



The Effectiveness of Mindfulness-Based Stress Reduction (MBSR) on the Posttraumatic Growth and the Psychological Capital in Women with Breast Cancer

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Abstract

Introduction: Breast cancer is known as the most prevalent type of cancer in the women around the globe. Cancer is a group of diseases which involving uncontrolled abnormal cell growth. Undergoing stress-provoking situations can lead to positive physical and psychological outcomes. Therefore, regarding the prevalence and importance of this condition, the current study aims to examine the effectiveness of the mindfulness-based stress reduction (MBSR) therapy on the posttraumatic growth and the psychological capital in women diagnosed with breast cancer.

Methods: The current investigation is an experimental design with pre-test and post-test assessments and experimental and control groups. The population of the study included all the women with breast cancer who had sought professional help in Imam Khomeini hospital (Tehran) since 2020. Among these individuals, 30 were selected using purposive sampling and afterwards were assigned to the control (15) and experimental (15) groups randomly. The conducted measurements included The Post Traumatic Growth Inventory (PTGI) (Tedeschi and Calhoun, 1996) and The Psychological Capital Questionnaire (PCQ) (Luthans, 2007). The data were analyzed using SPSS-23, descriptive statistics and inferential statistics (repeated measures ANOVA).

Results: According to the findings, compared to the control group, the mindfulness-based stress reduction therapy affected the experimental group more significantly in terms of the posttraumatic growth and the psychological capital ($P < 0.001$). The mentioned effects were maintained after a 1-month follow-up assessment.

Conclusions: Regarding the mentioned results, MBSR could be considered as an effective therapeutic approach for increasing the posttraumatic growth and the psychological capital in women suffering from breast cancer.

INTRODUCTION

Cancer is defined as a condition in which the abnormal cells grow and increase in number with no control [1]. As one of the most important fatal illnesses in the current century, cancer stands after the cardiovascular diseases. Presently, more than 7 million people are diagnosed with cancer, reaching to 28 million new cases in 2030 after a 50-percent rise [2, 3]. According to the statistics around the globe, breast cancer is the most

prevalent diagnosed type of cancer among the females all over the world. In Iran, breast cancer is known as the most prevalent cancer diagnosis and also the second cancer-related death cause in women [4]. Breast cancer affects Iranian women a decade earlier than their counterparts in developed countries [5, 6]. According to the statistical data, the likelihood of being diagnosed with breast cancer in women is 22.26% [7]. This illness

accounts for one third of all gynecologic cancers and is the main death cause in women aged between 35-45 [8]. Even though the considerable improvements in treating breast cancer has resulted in better tumor responses to treatment and longer lifetimes of the patients, the pain and distress caused by the illness, concerns about the future of the family members, fear of death, the side effects of the therapeutic methods, decreased levels of functionality, the possibility of dysmorphia, social and economic problems, sexual and body-image related problems are some of the factors that threaten the mental health of the breast cancer patients [8, 9]. In addition, anxiety, stress, depression, and other mood disorders are expected to emerge right after being diagnosed with the illness. These symptoms could be affected by time, in response to the diagnosis, after experiencing relapses and making improvements in terms of health [10, 11].

Despite these damages, reports have indicated that individuals with cancer also experience positive changes in life satisfaction and life meaningfulness, confidence and personal resistance in terms of priorities and life goals, and spirituality and devoutness in loving the others within family and friend relationships [12]. These alterations are known as the posttraumatic growth. Posttraumatic growth is defined as the positive individual and psychological changes one might experience after undergoing a traumatic event which are resulted from defying and fighting against this distressing experience. The role of the different occurrences in the posttraumatic growth (such as bereavement, cancer, road accidents, rape, war, surgeries and conditions) has been investigated in a body of research [13]. In a study by Yeung and Lu (2017), social support, the perceived stress and posttraumatic growth were examined in a population of 553 Chinese women suffering from breast cancer who were residents of the south of California (the US). The results demonstrated that social support correlated with higher levels of the posttraumatic growth and lower levels of the perceived stress. Furthermore, the perceived stress had negative correlations with the posttraumatic growth. The findings also supported the mediating role of the perceived stress between the posttraumatic growth and the social support, facilitating the occurrence of the posttraumatic growth by reducing the perceived stress [14].

A new concept in the positive psychology is the psychological capital. The psychological capacities such as hope, resilience, optimism, and self-efficacy form together the psychological capital of one [15]. By benefiting from the psychological capital, the individuals are enabled not only to defy the stressful situations more skillfully, but to also feel less tension and to manage the problems capably [16]. Various investigations have indicated that the psychological capital is correlated with a wide range of variables

including the increased psychological well-being and ability, and higher productivity in professional and social functions [17, 18].

During the recent years, various mindfulness-based treatments, have been performed on chronic pain disorders [19]. The most common method for mindfulness training is mindfulness-based stress reduction, known as the stress reduction and meditation training (MBSR). Mindfulness-based stress reduction is a behavioral intervention which is based upon concentrating on and paying attention to the self. Within the MBSR programs the individuals learn to expand acceptance and compassion instead of judging their experiences; and to increase the present moment awareness (as opposed to automatic direction) [20]. In addition, the program enables them to select newer techniques for responding to different situations. Evidence shows that mindfulness training can affect the perceived self-efficacy of the cancer patients positively; enhancing their quality of life and psychological well-being.

In general, breast cancer is very common in women and leads to many psychological problems in them and at the same time can cause the growth of these people in various fields. Many interventions have been used to reduce the psychological problems of these people and improve the psychological well-being of these women, but in the meantime, few studies have focused on the effectiveness of mindfulness-based treatments. Therefore, the present study was conducted to determine whether MBSR training can improve the level of post-traumatic growth and psychological capital in female patients with breast cancer.

METHODS

The present study is an experimental design with pre-test and post-test assessments and two groups (control and experimental). The population of the study consisted of the women with breast cancer seeking professional help in Oncology Clinic of Imam Khomeini hospital (Tehran) since 2020.

Sample Size

The sample size was calculated on the basis of prior research, using the formula shown below. The sample size needed in each group was estimated as about 12 people, for a 95% confidence interval (CI) and a 20% type II error. However, considering probable losses from samples, this number was increased to 15, for a total sample size of 30 patients.

$$n = \frac{\left(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta}\right)^2 (S_1^2 + S_2^2)}{(\mu_1 - \mu_2)^2}$$

Randomization

Thirty individuals were first selected using the purposive sampling method and then each study participant was coded with a number after enrolment. The sample was

divided into two groups (15 patients per group) with a computerized random number generator, using the permuted block randomization method. The required factors that were considered and asked during the primary interview included: being interested in the program, having informed consent, and having sufficient cooperation with the investigators. The present study lasted from May 2, 2020 to July 26, 2020. The inclusion criteria were: certain diagnosis of breast cancer and at least 6 months of the disease, not being diagnosed with any other serious conditions (chronic cardiovascular, kidney, lung diseases; especially in their advanced stages), Be at least 18 years old, having at least a high school diploma, and being interested in the therapeutic program.

The exclusion criteria were: being diagnosed with a second serious illness, participating in other psychiatric

interventions simultaneously, absence in the sessions more than twice, not completing the assignments, substance intake, and suicidal ideation. The participants were examined three times (before the intervention, after it, and a month after the end of the program) applying the Posttraumatic Growth Inventory (PTGI) and the Psychological Capital Questionnaire (PCQ). The experimental group received eight 90-minute sessions of mindfulness-based stress reduction (MBSR) training program according to the guidelines and MBSR techniques [21] (Table 1), while the control group received no treatment and remained in the waitlist. After considering the required pre-assumptions, the data were analyzed using the repeated measures ANOVA and SPSS-23.

Table 1.

Session	The session content
1	Introduction to the program, the structure and group objectives, getting familiar with the concept of anxiety and its components, education and practicing to eat raisins mindfully and discussing its rationale, giving homework assignments to consolidate the new skills
2	Training in mindfulness techniques and practicing them, breath awareness for increasing the attention and concentration capacity (including the 45-minute body scan meditation), 10 minutes of breathing mindfully and providing information on the rationales, reflecting on the exercises and feeling each, working on the 3-minute breath space and its rationale
3	The muscle relaxation technique, mindfulness walking / moving, keeping the thoughts and mind expanded by following the meditation exercises and focusing on the mindful breathing and the body organs, education on mindfulness (the concept of the automatic pilot, states of mind, and other concepts), providing information on the rationale and the goals of this treatment (interacting with the world differently) and practicing mindfulness techniques
4	Training in and practicing the 45-minute sitting exercise and discussing its rationale, the 3-minute breath exercise, Patterned exercises for applying when facing difficult emotions, education on Beck's cognitive model for anxiety according to ABS model and identifying the negative automatic thoughts in anxiety disorders, working on how thoughts generate emotions and exercising and teaching the 10-minute breathing with mindfulness
5	The 45-minute body scan exercise, training and exercising the process of discovering the reactions to the habitual patterns and employing the intrinsic abilities for the facilitation of reacting to the present-moment experiences, training and exercising the acceptance meditation and evaluating the negative automatic thoughts, and identifying the common cognitive distortions in anxiety disorders
6	The 45-minute sitting meditation, reviewing the problems occurring within doing homework and the feelings and emotions emerged when exercising, teaching techniques for responding to the negative automatic thoughts, exercising the 30-minute body scan technique and mindful breathing and bringing the stress and anxiety-related reactions to awareness
7	Performing the meditation exercises, the 3-minute breath exercise and raising a problem during the exercise and discovering its effects on the body and mind, discussing how the discipline and the motivation generated within the few past weeks could be maintained, providing a list of the skills and joyous signs, and performing the body scan exercise
8	Reviewing and summarizing the program, receiving feedback from the participants, encouraging them to implement their new skills for defying their negative moods, closing the session and applying the post-test

The scales, The Posttraumatic Growth Inventory (PTGI)

The posttraumatic growth inventory (Tedeschi and Calhoun, 1996) consists of 21 items designed for measuring the posttraumatic growth. This self-report measurement is scored on a 6-point scale (0 = I did not experience this change as a result of my crisis, to 5 = I experienced this change to a very great degree as a result of my crisis). The total scores range from 0 to 105. PTGI includes five subscales: Relating to Others, New Possibilities, Personal Strength, Spiritual Change, and Appreciation of Life. According to Tedeschi and Calhoun the test-retest validity (Cronbach's alpha) for the questionnaire was reported to be 0.90. Cronbach's alpha for the subscales varied from 0.67 to 0.85 [22]. In Iran, the reliability coefficient of PTGI was 0.94 after a

1-week period and the Cronbach's alpha of the measurement was calculated to be 0.92 [23].

Luthans's Psychological Capital Questionnaire (PCQ)

In order to measure the psychological capital, Luthans's 24-item Psychological Capital Questionnaire was performed. This scale includes four subscales: self-efficacy, resilience, optimism, and hope. Each item is scored on a 6-point Likert scale (from strongly disagree to strongly agree). Higher scores indicate stronger psychological capital. To calculate the total score, the scores of the subscales are first measured and then added up. The results of the confirmatory factor analysis indicated that PCQ includes the desired factors and structures of its designers. According to the calculations of Luthans using factor analysis and structural

equations, the chi-square ratio of PCQ was 24.6 and its factor validity was confirmed [24]. In a study by Hashemi et.al in Iran, Cronbach's alpha coefficient was reported to be 0.85 [25].

RESULTS

Table 2 provides information on the demographic characteristics of the two groups. After applying the chi-square and t-test, it was indicated that the two groups except financial situation have no significant differences in terms of their demographic characteristics. The mean ages in the experimental and control groups were 36.20 and 35.03 respectively. According to the marital status of the participants, single women accounted for 53.33% and 40% of the experimental and control groups respectively. The other demographic characteristics are presented in Table 2.

Before presenting the results of the repeated measures ANOVA, the parametric tests' pre-assumptions were assessed. Accordingly, the results of the Shapiro-Wilk test indicated that the normality of the data distribution is confirmed in most of the posttraumatic growth and psychological capital subscales within the experimental and control groups during the pre-test, post-test, and follow-up ($P > 0.05$).

Furthermore, the equality of variances was assessed using Levene's test which due to insignificant results, confirmed the equality of variances ($P > 0.05$). On the other hand, the results of the t-test demonstrated that the difference between the means of the pre-test scores of two groups in the dependent variables has not been significant ($P > 0.05$). Moreover, the results of Mauchly's test confirmed the sphericity of the data in the posttraumatic growth and the psychological capital variables ($P > 0.05$). To examine the effectiveness of the mindfulness treatment on the posttraumatic growth and the psychological capital, the repeated measures ANOVA was applied. In the current study, there was one within-subjects factor (the time of measuring the

variables of the study in pre-test, post-test, and follow-up) and one between-subjects factor (group membership). Between subjects.

The results of Table 4 show that the between and within-group differences (during the three stages of assessment) and also the interaction effects of the intervention and all the stages of the measurement are significant in all of the variables of the posttraumatic growth and the psychological capital ($P < 0.001$). Therefore, it can be concluded that the group mindfulness-based therapy program has been effective on the posttraumatic growth and the psychological capital. In addition, the interaction effects for the subscales are as follows: Relating to Others (%42), New Possibilities (%57), Personal Strength (%81), Spiritual Change (%52), and Appreciation of Life (%82) for the posttraumatic growth, and Self-efficacy (%73), Hope (%76), Resilience (%81), and Optimism (%79) for the psychological capital ($P < 0.001$). In order to find the stage of assessment in which the interaction effects have occurred, the Bonferroni post hoc test was performed.

As can be seen in Table 5, the differences between the mean scores of the pre-test and post-test, and also the pre-test and follow-up stages are significant in terms of all subscales of the posttraumatic growth and psychological capital. However, the mean scores of the post-test and follow-up assessments are not significantly different in the variables of New possibilities and Relating to others (posttraumatic growth) and Hope (psychological capital); meaning that the mean scores of the patients have not significantly changed in these subscales during the follow-up compared to post-test, while the other subscales have changed to a significant extent and have maintained the alterations during the follow-up stage. In conclusion, not only has the mindfulness-based treatment affected the mean scores of the subscales of the posttraumatic growth and psychological capital in post-test significantly, but it has also preserved the changes within time.

Table 2. The Demographic Characteristics

Variable.Group	MBSR N =%	Control N =%	Total N =%	P Value
Age				
20-30	3 (19.19)	2 (13.33)	5 (66.16)	0.63
31-40	10 (66, 66)	9 (59, 99)	19 (53.63)	
41-50	2 (13.33)	4 (26, 66)	6 (99.19)	
Marital status				
Single	7 (46, 66)	6 (40)	14 (70.46)	0.71
Married	8 53, 33	9 (59, 99)	16 (30.53)	
Education				
High school	5 (33, 33)	7 (46, 66)	13 (30.43)	0.73
Diploma	8 53, 33	6 (40)	14 (70.46)	
Associate and above	2 (13.33)	2 (13.33)	3 (19.19)	
Occupational status				
Employed	12 (79, 99)	10 (66, 66)	21 (70.00)	0.40
Unemployed	3 (99.19)	5 (33, 33)	9 (30.00)	
Financial situation				
Excellent	2 (13.33)	2 (13.33)	4 (30.13)	0.00
Average	9	6 (40)	15 (50.00)	
Poor	4 (26, 66)	5 (33, 33)	9 (30.00)	
Very poor	0 (0)	2 (13.33)	2 (6.70)	

Table 3. The Results of the Descriptive Statistics for the Dependent Variables in the Pre-Test, Post-Test, and Follow-Up

Scales	Subscales	Time	MBSR		Control		P Value
			M	SD	M	SD	
Post-traumatic growth							
	New Possibilities						
		pre-test	17.00	2.10	15.26	1.09	0.09
		post-test	23.26	1.90	16.36	2.20	0.00
		follow-up	23.40	1.84	17.46	1.76	0.00
	Relating to Others						
		pre-test	21.46	2.92	20.48	3.13	0.59
		post-test	31.06	3.65	23.80	2.07	0.00
		follow-up	37.66	3.87	24.86	2.29	0.01
	Personal Strength						
		pre-test	13.06	1.70	12.26	1.03	0.13
		post-test	22.00	2.07	13.73	1.03	0.00
		follow-up	23.66	2.16	14.33	1.29	0.04
	Appreciation of Life						
		pre-test	10.26	1.48	10.00	1.14	0.89
		post-test	20.86	2.82	10.06	1.12	0.00
		follow-up	20.26	2.81	11.80	1.69	0.03
	Spiritual change						
		pre-test	8.26	1.10	7.47	1.55	0.52
		post-test	16.48	4.59	8.46	1.63	0.02
		follow-up	16.17	4.10	8.95	0.88	0.05
Psychological capital							
	Self-efficacy						
		pre-test	15.00	2.17	15.33	1.39	0.62
		post-test	20.20	2.70	17.33	2.80	0.00
		follow-up	21.60	2.92	17.66	3.28	0.00
	Hope						
		pre-test	15.00	1.96	15.03	1.30	0.82
		post-test	24.46	3.11	19.60	3.30	0.00
		follow-up	23.00	3.50	21.03	3.76	0.01
	Resilience						
		pre-test	18.30	1.55	19.46	1.30	0.17
		post-test	22.68	2.69	20.08	2.09	0.01
		follow-up	24.33	2.45	20.86	2.20	0.05
	Optimism						
		pre-test	20.20	1.84	20.08	1.72	0.54
		post-test	24.54	2.13	21.93	2.07	0.00
		follow-up	26.53	2.16	23.13	2.97	0.00

Table 4. Repeated Measures ANOVA for Assessing the Group Differences in Terms of the Study Variables, *P<0.05 **P<0.001

Scales	Subscales	Source	SS	MS	F	ηp ²
Post-traumatic growth						
	New Possibilities					
		within-subjects (Time)	220.356	117.411	34.320**	0.511
		within-subjects (Time*Group)	5.400	5.400	1.867**	0.527
		Between subjects (Group)	336.400	336.400	95.379**	0.717
	Relating to Others					
		within-subjects (Time)	666.422	333.211	55.565**	0.723
		within-subjects (Time*Group)	18.150	18.150	6.499**	0.425
		Between subjects (Group)	284.444	284.444	19.909**	0.454
	Personal Strength					
		within-subjects (Time)	407.022	305.511	82.588**	0.897
		within-subjects (Time*Group)	1.067	1.067	0.480**	0.819
		Between subjects (Group)	270.400	270.400	100.384**	0.785
	Appreciation of Life					
		within-subjects (Time)	471.800	235.500	97.903**	0.846
		within-subjects (Time*Group)	0.600	0.600	0.604**	0.825
		Between subjects (Group)	291.600	291.600	69.745**	0.807
	Spiritual change					
		within-subjects (Time)	354.822	117.411	38.548**	0.643
		within-subjects (Time*Group)	0.600	0.600	0.600**	0.528
		Between subjects (Group)	193.600	193.600	46.323**	0.620
Fund Psychological						
	Self-efficacy					
		within-subjects (Time)	331.356	165.678	53.623**	0.686
		within-subjects (Time*Group)	54.150	54.150	13.706**	0.734
		Between subjects (Group)	111.111	111.111	7.600**	0.163
	Hope					
		within-subjects (Time)	999.022	499.511	75.336**	0.729
		within-subjects (Time*Group)	17.068	17.068	2.146**	0.766
		Between subjects (Group)	111.111	111.111	8.309**	0.240
	Resilience					
		within-subjects (Time)	239.356	119.678	51.466**	0.739
		within-subjects (Time*Group)	86.640	86.640	29.867**	0.811
		Between subjects (Group)	38.678	38.678	4.582**	0.134
	Optimism					
		within-subjects (Time)	302.422	151.211	51.981**	0.726
		within-subjects (Time*Group)	54.150	54.150	51.706**	0.796
		Between subjects (Group)	78.400	78.400	8.572**	0.269

Table 5. The Pairwise Comparisons of Paired during the Three Stages of Assessment (Pre-Test, Post-Test, and Follow-Up)

Scales .Subscales .Time(I).Time(J)	Mean Difference (I-J)	SD
Post-accident growth		
New Possibilities		
pre-test		
post-test	3.66**	0.42
follow-up	2.80**	0.43
post-test		
follow-up	0.86**	0.51
Relating to Others		
pre-test		
post-test	6.26**	0.73
follow-up	5.10**	0.43
post-test		
follow-up	1.16**	0.69
Personal Strength		
pre-test		
post-test	5.20**	0.33
follow-up	2.33**	0.33
post-test		
follow-up	2.86**	0.48
Appreciation of Life		
pre-test		
post-test	5.50**	0.44
follow-up	1.80**	0.25
post-test		
follow-up	3.70**	0.46
Spiritual change		
pre-test		
post-test	4.70**	0.66
follow-up	1.26**	0.26
post-test		
follow-up	3.43**	0.64
Psychological capital		
Self-efficacy		
pre-test		
post-test	3.50**	0.47
follow-up	4.46**	0.57
post-test		
follow-up	0.96*	0.23
Hope		
pre-test		
post-test	7.00**	0.67
follow-up	7.13**	0.72
post-test		
follow-up	0.13-	0.58
Resilience		
pre-test		
post-test	2.96**	0.47
follow-up	3.80**	0.43
post-test		
follow-up	0.83*	0.22
Optimism		
pre-test		
post-test	2.86**	0.32
follow-up	4.43**	0.47
post-test		
follow-up	1.60*	0.42

*P<0.05 **P<0.001

DISCUSSION

The aim of the current study was to examine the effectiveness of the mindfulness-based stress reduction therapy program on the posttraumatic growth and the psychological capital of the women suffering from breast cancer. The results demonstrated that compared to the

control group, the treatment affected the components of the posttraumatic growth and psychological capital in the experimental group. These findings are in line with the results of some previous studies [26, 27]. In a research by Nowrouzi et al. results showed that mindfulness-based cognitive therapy (MBCT) can affect the posttraumatic growth in patients with breast

cancer [26]. Moreover, according to Rajabi who had examined the effectiveness of mindfulness training on the psychological capital and the psychological empowerment in divorced employed women, the intervention led to increased levels of the psychological capital and the psychological empowerment [27].

The first aim of this investigation was to assess the effectiveness of MBSR on the posttraumatic growth in women with breast cancer. In line with some other studies [28, 29], the findings showed that this treatment can affect all the subscales of the posttraumatic growth. In his research on the effectiveness of the mindfulness-based cognitive therapy on ruminative thoughts and the posttraumatic growth with a population of 24 bereaved women, Rahmani (2019) reported that MBCT can effectively reduce rumination and increase the posttraumatic growth [29]. Moreover, Morgan and Sanaei suggested that mindfulness training could positively increase the perceived self-efficacy of cancer patients and improve their quality of life and mental well-being [30, 31].

To explain the findings, it could be argued that mindfulness can expand awareness of the self, the abilities, and the weaknesses. Therefore, the individuals will be more capable of taking positive actions to eliminate their weaknesses and accept their situation when making changes is impossible. Acceptance and commitment are the features that mindful individuals have. Acceptance is being open to the fact one's ability to change the situations is limited (some things can be altered while some others may not be changeable). When making changes is possible, modifications and improvements should be made committedly. In fact, mindfulness, acceptance and commitment lead to increases in self-efficacy [32]. In line with our findings, the investigations of Thompson et.al and Foureur et.al highlighted the importance of mindfulness as a key psychological factor in empowering the individuals in terms of taking non-responsive actions when facing the challenges and therefore, developing resilience against misfortune and the damages of life [33, 34].

Furthermore, by applying a set of meditation exercises (like body scan, sitting and standing meditations, mindful walking/ moving, 3-minute breathing space, centering the awareness on here and now), and some cognitive techniques (such as cognitive reappraisal and psychoeducation), MBSR assists women with breast cancer to find new ways of being in painful and challenging situations; methods which are characterized by the increased metacognitive awareness or by focusing on understanding and accepting the present negative experiences [35]. All in all, it can be concluded that the MBSR exercises could facilitate the posttraumatic growth in women with cancer by cognitive reappraisal, and developing a new insight, reducing rumination,

increasing the within-group support, sharing the undesirable experiences and memories, working on emotional distress, and recognizing the goals and the meaning generated after the experience of cancer.

The second objective of the present research was evaluating the effects of MBSR training on the psychological capital in women suffering from breast cancer. According to the findings in line with other studies [28, 29], this therapeutic method affected all the components of the psychological capital in the experimental group unlike the control group [36, 37]. The results of the current research agree with the findings of Shojaeyan and Abolma'ani (2016). They argued in their study that MBCT enhanced all the components of the psychological capital including self-efficacy, resilience, hope, and optimism [36]. Furthermore, according to Noullet et.al (2018), mindfulness treatment could result in higher levels of resilience [37]. In mindfulness exercises, the clients get informed of the relationship between thoughts, bodily sensations, and their feelings. In addition, they learn to accept the feelings and bodily sensations instead of employing experiential avoidance or getting pre-occupied with their ruminative thoughts. On the other hand, by expanding the nonjudgmental awareness of the present moment and implementing the positive emotion regulation strategies, the psychological capital of one could develop [38, 39]. Considering the literature review, Chiesa Serretti and Serretti concluded that the mindfulness-based interventions could improve the positive emotion regulation strategies and self-compassion while reducing the rumination and experiential avoidance [40]. Overall, this therapeutic approach targets the procedures like avoiding the negative emotions and pre-occupation with maladaptive and ruminative thoughts, by which the psychological capital of one could improve [40]. On the whole, it can be concluded that a key to enhancing the psychological capital lies in mindfulness exercises. In this respect, a study by Ebrahimi Moghaddam and Shirazi focusing on the effectiveness of mindfulness on increasing the psychological capital of women who had been exposed to extra marital affair, indicated that mindfulness can boost the psychological capital [41].

There were a number of limitations to the current study. First, due to the small sample size, the generalizability of the data was limited. The next limitation was the one-month follow-up assessment and finally, the self-report measurements. It is recommended that the future researchers employ larger samples, apply other scales and have longer follow-up assessments.

CONCLUSIONS

The findings of our study showed that MBSR can increase the posttraumatic growth and the psychological

capital significantly in women suffering from breast cancer. Therefore, considering the impacts of cancer on the various functions of the individuals, and regarding the importance of the posttraumatic growth and the psychological capital, the psychotherapists, counsellors, and other mental health professionals, could consider the role and effectiveness of this therapeutic intervention on developing the posttraumatic growth and the psychological capital of the females with breast cancer.

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AUTHOR CONTRIBUTION

Study design, implementation, writing the manuscript and data collection: Razie Rahimi Cham Heydari, project management, and data analyses: Heman Mahmoudfakhe. -Furthermore, the entire manuscript was eventually reviewed and edited by all authors.

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ETHICAL CONSIDERATION

The written consent has been obtained from all research units. Also, the authors affirm their observance of ethical rules when processing the results of the studies.

CONFLICT OF INTEREST

There are no conflicts of interest.

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