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The effect of cognitive therapy based on mindfulness on perceived stress, psychological capitals and emotional processing in women with breast cancer

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Abstract

Introduction: Regarding the high prevalence of breast cancer and necessity of appropriate psychological intervention in these patients, this research aimed to investigate the effectiveness of mindfulness-based cognitive therapy on perceived stress, psychological capital and emotional processing in women with breast cancer.

Materials and Methods: The population of this clinical trial was all women with breast cancer in Tehran in 2018 referred to the treatment centers of these patients. The sample size was thirty women with breast cancer who were selected by convenient sampling method and randomly assigned into experimental and control groups (n=15). The Mindfulness Cognitive Therapy Program conducted on the experimental group in eight weekly ninety-minute sessions. They fulfilled Perception Stress Scale (Cohen et al.), Psychological Capital Inventory (Lutanz et al.) and Emotional Information Processing Questionnaire (Barker et al.) in pre-test, post-test and follow-up. Data analyzed by descriptive statistics and repeated variance analysis through SPSS software.

Results: The comparison of the scores in two groups showed that cognitive therapy based on mindfulness was effective on perceived stress ($F=22.11$, $P=0.0001$), psychological capitals ($F=165.54$, $P=0.0001$) and emotional processing ($F=18.7$, $P=0.0001$). The follow-up phase also indicated that the effectiveness of intervention was persistent.

Conclusion: Overall, the results showed that the cognitive therapy based on mindfulness reduced the perceived stress and the emotional processing and increased their psychological capital in women with breast cancer. So, it is suggested to use this therapeutic approach in clinics and hospitals to reduce perceived stress and improve psychological capitals and emotional processing in cancer patients.

Keywords: Breast cancer, Cognitive therapy based on mindfulness, Emotional processing, Perceived stress, Psychological capital

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Introduction

Breast cancer is a multi-factorial disease, and it is considered the most prevalent cancer among women (1). Moreover, its rate increases worldwide, leading to major mortalities in developed countries (2,3). Based on the epidemiological study conducted by Abachizadeh et al., the mean incidence rate of breast cancer among women in Iran reported 24.6 cases in 100,000 individuals, and this rate is increasing through development in urbanization (4). Breast cancer negatively impacts different aspects of a patient's life in diagnosis, treatment, or recurrence phases. In addition to physical symptoms such as pain, fatigue, and sleep problems, women with breast cancer experience various psychological symptoms included depression, stress, and anxiety (5-11). So, the complementary treatments added to medical approaches can reduce these negative impacts such as chronic stress and even increase the patient's adherence to medications and treatment (12).

Mindfulness is one of these interventions which can apply in various conditions such as psychological and psychiatric problems and physical illnesses (13-16). Mindfulness origin was related to eastern cultures 2500 years ago, but it developed scientifically in western countries. It suggests: pay attention to the particular object, pay attention at the moment without any judgment (17), and it is used in a wide range such as mindfulness-based on cognitive therapy and mindfulness-based stress reduction to improve mental and physical conditions (18). Based on the available evidence, mindfulness techniques can reduce stress even in cases face chronic stress through different ways such as behavioral, biological, and self-regulation ways (19). In addition, mindfulness can positively influence the emotional process which interrupted in patients with cancer (20). Some self-reported based studies indicated that patients who received mindfulness intervention experience improved emotional regulation, increasing acceptance and reducing negative thoughts about their disease (21). Also, this technique can improve psychological capital and psychological well-being. Psychological capitals (hope, self-efficacy, optimism, and resilience) are influential factors to cope with stressful events (22,23). Regarding the gap in this field and studies that assess the effect of mindfulness on women with breast cancer, the present study

aimed to investigate the effect of cognitive therapy based on mindfulness on perceived stress, psychological capacities, and emotional processing in women with breast cancer.

Materials and Methods

The ethical committee of Payam-e-Noor University approved this clinical trial. The statistical community consisted of all women with breast cancer referred to the Breast Cancer Research Institute of Tehran during 2018-2019. Among them, thirty patients were selected through a convenient sampling method. Then they were divided into two groups of the experimental group (n=15) and the control group (n=15). The experimental group received cognitive therapy based on mindfulness in eight weekly ninety-minute sessions added to medical treatments. On the other hand, the control group only received medical treatments, assigned to a waitlist. Inclusion criteria concluded: net diagnosis of breast cancer, having at least diploma degree, aged 20-45 years, the tendency to participation (consent form), not having major psychiatric illnesses based on self-report of the patients. Exclusion criteria concluded: having two or more missed sessions, lack of tendency to continue, and lack of doing the intervention tasks. All participants fulfilled the questionnaires in three phases: pre-test, post-test, and two-month follow-up. The basis of mindfulness-based cognitive therapy design was formulated by Segal, Williams, and Tizdel in 2013, and it included meditation training, breathing, moment awareness, shifting of automatic thoughts, habits, ruminants, the relationship between thought and feeling, self-care, review of body, contact with variables of mind and body at the moment (24).

Research instruments

A) Perceived Stress Scale: This tool was developed by Cohen, Kamarck, and Mermelstein in 1983. This scale concluded 14 items which scored in a 5-degree Likert system as 1 (never), 2 (rarely), 3 (sometimes), 4 (usually), and 5 (almost times). The 4, 5, 6, 7, 9, 10, and 13 questions are scored reversely. The internal consistency of this scale and the subscales was studied, and its Cronbach alpha was calculated to equal 0.84 to 0.86 (25). Safaei and Shokri assessed the factorial validity of this scale, and the internal consistency of the total scale was calculated equal to 0.76 (26). In the present study, the Cronbach alpha was 0.83.

B) Emotional Information Processing Questionnaire: This questionnaire was developed by Baker et al. in 2007, and it consisted of 38 items that measure the styles of emotional processing. The questions are scored in a 5-degree Likert system (absolutely disagree to agree). The Cronbach alpha and re-test coefficients of this questionnaire measured 0.92 and 0.79, respectively (27). In the Iranian population, the internal consistency of this instrument was reported as acceptable (28).

C) Luthans Psychological Capital Questionnaire: This questionnaire is designed based on the theoretical context of psychological capitals included: hope, optimism, self-efficacy, and resilience. Each of these components has six questions in this questionnaire, so the total questionnaire has 24 items that scored in a 6 degree Likert system (1: absolutely disagree to 6: absolutely agree) (29). Luthans et al. calculated the Cronbach alpha equal to 0.88 (30). This scale has been applied in many countries, and it has good

psychometric properties (31). In Iran, the Cronbach alpha of this instrument was reported 0.88 in a study conducted by Forouhar et al. (32). In the present study, Cronbach alpha coefficients were obtained for subscales of self-efficacy, hope, resilience, and optimism as 0.84, 0.85, 0.74, and 0.73, respectively.

Data were analyzed by descriptive statistics and repeated variance through SPSS software.

Results

In this study, thirty women with breast cancer aged 22-37 years participated. In terms of demographic characteristics, a major part of experimental and control groups aged 22-31 years, and most of them had a diploma and bachelor degrees. There were no significant differences between the two groups in age and educational level ($P>0.05$).

Table 1 presented the findings related to the scores of the questionnaires in the experimental and control groups in pre-test, post-test, and follow-up.

Table 1. The scores of the questionnaires in experimental and control group

Variable	Group	Pre-test	Post-test	Follow up
		Mean \pm SD	Mean \pm SD	Mean \pm SD
Perceived stress	Experimental	54.20 \pm 7.14	40.66 \pm 9.17	38.93 \pm 6.52
	Control	52.86 \pm 7.23	53.60 \pm 6.82	52.2 \pm 6.52
Psychological capitals	Experimental	75.66 \pm 7.24	99.20 \pm 6.61	107.53 \pm 7.03
	Control	76.53 \pm 9.16	78.33 \pm 9.67	77.53 \pm 8.90
Emotional process	Experimental	46.46 \pm 3.54	38.33 \pm 3.28	35.53 \pm 8.74
	Control	46.66 \pm 2.69	46.80 \pm 2.88	47.13 \pm 3.15

Based on the findings, there were no significant differences between the two groups in the pre-test phase in the scores of perceived stress ($P=0.61$), psychological capitals ($P=0.34$), and emotional process ($P=0.12$).

Also, based on the Levene test, all variables have normality, and the repeated variance analysis was used to assess the effect of the intervention on the variables.

Table 2. The results of repeated measures variance analysis to assess the effect of cognitive therapy based mindfulness on patients with breast cancer

		Sum of squares	Degree of freedom	Mean of squares	F value	P value	Effect size	Power of test
Perceived stress	Phases	1068.82	2	534.41	22.68	0.0001	0.45	1
	Group	1545.87	1	1545.87	13.73	0.001	0.33	0.95
	Interaction	1042.02	2	521.01	22.11	0.0001	0.44	1
	Error	1319.15	56	23.55				
Psychological capitals	Phases	4446.86	2	2223.43	195.20	0.0001	0.87	1
	Group	6250.00	1	6250.00	35.01	0.0001	0.55	1
	Interaction	3771.26	2	1885.63	165.54	0.0001	0.85	1
	Error	637.86	56	11.39				
Emotional process	Phases	449.08	2	224.54	15.60	0.0001	0.35	0.99
	Group	1026.84	1	1026.84	30.25	0.0001	0.51	1
	Interaction	520.28	2	260.14	18.07	0.0001	0.39	1
	Error	805.95	56	14.39				

As seen in Table 2, there are significant differences between the scores related to two groups in 3 phases. These findings indicate the efficacy of cognitive therapy based on mindfulness in increasing psychological capital

and reducing perceived stress and difficulties in the emotional process.

To evaluate the differences between phases of the research, the Bonferroni test was used. They have been presented in Table 3.

Table 3. The differences between the scores of perceived stress, psychological capital, and emotional process in 3 phases of the research

Phase Variable	Pretest-Post-test		Pre-test-Follow up		Post-test-Follow up	
	Mean difference	P	Mean difference	P	Mean difference	P
Perceived stress	6.40	0.0001	7.97	0.0001	1.56	0.73
Psychological capitals	-12.66	0.0001	-16.43	0.0001	-3.76	0.11
Emotional process	4.00	0.0001	5.23	0.0001	1.23	0.74

Based on the findings, there are significant differences between pre-test and post-test in the scores of the questionnaires. Also, these significant differences are seen between pre-test and follow up while there are no significant differences between post-test and follow up, which indicates the consistency of the effect of intervention two months after the end of cognitive therapy based on mindfulness.

Discussion

The present study was conducted on thirty women with breast cancer in experimental and control groups. The results showed that cognitive therapy based on mindfulness reduced perceived stress and emotional processing. At the same time, it increased psychological capital in the experimental group significantly compared to controls, and the effect of this therapeutic approach was persistent in two-month follow-up.

In this line, some researchers investigated the effect of mindfulness-based interventions in promoting the psychological conditions of patients with breast cancer. In Iran, Pouy et al. assessed the effect of mindfulness training on sixty-six women with breast cancer divided into two groups of experimental and control groups. The experimental group received eight ninety-minute sessions (twice a week) of mindfulness training. Before and two months after interventions, both groups fulfilled the questionnaires of quality of life (WHOQOL-BREF), Schneider's life expectancy, and Depression Anxiety Stress Scale (DASS-21). The results showed that the experimental group had a higher score of quality of life and life expectancy than the controls, while their scores of depression, anxiety, and stress reduced significantly compared to the control group.

Although Pouy et al. used different instruments, their findings supported the results of the present study and indicated the positive effect of mindfulness on improving positive psychological emotions and reducing stress, depression, and anxiety-like the present study (33). In addition, a study by Schellekens et al. that evaluated thirty-seven women with breast cancer indicated that reducing stress by mindfulness-based therapy helped these patients to accept the conditions and know their emotions (34). This finding is concordant with the present study about the significant effect of mindfulness on emotional processing.

Also, the Liu et al. study on one-hundred eighty-two survivors of gastrointestinal cancer revealed that higher levels of mindfulness could predict decreased perceived stress, depression, anxiety, social impairment, and reduced loss of confidence among the survivors (35). These findings supported the results of the present study. Another study conducted by Sanaei et al. on forty women with breast cancer (experimental and control groups) indicated that two months of the intervention included mindfulness-based stress reduction training (8 weekly sessions) reduced perceived stress and increased positive orientation to life in experimental groups significantly compared to the control group. However, there was not seen a significant difference between the two groups in self-efficacy (36). Thus, the findings related to positive orientation to life and perceived stress are concordant to the present study, but the findings related to self-efficacy as a component of psychological capital do not support the present study. In this field, Shojaeyan and Abolmaali assessed the effect of mindfulness-based cognitive therapy on psychological capitals (hope, optimism, self-

efficacy, and resilience) in twenty veterans with a high percentage of injury in Tehran city selected randomly and divided into experimental and control groups. They concluded that eight two-hour sessions of mindfulness-based cognitive therapy increased psychological capitals significantly in the experimental group compared to the controls (37). This finding emphasizes the positive effect of mindfulness training in promoting psychological capital in individuals with chronic physical illnesses. One of the limitations of this study was the statistical population, which included women with breast cancer in Tehran city. On the other hand, research has only been done on women with breast cancer, so caution should be considered in generalizations to other groups. In addition, we could not control over variables affecting perceived stress, psychological capital, and emotional processing in the participants. Therefore, in future research, it is suggested

that a qualitative study of the factors affecting the variables of perceived stress, psychological capital, and emotional processing of women with breast cancer be conducted and their impact controlled.

Conclusion

The results showed that the cognitive therapy based on mindfulness reduced perceived stress and the emotional processing of women with breast cancer and increased their psychological capital. So, it is suggested that practitioners use this treatment to improve perceived stress, psychological capital, and emotional processing in cancer patients.

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