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Comparing the Effectiveness of Self-Healing Training and Emotional Schema Therapy on Health Locus of Control, Pain Self-efficacy, and Positive Meta-emotion in Women with Breast Cancer

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Abstract

Introduction: The present study compared the effectiveness of self-healing therapy and emotional schema therapy on health locus of control, pain self-efficacy, and positive meta-emotion in women with breast cancer.

Method: This research was an applied study following a quasi-experimental method with a pretest-posttest-control group design. The statistical population consisted of all female clients medically and clinically diagnosed with breast cancer in the healthcare centers of Tehran in 2022-2023. A total of 45 individuals with definite breast cancer detection were selected by convenience sampling and assigned into three groups randomly. The research instruments were Nickolas', Pain Self-efficacy questionnaire, Walston et al.'s, Health Locus of Control Scale, and Mitmansgruber et al.'s meta-emotion questionnaire. The two experimental groups were intervened constantly and weekly, while the control group received no intervention. The research data were analyzed by the multivariate analysis of covariance and post hoc tests run in the SPSS 26 software.

Results: Findings revealed that self-healing training and emotional schema therapy influenced the health locus of control, pain self-efficacy, and positive meta-emotion of women with breast cancer. Likewise, the findings revealed a significant difference between the effectiveness of the two interventions on health locus of control and pain self-efficacy.

Conclusion: In line with the outcomes of the research, it can be concluded that the therapeutic function of the mentioned interventions provides researchers with state-of-the-art strategies to expand knowledge, research, and treatment boundaries when facing psychological disorders in women with breast cancer.

Keywords: Self-healing Training, Emotional Schema Therapy, Health Locus of Control, Pain Self-efficacy, Positive Meta-emotion, Breast Cancer

Introduction

In the modern era, breast cancer is one of the paramount health problems of women in the world and the most prevalent women's cancer in many countries [1]. The increasing growth of cancer in the past several years and its harmful impacts on all somatic, emotional, spiritual, social, and economic dimensions have engrossed not only people but also experts to this illness, making them introduce cancer as the main health problem of the century [2]. Breast cancer is one of the most significant factors that threatens women's physical, mental, and social health and can influence their metacognitive beliefs, self-consciousness, self-confidence, and senses of worthiness and acceptability [3].

On the other hand, one of the factors that can crucially contribute to health-associated beliefs is health locus of control, which refers to individuals' beliefs in how they control their health [4] and falls into three belief categories: internal health locus of control, i.e., believing

in that the degree of healthiness is determined by the personal traits and characteristics that define behavior and are specified by the individual [5] and the external health locus of control, i.e., believing in that the degree of healthiness and health-related behaviors are determined by other individuals employed in health professions. This behavior usually manifests in individuals suffering from acute health situations [6]. Chance health locus of control means believing that health efficiency is controlled by chance and fate and can lead to underperformance alternately [7]. In this regard, individuals who believe in internal health control beliefs are healthier and socially active, while individuals with external health control beliefs are more passive in their social relationships [8].

Another psychological factor that can influence the degree of experienced pain is pain self-efficacy, defined as individuals' beliefs in their abilities to perform efficiently in a wide range of stressful situations in disease situations [9]. Individuals believing in their outperformance in their responsibilities are less stressed [10]. In psychology, self-efficacy beliefs are stronger predictors of behavioral outcomes than any other motivational structure. Evidently, what is important is not individuals' capacity levels but their abilities to believe in themselves [11]. Studies show that self-efficacy is a significant regulator of behavior, leads to self-regulation, improves the quality of life, prepares individuals to encounter ambiguous and challenging situations, paves the way for identifying actual capacities, and enhances self-confidence and self-acceptance [12]. The research on chronic pain has examined two psychological constructs of self-efficacy, i.e., pain and fear of movement, as two operational intermediates contributing to the conversion of acute to chronic pain and permanence of chronic pain [13].

One of the crucial investigable issues in examining cancerous individuals' psychological conditions pertains to meta-emotions, or secondary emotions, defined as responses to primary emotions. Meta-emotions fall into two dimensions: Positive meta-emotions, including meta self-compassion and meta-interest, and negative meta-emotions, involving meta-anger, meta-shame, meta self-humiliation, meta control of thought, and meta-prevention of emotions [14]. Meta-emotions inform about the emotion regulation process [15]. According to the appraisal theories of emotion, meta-emotions develop based on how any well-being contributing aspect of the environment impacts individuals' values, beliefs, purposes, and needs [16]. The cognitive appraisal theory of emotion assumes that emotions are the outcomes of assessment processes or direct evaluations [17]. If this definition is true, we cannot estimate any domain for emotions and meta-emotions [18]. In contrast, cognitive appraisal theories argue that emotions are a mix of qualitative phenomena, and cognitive judgments of certain emotions are neither necessary nor sufficient. Thus, meta-emotions refer to individuals' emotional responses to people or their primary emotions [19].

Various interventions have been so far investigated for the moderation of the mentioned psychological problems. However, the contribution of newer interventions like self-healing training is often neglected. Self-healing is literally defined as the ability to heal and cure the self [20]. In other words, it refers to self-healing exercises individuals do for themselves [21]. Researchers explain the self-healing force with the strength and influencing power of beliefs. Self-healing exercises involve five basic axes: lifestyle modification, spiritual excellence, the correction of inner talks about fear and unhealthy and false beliefs, meditation, and certain Lloyd exercises with prayers for self-healing [22]. This therapy encompasses all five physicals, psychological, communicative-social, spiritual, and moral dimensions of humans [23]. According to reports, Lloyd Johnson and Lipton Research Group therapy is effective in working with people's psychological issues [24]. Furthermore, another study implemented the self-healing program online among Canadian youths who simultaneously suffered from opiate abuse and emotional problems, such as anxiety and depression, and found that this program could enhance the subjects' quality of life and reduce their anxiety [25].

Ultimately, emotional schema therapy can present an integrated pattern of regulation that helps clinicians opt for better techniques [26]. It is a new form of cognitive behavioral therapy developed for the treatment of emotional problems [27]. Leahy called this pattern a metacognitive or meta-emotional model wherein emotions are recognized socially [28]. This model differs from Greenberg's emotional schema, where every emotion triggers a disorder regarding a certain cognitive content, and Izard's emotional schema, which denotes the interaction between cognition and emotions [29]. According to this therapeutic model, all individuals experience negative and painful emotions, yet, what differentiates them is how they interpret and react to emotions or emotional schemas. Emotional schema therapy matches acceptance and commitment therapy since both treatments attend to extending psychological flexibility and adaptive responses to distressing emotional experiences [30].

It is important to compare the effectiveness of the two mentioned treatments in terms of expanding theoretical knowledge as well as their application in the clinical field. On the one hand, by understanding the impact of interventions, they can be used in the treatment processes of the people involved. On the other hand, this research can be a guide for more research in the future so that the results can be generalized more strongly. On the other hand, the lack of comparative studies in this field could cause problems for researchers regarding the effectiveness of both treatments and cause material and spiritual expenses for future researchers. Therefore, due to the gap, the necessity of conducting research was felt. Considering the significance of the explained issues and the research gap arising from the absence of similar studies examining and comparing the mentioned two therapies, the researchers sought to answer the following question:

Is there a difference between the effectiveness of self-healing training and emotional schema therapy on health locus of control, pain self-efficacy, and positive meta-emotions in women with breast cancer?

Method

The present study applied quasi-experimental research with a pretest-posttest-control group design. The statistical population consisted of all female clients diagnosed with breast cancer medically and clinically in the Health centers of Tehran in 2022-2023. The samples were selected considering a test power of 0.80, effect size of 0.50, and alpha level of 0.05. Likewise, the sample size was based on the suggestion of Gall who believes that a sample size of 15-20 participants per experimental and control group is desirable in experimental and quasi-experimental studies. A total of 15 participants were considered for every group concerning the attrition probability. Thus, the clients were selected by convenience sampling and randomly assigned into three groups (two experimental and one control group, each with 15 members). The www.randomization.com site was used for the randomization process, and sealed envelopes with random sequences were used for allocation concealment, i.e., the researcher prepared 45 envelopes (equal to the sample size) and recorded every random sequence on a card. The cards were then put inside the envelopes, whose outer surfaces were numbered similarly to maintain the random sequences. Finally, the envelope flaps were stuck, and the envelopes were put inside a box. The envelopes were opened based on the entrance of eligible participants, and the groups into which they were assigned were determined. However, the researcher and participants were unaware of the allocation into the experimental and control groups. The women should have the inclusion criteria and were assessed through interviews and questionnaires. Afterward, the interventions were applied to the experimental groups, and the control group received no treatment. The self-healing training and emotional schema therapy interventions were provided separately in a two-hour sessions held once a week. The homogeneity of the groups was ensured by considering economic, social, etc. variables. The inclusion criteria were aging between 30 and 50 years, being diagnosed with breast cancer by a specialist, and having at least diploma literacy. The exclusion criteria were aging below 30 years, simultaneously participating in other therapeutic sessions and other studies, providing incomplete information, not filling out the questionnaires fully, causing a disturbance in the research process, lacking sufficient time, and being absent for more than two sessions. The ethical consideration of the research involved presenting written information to the participants about the research, assuring the confidentiality of the data and their use only for research purposes, voluntary participation in the study, the participants' unanimousness for their privacy, and receiving informed consent from the participant. The multivariate Analysis of Covariance (ANCOVA) and post hoc tests run in the SPSS 25 software were used for inferential statistics and hypothesis estimation.

The tools used in this study were as follows:

Multidimensional Health Locus of Control (MHLC): Walston et al. [31] developed the Multidimensional Health Locus of Control (MHLC) questionnaire to determine the source of health control in individuals. Whether individuals' health control systems are internal or external is based on some scaled features that determine the type of the health control axis. This questionnaire has 18 questions and three subscales. The subject should express his agreement or disagreement with each of them on a six-point Likert scale from completely disagree (1) to completely agree (6). The unidimensional axis measuring the control type was first designed by Walston et al. The Kuder-Richardson reliability coefficient was estimated at 0.50, 0.61, and 0.77 for the internal source of health control, health control tied to significant others, and chance source of health control. The correlation level of the subscales is estimated with a total score above 0.6 which indicates the validity of the structure [31]. Bidokhti et al. [32] reported the internal consistency (Cronbach's alpha) at 0.81, 0.83, and 0.79 for the internal, external, and chance health locus of control. The concurrent validity of the health control source scale with the internal-external scale of the Ratter was estimated at 0.4, which indicates convergent validity. The present study estimated the Cronbach alpha coefficient at 0.798.

Meta-Emotions Scale (MES): Developed by Mitmansgruber et al. [33], the Meta-Emotions Scale (MES) possesses 28 items. Scoring is done on a Likert scale from completely agree (6) to completely disagree (1). These researchers considered six components for this scale: anger, shame, thought control, and suppression (negative emotions), and compassion and interest (positive emotions). Every item is scored based on the responses. Higher scores indicate the high level of that component in the individual. Mitmansgruber et al. reported the reliability of the tool by Cronbach's alpha method as 0.87. Also, the validity of the scale is estimated to be higher than 0.4 for all dimensions using confirmatory factor analysis. In Iran, Rezaei et al. [34] reported the Cronbach alpha coefficient of the scale at 0.78 and confirmed its two main dimensions (positive and negative meta-emotions) based on confirmatory analysis. These researchers examined the concurrent validity of MES with the emotional intelligence questionnaire and reported the desirable correlation of the (particularly) positive meta-emotions with the emotional intelligence components. The present study estimated the Cronbach alpha coefficient of MES at 0.812.

Pain Self Efficacy Questionnaire (PSEQ): This scale is a 10-item questionnaire Nickolas [35] designed based on Bandura's theory of self-efficacy to measure patients' beliefs in their capacities to accomplish various activities contrary to ongoing pain. This single-factor questionnaire is scored based on a 6-point Likert scale from completely agree (6) to completely disagree (1)., where the scores range from 0 to 60. Higher scores indicate stronger beliefs in doing daily activities despite experiencing pain. The convergence validity of PSEQ with Scherer's self-efficacy scale equaled 0.57 in Boroumand's [36] research. Nicholas has estimated the reliability of the tool using Cronbach's alpha method as 0.81. In addition, its validity is estimated by the Bandura's self-efficacy questionnaire as 0.7, which indicates convergent validity. The present study estimated the Cronbach's alpha coefficient of PSEQ as 0.753.

Table 1. The Structure of the Emotional Schema Therapy Sessions [37]

Sessions	Content
1	Measuring and evaluating, presenting the treatment pattern, and formulating the program based on the treatment pattern.
2 and 3	Teaching and introducing emotions, relating emotional experiences with emotional schemas and employed strategies, conceptualizing emotional schemas, normalizing emotional experiences, encouraging self-evaluations that help recognize the emotional experiences of self, and examining patients' resistance.
4 and 5	The emotion normalization technique, emotion acceptance, training stress-lowering techniques, introducing types of beliefs and examining their merits and drawbacks, and identifying and challenging thoughts and their impacts on emotion states.
6 and 7	Teaching interpersonal skills, the technique of writing negative memories to facilitate emotion processing, encouraging patients to adopt a non-judgmental and temporary stance to emotions, teaching detached mindfulness, and raising tolerance of mixed feelings.
8 and 9	Addressing and challenging the identified problematic emotional schemas of patients, building emotional spaces and examining emotions as the target of emotional self-awareness, training emotion expression, imaginary exposure, emotional evacuation, and teaching relaxation techniques.
10 and 11	Adopting a non-judgmental approach to emotions, verbal challenges, and socratic dialogues about the outcomes of behavioral tests, experiencing emotions in waveforms, and twofold criteria.
12	Integrating and reviewing prior skills and working on the recurrence-prevention program.

Table 2. Summary of the Self-healing Training Sessions [38]

Sessions	Content
1	Familiarity with the group members and building therapeutic relationships, identifying the goals and rules of the sessions, introducing situational stresses, teaching situational stress management, and explaining the immune system of the body. Task 1: Members examine the situation and prepare a list of concerns, problems, and stresses.
2	Explaining physiological stresses, hidden stresses, and destructive cellular memories or false memories. Task 2: Observing the self, examining stresses, and performing correct breathing and relaxation at least once a day (the members are given the audio file for respiratory-muscular relaxation).
3	Teaching differentiation between real and false problems, and retrieving memories with respect to failures, conflicts, disappointments, and confusions. Task 3: Retrieving memories by the memory retrieval file about the events and traumas impacting all life periods, shocks, and PTSD regarding individuals' attitudes, practicing rose flower meditation.
4	Rooting destructive cellular memories in 12 groups, introducing revenge, harmful actions, false beliefs, and negative emotions. Task 4: Starting to recognize hidden beliefs and destructive cellular memories carefully and focusing on the revenge group.
5	Implementing the glass lift technique and retrieving life-influencing traumas, events, and shocks regarding individuals' attitudes. Task 5: Implementing the empty chair technique at home with other memories, examining the healthiness or unhealthiness of resultant feelings and beliefs, and thinking about forgiveness. Studying forgiving subjects.
6	Explaining heartfelt negative and positive feelings and teaching forgiveness techniques. Task 6: Continuing the mental challenge of withdrawing revenge and hatred feeling – analyzing the self to know the *poor me syndrome* – examining unhealthy thoughts and believed lies, identifying problematic feelings (anger, passion, pride, fear, sorrow, and shame) and accepting the power of will, authority, freedom, and the responsibility of self-behaviors.
7	Explaining harmful actions and false habits and teaching will-strengthening approaches (decisions, care, evaluation, punishment, and remuneration), learning the problem, and changing the environment. Task 7: Examining the *poor me syndrome* in harmful habits – recording the applied situations and skills for the three preventive groups.
8	Introducing healing codes 1 to 4 (love, happiness, peace, and endurance). Task 8: Starting to create and reinforce the four healing codes in daily life, doing certain practices of the healing code, and recording successes and progresses
9	Introducing, creating, and reinforcing healing codes 5-9 (kindness, goodness, trust, modesty, and self-control) and teaching the reverse memory retrieval technique. Task 9: Creating and reinforcing the four healing codes in daily life and performing specific exercises of the healing code, implementing the reverse memory retrieval technique, and recording successes and progresses.
10	Explaining the role of heartily demands, the effect of prayers, and continued focus on demands in the life path, describing scientific evidence on the role of prayers in self-healing, and training the practices of the general healing codes. Task 10: Spending certain time alone to pray and make relationships with God – worshiping (strengthening spirituality), practicing silence, solitude, and mental and physical mindfulness, and reviewing effective exercises – acting according to the self-value system + epitomizing the creator (optimism about the future).
11	Teaching a moderate lifestyle and improving life quality in health domains. Task 11: Practicing healing codes with prayers and real concentrative sentences – starting to modify lifestyle by identifying and decreasing false habits and continuing spiritual excellence exercises – recognizing dissatisfaction with certain domains and embarking on to lower dissatisfaction.
12	Modifying inner dialogues, planning for eternity and spiritual life purposefulness, and increasing internal richness (helping and caring for the self and others), teaching power breathing: Reviewing personal stresses – emphasizing continuous self-care against physical and mental traumas and managing emotions and relations. Task 12: Continuing previous exercises, correcting inner talks and self-care, and identifying peace and spirituality shortcuts for the self.

Results

This section first informs the participants' demographics. The experimental and control groups constituted 51% (23 participants) and 49% (22 participants) of the sample, with an age mean and standard deviation of 40.36 and 4.45. The youngest and oldest participants were 35 and 50 years old. Twenty participants (45%) had diplomas and below diploma education, 17 (35%) possessed bachelor's degrees, and 8 (20%) held master's degrees. Table 3 shows the descriptive statistics, e.g., mean and SD, of the research variables.

As the table above displays, the mean score of the individuals in the self-healing training group experiences uptrends in posttest i.e., health locus of control (M = 20.64, SD = 1.58), pain self-efficacy (M = 13.94, SD = 1.91), and positive meta-emotions (M = 8.93, SD = 1.49). Similarly, the mean score of the individuals in the emotional schema therapy group has increased in the posttests of health locus of control (M= 17.74, SD = 1.44), pain self-efficacy (M = 11.54, SD = 1.28), and positive meta-emotions (M = 9.94, SD = 1.67). Notably, the scores of individuals in the control group do not change considerably. The skewness and kurtosis indices are used to examine data normality. The scores of the research variables in the pretest and post-test range from -2 to +2, indicating the normal distribution of data and allowing the use of parametric methods. The researchers also found no missing data and outliers using a box plot. Likewise, Levene's test was employed to examine the homogeneity of variance in the pretest and posttest. The null hypothesis of this test asserts that the groups are homogenous in terms of their variance. As observed, the F-value (0.824) is larger than the error level for the health locus of control, and thus this assumption is observed for this variable. The F-value (0.987) is also larger than the error level (0.423) for pain self-efficacy, and this assumption holds for this variable. Likewise, this index (1.258) is larger than the error level (0.197) for positive meta-emotions, and this assumption is also observed for this variable. The Box M test was used to investigate the homogeneity of the variance-covariance matrices. It examines the null hypothesis on the equality of the observed covariance matrices of dependent variables in different groups. As displayed, since the F-value (1.820) is not significant at the error level of 0.249, the null hypothesis is not rejected, i.e., the observed covariance matrices are equal in different groups. The homogeneity of the regression slope, indicating that the regression slope of different lines should be equal in the groups, can be evaluated by an F test on the interaction between independent variables and covariates. As observed, the significance level of the group*pretest interaction in the health locus of control equals 0.179, which is larger than 0.05 and indicates the homogeneity of the regression slope. In a similar vein, the significance level of the group*pretest interaction in pain self-efficacy equals 0.524, which exceeds 0.05 and denotes the homogeneity of the regression slope. Similarly, the significance level of the group*pretest interaction in the positive meta-emptions equals 0.712, which is larger than 0.05 and indicates the homogeneity of the regression slope. Table 4 displays the results of the multivariate tests (Pillai's trace, Wilk's Lambda, Hoteling's trace, and Roy's largest root). The significance or insignificance of every test is recognizable by the P level, i.e., it is significant if P<0.05. Among the four multivariate tests, Wilk's lambda is more popular, while Pillai's trace is stronger than others in practice.

In the following, the results of tests of Pillai's effect, Lambda-Wilks, Hoteling's effect and the Roy's largest root are reported. According to the significance level for the test of Pillai's effect (P=0.001), Wilks's lambda (P=0.001), Hotling's effect (P=0.001) and the Roy's largest root (P=0.001), which is less than 0.05. There is a significant difference between the three groups in terms of the researched scores and the investigated components. Considering the results of the indices above, we can infer that self-healing training and emotional schema therapy influence the linear combination of the dependent variables, i.e., health locus of control, pain self-efficacy, and positive meta-emotions. In addition, that the groups are different minimally in one of the examined variables, and this difference results from the effect of the treatments.

Table 3. Descriptive Values of Research Variables in two Phases

Variable	Groups	Step	Mean	SD
Health locus of control	Self-healing training	pre-test	15.25	1.11
		Post-test	20.64	1.58
	Emotional schema therapy	pre-test	14.99	1.67
		Post-test	17.74	1.44
	Control	pre-test	12.65	1.97
		Post-test	12.00	1.64
Pain self-efficacy	Self-healing training	pre-test	10.30	1.14
		Post-test	13.94	1.91
	Emotional schema therapy	pre-test	8.64	1.22
		Post-test	11.55	1.28
	Control	pre-test	5.33	1.56
		Post-test	4.99	1.56
Positive meta-emotion	Self-healing training	pre-test	5.32	1.71
		Post-test	8.93	1.49
	Emotional schema therapy	pre-test	6.52	1.63
		Post-test	9.94	1.67
	Control	pre-test	3.88	1.91
		Post-test	3.23	1.52

With respect to the values in the table above, we can infer that the examined groups significantly differ in the examined components since the estimated F-values at the <0.05 level are significant for the benefit of the experimental group considering the estimated means. Hence, self-healing training and emotional schema therapy influenced the health locus of control, pain self-efficacy, and positive meta-emotions of women with breast cancer.

Table 6 shows the results of the post hoc least significant difference test to demonstrate inter-group differences in the means of the research variables. Accordingly, there is a significant difference between the effectiveness of self-healing training and emotional schema therapy on the health locus of control, i.e., the mean difference of the groups equals 3.95 and is significant at the <0.05 level. Thus, we can assert that self-healing training is more effective in improving the health locus of control than emotional schema therapy. The effectiveness of self-healing training and emotional schema therapy on pain self-efficacy is also significantly different, such that the mean difference of the groups equals 2.63 and is significant at the <0.05 level. Hence, we can claim that self-healing training is more effective in improving pain self-efficacy than emotional schema therapy. The effectiveness of self-healing training and emotional schema therapy on positive meta-emotions is not significantly different, i.e., the mean difference of the groups equals 1.002, which is not significant at the <0.05 level. Therefore, we can explain that these two therapies are not significantly different in their effectiveness on positive meta-emotions.

Table 4. ANCOVA Results

Source	Dependent	Sum of squares	df	Mean squares	F	P
Self-healing training	Health locus of control	325.01	1	325.01	25.60	0.001
	Pain self-efficacy	493.47	1	493.47	34.41	0.001
	Positive meta-emotions	816.34	1	816.34	30.12	0.001
Emotional schema therapy	Health locus of control	637.22	1	637.22	8.78	0.001
	Pain self-efficacy	742.64	1	742.64	20.00	0.001
	Positive meta-emotions	892.13	1	892.13	56.42	0.001

Table 4. Comparative Bonferroni Test to Examine the Difference between Therapies

Variable	Reference groups	Comparison group	Mean difference	Standard error	P
Health locus of control	Self-healing training	Emotional schema therapy	3.95	0.61	0.034
		Control	8.01	0.64	0.005
	Emotional schema therapy	Self-healing training	3.95	0.61	0.034
		Control	5.49	0.61	0.021
Pain self-efficacy	Self-healing training	Emotional schema therapy	2.63	0.72	0.002
		Control	7.94	0.72	0.005
	Emotional schema therapy	Self-healing training	2.63	0.72	0.002
		Control	6.49	0.72	0.021
Positive meta-emotions	Self-healing training	Emotional schema therapy	1.00	0.68	0.067
		Control	5.46	0.68	0.039
	Emotional schema therapy	Elf-healing training	1.00	0.68	0.067
		Control	4.32	0.68	0.041

Discussion

The findings showed that self-healing training influenced the health locus of control, pain self-efficacy, and positive meta-emotions of women with breast cancer. This result is in line with the research results of previous studies [4, 14, 15, 17, 18]. To explain this outcome, we can argue that self-healing training focuses on identifying and treating destructive cellular memories, which cause stress in the body intentionally or unintentionally, makes cells defensive, unbalances the autonomic nervous system and changes it to the fight-or-flight state, and leads to distress. Probably, the participants succeeded in balancing their autonomic nervous system and ceasing their fight-or-flight activation of the nervous system by reducing stresses and emotions when they learned techniques such as retrieving memories, forgiving, not taking revenge, avoiding harmful actions, correcting unhealthy beliefs, modifying lifestyles and inner dialogues, managing internal and external stresses, and performing healing codes [39]. Accordingly, when individuals make relationships with a mighty force and adopt higher goals and values, they are more resilient, outperform in controlling conditions, evaluate the illness more positively, and do not ruminate and catastrophe the disease. Also, patients with higher well-being are more insistent on solving life problems and more resistant to undesirable feedback they receive from their surroundings. Thus, they can manifest higher levels of positive emotions [23].

The results also showed that emotional schema therapy influenced the health locus of control, pain self-efficacy, and positive meta-emotions of women with breast cancer. This finding conforms to the research results of Alat et al. [6], Zheng et al. [7], Harbridge et al. [5], and Swanson et al. [8]. The cognitive regulation of emotions is a chief determinant factor in psychological well-being and activity. Using adaptive strategies to regulate emotions moderates perceptive stresses since these strategies help women with breast cancer improve their mental capacity, regulate emotions, strengthen their problem-solving ability, and react to this illness patiently [37]. Various studies show that individuals with breast cancer use maladaptive cognitive regulation strategies, like rumination and self-blame, due to holding maladaptive

primary schemas and thus experience double anxiety. Indeed, by regulating emotions cognitively, schema therapy reduces negative emotions and promotes psychological well-being and positive emotions. This therapy mainly underscores emotions and encompasses emotional and experimental techniques, which help individuals gain more knowledge and accept and regulate their emotions. Besides, by reorganizing emotions, accentuating health dimensions and a sense of resilience, and solving problems in disease conditions, they pave the way for correctly employing the adaptive strategies of emotion regulation [37].

The findings showed that self-healing training and emotional schema therapy differently impact the health locus of control of women with breast cancer. This outcome corresponds with the research results of Vahhab et al. [20], Yamazaki et al. [21], Jin et al. [24], Fathi et al. [23], and Zarean et al. [39]. We can assert that self-healing training is more effective in the health locus of control than emotional schema therapy. Self-healing training includes self-help, self-relaxation, and healing codes that balance cellular energy, reduce physiologic stress, and enhance comfort. Lipton believes that the sense of revenge and hatred rooted in the destructive cellular memories in cancer diseases gives rise to an unintentional imbalance in the automatic nervous system and enfeebles the immune system against illnesses. Thus, this stress can cause different diseases, like breast cancer. As observed, self-healing training and codes are more influential in individuals' emotions, behaviors, and awareness of their health and self-care [39].

According to the results, self-healing training and emotional schema therapy do not equally impact the pain self-efficacy of women with breast cancer. This finding aligns with the research outcomes of Edward et al. [26], Silva et al. [28], Gilanyi et al. [9], Nudelman et al. [11]. It can be argued that self-healing training is more effective in pain self-efficacy than emotional schema therapy. Self-healing means the ability to heal the self and refers to the role of individuals in improving their diseases or solving problems. This approach includes memory retrieval skills, recognizing problematic personality traits, reducing harmful actions, teaching self-relaxation skills, praying, and practicing healing codes. Self-efficacy is a special construct in the face of cancer and refers to the behaviors one displays when struggling with survival. Cancer detection and treatment and perceived self-efficacy are individuals' beliefs in implementing cancer-coping strategies. In the meantime, self-healing training overrides emotional schema therapy in enhancing this component.

The findings revealed no significant differences between the effectiveness of self-healing training and emotional schema therapy on positive meta-emotions. This result conforms to the research outcomes of Soucie et al. [14], Ciucci et al [15], Cain et al. [17], Zhang et al. [18], and Antoni et al. [4]. Self-healing training focuses on individuals' efforts to find the causes of physiological stress and cure destructive cellular memories. In addition, it foregrounds self-care, spiritual excellence, correcting inner talks, healthy lifestyles, modifying fears and unhealthy beliefs, meditation, praying, and practicing healing codes. This approach influences positive meta-emotions, which employ mindfulness and psychological acceptance to promote health in cancer patients. This issue holds for emotional schema therapy, where individuals balance negative emotions and strengthen positive ones by correcting maladaptive schemas. Hence, no difference was found between the effectiveness of these two approaches on the positive meta-emotions of women with breast cancer [20].

Similar to other studies, this research suffers from some limitations, the main of which are using convenience sampling and lacking any follow-up periods. Other limitations are the absence of commensurate research background about the health locus of control and positive meta-emotions, the finiteness of the examined samples, which problematizes generalization to other populations, and the selection of the samples only from Tehran city and thus difficulty in generalizing the results to the country and other groups due to sociocultural factors. The present study did not control variables like the subjects' marital status, social class, economic condition, and education, which could impact the outcomes. Considering the significance of the topic and outcomes, the researchers suggest using other variables in comparing these two therapies due to the acute psychological problems of these patients and examining other statistical samples like patients with skin diseases and diabetes and addicts. The results can be employed to promote conceptual and practical knowledge of counselors, therapists, and organizations dealing with psychological problems.

Conclusion

This study compared the effectiveness of self-healing training and emotional schema therapy on the health locus of control, pain self-efficacy, and positive meta-emotions of women with breast cancer. The results revealed the effectiveness of both treatments on the research variables. The self-healing intervention was, however, more effective in improving the health locus of control than the emotional schema therapy. Self-healing training was also more effective in improving pain self-efficacy compared to emotional schema therapy. However, both treatments displayed no significant difference in enhancing positive meta-emotions.

Conflict of Interest

The authors report that there were no conflicts of interest between them.

Ethical Approval

This research has been approved and approved by the Vice President for Research of the University under the ethics code IR.IAU.ARAK.REC.1402.028.

The ethical consideration of the research involved presenting written information to the participants about the research, assuring the confidentiality of the data and their use only for research purposes, voluntary participation in the study, the participants'

unanimousness for their privacy, and receiving informed consent from the participant.

Declaration of Generative AI and AI-Assisted Technologies

During the preparation of this work the authors did not use any AI tools

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