated by adding the four subscale scores and dividing this sum by four. The severity codes are: no fatigue (0), mild (1-3), moderate fatigue (4-6) and severe fatigue (7-10).

Validity and reliability:

Content validity and feasibility of the study tools (I and II) were tested and revised by a jury of 6 members' experts in the related field of oncology medicine, gerontological nursing, and medical surgical nursing. Their modifications and comments were considered.

The reliability of tool II (PFS-R) was assured by means of Cronbach's coefficient alpha, it indicated that tool II has a reliability of 0.92.

Pilot study:

A pilot study was conducted on 10% of elderly women (7) with breast cancer from the radiotherapy unit to ensure the clarity and applicability of the study tools, and accordingly the necessary modifications were done. These patients were excluded from the main study. Based on the findings of the pilot study, researchers found that the suitable time for implementation of massage session and data collection was after the radiation session while they need a time for rest.

Ethical Considerations:

An ethical approval was obtained from the Research Ethics Committee of the Faculty of Nursing – Mansoura University. The participants were assured that their participation is voluntary and that they have the right to accept or refuse to participate in this study. Also, the privacy of the study subjects and confidentiality of the collected data were assured. The study subjects were informed that in case of withdrawal at any time point, there was no any negative affection on their treatment pass way

Procedure of data collection:

To complete data collection, researchers (PI) needed a nine months' duration, starting from September 2020 to May 2021. Data collected through three phases; preparation, implementation, and evaluation phase.

I-Preparation phase

● Before approaching data collection, the researcher received a training course in massage therapy under supervision of a specialized trainer in the field of therapeutic massage and physical therapy in order to be skilled in practical application.

● The researcher has benefited from the offered training courses of the American Massage Therapy Association and other validated websites that are available for students and researchers to nourish their knowledge and ensure high quality practice.

● After obtaining the official approval for conducting the study, the researcher used to meet the eligible women in the restroom where they were waiting for radiation sessions and introduced herself to them.

● The researcher obtained informed consent from the elderly women after explaining the potential benefits and risks as well as study aims and procedures.

● Through face-to-face meetings, researchers (PI) interviewed the study participants individually before implementation of massage sessions to collect the baseline data using the study tools (I and II). Each interview lasted between 20 and 25 minutes. Telephone numbers of the studied elderly were recorded to ensure continuous communication.

II-Implementation phase

● Massage therapy was performed individually for the intervention group in the private room in the radiotherapy unit. The proposed massage therapy was adapted from **Listing M., et al (2009), Kinkead et al., (2018), Kashani F & Kashani P (2014)** and conducted in 12 massage sessions for a period of 6 weeks.

● During this phase, the elderly women who were assigned to the intervention group received a 30-minute Swedish massage of back, spine, shoulder and neck twice a week.

● At the beginning of the first session of massage, the researcher used to give the guided booklet to the participants in the intervention group to be familiar and oriented with steps of procedure and maintain their cooperation.

● The researcher used to prepare the environment; the room should be quiet and dim lighting maintain the patient's privacy by use of curtains.

● The researcher assisted the elderly woman to take off her clothes and assume a prone position, pillows and towels were put beneath the patient's head and legs to ensure her comfort.

● Using baby Jonson oil, the researcher rubs hands together to warm it and started to distribute the oil on the selected parts for massage to prevent the friction and promote comfort

● Swedish massage techniques were performed to the participant in the intervention group using long strokes and gliding motion massage technique with mild pressure (5 min) using two hands, one hand, and palm of the hands which encompass superficial effleurage.

➢ Deep effleurage with relatively greater pressure (7 min), using edge of hand, arm.

➢ Petrissage technique (kneading of the muscle) lasting 8 minutes using the palm of both hands, one hand, and two hands.

➢ Using thumb and fingertips, apply penetrating pressure over the muscle to demonstrate friction technique (5 min), and ending with superficial effleurage massage (5 min).

● Massage was performed on the following body parts with certain directions as follows;

➢ Massage started from lower back from the iliac crest muscle upward to the shoulders of the patient and neck and then came cascading down.

➢ Spine massage through paravertebral circular motion with gentle pressure and alongside the iliac crest then to the hip.

➢ Massage was applied over the hip (gluteus maximus muscle) then sacral up to the shoulder and round the scapulae then alongside the neck.

● After the neck was massaged, hands moved down to the shoulder, lower back and ended with an iliac crest.

● After the massage session was completely performed, researchers used to assist the patient in wearing her clothes and assuming setting position.

● Before leaving the room, the researcher made the correct sign on the session follow-up card attached to the patient's booklet as an evidence for session attendance.

● For control cases, they received only routine hospital care and the researcher used to give them a copy of printed booklet after finishing the data collection. The researcher also offered them the possibility of applying therapeutic massage sessions for those who want after completion the data collection.

III-Evaluation phase

● In relation to the intervention group, the participants were evaluated at three-point time; baseline evaluation, after 3 weeks, and after 6 weeks of the intervention, while the participants in the control group were evaluated at two-point time; baseline and after 6 weeks of intervention.

● Baseline evaluation was done at the preparatory phase before the implementation of massage sessions for both groups using the study tools I (demographic and clinical data questionnaire) and tool II (PFS-R).

● At the end of the third week, participants in the intervention group were evaluated using study tool II (PFS-R). At the end of the six week, participants in the intervention group and control group were evaluated using study tool II (PFS-R).

● Comparison between the pre and post results of one group was done for each of the intervention and control groups separately.

● Comparison between the intervention and control group's findings was done before and after the implementation of proposed intervention.

Statistical Analysis

Data was fed to the computer and analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp). Qualitative data were described using number and percent. The Kolmogorov-Smirnov test was used to verify the normality of distribution. Quantitative data were described using range (minimum and maximum), mean, standard deviation, median. Graphs were done for data visualization through using SPSS and Microsoft excel programs. The comparisons were determined using Student's t test for two variables with continuous data and ANOVA test for more than two variables with continuous data. Chi-square test was used for comparison of variables with categorical data. Correlation between variables was evaluated via Pearson's correlation coefficient (r). Statistical significance was set at $p < 0.05$.

3. RESULT

Table (1) illustrated the demographic characteristics of the study and control groups. The studied elderly women were young with a mean age of 64.69 ± 3.06 years for the study group, and 64.91 ± 3.22 years for the control group. Illiteracy was prevailing which constituted 65.6% of the study group and 48.6% of the control group. The majority of the study group (81.2%) were living in rural areas while 18.8% were living in urban areas.

Table (2) demonstrated the presence of other chronic diseases and medications taken in the study and control group. About two third of the studied elderly women have at least one chronic disease. Hypertension was more prevailing which represented 36% and 52% in the study and control group respectively. Analgesics were the mostly drugs taken by the study sample; 96.9% and 100% in the study and control group respectively.

Table (3) demonstrated the disease related characteristics of the study and control groups. More than half of the study and control groups; 62.5% and 65.7% respectively had stage II breast cancer. The modified radical mastectomy was the more prevailing type among the study and control groups; 43.8% and 57.1% respectively. Regarding the number of radiation sessions, about half (50%) of the study group and 45.7% of the control group reported that they received from six to ten radiation sessions.

Table 4 illustrated the total and subscale fatigue scores of the study and control groups before and after implementation of massage therapy. Both total and subscale fatigue score of the study group significantly improved after 6 weeks of massage sessions compared to the control group($P < 0.001$). No significant statistical differences between both group before applying massage sessions, while the differences between the both groups were statistically significant at 6 weeks after implementation of massage sessions.

Figure (4) illustrates total and subscales fatigue score among the study group across three time points (before, after 3 weeks and after 6 weeks) of massage therapy. The differences in all scores of three periods were statistically significant where p value found to be <0.001

Table (5) illustrates the degree of improvement in both total and subscale fatigue score. The total fatigue score was significantly decreased in the study group where the change in the mean was -3.28 ± 0.95, while in the control group it did not exceed -0.25 ± 1.13. The degrees of improvement were statistically significant between the study and the control group where p value was found to be <0.001 in total and all fatigue domains.

Table (6) illustrated the fatigue level of the study participants before and after implementation of massage therapy. After 6 weeks of massage sessions,78.1% of the study group were mildly fatigued. The difference of fatigue level among the study group was statistically significant (p <0.001). Moreover, the difference between the two groups before the program was not statistically significant, while it was significantly after 6 weeks of massage intervention.

Table 1: Comparison between the study and control groups according to demographic characteristics

Demographic characteristics	Study group (n = 32)		Control group (n = 35)		Test of Sig.	p-value
	N	%	N	%		
Age						
<65	14	43.8	19	54.3	$\chi^2=$ 0.742	0.389
≥65	18	56.2	16	45.7		
Min. – Max.	60.0 – 71.0		60.0 – 72.0		t= 0.295	0.769
Mean ± SD.	64.69 ± 3.06		64.91 ± 3.22			
Median	65.0		64.0			
Residence						
Rural	26	81.3	27	77.1	$\chi^2=$ 0.171	0.680
Urban	6	18.8	8	22.9		
Marital status						
Married	27	84.4	26	74.3	$\chi^2=$ 1.870	MCp= 0.531
Widow	5	15.6	7	20.0		
Divorced	0	0.0	2	5.7		
Level of education						
Illiterate	21	65.6	17	48.6	$\chi^2=$ 4.192	MCp= 0.369
Read and write	4	12.5	11	31.4		
Basic education	6	18.8	6	17.1		
University education	1	3.1	1	2.9		
Occupation before retirement						
Not working	25	78.1	28	80.0	$\chi^2=$ 0.036	0.850
Working	7	21.9	7	20.0		
Current job						
Not working	32	100.0	35	100.0	–	–
Income						
Enough	6	18.8	9	25.7	$\chi^2=$ 0.467	0.495
Not enough	26	81.3	26	74.3		
Living condition						
Alone	0	0.0	1	2.9	$\chi^2=$ 1.471	MCp= 0.829
With the husband	8	25.0	10	28.6		
With family (husband and sibling)	18	56.3	16	45.7		
With one of the sibling	6	18.8	8	22.9		

SD: Standard deviation   **t:** Student t-test χ^2: Chi square test   **MC:** Monte Carlo

p: p value for comparing between the studied groups

*: Statistically significant at p ≤ 0.05

Table 2: Comparison between the study and control group according to medical history

Items	Study group (n = 32)		Control group (n = 35)		Test of significance	p-value
	N	%	N	%		
Having other chronic disease						
No	7	21.9	10	28.6	$\chi^2 = 0.396$	0.529
Yes	**25**	**78.1**	**25**	**71.4**		
1	15	60.0	13	52.0	MC	p= 0.534
2	8	32.0	7	28.0		
3	2	8.0	5	20.0		
Mean ± SD	**1.48 ± 0.65**		**1.68 ± 0.80**		t=0.967	0.339
Types #						
● Hypertension	9	36.0	13	52.0	$\chi^2 = 1.299$	0.254

● Diabetes	7	28.0	9	36.0	$\chi^2 = 0.368$	0.544
● Cardiac diseases	8	32.0	9	36.0	$\chi^2 = 0.089$	0.765
● GIT diseases	3	12.0	2	8.0	FET	p=1.000
● musculoskeletal system diseases	8	32.0	7	28.0	$\chi^2 = 0.095$	0.758
● Respiratory system diseases	1	4.0	0	0.0	FET	p=1.000
● Renal diseases	0	0.0	2	8.0	FET	p=0.490
● others	1	4.0	0	0.0	FET	p=1.000
On regular medication						
Yes	32	100.0	35	100.0		
No. of medication						
1–2	7	21.9	11	31.4		
3	13	40.6	10	28.6	$\chi^2 = 1.302$	0.521
4 and more	12	37.5	14	40.0		
Types #						
● Analgesics	31	96.9	35	100.0	FET	p=0.478
● Multivitamins	28	87.5	34	97.1	FET	p=0.185
● Antihypertensive drugs	9	28.1	11	31.4	$\chi^2 = 0.087$	0.768
● Antidiabetic agents	7	21.9	9	25.7	$\chi^2 = .136$	0.713
● Cardiac medication	8	25.0	7	20.0	$\chi^2 = 0.241$	0.624
● Hepatic drugs	1	3.1	2	5.7	FET	p=1.000
● Renal drugs	0	0.0	2	5.7	FET	p=0.493
● Other(carbimazole)	1	3.1	0	0.0	FET	\p=0.478

SD: Standard deviation   **t:** Student t-test χ^2: Chi square test   **MC:** Monte Carlo

p: p value for comparing between the studied groups

*: Statistically significant at $p \leq 0.05$

Table 3: Comparison between the study and control group according to disease related characteristics

Items	Study group (n = 32)		Control group (n = 35)		Test of Sig.	p-value
	N	%	N	%		
Family history of breast cancer						
Yes	7	21.9	5	14.3	$\chi^2 =0.655$	0.418
No	25	78.1	30	85.7		
If yes	(n = 7)		(n = 5)			
First degree	3	42.9	2	40.0	FET	p=1.000
Second degree	4	57.1	3	60.0		
Duration of breast cancer						
<6 Months	7	21.9	12	34.3		
6 Months – 1 year	25	78.1	23	65.7	$\chi^2 =1.267$	0.260
>1 year	0	0.0	0	0.0		
Stage of disease						
Stage I	0	0.0	3	8.6		
Stage II	20	62.5	23	65.7	MC	p=0.272
Stage III	12	37.5	9	25.7		
Duration of breast surgery						
<6 Months	16	50.0	11	31.4		
>6 Months	16	50.0	24	68.6	$\chi^2 =2.396$	0.122

Type of breast surgery						
● Total Mastectomy	10	31.3	3	8.6	χ^2=5.505	0.064
● Lumpectomy	8	25.0	12	34.3		
● Modified radical mastectomy	14	43.8	20	57.1		
Number of radiation session						
● 5–6	2	6.3	7	20.0	MC	p=0.272
● 6–10	16	50.0	16	45.7		
● 11–15	14	43.8	12	34.3		
Min. – Max.	4.0 – 14.0		3.0 – 14.0		t=1.398	0.167
Mean ± SD.	9.84 ± 2.80		8.80 ± 3.27			
Median	9.50		9.0			

SD: Standard deviation   **t:** Student t-test   **χ^2:** Chi square test   FET: Fisher Exact

p: p value for comparing between the studied groups

*: Statistically significant at $p \le 0.05$

Table 4: Comparison between the study and control group according to fatigue scores before and after implementation of massage therapy

Total /Subscale fatigue score (PFS-R)	Study (n = 32)			Control (n = 35)			Sig test t (p_1)	Sig test t (p_2)
	Before	After 6 weeks	Sig test t_1 (p_0)	Before	After 6 weeks	Sig test $t_1(p_0)$		
Behavioral								
Min. – Max.	4.0 – 8.0	2.0 – 6.0	14.124* (<0.001*)	4.30 – 7.60	4.20 – 7.30	0.542 (0.591)	1.214 (0.229)	12.819* (<0.001*)
Mean ± SD.	6.45 ± 1.22	3.27 ± 0.83		6.11 ± 1.07	6.01 ± 0.91			
Median	7.0	3.10		6.20	6.0			
Affective								
Min. – Max.	4.40 – 8.0	2.0 – 5.30	24.223* (<0.001*)	4.10 – 7.30	4.00 – 7.50	1.176 (0.248)	1.960 (0.054)	11.599* (<0.001*)
Mean ± SD.	6.15 ± 0.86	2.89 ± 0.69		5.69 ± 1.05	5.44 ± 1.08			
Median	6.50	2.90		5.80	5.30			
Sensory								
Min. – Max.	4.0 – 7.60	1.40 – 4.0	19.932* (<0.001*)	4.20 – 7.50	3.80 – 7.60	1.878 (0.069)	1.677 (0.098)	12.636* (<0.001*)
Mean ± SD.	6.10 ± 0.94	2.65 ± 0.54		5.68 ± 1.07	5.28 ± 1.10			
Median	6.50	2.60		5.60	5.20			
Cognitive								
Min. – Max.	4.0 – 7.60	2.0 – 4.0	18.316* (<0.001*)	4.20 – 7.20	3.40 – 7.30	1.953 (0.059)	1.975 (0.053)	13.278* (<0.001*)
Mean ± SD.	6.0 ± 0.91	2.71 ± 0.54		5.52±1.08	5.14 ± 0.92			
Median	6.20	2.50		5.30	5.10			
Overall total score								
Min. – Max.	4.30 – 7.60	2.0 – 4.80	19.479* (<0.001*)	4.20 – 7.40	4.10 – 7.40	1.352 (0.185)	1.913 (0.060)	13.593* (<0.001*)
Mean ± SD.	6.17 ± 0.92	2.88 ± 0.54		5.71 ± 1.03	5.45 ± 0.96			
Median	6.55	2.80		5.70	5.40			

SD: Standard deviation   **t:** Student t-test   **t_1:** Paired t-test

p_0: p value for comparing between the studied **periods** groups before massage sessions

p_1: p value for comparing between the studied

p_2: p value for comparing between the studied groups **after 6 week**   *: Statistically significant at $p \le 0.05$

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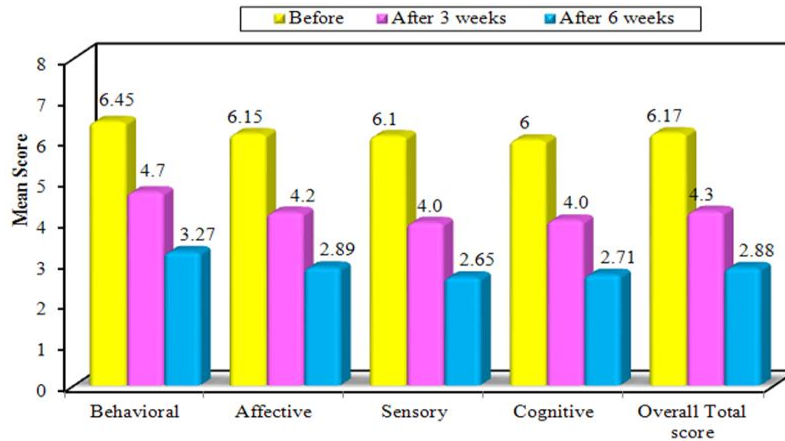Vol. 9, Issue 3, pp: (134-147), Month: September - December 2022, Available at: www.noveltyjournals.com

Figure (1): Total mean and subscales fatigue score among the study group before, after 3 weeks and after 6 weeks of massage intervention (P<0.001)

Table 5: Comparison between the study and control group according to change in both total mean and subscale fatigue score (difference in mean)

Total /Subscale fatigue Difference score	Study group (n = 32)	Control group (n = 35)	Test of significance (t)	p-value
	M±SD	M±SD		
Behavioral	-3.18±1.27	-0.10 ± 1.12	10.514*	<0.001*
Affective	-3.26 ± 0.76	-0.25 ± 1.26	11.668*	<0.001*
Sensory	-3.45 ± 0.98	-0.40 ± 1.26	10.990*	<0.001*
Cognitive	-3.29 ± 1.02	-0.38 ± 1.15	10.937*	<0.001*
Overall total score	**-3.28 ± 0.95**	-0.26 ± 1.14	11.699*	<0.001*

t: Student t-test **p**: p value for comparing between the studied groups *: Statistically significant at $p \le 0.05$

Table 6: Fatigue level of the study and control groups before and after implementation of massage therapy

Fatigue level	Study group (n = 32)							Control group (n = 35)					Test of Sig. (p_0)	Test of Sig. (p_1)	Test of Sig. (p_2)
	Before		After 3 weeks		After 6 weeks		Test of Sig. (p_0)	Before		After 6 weeks		Test of Sig. (p_0)			
	N	%	N	%	N	%		N	%	N	%				
Overall total score															
Mild	0	0.0	4	12.5	25	78.1	Fr=45.705* (<0.001*)	0	0.0	0	0.0	McN p=1.000	χ²=1.329 (0.249)	McN (p<0.001*)
Moderate	25	78.1	28	87.5	7	21.9		31	88.6	33	94.3			
Sever	7	21.9	0	0.0	0	0.0		4	11.4	2	5.7			

χ^2**:** Chi square test **MC:** Monte Carlo **t:** Student t-test **t₁:** Paired t-test

McN: McNemar test

Fr: Friedman test

p_0: p value for comparing between the studied **periods**

p_1: p value for comparing between the studied groups before massage sessions

p_2: p value for comparing between the studied groups after 6 weeks of massage sessions

*: Statistically significant at $p \le 0.05$

SD: Standard deviation

4. DISCUSSION

Fatigue is a significant and a debilitating symptom for elderly patients undergoing radiation therapy that can result in a reduction in usual activities and interferes with a patient's compliance to treatment plan (**O'Donovan, Baldini, & Battisti, 2022**). The aim of the present study was to determine the effect of massage therapy on minimizing fatigue among elderly women with breast cancer.

Fatigue in elderly women was assessed using a revised piper fatigue scale as a multidimensional tool while the elderly women in both groups were experiencing moderate or severe fatigue (score ≥ 4). In order to determine the effect of massage therapy on fatigue among elderly women with breast cancer, we applied within group comparison and between groups comparison pre-post intervention.

Within group comparison, there was a statistically significant difference in both total mean and subscale fatigue score among the study group before and after 6 weeks of massage intervention (P <0.001*) revealing improvement in fatigue score of elderly women who were subjected to massage therapy, while the scores remained the same for the control group. Between groups comparison, total mean and subscale fatigue score did not show any statistically significant differences between the study and the control groups before massage intervention meaning that homogenous and comparable groups, while the differences between both groups were statistically significant in total and subscale fatigue score after 6 weeks of massage intervention (P <0.001*).

This finding supports the research hypothesis of this study which supposed that elderly women with breast cancer who receive massage therapy will report less fatigue level than those who do not receive massage therapy.

These findings are consistent with **Villanueva et al., (2011)** who conducted a study in Spain to evaluate the effects of an 8-week physical therapy including massage intervention on fatigue among breast cancer survivors using piper fatigue scale which revealed a significant improvement of total and subscale fatigue scale among the study group. Another study conducted in Egypt by **Elkalashy and Binshalan, (2019)** also revealed that after back massage intervention there was a significant reduction in fatigue score in the study group as compared to the control group.

In the current study, we also made a comparison between fatigue scores of the study group across three -time points; before, at the end of week 3 and at the end of week 6 of massage intervention. The finding revealed that the total and all dimensions of fatigue including behavioral, affective, sensory and cognitive domains were improved significantly after 3 weeks and the improvement was optimally after 6 weeks of massage intervention.

These findings are in accordance with **Dion et al.,(2015)** who conducted a study in the USA and found that a significant improvement between pre intervention and post intervention mean fatigue score in the massage group at week 3. Moreover, **Robison & Smith, (2016)** carried out a study in USA and **Odebiyi, Aborowa, Sokunbi, Aweto, & Ajekigbe, (2014)** carried out a study in Nigeria reported that fatigue significantly improved in cancer patients who received a massage therapy. Also, **Mohammed & Hassan, (2018)** who conducted a study in Egypt revealed a significant improvement in fatigue score among the study group after 1week, 2 weeks, and 3 weeks of implementation of aromatherapy massage.

We also made a comparison between the studied elderly concerning the mean difference of fatigue scores in order to measure the degree of improvement and detect the change in subscale and total fatigue score from baseline (before) to the week 6 of massage intervention, the results indicate that both total and all domains of fatigue scores were improved significantly in the study group compared to the control group. This finding implies the importance of massage therapy in decreasing the level of fatigue among elderly breast cancer which should be a part of routine hospital care.

Similarly, our findings are in the same line with **Kinkead et al.,(2018)** who conducted a study in the USA and demonstrated a significant reduction in total fatigue mean score in the Swedish massage group compared with the control group. Furthermore, **Lopez et al., (2017)** done a study in USA to evaluate the effects of Swedish massage on symptom self-report for cancer patients and their caregivers which concluded that Massage therapy was associated with statistically (p < .0001) and clinically significant improvement of fatigue and other symptoms in patients and caregivers.

In relation to the level of fatigue severity, the findings of the current study revealed that the participants in the intervention group (the study group) who were experiencing severe fatigue before the intervention reported reduction in fatigue level after 3 weeks of massage therapy and this explains the increased percentage of moderate fatigue at week 3. After 6 weeks

of massage intervention, no participants reported severe fatigue and more than three quarters of the study group reported mild fatigue, while the fatigue level slightly increased in the control group at the end of week 6.

Additionally, the differences of fatigue level among the study group were statistically significant (P<0.001) compared to the control group. Moreover, differences between both groups before the program were not statistically significant while it was significantly after 6 weeks of massage intervention (P<0.001). This highly improving results are in agree with **Moradi, Khachian, Amini Behbahani, Saatchi & Haghani, (2020)** who studied the effect of massage on radiotherapy-induced fatigue in cancer patient in Iran and concluded that the difference of fatigue level was statistically significant in massage group after intervention.

Furthermore, our study findings are consistent with **Bahceli, Arslan & Ilik, (2022)** who conducted a study in Turkey to investigate the effect of slow-stroke back massage (SSBM) on the level of fatigue in women with breast cancer and found that fatigue level lower significantly in SSBM group after intervention compared to the control group, while the within-group change in (SSBM) group differed significantly between time points and not differ in the control group.

In the same line, the findings of studies of those **Karagozoglu, Kahve, (2013)**, and **Miladinia, Baraz, Shariati, & Malehi, (2017)** in Turkey and Iran respectively who studied the effect of back massage on fatigue in cancer patients found that level of fatigue in the intervention group decreased statistically significantly after intervention compared to the control group indicating the effectiveness of massage therapy on reducing fatigue severity.

Contrary to a study done in the USA by **Jacob et al., (2016)** demonstrated no significant difference in fatigue score before and after massage sessions among intervention groups. Also, studies by **Park**, **Chun, and Kwak, (2016)** in South Korea, and **Mustian et al., (2011)** in the USA revealed that there was an improvement in fatigue level but not enough to be statistically significant.

5. CONCLUSION

The present study concluded that elderly women with breast cancer who received massage therapy would significantly exhibit lower fatigue level than those who don't. It has been assumed that six week of Swedish massage therapy produced statistically significant differences in fatigue scores across three time points, which revealed that massage therapy is an effective approach which can improve fatigue symptoms in elderly women with breast cancer.

6. RECOMMENDATIONS

● Developing and implementing massage training programs directed to gerontological nurses and caregivers to become knowledgeable and skilled in performing massage sessions for fatigued elderly cancer women

● Integrate massage therapy to be a part of routine care that is provided to the elderly cancer women as a supportive care intervention to relieve and make control over fatigue symptoms.

● Evaluate the effectiveness of massage therapy in improving other fatigue associated symptoms including pain and insomnia.

Conflict of Interest Disclosure: Researchers declare that there is no conflict of interest in research.

REFERENCES

[1] **Bahceli, P. Z., Arslan, S., & Ilik, Y. (2022).** The effect of slow-stroke back massage on chemotherapy-related fatigue in women with breast cancer: An assessor blinded, parallel group, randomized control trial. *Complementary Therapies in Clinical Practice*, *46*, 101518.

[2] **Cantarero-Villanueva, I., Fernández-Lao, C., Díaz-Rodriguez, L., Fernández-de-las-Peñas, C., del Moral-Avila, R., & Arroyo-Morales, M. (2011).** A multimodal exercise program and multimedia support reduce cancer-related fatigue in breast cancer survivors: a randomised controlled clinical trial. *European Journal of Integrative Medicine*, *3*(3), e189-e200.

[3] **Deng, G. E., & Latte-Naor, S. (2018)**. Integrative Oncology: The Role of Complementary Medicine in Supportive Cancer Care. In *The MASCC Textbook of Cancer Supportive Care and Survivorship* (pp. 145-161). Springer, Cham.

[4] **Dion, L. J., Engen, D. J., Lemaine, V., Lawson, D. K., Brock, C. G., Thomley, B. S., ... & Wahner-Roedler, D. L. (2016).** Massage therapy alone and in combination with meditation for breast cancer patients undergoing autologous tissue reconstruction: A randomized pilot study. *Complementary Therapies in Clinical Practice*, *23*, 82-87.

[5] **Elkalashy, R. A. G., & Binshalan, T. M. (2019).** Effect of Back Massage on Nausea, Vomiting, Anxiety and Fatigue among Breast Cancer Women Who Receive Chemotherapy: Supportive care in Oncology Nursing. *IOSR Journal of Nursing and Health Science,8*(3), PP 50-61.

[6] **Global Cancer Observatory** :(Globocan)/ Fact sheet/ Population Fact Sheet /Egypt. 2021. Available at https://gco.iarc.fr/ today/data/factsheets/populations/818-egypt-fact-sheets.pdf retrieved on September, 2022.

[7] **Hurria, A., & Muss, H. (2015).** Special issues in older women with breast cancer. In *Improving outcomes for breast cancer survivors* (pp. 23-37). Springer, Cham.

[8] **Jacobs, S., Mowbray, C., Cates, L. M., Baylor, A., Gable, C., Skora, E., ... & Hinds, P. (2016).** Pilot study of massage to improve sleep and fatigue in hospitalized adolescents with cancer. *Pediatric Blood & Cancer*, *63*(5), 880-886.

[9] **Karagozoglu, S., & Kahve, E. (2013).** Effects of back massage on chemotherapy-related fatigue and anxiety: Supportive care and therapeutic touch in cancer nursing. *Applied Nursing Research*, *26*(4), 210-217.

[10] **Kinkead, B., Schettler, P. J., Larson, E. R., Carroll, D., Sharenko, M., Nettles, J., ... & Rapaport, M. H. (2018)**. Massage therapy decreases cancer-related fatigue: Results from a randomized early phase trial. *Cancer, 124*(3), 546-554.

[11] **Lin, P. J., Belcher, E. K., Gilmore, N. J., Hardy, S. J., Xu, H., & Mustian, K. M. (2021)**. Cancer-Related Fatigue. In *Common Issues in Breast Cancer Survivors* (pp. 153-168). Springer, Cham.

[12] **Lopez, G., Liu, W., Milbury, K., Spelman, A., Wei, Q., Bruera, E., & Cohen, L. (2017).** The effects of oncology massage on symptom self-report for cancer patients and their caregivers. *Supportive Care in Cancer*, *25*(12), 3645-3650

[13] **Miladinia, M., Baraz, S., Shariati, A., & Malehi, A. S. (2017).** Effects of slow-stroke back massage on symptom cluster in adult patients with acute leukemia: supportive care in cancer nursing. *Cancer nursing*, *40*(1), 31-38.

[14] **Misra, S., Lee, G., Korzets, Y., Wang, L., Lau, A., Koch, C. A., ... & Helou, J. (2020).** Patient-reported acute fatigue in elderly breast cancer patients treated with and without regional nodal radiation. *Breast Cancer Research and Treatment*, *183*(2), 391-401.

[15] **Mohammed, H. A., & Hassan, A. D. (2018).** Impact of aromatherapy massage using lavender oil on fatigue and insomnia among patients with leukemia. *IOSR Journal of Nursing and Health Science 7*(4), PP 11-22.

[16] **Moradi, M., Khachian, A., Amini Behbahani, F., Saatchi, K., Haghani, H. (2020).** The Effect of Aromatherapy by Inhalation and Massage on Radiotherapy-induced Fatigue in Patients with Cancer Journal of Client-Centered Nursing Care,6(2), pp. 79-86

[17] **Mustian, K. M., Alfano, C. M., Heckler, C., Kleckner, A. S., Kleckner, I. R., Leach, C. R., ... & Miller, S. M. (2017).** Comparison of pharmaceutical, psychological, and exercise treatments for cancer-related fatigue: a meta-analysis. *JAMA oncology*, *3*(7), 961-968.

[18] **Mustian, K. M., Roscoe, J. A., Palesh, O. G., Sprod, L. K., Heckler, C. E., Peppone, L. J., ... & Morrow, G. R. (2011).** Polarity therapy for cancer-related fatigue in patients with breast cancer receiving radiation therapy: a randomized controlled pilot study. *Integrative cancer therapies*, *10*(1), 27-37.

[19] **National Cancer Institute** : Cancer statistics/Reports on Cancer/Cancer Stat fact /female breast cancer .2022 available at https://seer.cancer.gov/statfacts/html/breast.html; retrieved on September, 2022.

[20] **National Comprehensive Cancer Network. NCCN guidelines,** version 2, 2022. Cancer-related fatigue. Available at https://www.nccn.org/guidelines/guidelines-detail?category=3&id=1424. Acceded on September, 2022.

[21] **O'Donovan, A., Baldini, C., Battisti, N.M.L. (2022).** Radiotherapy and Systemic Anti-Cancer Treatment in Older Adults with Cancer and Frailty. In: Gomes, F. (eds) Frailty in Older Adults with Cancer. Springer, Cham.

[22] **Odebiyi, D. O., Aborowa, A. T., Sokunbi, O. G., Aweto, H. A., & Ajekigbe, A. T. (2014).** Effects of exercise and oedema massage on fatigue level and quality of life of female breast cancer patients. *The European Journal of Physiotherapy*, *16*(4), 238-245.

[23] **Park, H., Chun, Y. and Kwak, S. (2016)** The Effects of Aroma Hand Massage on Fatigue and Sleeping among Hospice Patients. *Open Journal of Nursing,* 6, 515-523.

[24] **Pearson, E. J., Morris, M. E., & McKinstry, C. E. (2017)**. Cancer related fatigue: implementing guidelines for optimal management. *BMC health services research*, *17*(1), 1-11.

[25] **Piper, B. F., Dibble, S. L., Dodd, M. J., Weiss, M. C., Slaughter, R. E., & Paul, S. M. (1998, May).** The revised Piper Fatigue Scale: psychometric evaluation in women with breast cancer. In Oncology Nursing Forum. Oncology Nursing Society.

[26] **Rajjoub, R. A. (2012).** Fatigue patterns among women receiving adjuvant chemotherapy after breast cancer surgery and it's correlated factors. Unpublished master thesis. Alexandria : University of Alexandria, Faculty of Nursing.

[27] **Robison, J. G., & Smith, C. L. (2016)**. Therapeutic Massage During Chemotherapy and/or Biotherapy Infusions: Patient Perceptions of Pain, Fatigue, Nausea, Anxiety, and Satisfaction. *Clinical journal of oncology nursing*, *20*(2).

[28] **Subramani, R., & Lakshmanaswamy, R. (2017).** Complementary and alternative medicine and breast cancer. *Progress in molecular biology and translational science*, *151*, 231-274.

[29] **Wang, T., Zhai, J., Liu, X. L., Yao, L. Q., & Tan, J. Y. B. (2021).** Massage therapy for fatigue management in breast cancer survivors: a systematic review and descriptive analysis of randomized controlled trials. *Evidence-Based Complementary and Alternative Medicine*, *2021*.