

## The effect of group mindfulness - based stress reduction program and conscious yoga on the fatigue severity and global and specific life quality in women with breast cancer

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### Abstract

**Background:** Cancer is not merely an event with a certain end, but it is a permanent and vague situation that is determined by delayed effects due to the disease, its treatment and its related psychological issues. The aim of this study was to examine the effectiveness of the mindfulness-based stress reduction program and conscious yoga on the mental fatigue severity and life quality of women with breast cancer.

**Methods:** This was a quasi-experimental study with a pre-test, post-test and control group. In this study, 24 patients with the diagnosis of breast cancer were selected among the patients who referred to the Division of Oncology and Radiotherapy of Imam Hossein hospital in Tehran using available sampling method, and were randomly assigned into the experimental and control groups. All the participants completed the Fatigue Severity Scale, Global Life Quality of Cancer Patient and Specific Life Quality of Cancer Patient questionnaires. Data were analyzed by multivariate repeated measurement variance analysis model.

**Results:** Findings revealed that the mindfulness-based stress reduction treatment significantly improved the overall quality of life, role, cognitive, emotion, social functions and pain and fatigue symptoms in global life quality in the experimental group. It also significantly improved the body image, future functions and therapy side effects in specific life quality of the experimental group compared to the control group. In addition, fatigue severity caused by cancer was reduced significantly.

**Conclusion:** The results showed that the mindfulness - based stress reduction treatment can be effective in improving global and specific life quality and fatigue severity in women with breast cancer.

**Keywords:** Mindfulness, Yoga, Fatigue, Life Quality, Breast Cancer.

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### Introduction

Cancer is a global expression for malignant diseases and affects different aspects of individual's life (1). Breast cancer is the most common fatal cancer among women aged 40 to 55(2). It allocates more than 23% of the whole cancers in women to itself. Breast cancer is the second common

cancer after lung cancer, and the fifth cause of cancer-related deaths because of its relatively good prognosis. The ratio of mortality to catching is 35% (3). Thanks to the recent developments in medicine, many people can fight cancer better compared to the past. Despite the progress in the course of medical treatment, psychosocial and

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emotional needs of these patients are mostly ignored (4). Cancer develops many stressors and can disturb life quality and almost every aspect of individual's life significantly (5).

There are different factors in developing fatigue in breast cancer patients. Fatigue can result from a disease, treatments related to a disease, or other physical symptoms or conditions resulted from a disease (6). Fatigue can also depend on anatomical position of the tumor, treatment stage, type of the treatment and other factors (7). In breast cancer, many patients report fatigue at the beginning of the treatment (8). Fatigue can last months and years after the treatment (9). Different studies have shown that women who received chemotherapy as a treatment reported greater degree of fatigue (10). Fatigue is a mental feeling and it can be mostly seen as a lack of mental and physical energy (11), and it affects activity, circadian rhythm and life quality. Normally, the severity, pattern and quality of fatigue depend on their causes (12).

One of the most common treatments for fatigue reduction is the mindfulness-based stress reduction program (MBSR) that was presented by Kabat-Zinn in Medical Centre of Massachusetts University in 1979 (13,14). It is an 8-week program, in which every session lasts 2 to 2:30 hours; in this program, mindfulness skills for coping with life stresses and raising awareness of the present moment are taught and include thought-related meditation, relaxation and Hatha yoga (15). Mindfulness means paying attention to the present time in a special, targeted way without being judgmental (13). One of the main goals of this program is promoting health and reducing stress (16). Meditation and mindfulness exercises result in increasing self-awareness and self-acceptance ability in patients (17).

The mindfulness-based stress reduction model showed success in cancer treatment (18) and considerably improved life quality, stress symptoms and sleep quality in patients with breast and prostate cancers (19) and it also resulted in increasing men-

tal clarity, mental health and reducing physical stress significantly (20). In an 8-week intervention, based on the mindfulness and stress reduction, which was conducted on 19 women with breast cancer, it was found that these interventions had a positive effect on improving mental conditions (fear of recurrence, stress, anxiety, and depression), psychosocial characteristics (optimism, gaining support from others and spirituality) and physical symptoms (21). The results of a study showed that mindfulness exercises result in reducing mood disorders and finally increasing life quality in the trained group (22). In a research conducted on 133 patients with stages I to III breast cancer, the results showed that mindfulness has a significant effect on the quality of life of patients with cancer (23). In another research, mindfulness interventions and meditation were implemented on 49 patients with breast cancer and 10 patients with prostate cancer. The results revealed a reduction in stress symptoms and a significant increase in patients' quality of life (24, 25). Results of a study which used the mindfulness intervention revealed that the overall life quality, mental, physical, emotional and spiritual welfare and amount of social activity significantly improved among the participants after the intervention. Also positive changes were observed in the amount of pain, pain severity and amount of burnout, amount of support receiving from friends, family and financial and legal concerns. Therefore, even a short-term mindfulness intervention significantly improves participants' quality of life (26). In a study, the positive effect of the mindfulness-based stress reduction program on stress, anxiety, depression and sleep in patients with cancer was reported (27). A study was conducted about the relationship between emotional condition and immune system function after 8 sessions of mindfulness-based stress reduction program, and it was reported that the activity of NK cells increased and quality of life of the patients with cancer improved (28). Considering the problems

which women with breast cancer face and evidences related to the mindfulness-based stress reduction program on different psychological variables, this study was designed with the aim of examining the effect of the mindfulness-based stress reduction program on improving global and specific life quality of the patients. On the other hand, considering the fatigue caused by cancer, which is reported by these patients, improving fatigue in these patients was also one of the aims of this study.

### Methods

This was a full experimental study which was conducted with a randomized controlled trial. After obtaining approval from the hospital, and consent from the breast cancer patients, a random sample was selected and the participants were assigned into two groups. One group included those who were completing the mindfulness-based stress reduction program weekly and group conscious yoga (the experimental group) and the other group were those who did not receive any intervention (the control group). Written informed consent was obtained from all the patients who participated in the study.

### Participants

All women who referred to the Division of Oncology and Radiotherapy of Imam Hossein hospital during April 2013 to March 2014 were the population of this study. The Group Mindfulness - Based Stress Reduction Program is a group therapy with 6-12 members. Therefore, a sample of 24 patients was randomly assigned to the experimental group (12 patients) and the control group (12 patients). Inclusion and exclusion criteria for this study were as follows: patients diagnosed with stages I, II, III of breast cancer based on the clinical findings, cytological studies and diagnosis of a physician; the fatigue severity score in the patient had to be higher than 4; duration of breast cancer had to be more than a month; the patient should not have Anemia; the patient should not suffer from another

kind of cancer; the patient's age had to be between 30 to 55 years; the patient should not have received any psychological treatment from the time the disease was diagnosed; the patient had to have a degree of second school or higher; the patient should consent to participate in the study and should have the ability to take part in the desired courses. Exclusion criteria for the experimental group were as follows: absence of more than two intervention sessions; not wanting to continue to participate in the intervention; disease recurrence or development of metastasis elsewhere in the body during the research.

### Tools

*A: Fatigue Severity Scale:* Fatigue severity scale (FSS) is provided by Crop et al. (29) to assess the fatigue severity of chronic diseases such as multiple sclerosis and lupus. The fatigue scale measures patients' fatigue with 9 items on a 7-degree Likert scale, with higher score indicating more fatigue. Chronbach's alpha in healthy participants was .88, it was .81 in patients with MS and it was .89 in patients with lupus (29). The internal consistency of the Persian version of the test, Chronbach's alpha, was .98 and the re-test reliability was .93(29). In this study, the retest reliability over a 2-month interval was .86 and internal consistency with Cronbach's alpha was .89.

*B: Questionnaire Measuring the Global "Life Quality" in Cancer Patients (QLQ-C30):* To measure life quality in cancer patients, we used the third version of life quality measurement questionnaire, which belongs to a European Organization for Research and Treatment of Cancer. The Persian version of this questionnaire has been translated and validated by Montazeri et al. (30). This questionnaire is multidimensional and consists of 30 questions measuring life quality in 5 functional scales (physical, role playing, cognitive, emotion, social), 9 symptoms scales (fatigue, pain, nausea and vomiting, asthma, loss of appetite, sleep

disturbances, constipation and diarrhea) and economic problems caused by the disease and the treatment (an overall domain of life quality) (31). This questionnaire has been validated in Iran by Montazeri et al. (30). The range of validity of this questionnaire with Cronbach's alpha was reported to be .48 - .95 in the initial interview and .52 - .98 in the follow-up. The subscales such as (asthma, loss of appetite, sleep disturbances, constipation and diarrhea) were not used in this study.

*C: Specialized Supplemental Questionnaire to Measure Special "Life Quality" of Patients with Breast Cancer (QLQ-BR23):*

The QLQ-BR23 questionnaire is used for patients with different stages of breast cancer and for different treatments (surgery, chemotherapy, radiotherapy, hormone therapy). This questionnaire contains 23 questions that measure special life quality in 4 functional scales including body image, sexual functioning, sexual enjoyment and future perspective and 4 symptoms scales including systematic therapy side effects, breast symptoms, arm symptoms and sadness due to hair loss. This questionnaire has been used by Montazeri et al. (31). To de-

termine the reliability and validity of the Persian version, it was administered to 168 patients with breast cancer, and they reported that they understood 99% of the questions of the questionnaire. The reliability of this questionnaire with Cronbach's alpha was .63 - .95 at the initial interview and .72 - .92 in the follow-up. The reliability of this questionnaire with the scales consistent approach shows that almost all scales are conceptually related to each other and are statistically correlated in the expected direction. In this study, the subscales such as sexual enjoyment, arm symptoms and breast symptoms were not analyzed.

*D: Demographic Information Questionnaire:* This questionnaire was used to collect demographic data including age, marital status, education, socio-economic condition, educational background, career history; and also the patients were asked some questions about the breast, smoking and alcohol consumption, and when they found out about the disease and the disease stage.

The study was conducted at the Oncology Division of Imam Hossein hospital in Tehran by two master clinical psychologists who were familiar enough with the inter-

Table1. Summary of Operating Instruction Sessions of Mindfulness-Based Stress Reduction Program

Session	Topic
First	The introduction of automatic guidance system/ knowing how to use present moment awareness of bodily sensation, thoughts and emotions in reducing stress/practicing eating raisins <sup>1</sup> , giving feedback and discussion about the practice/three - minute breathing, giving assignment for next week and distributing leaflets of the first session and CDs of meditation
Second	Re-examining body workout/ giving feedback and discussion about examining body workout/ practicing breathing mindfulness meditation/ yoga stretching exercise/distributing leaflets of the second session and CDs of meditation
Third	Having conscious sitting with awareness of breathing(the sitting meditation)/practicing yoga exercises(in the hospital chapel)/ practicing three -minute breathing /distributing leaflets of the third session and video tape of yoga practices
Fourth	Re-examining body workout /practicing exercises related to conscious yoga(in the hospital chapel)/5-minute practicing of "seeing or hearing"/ re-practicing conscious session with awareness of breathing and body/ distributing leaflets of fourth session and CDs of meditation
Fifth	Practicing breathing /re-practicing conscious session(awareness of breathing ,body, sounds and thoughts)/explaining the stress and identifying participants' reactions to stress/examining awareness of pleasant and unpleasant events on feeling ,thoughts and bodily sensations/practicing conscious yoga exercises/practicing 3-minute breathing /distributing leaflets
Sixth	Practicing conscious yoga/practicing sitting meditation (mindfulness of sounds and thoughts)/distributing leaflets of the sixth session and number4 video tape to participants
Seventh	Practicing mountain meditation/sleep hygiene/ repeating exercises of the previous session/making a list of enjoyable activities/distributing leaflets of the seventh session
Eighth	Examining body workout /overview of program/examining and discussing programs /practicing stone, beads and marbles meditation

vention. After administering the ethical standards of the research (informed consent and anonymity of the participants of the two groups), the participants were asked to complete the questionnaires in three stages: before the intervention (pre-test), after the intervention (post-test) and two months after the intervention (follow-up). Treatment was done in 8 group sessions. Eight intervention sessions of this study were followed based on the mindfulness-based stress reduction program (14) and were conducted once a week in a 2-hour session for participants of the experimental group. Participants of the control group did not receive any interventions. Due to ethical considerations, participants of the control group were given a CD of the yoga practices at the end of the research. A summary of functional instructions of the mindful-

ness-based stress reduction program is presented in Table 1.

### Results

The age range of the participants was 30 to 55 years. Participants of the control group were, on average, a year (44.8±3.28) older than the participants of the experimental group (43.25±3.07). The average age when the disease was diagnosed was a year more in the control group than the experimental group (Table 2). Participants were of average socio-economic level and their left breast was involved, and they were receiving chemotherapy.

The mean and standard deviation of global life quality in functional scale (physical, role, emotion, cognitive and social), in symptoms (fatigue, nausea and vomiting and pain) and in total in the 3 stages of pre-

Table 2. The Mean and Standard Deviation of Age of the Participants and Age at the Time of Diagnosis in the Experimental and Control Groups

	Group	Mean	SD
Age	Control	44.08	3.28
	Experimental	43.25	3.07
Age at diagnosis time	Control	43.08	4.12
	Experimental	42.08	3.28

Table 3. Descriptive Statistics of Global and Specific Life Quality Dimensions in Patients with Cancer

			Control(n=12)			Experimental(n=12)		
			Pre-test	Post-test	Follow-up	Pre-test	Post-test	Follow-up
Global quality	Functions	Physical	65.00±12.752	66.11±10.809	58.33±19.306	61.66±8.587	72.77±3.432	69.44±13.768
		Role	37.50±7.537	38.88±10.855	36.11±9.622	37.50±10.359	59.72±8.582***	56.94±11.142
		Emotion	12.50±9.050	22.91±10.733	23.61±14.139	11.11±8.942	56.94±11.142	48.61±10.560
		Cognitive	59.72±8.582	59.72±11.142	61.11±16.412	62.50±10.359	75.00±11.236**	72.22±12.974
		Social	33.33±7.106	29.16±16.088	34.72±13.216	34.72±13.216	51.38±11.142**	54.16±7.537***
	Symptoms	Fatigue	76.85±5.721	71.29±12.938	72.22±11.111	77.77±4.737	37.96±8.810***	47.22±11.725
		Nausea and vomiting	31.94±24.050	20.83±7.537	23.61±8.582	25.00±16.666	19.44±6.487	22.22±8.206
		Pain	75.00±15.075	73.61±11.142	83.33±15.891	68.05±4.811	37.50±10.359	50.00±18.802
		Total score of life quality	39.58±7.216	54.16±10.952	58.33±10.050	41.66±6.154	66.66±9.401**	61.11±8.942
		Functions	45.13±9.030	41.66±7.945	36.80±17.573	42.36±8.301	50.69±7.502**	50.00±17.766
Specific quality	Sexual functioning	Sexual	13.88±11.962	16.66±14.213	15.27±15.005	16.66±14.213	18.05±11.142	16.66±12.309
		Future perspective	8.33±15.075	16.66±22.473	13.88±22.285	8.33±15.070	47.22±22.285**	50.00±22.473
	Symptoms	systematic therapy side effects	62.30±8.956	59.92±7.166	61.11±6.683	63.88±6.566	51.19±7.356**	50.00±7.994**
		upset by hair loss	80.55±17.164	86.11±17.164	86.11±17.164	80.55±17.164	80.55±17.164	80.55±17.164
Fatigue severity		5.69±1.580	5.60±1.457	5.52±.3075	5.85±1.972	4.81±2.609***	4.95±.2614***	

\*p<0.05

\*\*p<0.01

\*\*\*p<0.001

Note: Bonferroni adjustment were used for paired comparisons

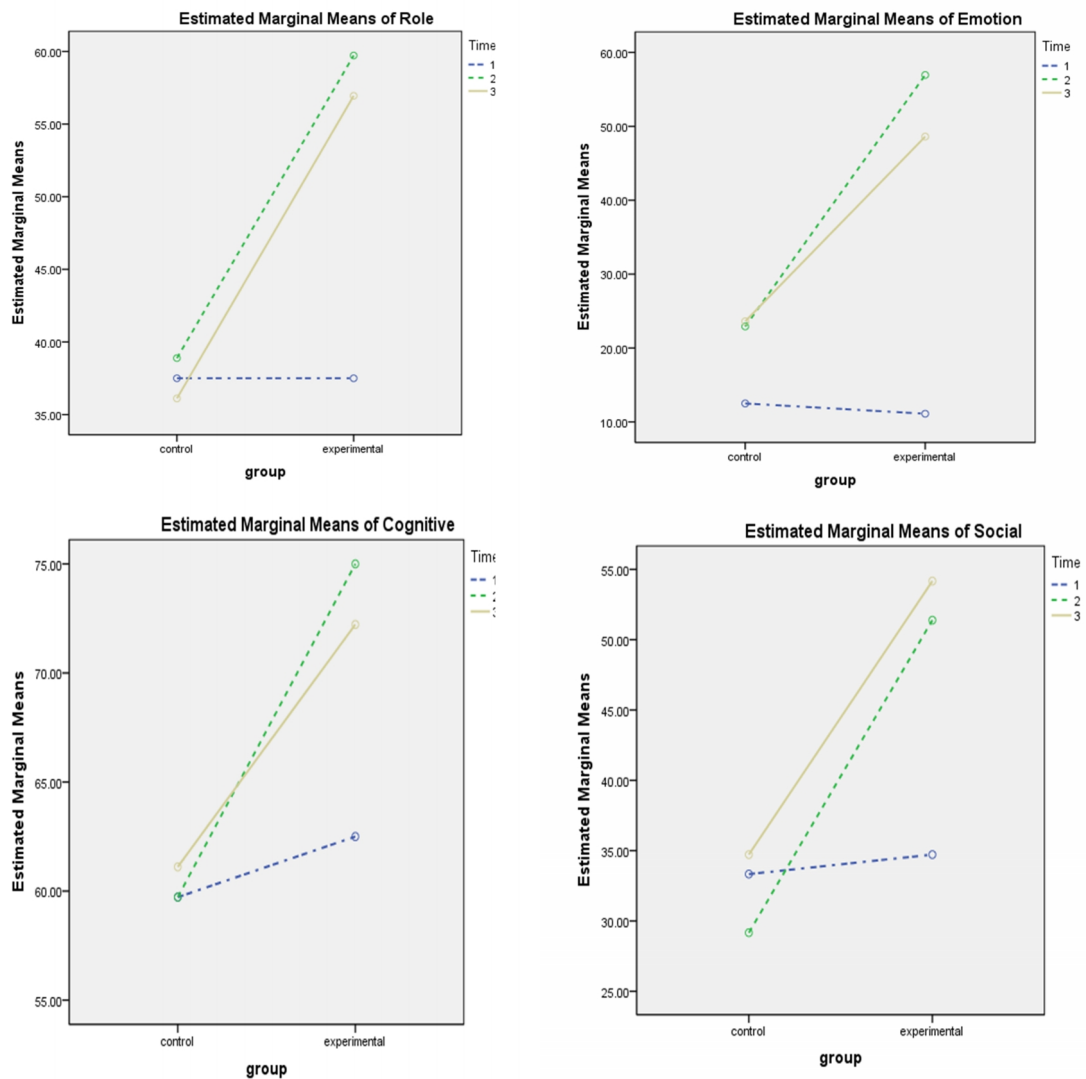


Fig. 1. Time Interaction Effect × Group on Global Life Quality Functional Dimensions A: Role B: Emotion C: Cognitive D: Social

test, post-test and follow-up in the experimental and control groups are reported in Table 3. Findings revealed that not only the scores of global life quality in the experimental group increased in the post-test compared to the pre-test in all the (physical, role, emotion, cognitive and social) functions, but also it showed a relative stability in the follow-up. Greatest increase in the scores was first seen in emotion dimension and then in the dimension of role of global life quality. Scores of global life quality in the symptoms scale showed the greatest

decrease first in fatigue dimension and then in pain dimension and it showed an increase of global life quality in these dimensions. The total score of the patients' global life quality also increased from pre-test to post-test suggesting an increase in the global life quality of the patients. The mean and standard deviation of different dimensions of specific life quality in functional scales (body image, sexual functioning and future perspective) and symptoms (systematic therapy side effects and sadness due to hair loss) in 3 stages of pre-test, post-test and

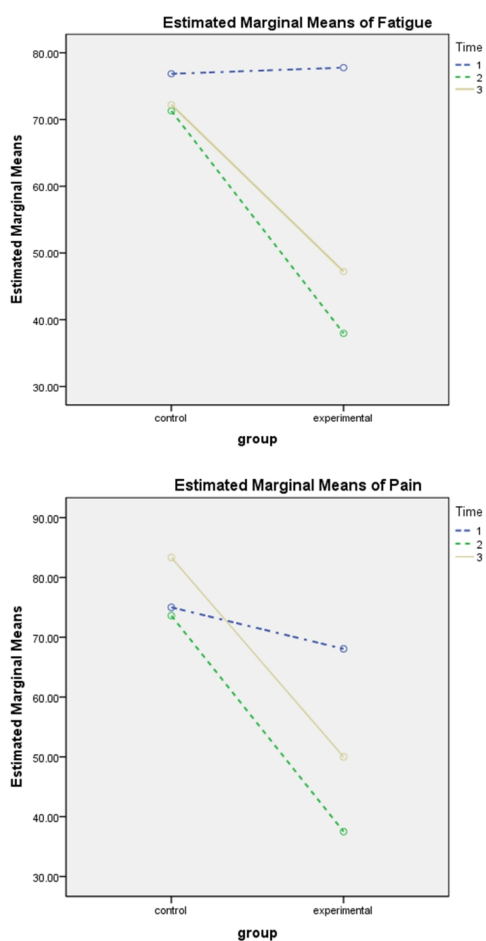


Fig. 2. Time Interaction Effect  $\times$  Group on Symptoms Dimensions and Total Score of Global Life Quality A: Fatigue B: Pain

follow-up in the experimental and control groups are reported in Table 3. Findings revealed that scores of body image, sexual functioning and future perspective increased in the experimental group from the pre-test to the post-test. Scores increase in future perspective is very egregious. In the body image and future perspective, the specific life quality scores had a relative consistency in the follow-up but in sexual functioning, the scores decreased in the follow-up. Specific life quality in symptoms scale decreased in the side effect dimension showing an increase of specific life quality in this dimension. However, the total score of the specific life quality in the dimension of sadness due to hair loss dimension had no changes. The average fatigue severity scores in the three stages of pre-test, post-test and follow-up in the experimental group suggests a score decrease in the post-

test and scores relative consistency in the follow-up and it shows patients' fatigue severity reduction (Table 3).

In this study, the global life quality scores, specific life quality and fatigue severity in the experimental and control groups were analyzed by multivariate repeated measurement model. First, the assumptions of using the model were examined. The results of sphericity Mauchly test showed that sphericity assumption was not rejected in emotion, fatigue and fatigue severity dimensions but it was rejected in other assumptions, so the corrected value of the Huynh - Feldt was used for comparisons. The results of the multivariate tests showed that the effect of time factor (pre-test, post-test and follow-up) was significant ( $p < 0.001$ ,  $\eta = 0.72$ ) and also time factor interaction effect  $\times$  group was significant ( $p < 0.001$ ,  $\eta = 0.61$ ). The results of univariate tests in global life quality scale showed that time main effect (pre-test, post-test and follow-up) was not significant in the physical dimension ( $p > 0.05$ ) but the main effect of nausea and vomiting dimension was significant ( $p < 0.05$ ,  $\eta = 0.15$ ). It also tested the effects of two-way. Findings suggested that the interaction effect of time  $\times$  group in the functional scale was significant in role function ( $p < 0.001$ ,  $\eta = 0.33$ ), emotion function ( $p < 0.001$ ,  $\eta = 0.47$ ), cognitive function ( $p < 0.05$ ,  $\eta = 0.15$ ) and social function ( $p < 0.01$ ,  $\eta = 0.27$ ). Findings were statistically significant and the greatest size effect was emotion function, that is, this treatment had the greatest effect on the emotion function. The interaction effect of time  $\times$  group in symptoms scale in fatigue dimension ( $p < 0.001$ ,  $\eta = 0.55$ ) and pain ( $p < 0.001$ ,  $\eta = 0.33$ ) was significant. The maximum size effect in symptoms scale was related to the fatigue dimension. The interaction effect of time  $\times$  group on the total quality was also significant ( $p < 0.05$ ,  $\eta = 0.15$ ). The results of the univariate tests in specific life quality showed the main effect of time (pre-test, post-test, follow-up) in functions scale in the sexual function dimension ( $p > 0.05$ ) and in symp-

toms scale, but it was significant in the dimension of sadness due to hair loss ( $p > 0.05$ ). Findings suggested that the interaction effect of time  $\times$  group in specific life quality in functions scale of body image dimension ( $p < 0.05$ ,  $\eta = 0.14$ ) and future perspective dimension ( $p < 0.001$ ,  $\eta = 0.31$ ) was significant. In the symptoms scale, the two-way interaction effect of time  $\times$  group for the systematic therapy side effects was significant ( $p < 0.001$ ,  $\eta = 0.33$ ). The results of the univariate tests in the fatigue severity scale showed that the two-way interaction effect of time  $\times$  group on the fatigue severity was significant ( $p < 0.001$ ,  $\eta = 0.61$ ). Findings also demonstrated a significant difference between the experimental and control groups in global life quality functions in role ( $p < 0.001$ ,  $\eta = 0.55$ ), emotion ( $p < 0.001$ ,  $\eta = 0.67$ ), cognitive ( $p < 0.05$ ,  $\eta = 0.20$ ) and social dimensions ( $p < 0.001$ ,  $\eta = 0.42$ ), but no significant differences were observed in the physical dimension ( $p > 0.05$ ). There was a significant difference in global quality symptoms in the two groups in fatigue ( $p < 0.001$ ,  $\eta = 0.69$ ) and pain dimensions ( $p < 0.001$ ,  $\eta = 0.67$ ). Total quality also showed significant differences between the two groups ( $P < 0.05$ ,  $\eta = 0.17$ ). Also, findings revealed a significant difference in specific life quality functions scale between the experimental and control groups just in the future perspective ( $p < 0.05$ ,  $\eta = 0.35$ ), but no significant differences were found in the body image ( $p > 0.05$ ) and sexual functions ( $p > 0.05$ ). In addition, in specific life quality symptom, a significant difference was observed between the experimental and control groups in systematic therapy side effects ( $p < 0.05$ ,  $\eta = 0.20$ ) but there was not a significant difference between the two groups in the dimension of sadness due to hair loss ( $p > 0.05$ ). Findings revealed a significant difference between the experimental and control groups in the fatigue severity scale ( $p < 0.001$ ,  $\eta = 0.64$ ). To examine the interaction effect, post hoc tests with Bonferroni adjustment were used. Paired comparison findings have been re-

ported in Table 3. The difference between the experimental and control groups in global life quality of functions scale was not significant in pre-test, but the difference was significant between the two groups in post-test and follow-up scores ( $p < 0.001$ ). In other words, not only the life quality in the role dimension significantly increased after the treatment in the experimental group, but also this increase was maintained in the follow-up (Fig. 1A). A similar pattern was observed in the emotion and social dimensions i.e., the difference between the two groups was not significant in the emotion and social dimensions in the pre-test, but the difference became significant between the two groups in the post-test and follow-up (Fig. 1B). In the cognitive dimension, the difference was significant between the two groups just in the post-test. The difference between the two groups was not significant in the cognitive dimension in the follow-up, suggesting that the effect of interaction in this dimension was not consistent (Fig. 1C). The difference between the two groups in global life quality of symptoms scale in the fatigue and pain dimensions in the pre-test was not significant, but the difference became significant between the two groups in the post-test and follow-up scores (Fig. 2A, 2B). Although the main effect was significant in nausea and vomiting dimensions, no significant difference was observed between the two groups in the pre-test, post-test, follow-up scores. In the total quality, the difference between the two groups was significant just in the post-test (Fig. 2C). Moreover, in the total quality dimension, the difference was not significant between the two groups in the follow-up suggested that the intervention effect in this dimension was not consistent. To examine the interaction effect, post hoc tests with Bonferroni adjustment were used. In specific life quality of functions scales in the body image dimension, the difference was significant between the two groups just in the post-test. The difference was not significant between the groups in the body image in the follow-up



which suggest that the intervention effect in this dimension was not consistent. In the future perspective dimension, the differences were not significant between the two groups in the pre-test, but the difference was significant between the two groups in the post-test and follow-up scores. In other words, life quality in the future perspective dimension not only increased significantly after the intervention in the experimental group, but also this increase was maintained in the follow-up. In the special life quality of symptoms scale in the systematic therapy side effects dimension, the differences were not significant between the two groups in the pre-test but the differences were significant between the experimental and control groups in the pre-test and follow-up scores. The interaction effect time  $\times$  group on the fatigue severity was examined by the post hoc tests and Bonferroni adjustment. Paired comparisons findings have been reported in Table 3. Furthermore, the differences between the two groups were significant in the pre-test, post-test and follow-up. The differences between the two groups became greater in the fatigue severity in the post-test and follow-up compared to the pre-test.

### Discussion

The aim of this study was to examine the effectiveness of mindfulness-based stress reduction program on fatigue severity and life quality in patients with breast cancer. The findings of this study revealed that the group mindfulness-based stress reduction program improved the overall life quality functions in patients with cancer. This program also improved global life quality functions in role, cognitive, emotion and social dimensions. In this regard, its most effectiveness was seen in the emotion function. When implementing this program, pain symptoms and fatigue considerably decreased in patients compared to the baseline and the control group. The maximum effect of this program was seen in improving fatigue. Moreover, the specific life quality of the patients in the body image

and future functions showed a considerable improvement in the post-test and follow-up in the experimental group compared to the control group. After implementing the group mindfulness-based stress reduction program, the treatment side effect symptoms in the specific life quality significantly improved in the experimental group compared to the baseline and the control group. These findings are consistent with those of previous studies that showed this program can be an effective mental-social intervention for improving life quality (17, 21). Carlson and Space found that performing mindfulness meditation, in addition to its effect on stress reduction, also causes a significant increase in mental clarity, mental health and decreases physical stress in patients. These researchers revealed that the mindfulness-based stress reduction program can play an important role in the improvement of symptoms and can bring about positive results for the patients after participating in this program (22). Another finding of this study suggested that global life quality in the physical dimension was not improved significantly. No significant improvement was found in the nausea and vomiting dimension before and after the program. Therefore, it can be suggested that although the mindfulness-based stress reduction program improves psychological variables of global and specific life quality, we cannot expect it to have a particular effect on the physical dimension. The findings of this study were consistent with those of previous studies (18, 21), and the mindfulness-based stress reduction program showed a considerable improvement in the global life quality of patients with breast cancer. In the specific life quality, the mindfulness-based stress reduction program did not have a significant effect on sexual functions and sadness due to hair loss. One of the probable explanations is that sexual function is not just related to the individual, and questions asked about sexual interactions (questions 15 and 16) in the hospital is not appropriate. Evaluation of sexual desire is associated with self-

orientation. In other words, a person must be placed in a position to be able to have an appropriate assessment of sexual function. The finding of this research is consistent with that of previous researches (22, 23, 26). The group mindfulness-based stress reduction program intervention causes mindfulness by meditation practices, and mindfulness causes an increase in self-awareness and self-acceptance ability in patients. Mindfulness is not a method or technique, but it is defined as an available technique to reduce pain and increase positive qualities such as consciousness, insight, wisdom and sympathy (16). Using relaxation training widely and emphasizing its importance shows that it is a valuable stress management skill that should be used regularly in individual's life and should be a consistent part of the individual's coping skills. Expressing emotions during all sessions of the program has different treatment advantages. Mindfulness through attention self-regulation by meditation practices affects affective and sensory components of the body. Regular exercise of Hatha yoga increases skeletal-muscle flexibility, strength and balance, and helps the individual to experience deep states of relaxation and awareness (32). The treatment effects of the group mindfulness-based stress reduction program increase by group-related factors, cause an increase in the ability to cope and adapt, to make sense of hope, to be more responsive to treatment, and so they affect more treatment consequences (33). Based on the findings of the present research, it seems that psychological interventions such as the mindfulness-based stress reduction program and conscious yoga can be effective in increasing mental health in patients with breast cancer. This study has some limitations. The first limitation of this study was its small sample size. Although the number of participants did not decrease in this study, the small sample size was one of its limitations that could hinder accurate measurement of the program effect. The second limitation was related to using self-report tools. These tools have

some essential problems (measurement error, lack of self-insight and etc.) The third limitation was related to lack of contextual and individual factors control. It is possible that the participants overestimated the effect of the program because of some contextual factors. Another possible hypothesis is that the participants may have overestimated the effect of the program because of personal willingness, optimism and similar factors. Therefore, it is recommended to conduct pseudo-therapy programs (placebo program) on control groups in the future studies to control the expected effect. It is also recommended to conduct further studies on this topic with a larger sample size to achieve a true effect size. This study was conducted on patients referring to Imam Hossein hospital in Tehran. It is recommended that this program be implemented on similar patients in other hospitals to expand the findings of this study.

### Conclusion

According to the results, the group mindfulness-based stress reduction program is an effective method for decreasing the fatigue severity and improving global and specific life quality in women with breast cancer.

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