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Comparison of the Effectiveness of Schema Therapy and Cognitive Behavioral Therapy on Treatment Adherence in Women with Breast Cancer

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ABSTRACT

The aim of the present study was to compare the effectiveness of schema therapy and cognitive behavioral therapy on treatment adherence in women with breast cancer. The research method was quasi-experimental with a pretest–posttest control group design and a two-month follow-up period. The statistical population consisted of all women with breast cancer who referred to the Comprehensive Cancer Center of Sari in 2025. A total of 24 participants were selected using purposive sampling and were randomly assigned to two experimental groups and one control group. The research instrument was the Treatment Adherence Questionnaire developed by Modanloo (2013). Cognitive behavioral therapy and schema therapy interventions were implemented in eight weekly 90-minute group sessions for the first and second experimental groups. The data were analyzed using mixed analysis of variance. The results of analysis of variance showed that there was a significant difference among the groups in treatment adherence at the posttest and follow-up stages ($p < 0.05$). The results also indicated that cognitive behavioral therapy was significantly more effective in improving treatment adherence among women with breast cancer, and a significant difference was observed between the two treatments ($p < 0.05$). It can therefore be concluded that there is a significant difference between schema therapy and cognitive behavioral therapy.

Keywords: Cognitive behavioral therapy, schema therapy, treatment adherence, breast cancer.

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Introduction

Breast cancer is one of the most prevalent chronic diseases and remains a major public health concern worldwide. According to the World Health Organization, breast cancer is among the leading causes of cancer-related mortality in women and constitutes a substantial proportion of diagnosed malignancies globally (1). The prevalence and incidence of breast cancer have increased considerably during recent decades due to demographic transitions, lifestyle changes, delayed childbearing, and improvements in diagnostic procedures (2). In addition to the physical burden of the disease, women with breast cancer frequently experience significant psychological distress, emotional instability, fear of recurrence, death anxiety, and difficulties in adapting to long-term treatment regimens (3, 4). The diagnosis of breast cancer often disrupts multiple dimensions of patients' lives, including interpersonal relationships, occupational functioning,

emotional regulation, and overall quality of life. Consequently, contemporary oncology increasingly emphasizes not only biomedical treatment but also psychological interventions that can improve adjustment, treatment adherence, and emotional well-being among patients with cancer (5, 6). Furthermore, recent investigations have demonstrated that cognitive and emotional disturbances among cancer survivors may negatively affect information processing, executive functioning, and decision-making abilities, thereby influencing the extent to which patients comply with medical recommendations and therapeutic protocols (7, 8). Therefore, understanding the psychological determinants of treatment adherence in women with breast cancer has become an important priority in psycho-oncology and behavioral medicine research.

Treatment adherence is one of the most critical predictors of successful disease management and recovery in chronic illnesses, particularly among individuals undergoing prolonged and demanding cancer treatments. Treatment adherence refers to the degree to which patients follow prescribed medical instructions, including medication use, dietary recommendations, physical activity guidelines, attendance at medical appointments, and engagement in self-care behaviors (9). Poor adherence to treatment regimens may lead to disease progression, increased healthcare costs, treatment failure, recurrence of symptoms, and elevated mortality rates (10). Women with breast cancer often encounter numerous barriers to treatment adherence, including fatigue, emotional distress, fear of side effects, hopelessness, stigma, and cognitive dysfunction (11, 12). Research has shown that fear of cancer recurrence and death anxiety can intensify avoidance behaviors and reduce patients' motivation to continue invasive therapeutic procedures such as chemotherapy and radiotherapy (3). In addition, maladaptive beliefs regarding illness, vulnerability, and personal helplessness may contribute to treatment noncompliance and emotional withdrawal (13). Contemporary health psychology models suggest that adherence behaviors are strongly influenced by cognitive, emotional, and behavioral factors that shape individuals' perceptions of illness and treatment effectiveness (14). Consequently, psychological interventions capable of modifying dysfunctional cognitions, improving coping strategies, and reducing emotional distress may significantly enhance adherence to treatment among patients with chronic diseases (15, 16).

One of the major psychological difficulties experienced by women with breast cancer is death anxiety. Death anxiety refers to persistent fear, worry, and emotional distress related to death and dying and is particularly prevalent among individuals diagnosed with life-threatening diseases (4). The confrontation with cancer diagnosis, uncertainty regarding prognosis, invasive medical procedures, and fear of recurrence often intensify existential concerns and psychological vulnerability among patients (17). Studies have demonstrated that elevated levels of death anxiety are associated with depression, sleep disturbances, emotional dysregulation, hopelessness, and lower quality of life in patients with chronic illnesses (18, 19). Moreover, death anxiety may increase experiential avoidance and maladaptive coping patterns, which in turn reduce treatment engagement and adaptive health behaviors (12). Researchers have therefore emphasized the importance of integrating psychotherapeutic interventions into oncology care in order to address emotional distress and facilitate psychological adaptation among patients with cancer (5). Several investigations have confirmed the effectiveness of cognitive and behavioral interventions in reducing death anxiety among patients with chronic diseases, including cancer, HIV/AIDS, epilepsy, and hemodialysis patients (20-22). These findings suggest that targeting maladaptive cognitions and emotional responses may

improve psychological resilience and encourage patients to adhere more consistently to treatment recommendations.

Cognitive behavioral therapy has been identified as one of the most effective and empirically supported psychotherapeutic approaches for the treatment of emotional and behavioral problems in both clinical and medical populations (23). This therapeutic approach is based on the assumption that maladaptive cognitions, dysfunctional beliefs, and ineffective coping behaviors contribute significantly to psychological distress and behavioral difficulties (24). Cognitive behavioral therapy aims to modify distorted patterns of thinking, increase emotional regulation, enhance coping skills, and improve behavioral functioning through structured and goal-oriented interventions (25). Techniques commonly used in cognitive behavioral therapy include cognitive restructuring, monitoring of automatic thoughts, relaxation training, exposure, behavioral activation, coping skills training, and problem-solving strategies (26). Previous studies have demonstrated the effectiveness of cognitive behavioral therapy in reducing anxiety, depression, experiential avoidance, and emotional distress across diverse populations (27, 28). In oncology settings, cognitive behavioral interventions have shown promising effects on fear of recurrence, treatment adherence, self-care engagement, resilience, and emotional adjustment among patients with cancer (29, 30). Similarly, Abbas et al. reported that brief cognitive behavioral therapy significantly improved treatment adherence and psychological functioning among patients with HIV/AIDS (31). Braunewell et al. also demonstrated that cognitive behavioral approaches can effectively improve self-care engagement and trauma-related symptoms among patients coping with chronic medical conditions (32). These findings indicate that cognitive behavioral therapy may represent an effective intervention for improving treatment adherence among women with breast cancer by reducing maladaptive cognitions and enhancing adaptive coping mechanisms.

Alongside cognitive behavioral therapy, schema therapy has emerged as an integrative and increasingly influential psychological intervention for individuals with chronic emotional and behavioral difficulties. Schema therapy was originally developed to address deep-rooted maladaptive schemas and dysfunctional emotional patterns formed during childhood and adolescence (33). Early maladaptive schemas are broad and pervasive cognitive-emotional structures that influence individuals' interpretations of experiences, interpersonal relationships, and coping responses throughout life (14). According to schema theory, when fundamental emotional needs are inadequately met during development, maladaptive schemas related to abandonment, vulnerability, mistrust, failure, or emotional deprivation may emerge and become activated during stressful situations (13). In patients with chronic illnesses such as cancer, these maladaptive schemas may intensify emotional suffering, fear of death, helplessness, and treatment avoidance behaviors (34). Schema therapy seeks to modify these dysfunctional schemas through cognitive, experiential, behavioral, and interpersonal techniques that strengthen the healthy adult mode and promote emotional healing (35). Research has demonstrated that schema-based interventions can reduce cognitive avoidance, emotional dysregulation, experiential avoidance, and maladaptive coping behaviors in clinical populations (36, 37). Moreover, schema therapy has shown effectiveness in improving treatment adherence and psychological functioning among patients with cardiovascular disease and chronic conditions (38, 39). Mirbagheri et al. also reported that group schema therapy significantly reduced death anxiety and emotional distress among women with breast cancer (34). These findings suggest that schema therapy may help women with breast

cancer improve emotional adjustment and adherence to treatment through modification of maladaptive cognitive-emotional structures.

Despite growing evidence supporting the effectiveness of cognitive behavioral therapy and schema therapy separately, limited research has directly compared these two interventions in women with breast cancer, particularly regarding treatment adherence. Most previous studies have focused on anxiety reduction, emotional regulation, or psychological adjustment rather than adherence-related outcomes (17, 40). Furthermore, although several investigations have explored the relationship between death anxiety, experiential avoidance, and maladaptive schemas among patients with chronic illnesses, comparatively little attention has been devoted to examining which psychotherapeutic approach may produce superior outcomes in adherence-related behaviors (41, 42). Existing findings also indicate that psychological flexibility, emotional expression, and adaptive coping play important roles in determining how patients respond to treatment-related stressors (27). Since cognitive behavioral therapy primarily targets distorted cognitions and behavioral patterns, whereas schema therapy addresses deeper personality structures and early maladaptive schemas, comparing these two interventions may provide valuable insights regarding the most effective psychological approach for women coping with breast cancer (33). Additionally, advances in psycho-oncology emphasize the need for evidence-based interventions that can be integrated into multidisciplinary cancer care programs in order to improve both psychological well-being and medical outcomes (5). The importance of rigorous methodological approaches in evaluating psychological interventions has also been emphasized in behavioral science research (43). Therefore, identifying effective therapeutic strategies for enhancing treatment adherence may contribute substantially to the development of more comprehensive and patient-centered oncology services.

Given the increasing prevalence of breast cancer, the psychological burden associated with chronic disease management, and the essential role of treatment adherence in improving health outcomes, there is a clear need for comparative investigations examining the effectiveness of major psychotherapeutic interventions in this population. Although previous studies have separately supported the effectiveness of cognitive behavioral therapy and schema therapy in reducing emotional distress and maladaptive psychological processes, the comparative effectiveness of these interventions on treatment adherence among women with breast cancer remains insufficiently explored (18, 20, 44). Moreover, emotional disturbances such as death anxiety, experiential avoidance, and hopelessness continue to represent major challenges in oncology settings and may interfere with patients' willingness to follow demanding medical treatments (4, 41). Therefore, the present study was conducted with the aim of comparing the effectiveness of schema therapy and cognitive behavioral therapy on treatment adherence in women with breast cancer.

Methods and Materials

Study Design and Participants

The present study employed a quasi-experimental method with a pretest–posttest control group design and a two-month follow-up period. The statistical population included all women diagnosed with breast cancer who referred to the Comprehensive Cancer Center of Sari in 2025. Considering the number of experimental groups and the variables under investigation, a total sample of 24 participants was selected using purposive sampling after conducting preliminary clinical interviews and evaluating the inclusion and

exclusion criteria. The participants were then randomly assigned into three groups, including a cognitive behavioral therapy experimental group (n = 8), a schema therapy experimental group (n = 8), and a control group (n = 8). The inclusion criteria consisted of having a confirmed diagnosis of breast cancer for at least one year, completion of chemotherapy treatment sessions, literacy in reading and writing, being between 20 and 50 years of age, absence of psychiatric medication use, absence of diagnosed psychiatric disorders based on self-report, no simultaneous participation in other psychotherapy programs, no psychiatric medication use during the month prior to the assessment process, and sufficient physical and psychological readiness to participate in the study and complete the questionnaires. The exclusion criteria included absence from more than two treatment sessions, unwillingness to continue participation in the study, concurrent participation in other counseling or psychotherapy interventions, and failure to complete the questionnaires during the pretest, posttest, and follow-up stages. Following the necessary administrative coordination with the Comprehensive Cancer Center of Sari, eligible participants were identified through interviews and subsequently assigned to the study groups. After the completion of the intervention sessions, all participants completed the research instruments during the posttest phase and again 60 days later during the follow-up stage. Ethical considerations were carefully observed throughout the study. Participants were fully informed about the objectives and procedures of the research before participation, confidentiality of personal information was guaranteed, and data were used solely for scientific purposes. Participants were informed that they could receive explanations regarding the results of the study if desired, and any ambiguity regarding the research procedure was clarified by the researcher. Participation imposed no financial burden on the participants, and the intervention procedures were implemented in a manner consistent with the cultural and religious values of the participants and the community.

Data Collection

Treatment adherence was assessed using the Treatment Adherence Questionnaire for Chronic Diseases developed and validated by Modanloo in 2013. This instrument was designed to evaluate the degree of adherence to therapeutic recommendations among individuals with chronic illnesses. The questionnaire consists of 40 items distributed across seven dimensions, including effort in treatment, willingness to participate in treatment, ability to adapt treatment to daily life, integration of treatment into life activities, persistence in treatment, commitment to treatment, and management of treatment implementation. Responses are scored on a six-point Likert scale ranging from “strongly agree” to “not at all,” with scores ranging from 5 to 0. Higher scores indicate greater treatment adherence. Previous psychometric evaluations demonstrated satisfactory reliability and validity for the instrument. Modanloo reported an internal consistency coefficient of 0.921 using Cronbach’s alpha and a test–retest reliability coefficient of 0.875 over a two-week interval. In addition, Seyedfatemi et al. reported a validity coefficient of 0.87 and a reliability coefficient of 0.84, indicating acceptable psychometric properties for use in clinical populations.

Intervention

The schema therapy intervention protocol used in this study was developed based on the schema therapy model proposed by Jeffrey Young and colleagues. The intervention was administered in eight sessions lasting approximately two hours each and conducted twice weekly. The initial sessions focused on establishing a

therapeutic alliance, introducing the principles and goals of schema therapy, and conceptualizing participants' psychological problems within the schema-based framework. Subsequent sessions addressed the identification of early maladaptive schemas, exploration of evidence supporting or contradicting schemas in past and present experiences, and education regarding schema domains and schema functions. Participants were also trained to recognize maladaptive coping styles and schema modes that contribute to the maintenance of dysfunctional schemas. Later sessions emphasized schema assessment and modification using experiential techniques such as guided imagery, confrontation with distressing situations, role-playing, and dialogue exercises between healthy and maladaptive schema modes. Behavioral change strategies, interpersonal relationship skills, and methods for overcoming barriers to adaptive behavior were also discussed. The final session focused on reviewing previously learned strategies, practicing therapeutic skills, and administering the posttest measures.

The cognitive behavioral therapy protocol consisted of eight therapeutic sessions lasting approximately two hours each. The intervention was based on the principles of cognitive behavioral therapy and focused on modifying maladaptive thoughts and behaviors associated with psychological distress in women with breast cancer. During the initial sessions, participants became familiar with the cognitive behavioral model and received psychoeducation regarding the relationship between thoughts, emotions, and behaviors. Problem conceptualization and emotional self-monitoring were introduced at the beginning of treatment. Subsequent sessions included relaxation training, deep breathing exercises, and daily practice assignments designed to reduce anxiety and physiological tension. Participants were also trained in monitoring automatic negative thoughts, identifying cognitive distortions, and challenging maladaptive beliefs through cognitive restructuring techniques. Additional sessions emphasized practicing adaptive coping strategies, improving emotional regulation, and strengthening cognitive flexibility. Time management skills and lifestyle modification strategies were also incorporated to improve daily functioning and psychological adjustment. The final session involved summarizing therapeutic concepts, reviewing learned skills, terminating the intervention process, and administering the posttest assessment.

Data Analysis

Data analysis was conducted using SPSS software version 26. Descriptive statistics, including means and standard deviations, were calculated to summarize the characteristics of the study variables across the pretest, posttest, and follow-up stages. To evaluate the effectiveness of schema therapy and cognitive behavioral therapy on treatment adherence among women with breast cancer, mixed analysis of variance with repeated measures was employed. This analytical method allowed the researchers to examine both within-group changes across time and between-group differences among the experimental and control groups. The significance level for all statistical analyses was considered at $p < .05$.

Findings and Results

The demographic findings showed that 24 participants were included in the study, including 8 participants in the schema therapy group, 8 participants in the cognitive behavioral therapy group, and 8 participants in the control group. The mean and standard deviation of age were 35.43 and 1.45 years for the schema therapy group, 35.63 and 1.02 years for the cognitive behavioral therapy group, and 35.47 and 0.94

years for the control group, respectively. The descriptive findings of the research variables are presented below. To describe the data, the mean was used as the index of central tendency and the standard deviation as the index of dispersion.

Table 1. Mean and Standard Deviation of the Treatment Adherence Variable at the Pretest, Posttest, and Follow-Up Stages

Variable	Group	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD	Follow-up Mean	Follow-up SD
Treatment adherence	Control	39.13	9.76	38.47	11.72	38.87	9.28
Treatment adherence	Schema therapy	40.40	10.21	67.33	10.80	67.13	11.70
Treatment adherence	Cognitive behavioral therapy	39.27	10.45	70.93	12.34	71.87	12.51

As shown in Table 1, treatment adherence is presented for the three groups of control, schema therapy, and cognitive behavioral therapy across the three measurement stages of pretest, posttest, and follow-up. As observed, in the control group, the mean total score of treatment adherence in the posttest and follow-up stages did not show a considerable change compared with the pretest stage. However, in the schema therapy and cognitive behavioral therapy groups, a considerable increase in treatment adherence was observed at the posttest and follow-up stages compared with the pretest stage. The significance of these changes was examined using mixed analysis of variance.

Before conducting the mixed analysis of variance, the Kolmogorov–Smirnov test was used to examine the normality of the distribution of treatment adherence scores across the three measurement stages ($p > 0.05$). Levene's test was used to examine the homogeneity of variances of treatment adherence at the three measurement stages: pretest ($F = 0.186$, $p = 0.20$), posttest ($F = 1.105$, $p = 0.123$), and follow-up ($F = 1.33$, $p = 0.263$). Box's M test was also used to examine the homogeneity of the variance–covariance matrix for treatment adherence (M Box = 29.73, $F = 1.04$, $p = 0.32$). The results of these tests were not significant. In addition, Mauchly's test was used to examine the assumption of sphericity, and the results showed that the sphericity assumption was not met for the treatment adherence variable. Therefore, the Greenhouse–Geisser method was used to interpret the results.

Table 2. Results of Mixed Analysis of Variance for Within-Group and Between-Group Effects

Variable	Factors	Source of change	Sum of squares	df	Mean square	F	Significance level	Effect size
Treatment adherence	Within-group	Time	292.98	1.33	220.53	0.46	0.56	0.01
Treatment adherence	Within-group	Time × Group	5812.20	2.66	2187.50	4.55	0.01	0.19
Treatment adherence	Within-group	Error	24283.19	50.48	481.02	-	-	-

Accordingly, the results of the mixed analysis of variance are presented in Table 2. According to the results, there was a significant difference between group and time in the treatment adherence variable, indicating that there were differences among the pretest, posttest, and follow-up stages between the two treatment groups and the control group in the dependent variable. In addition, based on the F values and significance levels for the group effect, there was a significant difference in treatment adherence among the

schema therapy group, the cognitive behavioral therapy group, and the control group. Pairwise comparisons of these groups at each stage were conducted using the Bonferroni test, and the results are presented in Table 3.

Table 3. Bonferroni Post Hoc Test Results for Pairwise Comparison of the Mean Scores of Treatment Adherence

Variable	Group I	Group J	Pretest Mean Difference	Pretest SE	Pretest p	Posttest Mean Difference	Posttest SE	Posttest p	Follow-up Mean Difference	Follow-up SE	Follow-up p
Treatment adherence	Schema therapy	Control	5.200	5.443	1.000	-38.067*	4.323	1.000	-38.733*	4.291	0.0001
Treatment adherence	Schema therapy	Cognitive behavioral therapy	3.400	5.443	1.000	21.133*	4.323	1.000	21.267*	4.291	0.0001
Treatment adherence	Cognitive behavioral therapy	Control	1.800	5.443	1.000	-59.200*	4.323	1.000	-60.000*	4.291	0.0001
Treatment adherence	Cognitive behavioral therapy	Schema therapy	3.400	5.443	1.000	21.133*	4.323	1.000	21.267*	4.291	0.0001

According to Table 3, there was a significant difference between the schema therapy and control groups in treatment adherence ($p < 0.05$), and also between the cognitive behavioral therapy and control groups in treatment adherence ($p < 0.05$). The results also showed a significant difference between schema therapy and cognitive behavioral therapy at the 0.05 significance level. According to Table 3, the mean difference between schema therapy and cognitive behavioral therapy for treatment adherence was positive and significant at the posttest and follow-up stages. Therefore, cognitive behavioral therapy was more effective than schema therapy in increasing treatment adherence ($p < 0.05$).

Discussion and Conclusion

The present study aimed to compare the effectiveness of schema therapy and cognitive behavioral therapy on treatment adherence in women with breast cancer. The findings demonstrated that both schema therapy and cognitive behavioral therapy significantly improved treatment adherence compared with the control group at the posttest and follow-up stages. However, cognitive behavioral therapy showed greater effectiveness than schema therapy in increasing treatment adherence among women with breast cancer. These findings indicate that structured psychological interventions can play a substantial role in improving adherence to medical recommendations and long-term treatment engagement among women facing chronic and emotionally demanding illnesses such as breast cancer. The persistence of treatment effects during the follow-up phase also suggests that both interventions were able to create relatively stable cognitive and behavioral changes in participants over time. These findings are particularly important because treatment adherence is one of the strongest predictors of successful disease management, symptom control, and survival among patients with cancer (1, 11). In addition, the findings support contemporary psycho-oncology perspectives emphasizing that emotional distress, maladaptive beliefs, and psychological vulnerability may

interfere with treatment engagement and adaptive health behaviors among women diagnosed with breast cancer (3, 5).

The significant effectiveness of cognitive behavioral therapy in improving treatment adherence can be explained through the theoretical foundations of this therapeutic approach. Cognitive behavioral therapy assumes that dysfunctional cognitions, catastrophic interpretations, and maladaptive coping strategies contribute to emotional distress and behavioral problems (24). Women with breast cancer frequently experience negative automatic thoughts related to hopelessness, fear of recurrence, treatment side effects, and mortality, which may reduce motivation to continue difficult treatment procedures (4). Through techniques such as cognitive restructuring, self-monitoring, relaxation training, and coping skills enhancement, cognitive behavioral therapy helps patients challenge distorted cognitions and replace them with more adaptive and realistic interpretations (25). As a result, patients may experience greater emotional control, improved self-efficacy, and stronger motivation to adhere to treatment recommendations. Furthermore, cognitive behavioral therapy emphasizes active problem-solving and behavioral activation, which can increase patients' engagement in self-care behaviors and medical treatment processes (26). Since women with breast cancer often experience emotional exhaustion and psychological helplessness during chemotherapy and prolonged treatment, structured cognitive and behavioral interventions may enhance their sense of control over illness-related challenges and reduce treatment-related avoidance behaviors (29).

The findings of the present study are consistent with previous investigations demonstrating the effectiveness of cognitive behavioral interventions in improving treatment adherence and psychological adjustment in patients with chronic diseases. Abbas et al. found that brief cognitive behavioral therapy significantly improved treatment adherence, social support, and psychological functioning among patients with HIV/AIDS (31). Similarly, Ghasemi et al. reported that both face-to-face and online cognitive behavioral therapy significantly improved treatment adherence among individuals with bulimia nervosa (15). Xiang et al., in a systematic review and meta-analysis, concluded that cognitive behavioral therapy effectively increased resilience among adult cancer patients and improved adaptive psychological functioning (30). Furthermore, Togluk and Budak demonstrated that cognitive behavioral therapy-based psychoeducation significantly reduced death anxiety and improved emotional management among individuals undergoing chemotherapy (29). Other studies have also shown that cognitive behavioral therapy effectively reduces emotional distress, experiential avoidance, loneliness, sleep disturbances, and anxiety among clinical populations (18, 27, 28). These findings collectively support the idea that cognitive behavioral therapy not only modifies maladaptive cognitive patterns but also enhances adaptive coping mechanisms that facilitate greater commitment to treatment and disease management.

Another explanation for the superior effectiveness of cognitive behavioral therapy may relate to the highly structured and skill-based nature of this intervention. Cognitive behavioral therapy provides patients with practical techniques for managing anxiety-provoking thoughts, emotional reactions, and treatment-related stressors in a relatively short period of time (23). Since patients with breast cancer often require immediate psychological support to cope with treatment burden and uncertainty, interventions emphasizing direct symptom management and behavioral change may produce faster and more observable improvements in adherence behaviors. The educational orientation of cognitive behavioral therapy may also increase patients' awareness regarding the importance of consistent treatment participation and self-care practices (25).

Moreover, by strengthening self-regulation skills and reducing emotional dysregulation, cognitive behavioral therapy may reduce avoidance of medical procedures and increase willingness to continue treatment despite physical discomfort and psychological distress. Studies on psychological interventions in oncology settings have similarly shown that structured and goal-oriented therapies are highly effective in promoting adaptive health behaviors and reducing treatment-related psychological burden (5, 6).

The present findings also demonstrated that schema therapy significantly improved treatment adherence compared with the control group, although its effectiveness was lower than that of cognitive behavioral therapy. This finding suggests that schema-focused interventions can positively influence adherence behaviors by targeting deeper emotional and cognitive structures associated with maladaptive coping patterns. Schema therapy is based on the assumption that early maladaptive schemas formed during childhood influence emotional responses, interpersonal functioning, and behavioral reactions throughout adulthood (33). Women with breast cancer may experience activation of schemas related to vulnerability, abandonment, dependence, or failure when confronted with a life-threatening illness, leading to emotional distress and treatment avoidance (13). Schema therapy attempts to identify and modify these maladaptive schemas while strengthening the healthy adult mode and promoting emotional healing (14). Through experiential techniques, emotional processing, and cognitive restructuring, schema therapy may help patients reduce maladaptive emotional reactions and improve their ability to cope with illness-related stressors (35).

The effectiveness of schema therapy observed in the present study is consistent with previous research findings. Mirbagheri et al. found that group schema therapy significantly reduced death anxiety and emotional distress among women with breast cancer (34). Ahmadzadeh Samani et al. also reported that schema therapy effectively reduced cognitive avoidance among female students with early maladaptive schemas (36). Likewise, Hokmabadi et al. demonstrated that schema therapy improved treatment adherence and reduced maladaptive personality symptoms among patients with coronary heart disease (38). Another study by Hokmabadi et al. showed that schema therapy techniques improved memory functioning, personality characteristics, and medication adherence in cardiac patients (39). Nazarandaz Korandeh et al. further indicated that schema therapy effectively reduced experiential avoidance among patients with dysthymia (37). These findings suggest that schema therapy can contribute to improvements in emotional regulation and adaptive coping by modifying long-standing maladaptive cognitive-emotional patterns that interfere with treatment adherence and psychological adjustment.

Despite the effectiveness of schema therapy, cognitive behavioral therapy demonstrated superior outcomes in the present study. One possible explanation for this finding is that schema therapy primarily focuses on deep-rooted personality structures and emotional experiences that may require longer treatment duration to achieve substantial behavioral changes (33). In contrast, cognitive behavioral therapy directly targets current dysfunctional thoughts and maladaptive behaviors that are immediately associated with treatment adherence. Since the participants in the present study received only eight therapeutic sessions, cognitive behavioral therapy may have produced more rapid and observable improvements in adherence behaviors due to its symptom-focused and structured nature. Furthermore, schema therapy often involves intensive emotional exploration and experiential work, which may initially increase emotional vulnerability before long-term adaptive changes become evident (14). Therefore, while schema therapy may produce

broader personality-level changes over extended treatment periods, cognitive behavioral therapy may be more efficient in short-term interventions aimed at improving treatment-related behaviors among patients coping with active medical conditions.

Another important aspect of the findings relates to the role of death anxiety and emotional distress in influencing treatment adherence among women with breast cancer. Several studies have shown that death anxiety is highly prevalent among cancer patients and significantly affects emotional adjustment, coping behaviors, and quality of life (4, 17). Fear of recurrence and mortality may intensify experiential avoidance and psychological helplessness, reducing willingness to continue invasive medical procedures (3). Cognitive behavioral therapy appears particularly effective in addressing these concerns because it teaches patients how to identify catastrophic thoughts, challenge irrational beliefs, and develop adaptive coping responses (41). Previous studies have confirmed the effectiveness of cognitive behavioral interventions in reducing death anxiety among patients with cancer, HIV/AIDS, epilepsy, and hemodialysis patients (19-22). Rezaei and Mousavi also reported that cognitive behavioral therapy effectively reduced death anxiety among women experiencing severe psychological distress (42). Therefore, reductions in death anxiety and emotional distress may partially explain the observed improvements in treatment adherence among participants receiving cognitive behavioral therapy.

The findings of the present study also support theoretical perspectives emphasizing the relationship between cognitive functioning, emotional processing, and health-related behaviors among patients with chronic diseases. Women with breast cancer frequently experience cognitive difficulties, emotional dysregulation, and impaired concentration due to both psychological distress and medical treatments (7). Cognitive behavioral interventions may enhance psychological flexibility and improve cognitive control by teaching patients adaptive methods for managing stress and emotional reactions (27). Furthermore, strengthening coping skills and emotional regulation may reduce treatment fatigue and increase patients' willingness to actively participate in treatment processes. Research has also shown that maladaptive schemas and experiential avoidance are closely related to emotional distress and behavioral dysfunction (13, 37). Consequently, interventions that target these psychological mechanisms may improve not only emotional well-being but also treatment adherence and long-term disease management outcomes.

The present study contributes to the growing literature on psycho-oncology by demonstrating the importance of psychological interventions in improving treatment adherence among women with breast cancer. The findings highlight the necessity of integrating structured psychotherapeutic approaches into oncology care programs in order to address emotional and cognitive barriers associated with chronic illness management. Given the increasing prevalence of breast cancer and the substantial psychological burden associated with diagnosis and treatment, psychological support services should be considered an essential component of comprehensive cancer care (1). Moreover, the findings indicate that interventions focusing on cognitive restructuring, emotional regulation, and maladaptive schemas may significantly improve patients' engagement with medical treatments and enhance overall psychological adjustment.

One limitation of the present study was the relatively small sample size and the use of purposive sampling among women with breast cancer from a single treatment center in Sari, which may limit the generalizability of the findings to broader populations. Another limitation was the reliance on self-report questionnaires that may have been influenced by social desirability bias or participants' emotional states during data collection.

Additionally, the study did not control for certain potentially influential variables, such as cancer stage, family support, socioeconomic status, and individual personality characteristics, which may affect treatment adherence and psychological adjustment.

Future research is recommended to investigate the long-term effectiveness of cognitive behavioral therapy and schema therapy using larger and more diverse samples from different cultural and clinical settings. Researchers are also encouraged to examine the mediating role of variables such as psychological flexibility, resilience, emotional regulation, social support, and self-efficacy in explaining treatment adherence among women with breast cancer. Comparative studies involving other psychological interventions, including acceptance and commitment therapy, mindfulness-based therapies, and meaning-centered psychotherapy, may also provide valuable insights into the most effective approaches for improving psychological functioning and adherence behaviors in oncology populations.

From a practical perspective, the findings of the present study suggest that psychological interventions, particularly cognitive behavioral therapy, should be integrated into routine oncology and cancer rehabilitation services. Psychologists, counselors, nurses, and healthcare professionals working with women diagnosed with breast cancer can use cognitive behavioral strategies to reduce emotional distress, improve coping skills, and strengthen adherence to medical recommendations. Providing psychoeducational and supportive intervention programs in hospitals and cancer treatment centers may enhance patients' emotional adjustment and encourage greater participation in long-term treatment plans. Additionally, training healthcare providers to identify psychological barriers to adherence may improve multidisciplinary cancer care and contribute to better treatment outcomes and quality of life for women with breast cancer.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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