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Effectiveness of Positive Thinking Training on Perceived Stress, Metacognitive Beliefs, and Death Anxiety in Women with Breast Cancer

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ABSTRACT

Background: Women with breast cancer suffer high levels of stress due to their disease-induced emotional, cognitive, behavioral and physical problems which increase their metacognitive beliefs, death anxiety, and rumination, disrupting the treatment process and exerting a negative impact. The present study aimed to investigate the effectiveness of positive thinking training in perceived stress, metacognitive beliefs, and death anxiety in women with breast cancer in Ahvaz in 2019.

Methods: This was a quasi-experimental study with a pretest-posttest control group design. Statistical population consisted of all women with breast cancer visiting Shafa Health Center of Ahvaz in 2019, among whom 30 women were selected as the sample using convenience sampling. Cancer patients were randomly divided into intervention (n=15) and control (n=15) groups. The research instruments included the Perceived Stress Scale, the Metacognitions Questionnaire (MCQ-30), and the Scale of Death Anxiety (SDA). Univariate and multivariate analyses of covariance were used to analyze data.

Results: Results suggested that positive thinking training reduced perceived stress, metacognitive beliefs and death anxiety in women with breast cancer in the intervention group compared with those in the control group ($P < 0.001$).

Conclusion: The results showed that positive thinking training was effective in reducing perceived stress, metacognitive beliefs, and death anxiety in women with breast cancer.

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INTRODUCTION

Breast cancer remains the second leading cause of cancer death worldwide and the leading cause of cancer death in women. It accounts for around 21% of all cancers.¹ The breast is an important part of a woman's body image; thus, any abnormality in this area can lead to cognitive problems for women.²

The disease-induced clinical symptoms lead to high perceived stress, and impede socio-individual relationships and adjustment.³ Women with breast cancer may experience boredom, sadness, hopelessness, discouragement, loneliness, and dissatisfaction.⁴ Perceived stress is a common problem in these women.⁶ The high perceived stress in these women influences their mental state during the disease.⁵ Studies suggest that stress involves physical, mental, and emotional reactions experienced as a result of changes in the needs of a person's life. These major or minor changes could disturb patients. Perceived stress impairs a person's perceived ability and confidence in the face of stress and leads to mood problems.^{7,8}

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Women with breast cancer develop metacognitive beliefs due to their suffering which threatens their mental health.⁹ Metacognitive beliefs cause disorders that affect their thinking style and adaptability,¹⁰ making them anxious and worried. To cope with anxiety, patients usually resort to metacognitive beliefs. Metacognitive beliefs and unwanted or disturbing thoughts are the main problem of patients with special diseases, because they permanently experience threat and negative emotions. According to psychologists, this coping style is inefficient and incompatible as it fails to solve problems and exacerbates psychological and mood disorders.¹¹

On the other hand, these patients experience high levels of death anxiety due to the cancer-induced stress and fear. Death anxiety disturbs the mental balance of patients. Cancer induces death anxiety more than other diseases due to its specific conditions.¹² Death anxiety is closely related to the underlying fear associated with the destruction of a person's life. It includes overt or covert horror elements in various degrees. Perceived stress affects the degree of death anxiety. Major cognitive components of death anxiety include attitudes, conceptual ability to predict and expect the future, and open awareness of dying.^{13,14}

Women with breast cancer suffer high levels of stress due to their disease-induced emotional, cognitive, behavioral and physical problems which increase their metacognitive beliefs, death anxiety, and rumination, disrupt the treatment process, and exert a negative impact. Due to the specific condition of breast cancer patients, there is a concern about what treatment is more effective in reducing stress and rumination in them as they disturb quality of life and increase death anxiety in patients. There is a need to increase their quality of life and improve their cognitive status using the best educational approach.¹⁵⁻¹⁷ Positive thinking training helps individuals identify their positive experience in coping with hardships and strengthens their self-respect and self-esteem, thus boosting their well-being and resistance to stress, reducing their rumination and anxiety, and establishing peace and hope in these patients.^{18,19}

Positive psychology is the scientific study of human flourishing and strength. Positive thinking training plays a major role in human flourishing and optimal functioning.²⁰ It applies theories, studies, and psychological intervention techniques to identify the components of satisfactory, adaptive, creative, and emotional human behavior. It is the scientific study of human experiences, positive traits and institutions that facilitate changes in individuals.^{21,22}

Positive thinking training may exert positive effects on controlling perceived stress, metacognitive beliefs and death anxiety in patients with breast cancer.¹⁰ Studies suggest that this training has a significant effect

on reducing stress and cognitive problems.²³ Research shows that positive thinking training has a significant effect on reducing perceived stress and symptoms of stress, improving metacognitive beliefs, and reducing death anxiety in women with breast cancer.^{24,25}

Given the severity of the breast cancer symptoms and the high degree of disability, researchers and therapists have always sought to find the best effective ways to reduce the physical and psychological symptoms of women with breast cancer, on the one hand, and increase their ability, on the other. It is important for therapists to find out what treatment is more effective in the short term. In recent years, the role of psychological factors in diseases has been taken into account. An effective protocol should be identified to reduce perceived stress, metacognitive beliefs, and death anxiety in women with breast cancer. The study of a therapeutic intervention that balances stress episodes in these women and improves their metacognitive beliefs and death anxiety could promote their quality of life and be a major help to these patients and medical centers and improve their perceived stress, metacognitive beliefs, and death anxiety. Given the paucity of studies on the effect of positive thinking training on psychological variables in women with breast cancer, this study aimed to investigate the effectiveness of positive thinking training on perceived stress, metacognitive beliefs, and death anxiety in women with breast cancer.

METHODS

This was a quasi-experimental study with pretest-posttest control group design. Statistical population consisted of all women with breast cancer visiting Shafa Health Center of Ahvaz in 2019. In this study, 30 women with breast cancer were selected using convenience sampling. Breast cancer patients were randomly divided into intervention (n=15) and control (n=15) groups. In the present study the specified sample size was selected according to G*Power software (effect size=0.75; test power=0.90; α =0.05). Randomization was done by the researcher after obtaining participants' consent and participants were assigned to the intervention and control groups by a coin-throwing method. Inclusion criteria were: not being in the mastectomy and chemotherapy stage during training sessions, living in Ahvaz during the intervention, informed consent to attend the sessions of positive thinking training, taking no psychotropic medications at least three months before and during the study, minimum junior high school education, and having no severe neuropsychiatric disorders based on participants' self-reports. Exclusion criteria were: starting a simultaneous psychotherapy intervention and missing more than two treatment sessions during the intervention.



Before the positive thinking training, a pre-test was performed to assess perceived stress, metacognitive beliefs and death anxiety in women with breast cancer. The role of the pre-test in this study was to control and compare perceived stress, metacognitive beliefs and death anxiety in the intervention and control groups through the pre-test and post-test. The intervention group received eight 90-minute sessions (once a week) of positive thinking training. The post-test was then conducted on intervention and control groups to measure their perceived stress, metacognitive beliefs and death anxiety. At the end of the study, to observe ethical considerations, the control group received a course of positive skills training. Also, to take ethical considerations, the researchers received written consent from the participants for participation in the research. The study was approved by the Ethical Committee of Islamic Azad University, Bushehr Branch (code: 953001598).

Instruments

Perceived Stress Scale: The Perceived Stress Scale (PSS) was developed by Cohen in 1983. The items were developed to elicit respondents' opinion about their uncontrollable, unpredictable, and difficult life. It is a 14-item inventory scored on a 5-point scale from 1=Never to 5=Always. Items 4, 5, 6, 7, 9, 10 and 13 were inversely scored. The minimum and maximum scores were 14 and 70. Badie *et al.*,²⁶ reported the reliability of this scale equal to 0.86 based on Cronbach's alpha coefficient. In the present study, Cronbach's alpha coefficient was 0.82 for the scale.

Metacognitions Questionnaire (MCQ-30): The 30-item MCQ-30, developed by Wells in 2004, is a self-report that measures individuals' beliefs. It was designed to measure several metacognitive elements, some of which play a pivotal role in the metacognitive model of psychological disorder. It consists of 5 subscales: 1) positive beliefs about worry, 2) negative beliefs about uncontrollability and danger of worry, 3) cognitive confidence in memory/attention, 4) beliefs about the need to control thoughts, and 5) cognitive self-consciousness. Cronbach's alpha coefficients for positive beliefs about worry, uncontrollability and danger of worry, cognitive confidence, the need to control thoughts, and cognitive self-consciousness were 0.77, 0.74, 0.84, 0.86 and 0.79, respectively.²⁷ In this study, Cronbach's alpha coefficients for positive beliefs about worry, uncontrollability and danger of worry, cognitive confidence, the need to control thoughts, and cognitive self-consciousness were 0.82, 0.85, 0.87, 0.84, and 0.83 respectively.

Scale of Death Anxiety: The Scale of Death Anxiety (SDA) was developed by Templer in 1970 to measure anxiety and fear of death. It is a 14-item inventory conducted with no time limits. The individuals are

asked to answer 14 items with Yes or No and the scores range between 0 and 14. Higher scores indicate higher levels of anxiety and fear of death. Salmanian and Marashian,²⁸ reported the reliability of this scale equal to 0.88 based on Cronbach's alpha coefficient. In the present study, Cronbach's alpha coefficient was 0.86 for the scale.

Intervention program

Positive Thinking Training Course: The positive thinking training course was developed based on the power of positive thinking by Norman in 2010 and was provided to the intervention group in eight 90-minute sessions.²⁹ A summary of training sessions is provided in Table 1.

Statistical analyses

Data were analyzed by descriptive and inferential statistics: (mean, standard deviation, analysis of covariance (ANCOVA), and multivariate analysis of covariance (MANCOVA)). In addition, the Shapiro-Wilk test was performed to examine the normal distribution of the pre-test and post-test. Levene's test was performed to examine the equality of variances. SPSS version 23.0 was used to analyze the data.

RESULTS

The participants included 30 women with breast cancer, aged 42.81 ± 7.35 years old. As shown in Table 2, the mean and standard deviation of perceived stress in women with breast cancer were 63.60 ± 4.08 in the pre-test and 17.01 ± 2.32 in the post-test for the intervention group; these values were 52.60 ± 4.54 in the pre-test and 54.10 and 4.37 in the post-test for the control group. The mean and standard deviation for positive beliefs about worries in women with breast cancer were 21.26 ± 2.18 in the pre-test and 8.40 ± 1.54 in the post-test for the intervention group while these values were 20.73 ± 1.48 in the pre-test and 20.53 ± 1.76 in the post-test for the control group. For the uncontrollability and danger of worry in women with breast cancer, the mean and standard deviation were 22.40 ± 1.18 in the pre-test and 8.60 ± 0.98 in the post-test for the intervention group, and 21.20 ± 2.07 in the pre-test and 21.86 ± 1.35 in the post-test for the control group. The mean and standard deviation for cognitive confidence of women with breast cancer were 23.13 ± 1.06 in the pre-test and 7.93 ± 1.09 in the post-test for the intervention group and they were 20.32 ± 1.87 in the pre-test and 21.26 ± 1.16 in the post-test for the control group. The mean and standard deviation for the need to control thoughts in women with breast cancer were 22.33 ± 1.49 in the pre-test and 6.66 ± 1.39 in the post-test for the intervention group and they were 21.20 ± 2.4 in the pre-test and 26.21 ± 2.12 in the post-test for the control group. The



mean and standard deviation for cognitive self-awareness in women with breast cancer were 23.13 ± 0.91 in the pre-test and 6.93 ± 1.75 in the post-test for the intervention group and they were 22.01 ± 1.46 in the pre-test and 21.66 ± 1.87 in the post-test for the control group. The mean and standard

deviation for death anxiety in women with breast cancer were 12.86 ± 0.91 in the pre-test and 3.01 ± 1.30 in the post-test for the intervention group and they were 12.46 ± 1.37 in the pre-test and 12.33 ± 1.45 in the post-test for the control group.

Table 1. Summary of positive thinking training course

Sessions	Details
1	Introduction, conducting pre-test, introducing and contracting for the training process Explaining the fundamentals of positive thinking approach Explaining the effect of positive thinking on maturity of emotional dimensions Explaining the positive thinking concept Positive thinking modeling to deal with stress
2	Flexibility: changing adaptation, stability amid turmoil, authoritarian leadership Connection: support, respect, compromising damaged relationships and forgiving Teaching self-awareness and self-knowledge Teaching positive thinking processes Sharing excitement: talking about pleasure, pain, mutual empathy, responsibility, pleasing interactions, humor
3	Collaborative problem solving: problem identification, brainstorming, joint decision making, focusing on goals, relying on successes Teaching self-acceptance Increasing self-esteem in diseases Tips to strengthen a positive attitude in the treatment process Giving meaning to difficulties: normalization, sense of coherence and explanatory documents Positive vision: hope, courage and encouragement, seizing opportunities, accepting what cannot be changed
4	Explicit expression of feelings Identifying responsibilities Behaving responsibly Positive hope Teaching hope in the face of challenges
5	Assessing stress and potential forces on the individual and thinking positively about ones abilities Strengthening positive thinking Optimism and having hope Teaching how to identify negative-irrational thoughts Boosting positive thinking in women through controlling psychological pressures Facilitating adaptation
6	Family processes affecting stress control Learning to share excitement and getting support Teaching positive thinking and identifying one's positive traits Forming resilience to challenges through positive thinking.
7	Having the spirit Teaching positive self-talk and its effect on behavior and cognitive dimensions Summing up positive thinking trainings
8	Teaching the connection between positive thoughts and emotions and behavior Summing up sessions Submitting suggestions and conducting post-test

In the present study, Shapiro-Wilk test was used before testing the normality of data distribution. According to the results of the Shapiro-Wilk test, the assumption of normality of scores in the intervention and control groups was met for perceived stress, metacognitive beliefs, and death anxiety. The assumption of normality of scores in the pre-test was

met for both the intervention and control groups. Moreover, Levene's test was not significant for perceived stress, metacognitive beliefs, and death anxiety ($P > 0.05$). By controlling the pre-test, all of the tests showed a significant difference between the intervention and control groups in terms of at least one of the variables of perceived stress, metacognitive



beliefs, and death anxiety in women with breast cancer ($F=124.69$, $P<0.001$). One-way ANCOVA was used to find out which variable differed between the intervention and control groups.

As shown in Table 3, by controlling the pre-test, all of the tests indicated a significant difference between women with breast cancer in the intervention and control groups in terms of perceived stress ($F=241.24$, $P<0.001$), positive belief about worry ($F=135.43$, $P<0.001$), uncontrollability and danger of

worry ($F=149.18$, $P<0.001$), cognitive confidence ($F=315.15$, $P<0.001$), belief in the need to control thoughts ($F=163.83$, $P<0.001$), cognitive self-awareness ($F=127.07$, $P<0.001$) and death anxiety ($F=98.78$, $P<0.001$). In other words, positive thinking training reduced perceived stress, metacognitive beliefs and death anxiety in women with breast cancer in the intervention group given their mean scores of perceived stress, metacognitive beliefs and death anxiety compared to the control group.

Table 2. Mean and standard deviation (SD) of research variable in experimental and control groups

Variable	Group	Phases	M ± SD	Skewness	Kurtosis
Perceived stress	Intervention	Pre-test	53.60 ± 4.08	0.72	0.97
		Post-test	17.01 ± 2.32	0.14	-1.05
	Control	Pre-test	52.60 ± 4.54	0.06	-0.64
		Post-test	54.10 ± 4.37	-0.89	1.64
Positive beliefs about worry	Intervention	Pre-test	21.26 ± 2.18	0.48	0.31
		Post-test	8.40 ± 1.54	-0.62	1.41
	Control	Pre-test	20.73 ± 1.48	-0.35	-1.12
		Post-test	20.53 ± 1.76	0.07	1.11
Negative beliefs about uncontrollability and danger of worry	Intervention	Pre-test	22.40 ± 1.18	0.39	0.46
		Post-test	8.60 ± 0.98	-0.72	1.51
	Control	Pre-test	21.20 ± 1.35	-0.27	-1.42
		Post-test	21.86 ± 1.06	0.14	1.18
Cognitive confidence in memory/attention	Intervention	Pre-test	23.13 ± 1.06	0.68	0.42
		Post-test	7.93 ± 1.09	-0.87	1.32
	Control	Pre-test	20.32 ± 1.87	-0.84	-1.27
		Post-test	21.26 ± 1.06	0.36	1.41
Beliefs about the need to control thoughts	Intervention	Pre-test	22.33 ± 1.49	0.18	-0.62
		Post-test	6.66 ± 1.39	-0.41	1.39
	Control	Pre-test	21.20 ± 2.04	0.75	0.29
		Post-test	21.26 ± 2.12	-0.51	1.31
Cognitive self-consciousness.	Intervention	Pre-test	23.13 ± 0.91	-0.87	-1.21
		Post-test	6.93 ± 1.75	0.20	-0.75
	Control	Pre-test	22.01 ± 1.46	0.41	-0.73
		Post-test	21.66 ± 1.87	-0.98	1.18
Death anxiety	Intervention	Pre-test	12.86 ± 0.91	0.84	0.64
		Post-test	3.01 ± 1.30	-0.36	1.12
	Control	Pre-test	12.46 ± 1.37	-0.53	-1.54
		Post-test	12.33 ± 1.45	0.28	-0.76

Table 3. Results of one-way analysis of covariance on research variables in experimental and control groups



Variable	SS	df	MS	F	P	η^2	Power
Perceived stress	3328.01	1	3328.01	241.24	0.001	0.90	1.00
Positive beliefs about worry	167.68	1	167.68	135.43	0.001	0.86	1.00
Negative beliefs about uncontrollability and danger of worry	327.91	1	327.91	149.18	0.001	0.85	1.00
Cognitive confidence in memory/attention	443.35	1	443.35	315.15	0.001	0.82	1.00
Beliefs about the need to control thoughts	502.61	1	502.61	163.83	0.001	0.84	1.00
Cognitive self-consciousness	427.29	1	427.29	127.07	0.001	0.88	1.00
Death anxiety	111.96	1	111.96	98.78	0.001	0.82	1.00

DISCUSSION

The present study aimed to investigate the effectiveness of positive thinking training on perceived stress, metacognitive beliefs, and death anxiety in women with breast cancer. Results suggested a significant difference between women with breast cancer in the intervention and control groups in terms of perceived stress, positive beliefs about worry, uncontrollability and danger of worry, cognitive confidence, the need to control thoughts, cognitive self-awareness, and death anxiety. In other words, given the mean scores of perceived stress, metacognitive beliefs and death anxiety, positive thinking training reduced these variables in women with breast cancer in the intervention group compared with the control group. This finding is consistent with the results of Shokrpour *et al.*²⁰

Women with breast cancer are not in good conditions due to perceived stress and cancer-induced death anxiety and they often experience high levels of worries which exacerbate their problems during the treatment process.³⁰ This study showed that positive thinking training reduces perceived stress and death anxiety in women with breast cancer. Positive thinking training in women with breast cancer provides useful strategies to identify negative thoughts on the disability to control stress and anxiety, and it helps these women know the stress they perceive, increase their coping ability and hardiness, and enhance their inner resistance to stress.

Positive thinking taught these women to have hope and think positively about their abilities, boosted their optimism, provided them with training techniques to identify negative and irrational thoughts, and helped them reduce stress, tension, and worry about disease-induced death anxiety. It assisted them in recognizing symptoms of stress and death anxiety, and increased their internal resistance to stress and stressful situations by mastering optimism and hope to moderate problems and stressors. These trainings can boost their hardiness, including stress management, mastering their condition, seeking challenges, thinking positively, and being purposeful in combating cancer-induced stress.²³

Isolation, stress-induced helplessness, and death anxiety decreased in these women. Positive thinking training helped them to recognize their positive experience in dealing with difficult and stressful situations caused by the suffering of the disease, strengthen their self-respect and self-esteem, develop well-being and resistance to tension, stress, and anxiety, boost their peace, and build hope.²⁰

Positive thinking training improved respect and self-esteem and cognitive resistance to negative stress in women with breast cancer. This training intervention strengthened positive thinking in women, facilitated their adaptation, regulated their emotions and positivism, and made them identify their positive traits. The development of these traits in women with breast cancer controlled their stress and tension caused by death anxiety that negatively affects their treatment process, and it reduced death anxiety.³¹ Thus, they experienced less stress and anxiety and more peace of mind following positive thinking. In other words, positive thinking enabled the women with breast cancer to have an appropriate understanding of behaviors, attitudes, and feelings and to reduce stress by staying calm. Due to the creation of constructive and energizing thoughts through indoctrination, repetition and practice, these positive thoughts made the minds and thoughts of women with breast cancer positive. This positivism persisted in creating the right mood and controlled death anxiety in these women.

This study showed that positive thinking training reduced metacognitive beliefs in women with breast cancer. The ability to think positively in women with breast cancer helped them reduce negativism and rumination during the treatment process. In addition, positive thinking training improved their positive relations with others and their life and increased their happiness and success. Positive thinking training encouraged women to recognize their positive and good experiences and their role in increasing and enhancing self-respect and having a happy and joyful spirit. Following these effective techniques, the negative consequences of rumination for the disease



were moderated. Negative metacognitive beliefs, which caused high concerns in these women, were controlled, and metacognitive beliefs decreased in them as positive waves were generated in their thoughts. Positive thinking made these women adopt an active position, shape their lives personally, and avoid negative thoughts as a strategy to alleviate the rumination-induced stress.³² Positive thinking training solved psychological problems, reduced stress and anxiety, improved psychological well-being, hope and optimism for the future, and developed interpersonal skills, aesthetic feelings, perseverance and endurance, and spirituality in women with breast cancer, and it reduced metacognitive beliefs following optimism and hope. Positive thinking training also helped them identify resilience in the face of problems. They boldly reconstructed and repaired themselves in a behavioral and motivational manner. In addition, they showed fewer negative thoughts and metacognitive beliefs given their physical condition, because positive thinking boosted positive thoughts and hope in these women.

CONCLUSION

Positive thinking training creates a system of optimism in women, and builds hope in them; this approach is quite effective in reducing metacognitive beliefs over time. This study showed that positive thinking training reduces perceived stress, metacognitive beliefs and death anxiety in women with breast cancer. Counseling centers are recommended to apply positive thinking training and consider its effectiveness in reducing perceived stress, metacognitive beliefs, and death anxiety in women with breast cancer. Therapists are also recommended to

apply positive thinking training in workshops to improve perceived stress, metacognitive beliefs, and death anxiety in women with breast cancer. In addition, health care providers are recommended to be attentive to the effect of positive thinking training on patient referral policies by identifying its effectiveness in medical centers and prepare medical centers to use this protocol to alleviate cognitive problems and make optimal use of it for women with breast cancer.

Since the present study was performed on women with breast cancer visiting Shafa Health Center of Ahvaz city, caution should be observed in generalizing the results to other communities in different time and place situations due to different cultural conditions. Due to the difficulty of access to participants, it was not possible to conduct a follow-up stage to monitor the stability of the results. Another limitation was the small sample size in both groups. Considering these limitations and the paucity of studies on the effects of positive thinking training, there is a need for further studies to more precisely determine the effects of this integration.

ETHICAL CONSIDERATIONS

This study was approved by the Ethical Committee of Islamic Azad University- Bushehr Branch (code: 953001598).

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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