

# Effect of Slow-Stroke Back Massage on Anxiety of Older Women With Breast Cancer Undergoing Chemotherapy



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## ABSTRACT

**Background:** Anxiety is the most prevalent psychological side effect of breast cancer and chemotherapy. This study aimed to determine the effect of slow-stroke back massage (SSBM) on the anxiety of old female patients with breast cancer undergoing chemotherapy.

**Methods:** In this quasi-experimental study, 80 elderly women with breast cancer undergoing chemotherapy were enrolled by continuous sampling method. They were divided into two groups of experiment and control. The experiment group received three 15-min sessions of SSBM for 3 consecutive days. The data collection instrument was geriatric anxiety scale, used to measure the anxiety level of the subjects. Descriptive and inferential statistics were used to analyze the data with 95% of confidence level in SPSS 21.

**Results:** Before the intervention, there was no significant difference between two groups in terms of anxiety and they were quite homogeneous ( $P=0.220$ ). The average score of anxiety level reduced significantly from 40.97 before intervention to 30.47 after the intervention in the experiment group compared to the control group and this decrease was significant ( $P<0.001$ ). Furthermore, no significant reduction was found in the average anxiety level of the control group before and after the intervention ( $P=0.457$ ). There was also a significant difference between the average score of anxiety levels of two groups after the intervention ( $P<0.001$ ).

**Conclusion:** Because of the significant reduction of anxiety in the experiment group by using SSBM, this method can be recommended as an easy, accessible, and affordable method to apply on elderly women with breast cancer undergoing chemotherapy. Also, it is recommended that SSBM be used by nurses working with this group of women.

### Keywords:

Elderly, Breast cancer, Chemotherapy, Massage therapy

## 1. Introduction

**A**

ging is the greatest demographic risk factor in most human malignancies, includ-

ing breast cancer (Parsa 2012), which is the most common malignancy among women over 65. It accounts for 40% of all cancers and is the leading cause of death in the old people with cancer (Reginelli et al. 2014; Vicini et al.

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2014). In Iran, the chance of having an advance stage of breast tumor among women over 60 is significantly more than younger women; and by reaching the age 65, life expectancy among these women decreases remarkably (Voštakolaei et al. 2012).

Chemotherapy is the most common and effective treatment of choice for breast cancer. A complete course of chemotherapy, apart from its physical side effects, bears unfortunate psychological effects (Aaldriks et al. 2013; Cardoso & Papoila 2014). Of all psychological side effects of chemotherapy, anxiety is the most common and disturbing one (Byar et al. 2006; Breen et al. 2009), which lowers the patients' spirits as the number of chemotherapy sessions increases (Pandey et al. 2006; Karagozlu & Kahve 2013). Prevalence of this problem in patients with breast cancer is reported to be 16% to 65% (Alavi & Monae 2009).

Using complementary and alternative therapies alongside common medical methods are increasing among both patients and health service providers. Massage therapy is among complementary therapies, which soothes the patient, relieves her pains and decreases the amount of anxiety in the face of cancer side effects. Furthermore, it is an easy, harmless, noninvasive, and relatively cheap method to administer.

In 2014, Pan and colleagues, in a systematic survey reviewed 18 quasi-experimental studies conducted on 950 patients. In this review, 8 studies investigated the effects of massaging on anxiety of patients with breast cancers at the stages of I to III who underwent one therapy or a combination of hormone therapy, radiotherapy, mastectomy, and chemotherapy. Slow-stroke back massage (SSBM) was not used in any of massages used in these studies; methods were usually Swedish massage, reflexology, or massaging the operated region of the body. Furthermore, the classification age of none of the study samples included senile group. Out of these studies, 5 ones showed effective results on reducing the anxiety of patients and 3 studies reported no effects. The cause of these discrepancies in results were attributed to the massaging techniques and low pressure on soft tissue of the body (Pan et al. 2014). Generally based on that study, massage therapy can be effective in the treatment of breast cancer side effects, but further research is inevitable with regard to contradicting results.

Massage has different types; SSBM is one of its different methods, which is effective in patient relaxation. The observations and results show that SSBM is an effective way in relieving the side effects of diseases and acts as

a sedative complementary medicine in cancer disease. Several studies show that SSBM is a successful nursing intervention for reducing the anxiety levels in patients (Goldstein & Casanelia 2009; Field 2014).

Because the effects of SSBM has been never tested on anxiety level induced by chemotherapy on senile women with breast cancer; this research investigated the anxiety variable, using the geriatric anxiety scale (GAS).

## 2. Materials and Methods

### Study type

This research was registered in Iranian registry of Clinical Trials (IRTC) with code number of IRCT2015082223713N1 and was a type of non-randomized (quasi-experimental) clinical trial with pretest, posttest, and control group.

### Method

After obtaining the written introduction letter from the authorities of faculty of nursing and midwifery School of Iran university of medical sciences and acquiring the permission from Ethics Committee (IR.IUMS. rec.1394.9211580204), the researchers referred to the study settings, i.e. Hazrat Rasool (PBUH) and Firoozgar hospitals, affiliated to Iran University of Medical Sciences with a predetermined schedule. The researchers introduced themselves to the authorities and explained their objectives and the procedures of their research and data collection instruments. Next, they arranged the necessary coordination to collect the data and entered the research settings.

At first, the researchers used and analyzed the existing cases and chose the samples according to inclusion criteria; then, after talking to the subjects and explaining the research objectives and acquiring their verbal consent, the consecutive sampling method started.

### Research participants

Samples in this research comprised 80 old women with breast cancer who were under TAC (Taxotere, Adriamycin, Cytoxan) chemotherapy. They visited oncology departments of Hazrat Rasool (PBUH) and Firoozgar educational and treatment hospitals. Through random selection (coin flip), samples visiting Hazrat Rasool (PBUH) Hospital were chosen as the control group, and the patients referred to Firoozgar Hospital were chosen as the experiment group.

Inclusion criteria were 1) Lack of cognitive disorders confirmed by Abbreviated Mental Test, 2) Having at least 60 years of age, 3) Passed at least one course of chemotherapy before the study intervention, 4) Lack of intense discharge in their respiratory tracts due to lung diseases, 5) Having breast cancer at stages of I, II, or III, 6) Having consciousness as well as hearing and olfactory sensations to be able to talk on the phone, 7) Not having bed rest, 8) Not having skin and bone problems on the back of the neck and sacrum, and 9) Not having spinal malignant tumors.

Also, these were exclusion criteria for this research: 1) Not willing to cooperate or death of the senile subject, 2) Using antianxiety medicines, anticoagulant medicine, corticosteroids, and narcotics, 3) Change in the treatment procedure of the patient to cytostatic medicines (hormone therapy instead of chemotherapy), and 4) Patient discharge before three days study due to chemotherapy.

### Data gathering instrument

In this research, geriatric anxiety scale (GAS) was used to determine the level of anxiety in senile patients (Segal et al. 2010). The correlation coefficients of the scale show that there is a strong and positive relation ( $P < 0.01$ ) between whole scale and its subscales (cognitive:  $r = 0.91$ , physical:  $r = 0.86$ , and emotional:  $r = 0.92$ ), and also between subscales (cognitive with physical:  $r = 0.61$  and cognitive with emotional:  $r = 0.82$ ). The validity and correlation of this scale with other scales (like GDS, BAI, STAI, AMAS-E) were also investigated by Segal et al. in Canada. Total score of GAS scale and each of its subscales were remarkably correlate with other tests ( $P < 0.01$ ); for example GDS correlation with the total GAS test ( $r = 0.61$ ) and its cognitive ( $r = 0.78$ ), physical ( $r = 0.82$ ), and emotional subscales ( $r = 0.53$ ). The values of internal reliability (Cronbach  $\alpha$  coefficient) for the whole scale and all its 3 subscales were at high levels (total score [ $\alpha = 0.93$ ], cognitive [ $\alpha = 0.90$ ], physical [ $\alpha = 0.80$ ], and emotional [ $\alpha = 0.82$ ]) (Segal et al. 2010).

In 2013, Bolghan-Abady et al. examined Farsi version of GAS instrument, and also investigated the reliability and validity of its internal items by Cronbach  $\alpha$  coefficient in Iran. The value of this coefficient for total GAS score was favorable ( $\alpha = 0.92$ ) and the value of reliability for cognitive subscale ( $\alpha = 0.81$ ), physical ( $\alpha = 0.84$ ), and emotional subscales ( $\alpha = 0.80$ ) were satisfactory, too ( $P < 0.001$ ). Also, correlation coefficient between different items of this scale was reported as  $r = 0.71$ . Furthermore, the stability of the instrument was confirmed after two

weeks using test-retest ( $r = 0.54$ ) (Bolghan-Abadi et al. 2013).

For collecting demographic information, a questionnaire in accordance with Table 1 was applied. The Cronbach  $\alpha$  coefficient obtained by the researcher, with the value of 0.98 indicates high stability and correlation of internal items of this questionnaire.

### Intervention

At first, demographic characteristics and GAS scores of the samples were completed for both experiment and control groups an hour before the intervention as the pre-test. It is worth mentioning that due to illiteracy of some participants, or their physical weakness and fatigue, the questionnaires were completed by researchers who had been trained in interview section. Completing the questionnaire took 20 minutes. The experiment group was subjected to three days of SSBM massaging intervention and control group did not receive any sort of intervention. In the first day of massaging course, the patients were subjected to 15 minutes of massage by a researcher who possessed a certificate in massage therapy. On the second and third days, massaging was performed at the same time of previous days by the researcher.

The massage was performed as follows: The patient sat on massage table and her head was tilted on a pillow. Small movements in circles was done on the neck by researcher's thumb. Then strokes were delivered on regions of scalp base to buttocks using palm of one hand and the same act was repeated on the spine with the palm of other hand. In the meantime, the first hand moved towards the scalp base. Length of shoulder blades was stroked by the thumb. This action was repeated on the sides of the spine, from shoulders to lower back, and in the end, sweeping strokes were done from neck down to buttocks with palm of both hands.

Immediately after finishing the intervention on the third day, GAS scale was again completed for both groups. Finally, the collected research data were analyzed using descriptive (including central, mean, and median) and inferential (independent t test, paired samples t test, Fisher and Chi-square) statistical methods at 0.05 significant level using SPSS, version 21.

### 3. Results

Two groups of experiment and control (each  $n = 40$ ) did not show any significant difference with regard to demographic characteristics (Table 1). Also, compar-

**Table 1.** Demographic characteristics of experiment and control groups.

Variable	Experiment group (n=40), Mean(SD)	Control group (n=40), Mean(SD)	Type of test	Result
Age, y	67.72(5.10)	67.72(5.10)	Independent t test	t=0.306, df=78, P=0.446
Body mass index, kg/m <sup>2</sup>	23.59(3.37)	23.81(3.37)	Independent t test	t=0.314, df=78, P=0.775
<b>Type of insurance</b>				
Treatment services	16	19	Fisher exact test	P=0.896
Social providence	20	17		
Relief committee	4	4		
<b>Residence</b>				
Urban	35	34	Chi-square	X <sup>2</sup> =0.314, df=1, P=0.745
Village	5	6		
Duration of cancer diagnose, y				
<1	16	20	Fisher exact test	P=0.113
1-2	17	19		
>5	7	1		
Disease accompanying breast cancer	31	34	Chi-square	X <sup>2</sup> =0.738, df=1, P=0.390
Most common accompanying disease	Blood pressure (12)	Blood pressure (15)		
History of cancer in first degree relatives	14	16	Chi-square	X <sup>2</sup> =0.213, df=1, P=0.644
<b>Education level</b>				
Illiterate	6	13	Fisher exact test	P=0.206
Reading and writing	15	16		
High school Diploma	14	8		
Higher than high school diploma	5	3		
<b>Marital status</b>				
Married	26	28	Fisher exact test	P=0.923
Divorced	2	2		
Widowed	12	10		
<b>Occupation status</b>				
Housewife	28	30	Fisher exact test	P=0.143
Employed	4	0		
Retired	8	10		
<b>Economic status</b>				
Weak	7	10	Chi-square	X <sup>2</sup> =0.222, df=2, P=0.543
Medium	19	20		
Well	14	10		
Capable of self-care	28	27	Chi-square	X <sup>2</sup> =0.058, df=1, P=0.809

Variable	Experiment group (n=40), Mean(SD)	Control group (n=40), Mean(SD)	Type of test	Result
<b>Relation to caregiver</b>				
Offspring	9	9	Fisher exact test	P=0.098
Husband	1	3		
Husband and children	2	1		
<b>Disease stage</b>				
Stage I	22	12	Fisher exact test	P=0.098
Stage II	16	25		
Stage III	2	3		

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ing two groups of control and experiment did not reveal a significant difference with regard to total anxiety score (P=0.220) and showed homogeneity in cognitive

(P=0.738) and emotional (P=0.354) dimensions before the intervention. However, with regard to physical dimension, the difference was significant and the average

**Table 2.** Comparing anxiety and its three dimensions (physical, cognitive, and emotional) scores in old women with breast cancer undergoing chemotherapy between control and experiment groups, before and after the intervention.

Variables	Experiment group (n=40)		Control group (n=40)		Comparing result of control and experiment groups <sup>(c)</sup>
	Mean (SD)	Significant test <sup>(a)</sup>	Mean(SD)	Ssignificant test <sup>(b)</sup>	
<b>Total anxiety</b>					
Before intervention	40.97 (5.38)	t=10.648, df=39, P<0.001	39.32(6.50)	t=0.306, df=39, P=0.721	t=1.235, df=78, P=0.220
After intervention	33.47 (5.44)		39.08(5.80)		t=3.217, df=78, P<0.001
<b>Physical dimension</b>					
Before intervention	15.85 (2.45)	t=8.260, df=39, P<0.001	13.80(3.19)	t=1.153, df=39, P=0.256	t=3.217, df=78, P<0.001
After intervention	12.60 (2.14)		14.37(2.31)		t=3.555, df=78, P<0.001
<b>Cognitive dimension</b>					
Before intervention	12.07 (2.75)	t=3.586, df=39, P<0.001	11.87(2.56)	t=0.555, df=39, P=0.582	t=0.336, df=78, P=0.737
After intervention	10.82 (2.30)		12.01(2.46)		t=2.349, df=78, P<0.05
<b>Emotional dimension</b>					
Before intervention	13.05 (2.75)	t=7.213, df=39, P<0.001	13.65(2.58)	t=0.453, df=39, P=0.653	t=0.932, df=78, P=0.354
After intervention	9.62(3.13)		13.42(2.42)		t=3.217, df=78, P<0.001

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The level of significance in numerical anxiety indexes in old women with breast cancer undergoing chemotherapy in the experiment group before and after the intervention (paired samples t test).

The level of significance in numerical anxiety indexes in old women with breast cancer undergoing chemotherapy in the control group before and after the intervention (paired samples t test).

The level of significance in numerical anxiety indexes in old women with breast cancer undergoing chemotherapy in experiment and control groups before and after the intervention (independent t test).

**Table 3.** Results of anxiety variation test before and after the intervention and its dimensions in control and experiment groups.

Dimensions of anxiety	Average difference before and after the intervention in control group <sup>(a)</sup>	Average difference before and after the intervention in experiment group <sup>(b)</sup>	Independent t significant test	Difference of anxiety before and after the intervention in control and experiment groups <sup>(c)</sup>
Physical	0.57	-3.25	t=3.825, df=78, P<0.0001	3.82
Cognitive	-0.14	-1.25	t=1.450, df=78, P<0.005	1.11
Emotional	-0.23	-3.43	t=3.200, df=78, P<0.0001	3.20
Total anxiety	0.58	-7.5	t=7.975, df=78, P<0.0001	7.98

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(c) The difference of (a) and (b); meaning total changes in average difference of parameters (before and after the intervention) in control and experiment groups.

score in experiment group was higher by 2.05 scores ( $P<0.001$ ). As it is shown in Table 3, the average anxiety score and its dimensions in the experiment group was remarkably lower after the intervention compared to the control group.

Justifying the significant difference between experiment and control group with regard to physical dimension, this difference got more obvious after the intervention. Regarding this dimension, the difference in the control group before and after intervention was 0.57; i.e., the average level of anxiety in physical dimension was relatively steady. The corresponding difference for experiment group was -3.25, which shows a remarkable and significant (regarding the results of independent t test) decrease in average anxiety level in physical dimension ( $P<0.0001$ ). It is to be noted that the level of average anxiety difference and decrease before and after intervention in the experiment group compared to control group with regard to cognitive and emotional dimensions were significant ( $P<0.005$  and  $P<0.0001$ , respectively) (Table 3).

According to Table 2, the results of paired sample t test revealed that in the experiment group the average score of anxiety and its dimensions after the intervention, compared to preintervention conditions, showed significant changes and after intervention the average scores of anxiety dimensions (physical, cognitive, and emotional) and its total scores decreased ( $P<0.001$ ). Furthermore, the average anxiety level and its dimensions in the control group showed no significant change before and after the intervention. Based on the results, two groups of control and experiment, after intervention had significant difference with regard to anxiety ( $P<0.001$ ) and its 3 dimensions of physical ( $P<0.001$ ), cognitive ( $P=0.022$ ), and emotional ( $P<0.001$ ). Also, the average anxiety score in the control group was higher than the experiment group after the intervention.

Moreover during and after intervention, no side effects like stinging, itch, red skin, bruise, pain, swelling, shortness of breath, palpitation, or any other form of discomfort was not reported by the patients.

#### 4. Discussion

The results of this study indicate a better anxiety condition in the experiment group compared to control group after the intervention. In other words, SSBM was able to decrease total anxiety level and its dimensions; physical, emotional, and cognitive in old women with breast cancer undergoing chemotherapy.

This research results agree with another quasi-experimental study results in which SSBM was tested on 102 old people for 5 consecutive days. The results of this research, using Spielberger anxiety instrument, revealed that there was a significant difference between anxiety level of two groups after the intervention ( $P<0.001$ ) (Yeganekhah & Mohammadi 2010). In another similar study, which was a randomized clinical trial on 30 patients, after performing the intervention of 10 sections of 10-minute SSBM, total anxiety score in two groups of intervention and control showed a significant difference ( $P<0.001$ ) (Atashi et al. 2014).

In another study with similar results, 40 men and women with lung, breast, colon, rectum, cervical, and ovary cancers were subjected to three sessions of SSBM for 15 minutes during chemotherapy. Comparing mean anxiety scores of the patients in experiment group before and after the intervention (using Spielberger questionnaire) showed that their average score of anxiety was significantly lower than what it was before the intervention ( $P<0.05$ ) (Karagozoglu & Kahve 2013).

In another study, 114 people received 3 massage sections in 3 consecutive days, each section 10 minutes. The results (obtained by Spielberger questionnaire) showed that SSBM was able to make a significant difference in two groups of control and experiment ( $P < 0.05$ ) and proved to be effective on anxiety level of the participants (Bazrafshan & Ghorbani 2010).

Various studies indicate that SSBM massage is an effective nursing intervention, and is able to decrease distress, anxiety, pain, tension, fatigue, blood pressure and raise spirits, and as a whole, induces spiritual and physical relaxation in the old people (Holland & Pokorny 2001; Mok & Woo 2004; Harris & Richards 2010). Field believed that applying massage programs done by nurses was beneficial for cancer patients and this intervention could be used for those with high level of anxiety during chemotherapy (Field 2014).

Old women with breast cancer are facing with many stressful issues that increase their anxiety; this anxiety reflects on all aspects of their lives, lowers their life quality (Schreier & Williams 2004), and causes irreversible harms to different systems of their bodies. One of the most obvious ways for decreasing anxiety in cancer patients is relieving pain resulted from spasms and muscle tensions in patient's body (Ferrell-Torry & Glick 1993). Pain and muscle spasms in patient's body is a common problem and their companionship with other stressful problems like cancer and chemotherapy, as well as their unfamiliarity to treatment process can increase the anxiety levels of the patients both physically and emotionally. Given that there is a close relationship between pain and anxiety (French 1989), behavioral tensions and anxious actions are observable among women with breast cancer (Campbell-Sills et al. 2006; Segrin et al. 2007). In this regard, using massage therapy and relieving one of the side effects of cancer, i.e. anxiety, can increase the patient's quality of life (Quattrin et al. 2006).

Massaging decreases muscle tensions and relaxes them, this way, it relieves pain and creates a cooperative and sympathetic sensation which causes more relaxation and less anxiety. On the other hand, massaging decreases the level of catecholamines (epinephrine and norepinephrine) that affect anxiety level, and also increases hormones secretion which their main role is to create euphoria and happiness in the patients; hormones like dopamine and serotonin decrease anxiety levels in the patient (Field et al. 2005; Quattrin et al. 2006; Krohn et al. 2011; Dasht-bozorgi et al. 2012).

About the study limitations, the psychological and mental conditions of women subjected to this study at the time of answering the questions were not considered and their family problems and other maladies were not identified. This condition may affect the results; and their exact management was out of the researcher's control. However, with the presence of the control group, this problem is dealt with somehow. Furthermore, the study samples were chosen out of the patients of Hazrat Rasool (PBUH) and Firoozgar hospitals, and the study design (quasi-experimental randomized trial) does not permit generalization of the results. Therefore, application the results of this research should be done with caution. In the end, researchers suggest that, in order to confirm the findings of this research, other studies with longer duration (for example 6 weeks, 12 weeks, etc.) be performed so that the physical and emotional effects of SSBM on patients with breast cancer can be determined. Also, it is possible to teach this sort of massage to relatives of the patients and analyze the difference of doing massage therapy on the patients' anxiety level in clinical environments compared to their homes.

Results of this research indicate that performing SSBM as a nursing intervention (done by the researcher as a nurse) is possible to be done on the old patients undergoing chemotherapy. Using this technique causes a significant difference in the anxiety level of patients with breast cancer; in a way that performing 3 sessions of massage therapy lowers the level of anxiety in patients with breast cancer undergoing chemotherapy. Based on the findings of this research, massage therapy is a simple, handy, cheap, and practical method which can be done in all clinical environments and home, for female patients with breast cancer undergoing chemotherapy. Nurses, nurse training authorities, nursing teachers, and other medical groups can recommend massage therapy to decrease anxiety, probably relieve pain, and finally increase welfare sensation in this group of patients.

## Conflict of Interest

The authors declared no conflict of interest.

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