

Effects of Swedish Massage on the Improvement of Mood Disorders in Women with Breast Cancer undergoing Radiotherapy

Sara Darabpour,¹ Masoomeh Kheirkhah,^{2,*} and Erfan Ghasemi³

¹Department of Midwifery, School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, IR Iran

²PhD of Medical Education, Assistant Professor, Department of Midwifery, Iran University of Medical Sciences, Tehran, IR Iran

³Department of Biostatistics, Faculty of Paramedical Sciences, Shahid Beheshti University of Medical Sciences, Tehran, IR Iran

*Corresponding author: Masoomeh Kheirkhah, PhD of Medical Education, Assistant Professor, Department of Midwifery, Iran University of Medical Sciences, Tehran, IR Iran. Tel: +98-9124137578, Fax: +98-2188201978, E-mail: masoomeh_kheirkhah2002@yahoo.com

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Abstract

Background: Breast cancer is the most common cancer in women, and the second leading cause of cancer deaths. The detection and treatment of this cancer may create mental pressure and lower mood levels, causing anxiety, depression, stress, and pain for the patients.

Objectives: The aim of this study was to determine the effects of Swedish massage on mood disorders in breast cancer patients undergoing radiotherapy at the cancer institute of the Imam Khomeini hospital at the Tehran University of Medical Sciences.

Patients and Methods: This study consisted of a clinical trial including 100 patients with breast cancer. The participants were chosen randomly, with their consent, by the use of polling, to be included in the intervention group (which received a Swedish massage three times a week, for 30 minutes, over five weeks) and control group (which received routine care). At the beginning of the intervention and after 5 weeks, the mood disorders of the patients, including anger, anxiety, depression, and any positive affect, were assessed using the affective control scale (ACS) questionnaire.

Results: Before the intervention, there was no significant difference in the average of the overall scale between the intervention and control groups in the subscales of anger, anxiety, depression, and positive affect ($P = 0.469$). The average of the overall scale in the Swedish massage group decreased from 3.52 ± 0.65 to 2.42 ± 0.76 when compared to the pre-intervention conditions, and to ($P < 0.001$) after the intervention. Moreover, the values for the control group were 3.41 ± 0.94 for the pre-intervention and 3.38 ± 0.9 after the intervention ($P = 0.620$).

Conclusions: When compared to the control group, the Swedish massage showed an improvement in the mood disorders of women with breast cancer.

Keywords: Breast Cancer, Mood Disorders, Swedish Massage, Radiotherapy

1. Background

Breast cancer is the most common cancer worldwide, and the second leading cause of cancer deaths in women 40 - 50 years old. This cancer can threaten the different aspects of a patient's physical and mental health (1-4). In the United States, the average age of a breast cancer diagnosis has been reported to be 61 years old, while in Iran it is 40 - 49 years old (5, 6). The risk of suffering from breast cancer in a woman's lifetime is 12.3%, and it has been estimated that one out of every eight women will probably suffer from breast cancer (5, 7). From 2008 - 2010, breast cancer accounted for 29% of all cancer cases in women (8). Moreover, the incidence rate of breast cancer worldwide is 38.9%, and 32.7% in East Asia. Breast cancer in Iran occurs with an incidence rate of 23%, remaining in first place, while this rate has been reported to be 26% in the city of

Tehran (9).

The diagnosis of breast cancer in women is a stressful event, including depression, confusion, anger, and sadness. In 70% of breast cancer patients, 14 - 38% show mental stress after diagnosis and treatment (10). Cancer and its method of treatment are associated with several complications, the most common being pain and psychological distress, which includes concerns about the illness and declining health, disturbances in concentration, loss of appetite, depression, anxiety, and anger (11, 12). To increase the survival rates of women with breast cancer and alleviate its psychological stress, psychological treatments are recommended as complementary therapy, along with clinical treatments (13). These methods include relaxation, massage, acupuncture, heat, and cryotherapy.

One of the most common non-medical interventions in cancer patients is massage therapy (14-16). Massage in-

creases the secretion of endorphins, dopamine, and serotonin, and reduces the levels of stress hormones, such as cortisol, epinephrine, and norepinephrine, which can reduce anxiety, fatigue, stress, and physical and mental strain (14, 17). There are several types of massage, the most common of which is Swedish massage, which involves three mechanisms: stroking, compression, and percussion (17). This massage is a kind of European traditional massage including methods based on the physiology and anatomy of Western medicine (18).

The positive effects of massage therapy include improvement in blood circulation and enhancement of the metabolism of the body. Swedish massage, which uses gentle strokes, has been proven effective in reducing muscle pain and stress, and has been proven safe. In addition, it is very efficient at increasing respiratory function, reducing edema caused by the obstruction of the lymphatic vessels, and helping to improve the damaged soft tissues of the body (19). The mechanism of the effects of this massage is via the beta fibers, which leads to the activation of mechanoreceptors. These receptors cause the transmission of information due to mechanical stress on the limbic nervous system and pituitary gland, which regulates the secretion of cortisol from the adrenal glands (20).

Gentle massage causes patients to express their feelings more comfortably. Therefore, this method makes it easier to counsel patients with physical, social, and emotional pain, and actually creates positive constructive thoughts about life (21).

The studies that have been done on the effects of massage on mood disorders show conflicting results. For example, a study that was done by Hernandez-Reif et al. in 2005 showed that massage in patients with breast cancer leads to the improvement of anger, depression, and anxiety (22); while the study by Billhult et al. in 2008 did not show a significant difference between the massage and control groups in anger, depression, and the quality of life of women with breast cancer (23). Thus far, no studies have been conducted to examine the effects of Swedish massage on mood disorders in women with breast cancer who receive radiotherapy, with regard to it being non-invasive, decreasing side effects, and showing high acceptance and cooperation in patients. Therefore, this innovative study was conducted to evaluate the effects of these techniques on improving mood disorders in women with breast cancer.

2. Objectives

The aim of this study was to determine the effects of Swedish massage on mood disorders in breast cancer patients undergoing radiotherapy at the cancer institute of the Imam Khomeini Hospital at the Tehran University

of Medical Sciences. This study was carried out with the hypothesis that Swedish massage (compared to the control group) creates improvement in the mood disorders of women with breast cancer.

3. Patients and Methods

This study is a randomized clinical trial using a sample of 100 patients with breast cancer undergoing radiotherapy at the cancer institute of the Imam Khomeini hospital in 2014. This research project is part of a thesis approved by the Research Council of the Tehran University of Medical Sciences (a governmental center providing health-care services), and was approved by the Ethics Committee of the university (93/ D/ 130/ 403) on May 19, 2014. This study has been registered on the Iran Clinical Trial site (Irct201312102751n11).

The sample size was calculated by using PASS 11 software, with a power = 80%, $\alpha = 0.05$, level of confidence = 95%, case: $\mu_1 = 7.5$, $s = 1.5$, control: $\mu_2 = 8.4$, and $s = 1.5$. Based on these calculations, $n = 44$ was determined for each group. With a probability of a 10% loss in the sample size, 50 patients were selected for each group. The inclusion criteria were: age 20 - 60 years old, suffering from breast cancer stages 1-3, undergoing total or partial mastectomy, scheduled for radiotherapy, no metastasis to other parts of the body, no history of mental illness or other chronic diseases, and no use of muscle relaxants, sleeping pills, or hallucinogenic drugs. The exclusion criteria were: participation in counseling and training programs along with the intervention, use of psychoactive drugs, presence of clinical signs and symptoms, reported metastasis to other parts of the body during treatment (in the patient medical file), diagnosis of suffering from mental illness (by center), and presence of stressful events (divorce, death of relatives, the loss of job, etc.) during the past 6 months.

After obtaining informed consent from the participants, the research objectives were explained to the patients. Randomization was done with simple allocation, in which the letters A or B were written on over 100 cards; the letter A indicated the intervention group, and the letter B indicated the control group. The patients were randomly assigned to the intervention or control groups (NA = 50, massage intervention and NB = 50, control group) by selecting a card, assigning it to a patient, and separating it from the others. At each visit, the participants brought their cards.

The participants in the intervention group received a Swedish massage three times a week, for 30 minutes, over five weeks, and the control group received routine center care. To measure the variables of the research, the affective control scale (ACS) questionnaire and a demographic

questionnaire were used. Content validity and retesting ($r = 84\%$) were used to determine the validity and reliability of the demographic questionnaire and the scale of emotion control. The ACS questionnaire (with 42 questions), demographic questionnaire, and disease information (including 19 questions) were completed as self-assessment by the patients before the intervention. The responses to the questions were prepared in a seven-grade scale, from 1 = strongly disagree to 7 = strongly agree.

After five weeks of intervention, the questionnaire was again completed by the patients to evaluate their emotions. The patients reported reduced scores assigned to each question after the intervention, and when compared to the scores before the intervention, this difference was considered to be significant. The normally distributed data was evaluated via the Kolmogorov-Simonov test, verifying the normal distribution, and the data obtained were analyzed using SPSS version 20 and an independent sample t-test. A P value < 0.05 was considered to be significant.

4. Results

Two groups of 50 individuals each (100 patients) participated in this study. All of them were entered into the statistical analysis, with no sample loss. Some of the demographic characteristics of the participants are listed in [Table 1](#). There was no significant difference between the two groups with regard to age, age at first menstruation, age at first pregnancy, and age of menopause at the beginning of the study ([Table 1](#)).

Before the intervention, no significant differences were observed in the overall scale between the two groups with regard to anger, anxiety, depression, and positive affect ($P = 0.469$). The overall scale of the Swedish massage group was reduced from 3.52 ± 0.65 in the pre-intervention to 2.42 ± 0.76 ($P < 0.001$) after the intervention, while the values reported for the control group were 3.41 ± 0.94 before the intervention and 3.38 ± 0.92 after the intervention ($P = 0.620$) ([Table 2](#)).

5. Discussion

In this study, the effects of Swedish massage (over 5 weeks) on mood disorders in women with breast cancer receiving radiotherapy were examined. The results showed that all of the sub-measures of the mood disorders, including anger, anxiety, depression, and positive affect, were improved in the Swedish massage group when compared to the control group.

A study by Cassileth et al. was conducted in 2004 to determine the effects of massage therapy on the symptoms of

cancer patients (pain, anxiety, fatigue, nausea, and depression) (15). In this study, 1,290 cancer patients participated in three groups: Swedish massage, soft touch massage, and foot massage. The patients who received the Swedish massage and soft touch massage improved by 58%, while this rate was 50% in the group receiving the foot massage. However, there was no significant difference between the Swedish massage and soft touch massage. There was improvement in the symptoms during and after the massage with regard to the pain variables (40.2, 47.8), fatigue (40.7, 42.9), anger (52.2, 59.9), nausea (21.2, 51.4), and depression (30.6, 48.9). Since Swedish massage improves symptoms in patients with cancer, the results of the above study in terms of the sub-scales of anger and depression are consistent with those of our study.

In 2005, Hernandez-Reif et al. studied 58 patients suffering from early stages (stages 1-3) of breast cancer (22). In their study, there were 22 patients in the massage intervention group, 20 patients in the progressive muscle relaxation intervention group, and 16 patients in the control and standard care group. Interventions were performed for 30 minutes, three times per week, over five weeks. The results showed that when compared to the control group, the group undergoing progressive muscle relaxation and massage therapy reported lower levels of depression, anger, and pain. Moreover, in the massage intervention group, a significant reduction in pain and anger was shown. Over the long term, massage is associated with a reduction in anxiety and depression, and because in this study massage led to improvements in anger, depression, and anxiety in breast cancer patients, it is consistent with the results of our study.

In the study by Mehling et al. in 2007, 138 cancer patients were randomly divided into two groups: one receiving a standard Swedish massage and acupuncture, and the other was the control group (24). The average treatment time was 20 minutes, and the results showed a significant statistical difference in the depression indicator ($P = 0.003$). The results of this study were comparable to our study with regard to depression treatment (24).

In 2008, Billhult et al. conducted research on 22 women with breast cancer undergoing radiotherapy. The patients were randomly assigned into two groups: control and effleurage massage (23). The intervention group received 10 sessions of massage over 3 to 4 weeks; however, after the study, no significant differences were observed with regard to anger, depression, and the quality of life for these women. The differences with the results of our study may be due to the small sample size, type and time of the massage, and the number of massage sessions.

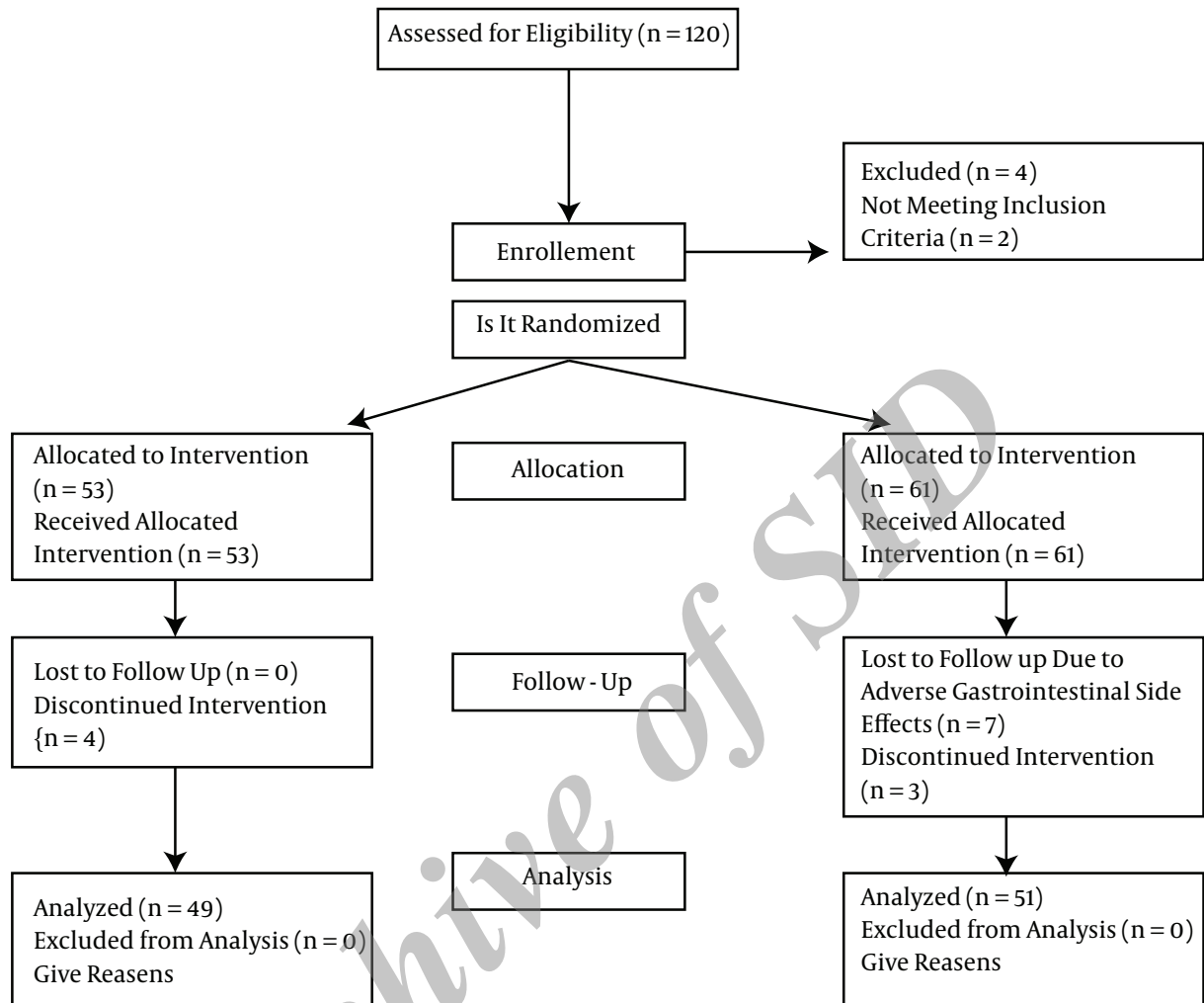


Figure 1. Flow Diagram of Participants

Table 1. Some of the Characteristics of the Participants According to Specific Groups

Group	Swedish Massage, N = 50	Control, N = 50	P Value
Age	49.14 ± 8.60	50.02 ± 10.88	0.088
Age at first menstruation	13.46 ± 1.50	13.76 ± 2.52	0.749
Age at first pregnancy	21.14 ± 4.49	21.08 ± 7.09	0.416
Age of menopause	42.22 ± 7.28	43.36 ± 12.23	0.195

5.1. Conclusion

The results of this study showed that when compared to the control group, Swedish massage improved the mood disorders of women with breast cancer.

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Table 2. Comparison of Mood Disorders in the Swedish Massage and Control Groups Before and After the Intervention^a

Variable/Intervention	Before Intervention	After Intervention	Difference Between Before and After Intervention ^b	P Value
	Mean ± SD	Mean ± SD	Mean ± SD	
Overall scale				< 0.001
Swedish massage	3.52 ± 0.65	2.42 ± 0.76	-1.10 ± 0.46	
Control	3.41 ± 0.94	3.38 ± 0.92	-0.02 ± 0.39	
Anger				< 0.001
Swedish massage	3.80 ± 0.58	2.47 ± 0.87	1.33 ± 0.78	
Control	3.65 ± 1.02	3.66 ± 1.03	0.01 ± 0.42	
Positive affect				< 0.001
Swedish massage	3.27 ± 0.78	2.40 ± 0.78	0.87 ± 0.50	
Control	3.25 ± 0.86	3.24 ± 0.93	0.01 ± 0.32	
Depressed mood				< 0.001
Swedish massage	3.74 ± 1.09	2.59 ± 1.14	1.16 ± 0.74	
Control	3.71 ± 1.77	3.58 ± 1.27	0.13 ± 1.40	
Anxiety				< 0.001
Swedish massage	3.48 ± 0.80	2.31 ± 0.83	1.16 ± 0.51	
Control	3.23 ± 1.02	3.22 ± 1.01	0.01 ± 0.32	

^aP values < 0.05 were considered to be significant.

^bThe mean of the differences in the responses before and after the intervention in each group.

Footnotes

Authors' Contribution: Sara Darabpour participated in the data collection. Sara Darabpour and Masoomeh Kheirkhah participated in the design and writing of the manuscript. Erfan Ghasemi contributed to the analysis of the data. All of the authors have given final approval of the version of the manuscript submitted for publication.

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