

Effectiveness of Acceptance and Commitment Therapy (ACT) on Health-Related Locus of Control and Cognitive Regulation of Emotion in Women with Breast Cancer

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Abstract

Background: Patients with breast cancer (BC) experience psychological challenges necessitating therapeutic interventions. This study evaluated the efficacy of Acceptance and Commitment Therapy (ACT) in influencing health-related locus of control and emotional regulation in women diagnosed with BC.

Methods: This semi-experimental research, employing a pre-test, post-test, and control group design, was conducted among women with BC receiving care at health centers in Dezful City, Iran in 2019. Forty participants were selected through convenience sampling and subsequently randomized via lottery into experimental and control groups, each comprising 20 individuals. The experimental group underwent an eight-session ACT-based treatment, with one 90-minute session per week. Assessment instruments utilized in this study included Wallston's health-related locus of control questionnaire and Garnefski's cognitive emotion regulation questionnaire. Data analysis was conducted using ANCOVA and SPSS version 24.

Results: No significant differences were observed between the groups in the pre-test concerning health-related locus of control and emotional regulation. In the post-test, the mean±SD score for the health-related locus of control in the ACT group was 61.80±7.23, demonstrating a significant difference compared to the control group (47.94±6.11) ($P<0.001$). Emotional regulation mean scores in the experimental and control groups were 87.35±9.28 and 59.74±7.38, respectively, signifying statistical significance ($P=0.005$). ACT significantly enhanced health-related locus of control and emotional regulation in women diagnosed with BC ($P<0.001$).

Conclusion: ACT effectively enhances health-related locus of control and emotional regulation in women with BC. Healthcare professionals and therapists may consider incorporating ACT into their comprehensive treatment strategies to augment health-related locus of control and emotional regulation in this patient population.

Keywords: Acceptance and commitment, Emotional regulation, Women, Breast cancer, Health

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1. Introduction

The uncontrolled development and spreading of abnormal cells characterize cancer. Breast cancer (BC) is the most prevalent cancer among women worldwide, with the highest mortality rate among cancer patients (1). In Iran, BC comprises 22.26% of all cancer types in women and ranks as the most common cancer among Iranian women (2). BC has been identified as the primary health concern in Iran by health professionals, accounting for 22.26% of gynecological cancers and remaining the most frequently diagnosed cancer among Iranian women (3).

Various potential risk factors, including genetics, hormonal and reproductive factors, environmental aspects such as lifestyle, and

notably psychological factors like health-related locus of control, contribute to the occurrence of BC (4). Health-related locus of control influences how individuals cope with cancer and plays a significant role in their response to the disease. The concept of locus of control is a fundamental topic in psychology, initially proposed by Mani and colleagues and rooted in social learning theory (5). Locus of control represents a relatively intricate construct that pertains to how individuals attribute the primary outcomes of life events. It revolves around whether individuals perceive themselves as having control over these outcomes (6). These attributions can be internal, where the person takes direct responsibility for their actions and behaviors, or external, where they believe that environmental factors, superior forces, or others control their actions and behaviors (7).

In individuals with chronic illnesses, including cancer, closely applying cognitive regulation strategies relates to adaptation and more effective treatment outcomes. Employing cognitive emotion regulation strategies aids these individuals in acquiring knowledge on ways to achieve and sustain optimal health. Adherence to cognitive emotion regulation strategies during treatment can play a pivotal role in expediting the healing process (8). Treating these patients without active involvement and without implementing cognitive emotion regulation strategies, such as following a prescribed diet, engaging in regular exercise, adhering to medical recommendations, and mitigating stress, is likely to yield unfavorable results (9).

People employ various emotional strategies to cope with stressful situations. Emotional responses to stressful events can be managed through coping strategies emphasizing recognition (10). In the realm of psychotherapy, particularly within the third wave of psychotherapies, it is postulated that cognitions and emotions should be considered in the conceptual context of phenomena. In this third wave, patients are instructed to accept their emotions and embrace the “here and now” to enhance their psychological flexibility (11). This approach encompasses practical methods suitable for both clinical and non-clinical settings and includes widely employed techniques such as acceptance-based therapy, known as Acceptance and Commitment Therapy (ACT) (12).

ACT, a process-oriented therapeutic approach, represents one of the third-wave cognitive therapies. ACT involves mindfulness (focused on goal-oriented, non-judgmental presence in the present moment), acceptance (willingness to stay connected and open), and skills for responding to uncontrollable experiences while committing to values derived from life (13). ACT enhances the quality of life for BC patients by fostering acceptance, present-moment awareness, and commitment to values (14).

Numerous studies showed that ACT interventions can impact health-related locus of control (15) and emotion regulation (16). From the moment a BC patient receives their diagnosis to the commencement of treatments such as chemotherapy, radiation therapy, drug and dietary regimens, and the subsequent consequences of the disease and treatments, various factors

profoundly affect patients emotionally and cognitively. Cognitive regulation strategies can either exacerbate or ameliorate these emotional responses. Conversely, the belief held by women with BC that they have control over their health can serve as an internal motivator, driving appropriate health behaviors. Women with BC who perceive their health as a product of their actions are more likely to prioritize health promotion behaviors, adhere to medical treatments and drug and dietary regimens, and follow medical directives. Given these considerations and the paucity of similar research in Iran, conducting this study becomes imperative. Consequently, the efficacy of ACT in improving health-related locus of control and emotion regulation in women with BC was assessed.

2. Methods

This semi-experimental study employed a pretest-posttest design with a control group and was conducted on women diagnosed with BC who had sought medical care at healthcare centers and hospitals in Dezful City, Iran or had medical records during the second quarter of 2020. Among these individuals, 40 participants were selected through convenience sampling and randomly allocated into two groups – an experimental group and a control group, each consisting of 20 individuals. The necessary sample size was determined by considering a test power of 0.80, a confidence level of 0.95, an effect size of 0.40, and a dropout rate of 10 percent, resulting in 15 participants for each group.

The inclusion criteria for this research encompassed individuals diagnosed with BC for at least one year and were in stages 1 to 3 of the disease. Additionally, participants were required to have attained at least a diploma level of education and not to have received psychiatric treatment concurrently within the preceding six months. Exclusion criteria encompassed having more than two consecutive absences from the research sessions, non-cooperation, failure to complete assigned tasks during the sessions, and a lack of willingness to continue participating in the research process.

Ethical considerations were paramount in this study and included the following: a) All research participants volunteered and provided their informed consent willingly, b) They were assured of the confidentiality and privacy of

their identities, with a commitment to keep all information strictly confidential, c) Ultimately, participants were duly appreciated and thanked for their valuable contributions to the research, d) Participants retained the right to withdraw from the study at any point without repercussions. This study was conducted in compliance with ethical guidelines and holds an ethics code of IR.DUMS.REC.1400.004 from Islamic Azad University, Bandar Abbas Branch.

participant progress throughout the study is presented in Figure 1. Table 1 shows a summary of the content of treatment sessions based on acceptance and commitment. Assessments were conducted at the baseline and following the intervention using research scales.

2.1. Research Instruments

2.1.1. The Multidimensional Scale of Health-related Locus of Control (MSHLC): The Multidimensional Scale of Health-related Locus

The CONSORT flow diagram illustrating

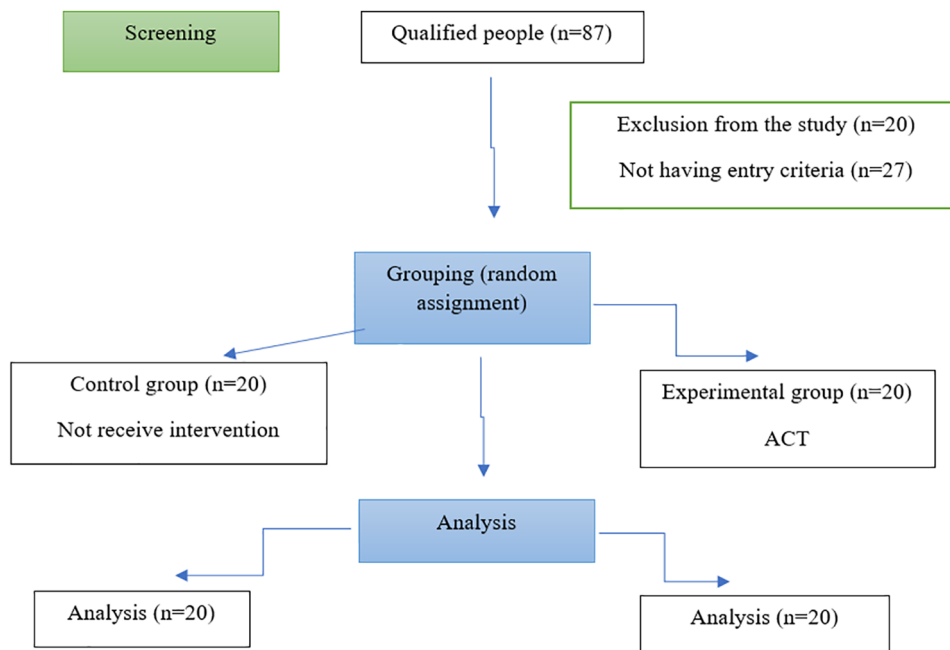


Figure 1: The figure shows the CONSORT flow diagram of the research.

Table 1: Content of acceptance and commitment therapy sessions

Sessions	Activities and content of sessions
Session one	Introduction of members to each other and the therapist, explanation of the group rules, introduction and description of the general approach of Therapy. Homework: Listing five instances of the most important problems faced by patients. Extracting the experience of avoidance, fusion, and values.
Session two	Review of the previous session's assignment, and assessment of patients' problems from individual perspectives. Homework: Preparation of a list containing disadvantages and advantages and methods of controlling problems.
Session three	Review of the previous session's assignment, clarification of the ineffectiveness of managing negative events by metaphors, and teach willingness toward negative experiences and emotions. Homework: Record instances where patients have succeeded in putting aside ineffective control methods.
Session four	Review of the previous session's assignment, teach how to separate evaluations from personal experiences (the bad cup metaphor), and observing thoughts with no judgment. Homework: Record instances where patients have succeeded in observing and not evaluating experiences and emotions.
Session five	Review of the previous session's assignment, connect with the present moment consider oneself as a context (the chessboard metaphor), and teach mindfulness skills. Homework: Record instances where patients could monitor thoughts by mindfulness skills.
Session six	Review of the previous session's assignment, identification of patients' life values, and measuring values according to their significance. Prepare a list containing obstacles to achieving values.
Session seven	Review of the previous session's assignment, presentation of practical solutions to overcome obstacles along with using metaphors, and plan for commitment to pursuing values. Homework: Value follow-up report and thinking about the sessions' outcomes.
Session eight	Summary of the concepts explained in the sessions, ask members to describe their achievements and plans for continuing life.

of Control (MSHLC), developed by Wallston and colleagues in 1994, serves as a valuable tool for assessing health-related locus of control within patient populations (17). This scale comprises three distinct forms: Forms A, B, and C. Forms A and B represent the original iterations of this scale and are presented in two versions designed to evaluate the same construct, typically applied to individuals without specific medical conditions. In contrast, Form C, utilized in this study, targets individuals dealing with medical conditions or health-related problems.

Forms A and B each consist of six-item scales, with responses on a Likert spectrum ranging from one (strongly disagree) to six (strongly agree). These forms evaluate three distinct subscales: chance-based locus of control, internal health locus of control, and powerful others.

1. Internal Health Locus of Control Subscale (Items 1, 6, 8, 12, 13, 17): This subscale assesses individuals' beliefs regarding how much their actions influence their health outcomes.

2. Chance-based Locus of Control Subscale (Items 2, 4, 9, 11, 15, 16): This subscale gauges the degree to which individuals attribute their health outcomes to fate, luck, or chance.

3. Powerful Others Locus of Control Subscale (Items 3, 5, 7, 10, 14, 18): This subscale explores individuals' perceptions of how influential external factors, such as doctors, family members, or a higher power (e.g., God), are in determining their health outcomes.

Each subscale yields scores ranging from 6 to 36, with higher scores indicating a greater degree of the corresponding health-related locus of control. The total score for the scale is calculated by summing the scores for all items, resulting in a range of total scores from 18 to 108.

Original version of form C exhibited a Cronbach's alpha coefficient ranging from 0.60 to 0.70 and a test-retest coefficient between 0.40 and 0.80 (18). Additionally, Form C demonstrated satisfactory criterion, construct, and convergent validity (18). Moshki and colleagues reported a Cronbach's alpha coefficient of 0.85 in their study (19).

Confirmatory factor analysis of Form B's structure, conducted by Moshki and colleagues (19),

affirmed three Internal Health Locus of Control factors. Correlation analysis revealed approximate correlations between these dimensions.

Moshki and colleagues (19) further contributed to the field by presenting the Content Validity Ratio (CVR) and Content Validity Index (CVI) for the Persian version of the scale. Ten experts in psychology and health education were consulted for their opinions. The CVR was calculated using Lawshe's formula, and the CVI was determined using Towey-Swift et al. They considered a CVR value exceeding 0.62 and a CVI value surpassing 0.79 acceptable for each item. The entire scale achieved a mean CVR value of 0.92 and a mean CVI value of 0.90 (20).

In a separate study by Bayazidi and co-workers (21), the CVI and CVR were calculated for the Persian version of the scale, drawing on the insights of ten experts in nursing ethics and education. Employing the same formulas as Moshki and colleagues (19), they obtained an average CVR value of 0.78 and an average CVI value of 0.85 for the entire scale.

The Cronbach's alpha coefficient for our study yielded a score of 0.82, indicating strong internal consistency.

2.1.2. Cognitive Emotion Regulation Questionnaire (CERQ): The Cognitive Emotion Regulation Questionnaire (CERQ) was developed by Garnefski and colleagues in 2001 to assess cognitive emotion regulation strategies in response to threatening events and life stressors (22). Each item in this questionnaire is rated on a scale from 1 (never) to 5 (always). The multidimensional nature of the CERQ allows for identifying cognitive coping strategies following negative situations or events. Unlike other coping questionnaires that fail to distinguish between an individual's thoughts and actual actions, the CERQ explicitly evaluates an individual's thoughts following the encounter with a negative experience or distressing event (22). This questionnaire consists of 36 self-report items, and the total score is computed by summing the scores of all the items. Each subscale corresponds to a distinct cognitive emotion regulation strategy and ranges from 4 to 20; higher scores indicate a greater utilization of that particular strategy. The overall use of cognitive emotion regulation strategies is reflected in the total score, which ranges from 36 to 180.

The subscale internal consistency was assessed using Cronbach's alpha coefficient, resulting in values ranging from 0.71 to 0.81, indicating satisfactory reliability. The validity of the CERQ was also reported to be satisfactory. The Persian version of the CERQ was culturally standardized by Hasani (23). Internal consistency and test-retest reliability were found to be between 0.70 and 0.78. The questionnaire's validity was established through principal component analysis utilizing Varimax rotation and correlations between subscales and criterion validity.

Hasani (23) reported the CVI and CVR for the Persian version of the questionnaire based on the input of ten clinical psychology and psychometrics experts. Acceptable values were considered to be a CVR exceeding 0.62 and a CVI exceeding 0.79 for each item. The overall scale demonstrated a mean CVR of 0.88 and a mean CVI of 0.95 (23). This version's Cronbach's alpha coefficient was also determined to be 0.77.

2.2. Statistical Analysis

The K-S test was employed to assess the normal distribution of the data. Leven's test was utilized to evaluate the equality of variances, while the equality of covariance was assessed using the Box test. Data analyses were conducted through the

independent t-test, Chi-square test, and ANCOVA in SPSS version 24 at a significance level of 0.05.

3. Results

The mean±SD age of women with BC in the ACT and control groups was 37.74±5.46 and 38.12±5.82, respectively. Table 2 presents the demographic variables of the women. The Chi-squared test indicated that there were no significant differences between the groups in terms of demographic characteristics (Table 2).

Based on the t-test results, the groups had no significant differences in the pre-test assessments of health-related locus of control and emotional regulation. However, the two groups exhibited significant differences in the post-test assessments of health-related locus of control ($P=0.001$) and emotional regulation ($P=0.005$). The control group showed no significant differences in the pre-and post-test scores of the study variables. The mean±SD score for the health-related locus of control in the post-test of the ACT group was 61.80±7.23, indicating a significant difference compared to the control group (47.94±6.11) ($P<0.001$). Additionally, the average score for emotional regulation in the experimental and control groups was 87.35±9.28 and 59.74±7.38, respectively, which was statistically significant ($P=0.005$) (Table 3).

Table 2: Demographic variables of the women with breast cancer

Variable	Range	Experimental group	Control group	P value
	% (No.)	% (No.)	% (No.)	
Marital status	Single	46.67 (7)	53.33 (8)	0.237
	Married	53.33 (8)	46.67 (7)	
Age (years)	20-30	13.33 (2)	6.67 (1)	0.413
	31-40	53.34 (8)	60 (9)	
	41-50	33.33 (5)	53.33 (5)	
Education level	Diploma	46.67 (7)	40 (6)	0.187
	Associate degree	13.33 (2)	6.67 (1)	
	Bachelor's degree	33.33 (5)	40 (6)	
	Higher than a bachelor's degree	6.67 (1)	13.33 (2)	

Table 3: Mean values of the study variables in control and experimental groups

Variable	Phase	ACT	Control	P (between-group)
		Mean±SD	Mean±SD	
Health-related locus of control	Pre-test	47.94±6.11	48.66±6.48	0.614
	Post-test	61.80±7.23	47.23±7.12	0.001
P (within group)		0.001	0.781	-
Emotion regulation	Pre-test	59.74±7.38	60.45±8.21	0.193
	Post-test	87.35±9.28	59.14±7.79	0.005
P (within group)		0.001	0.813	-

ACT: Acceptance and Commitment Therapy

ACT significantly influenced health-related locus of control and emotional regulation in women with BC. The mean values suggested that this intervention increased health-related locus of control and emotional regulation.

4. Discussion

A study was conducted to assess the effectiveness of ACT on health-related locus of control and emotion regulation in women diagnosed with BC. The results indicated that ACT positively impacted health-related locus of control, aligning with findings from previous studies (14, 15). There were no conflicting outcomes observed.

As a therapeutic approach, ACT utilizes acceptance, mindfulness skills, and cognitive defusion techniques to enhance psychological flexibility during interventions. This approach allows individuals to confront their experiences in the present moment and act according to their core values. Moreover, by fostering a connection with present-moment experiences, individuals are less likely to become preoccupied with concerns about the future. Consequently, this mindset empowers individuals to manage chronic conditions and disease effectively, thereby gaining control over their health (14). The increased acceptance among women with breast cancer motivates them to prioritize their well-being and engage in better self-care practices, including timely medication adherence, adherence to recommended dietary guidelines, and increased physical activity—all of which contribute to an improved health-related locus of control (15).

Another noteworthy finding from our study was the positive effect of ACT on emotion regulation, consistent with previous research (16, 17). No contradictory results were observed. ACT employs cognitive methods such as evaluation and familiarization with concepts like worry and hopelessness to enhance emotion regulation. Consequently, women with breast cancer who undergo ACT therapy gain a comprehensive awareness of their worries, hopelessness, and thoughts, subsequently taking action to address these concerns once they become aware of them. This process gradually diminishes their cognitive-emotional evaluations and enhances their emotion regulation skills (16).

Additionally, it is worth noting that ACT incorporates cognitive methods to address cognitive distortions, rumination, and body image-related beliefs. Through techniques like differentiating between the self, inner experiences, and behavior and familiarizing clients with cognitive inconsistencies, individuals learn to become less indifferent to themselves and their psychological and cognitive needs. By engaging in exposure to mental experiences and becoming acquainted with cognitive gaps, clients are trained to confront aspects of their lives, including their bodies, which they had previously disregarded. This newfound appreciation for themselves reduces stress, distress, suppression, and difficulty managing emotional arousal (24).

Furthermore, ACT therapy equips women with breast cancer with a sense of personal control, thereby reducing their stress levels. This phenomenon can be understood by considering the inherently stressful nature of a cancer diagnosis and treatment journey. As women progress through their treatment courses, they acquire strategies to increase their sense of personal control during the treatment process. Like individuals facing stress in other contexts, these women can mitigate the stress associated with their condition by exerting influence over their circumstances, ultimately enhancing their perception of health control. It is essential to note that ACT therapy does not seek to directly alleviate clients' distressing emotions or alter their troubling thoughts. Instead, the primary focus is on enhancing behavioral efficacy in the presence of unpleasant feelings and thoughts. ACT therapists do not attempt to diminish their clients' negative emotions or alter their disturbing thoughts. The fundamental premise of ACT is that a significant portion of psychological distress is an inherent aspect of the human experience. Therefore, the therapy enhances cognitive regulation and emotional management in women with BC.

4.1. Limitation

The research in question has several limitations that must be acknowledged. First and foremost, the study's scope was restricted to women diagnosed with breast cancer in Bandar Abbas city, Iran. Additionally, there was a notable absence of control over variables influencing health-related locus of control and emotion regulation. Moreover, a follow-up period was not incorporated into the

research design. Lastly, the study did not employ a random sampling method.

To enhance the applicability and generalizability of the findings, future investigations are proposed to expand their scope beyond Bandar Abbas City, Iran to encompass various provinces and regions. Furthermore, including a diverse patient population in future research is advisable. Incorporating more rigorous control measures is essential to address the variable control issue. The adoption of a random sampling method is strongly recommended, and the inclusion of a follow-up period should be considered.

5. Conclusion

This study has demonstrated that Acceptance and Commitment Therapy (ACT) significantly influences health-related locus of control and emotion regulation among women diagnosed with breast cancer. Consequently, they recommend the implementation of ACT as a practical approach for ameliorating psychological challenges faced by women coping with breast cancer. Counselors and therapists are encouraged to utilize ACT as a valuable tool for supporting and guiding this patient population.

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Ethical Approval

The Ethics Review Board of Islamic Azad University, Bandar Abbas Branch, Iran approved the present study with the code of IR.DUMS.REC.1400.004. Also, written informed consent was obtained from the participants.

Authors' Contribution

Mehrnaz Goodarzian: Substantial contributions to the conception and design of the study, data analysis, acquisition, and interpretation, drafting the work. Koorosh Mohammadi: Substantial contributions to the conception of the study, reviewing the work critically for important

intellectual content. Azita Amirfakhraei: Substantial contributions to the design of the work, drafting the work and reviewing it critically for important intellectual content. All authors have read and approved the final manuscript and agree to be accountable for all aspects of the work, such that the questions related to the accuracy or integrity of any part of the work.

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