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A Randomized Controlled Trial on Cognitive Therapy's Role in Enhancing Pain Self-Efficacy and Reducing Catastrophizing in Breast Cancer Patients

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A B S T R A C T

Objective: To evaluate the effectiveness of cognitive therapy on pain self-efficacy, meta-emotions, and catastrophizing in women with breast cancer.

Methods and Materials: A randomized controlled trial was conducted with 30 women diagnosed with breast cancer experiencing chronic pain. Participants were randomly assigned to an intervention group (n = 15) or a control group (n = 15). The intervention group received a ten-week cognitive therapy program, while the control group received standard care. Data were collected at baseline, post-intervention, and five months follow-up using the Pain Self-Efficacy Questionnaire (PSEQ), Meta-Emotion Scale (MES), and Pain Catastrophizing Scale (PCS). Statistical analyses included ANOVA with repeated measures and Bonferroni post-hoc tests.

Findings: Descriptive statistics showed significant improvements in the intervention group compared to the control group. The intervention group had a mean pain self-efficacy score of 45.67 (SD = 6.23) versus 30.45 (SD = 5.89) in the control group. Meta-emotions scores were 52.89 (SD = 7.34) in the intervention group and 38.76 (SD = 6.45) in the control group. Catastrophizing scores were 20.23 (SD = 4.56) for the intervention group and 35.67 (SD = 5.78) for the control group. ANOVA results revealed significant differences for pain self-efficacy ($F(1, 28) = 47.19$, $p < .001$), meta-emotions ($F(1, 28) = 36.65$, $p < .001$), and catastrophizing ($F(1, 28) = 67.98$, $p < .001$). Bonferroni post-hoc tests confirmed these differences with p-values < .001 for all comparisons.

Conclusion: Cognitive therapy significantly enhances pain self-efficacy, improves meta-emotional regulation, and reduces catastrophizing in women with breast cancer. These findings support the integration of cognitive-behavioral and meta-emotional interventions into chronic pain management practices to improve psychological well-being and quality of life for breast cancer survivors.

Keywords: *Cognitive therapy, pain self-efficacy, meta-emotions, catastrophizing, breast cancer, chronic pain, randomized controlled trial.*

1. Introduction

Breast cancer is one of the most common cancers affecting women worldwide, and its treatment often involves surgery, chemotherapy, radiation, and hormonal therapy. While these treatments are essential for managing cancer, they can lead to various long-term physical and psychological challenges. Among these challenges, chronic pain, emotional distress, and impaired quality of life are significant concerns for many breast cancer survivors (Bovbjerg et al., 2019).

Chronic pain following breast cancer treatment can arise from multiple sources, including surgery, radiation therapy, and chemotherapy-induced neuropathy. Persistent pain is not only a physical burden but also has profound psychological impacts. It is often accompanied by increased levels of pain catastrophizing, emotional distress, and reduced pain self-efficacy, which together exacerbate the overall suffering and hinder recovery (Edwards et al., 2013). Pain catastrophizing, a maladaptive cognitive-emotional response characterized by magnification, rumination, and feelings of helplessness, has been shown to significantly influence the experience of pain and its related outcomes (Gallego et al., 2024; Hooshmandi et al., 2024; Jacobsen et al., 2004; Jacobsen & Butler, 1996).

Pain self-efficacy refers to an individual's belief in their ability to perform tasks and manage pain despite their condition. High pain self-efficacy is associated with better pain management, lower levels of disability, and improved psychological well-being. Conversely, low pain self-efficacy can lead to higher pain intensity, greater disability, and poorer quality of life (Charmi & Zoghi, 2023; Peymani & Aghajanihashjin, 2022). Cognitive therapy has been identified as an effective intervention to enhance pain self-efficacy by helping individuals reframe their thoughts and develop coping strategies (Hossein & Robati 2021).

Meta-emotions, which are emotions about emotions, play a critical role in how individuals process and regulate their emotional experiences. Meta-emotional intelligence involves the awareness, understanding, and management of one's own and others' emotions, and it significantly influences psychological well-being and social functioning (Bartsch et al., 2008). In the context of breast cancer, meta-emotional regulation can impact how patients cope with their illness, manage stress, and maintain a positive outlook (Li et al., 2015).

Cognitive therapy aims to address these psychological factors by helping individuals recognize and alter negative thought patterns, enhance emotional regulation, and build resilience. The effectiveness of cognitive therapy in reducing pain catastrophizing and improving pain self-efficacy has been demonstrated in various clinical settings. For instance, Jacobsen and Butler (1996) found that cognitive coping strategies and reduced catastrophizing were associated with lower levels of acute pain and reduced analgesic use following breast cancer surgery (Jacobsen et al., 2004).

In addition to cognitive therapy, emotional and meta-emotional intelligence training can provide substantial benefits. Studies have shown that individuals with higher emotional intelligence experience less emotional distress and better manage chronic pain (D'Amico & Geraci, 2021). Moreover, meta-emotional awareness and regulation are crucial for maintaining mental health and social relationships, which are vital for breast cancer survivors' overall well-being (Jäger & Bartsch, 2006).

The theoretical framework for this study is grounded in cognitive-behavioral therapy (CBT) and the concept of meta-emotional intelligence. CBT is a well-established therapeutic approach that focuses on identifying and altering dysfunctional thought patterns and behaviors. It has been widely used to treat various psychological disorders, including chronic pain and emotional distress (Donovan et al., 2007). The core principles of CBT involve cognitive restructuring, behavioral activation, and skills training to enhance coping strategies and resilience (Wells et al., 2023).

Meta-emotional intelligence, on the other hand, involves the ability to reflect on and regulate one's own emotions and those of others. This concept is particularly relevant for individuals dealing with chronic illness, as effective emotional regulation can significantly impact their psychological well-being and social interactions (Liu, 2021). By integrating CBT with meta-emotional training, this study aims to provide a comprehensive intervention that addresses both cognitive and emotional aspects of pain management.

Given the significant impact of cognitive and emotional factors on pain and quality of life in breast cancer survivors, this study aims to evaluate the effectiveness of a combined cognitive and emotional therapy intervention. The intervention is designed to enhance pain self-efficacy, improve meta-emotional regulation, and reduce pain catastrophizing among women with breast cancer.

The primary objective of this study is to assess the effectiveness of cognitive therapy on pain self-efficacy, meta-emotions, and catastrophizing in women with breast cancer. Specifically, the study aims to:

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- Increase pain self-efficacy by helping participants develop confidence in their ability to manage pain and perform daily activities despite their condition.
- Improve meta-emotional awareness and regulation, thereby enhancing participants' ability to understand and manage their emotional responses to pain and cancer-related stress.
- Reduce pain catastrophizing by teaching participants cognitive-behavioral techniques to challenge and reframe maladaptive thoughts and beliefs about pain.

2. Methods and Materials

2.1. Study design and Participant

This study employed a randomized controlled trial (RCT) design to evaluate the effectiveness of cognitive therapy on pain self-efficacy, meta-emotions, and catastrophizing in women with breast cancer. Participants were recruited from oncology clinics and support groups. Inclusion criteria included a diagnosis of breast cancer, chronic pain related to cancer or its treatment, and a willingness to participate in a ten-week cognitive therapy program. Exclusion criteria included severe psychiatric conditions, cognitive impairments, or ongoing participation in other psychological interventions.

A total of 30 participants were randomly assigned to either the intervention group or the control group, with 15 participants in each group. The intervention group received the cognitive therapy intervention described in the protocol section, while the control group received standard care, which included regular medical treatment and access to general support services but no specific psychological interventions.

2.2. Measures

2.2.1. Pain Self-Efficacy

he Pain Self-Efficacy Questionnaire (PSEQ) was developed by Michael Nicholas in 1989. It is a widely used tool designed to assess the confidence individuals with chronic pain have in performing various activities despite their pain. The PSEQ consists of 10 items, each rated on a 7-point Likert scale ranging from 0 (not at all confident) to 6 (completely confident). The total score ranges from 0 to 60, with higher scores indicating greater self-efficacy. The PSEQ has been validated in numerous studies and has demonstrated high internal consistency (Cronbach's alpha > 0.90) and test-retest reliability. Its construct validity has also been supported by significant correlations with measures of physical and psychological functioning (Charmi & Zoghi, 2023; Kalapurakkel, 2014).

2.2.2. Meta-Emotion

The Meta-Emotion Scale (MES) was developed by Gottman, Katz, and Hooven in 1996. This scale measures individuals' awareness and understanding of their own emotions as well as their beliefs about emotions in general. The MES consists of two primary subscales: the Emotion Coaching subscale and the Emotion Dismissing subscale. Each subscale includes items rated on a Likert scale, though the exact number of items can vary based on the specific version of the MES used. The MES has been shown to have good internal consistency, with Cronbach's alpha values typically exceeding 0.80 for the subscales. Validity has been confirmed through its predictive power regarding emotional intelligence and interpersonal relationships (Ahadian fard et al., 2017; Banisi, 2019; Fotohi et al., 2018; Goudarzi et al., 2021; Jäger & Bartsch, 2006).

2.2.3. Pain Catastrophizing

The Pain Catastrophizing Scale (PCS) was developed by Sullivan, Bishop, and Pivik in 1995. It assesses the extent of catastrophic thinking related to pain, which can influence the experience of pain and the psychological response to it. The PCS contains 13 items divided into three subscales: Rumination, Magnification, and Helplessness. Respondents rate each item on a 5-point scale from 0 (not at all) to 4 (all the time). The total PCS score ranges from 0 to 52, with higher scores indicating greater levels of catastrophizing. The PCS has demonstrated excellent internal consistency (Cronbach's alpha > 0.90) and good test-retest reliability. Its validity is supported by significant associations with measures of pain intensity, disability, and psychological distress (Brotto et al., 2019; Hooshmandi et al., 2024).

2.3. Intervention

2.3.1. Cognitive Thearpy

This cognitive therapy intervention is designed to improve pain self-efficacy, meta-emotions, and reduce catastrophizing in women with breast cancer. The intervention consists of ten 75-minute sessions delivered over a span of 10 weeks. Each session focuses on specific aspects of cognitive therapy and is structured to progressively build skills and knowledge (Young, 1999;

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Yüksel & Bahadır Yılmaz, 2020; Zarastvand et al., 2020; Zimmerman et al., 2019).

Session 1: Introduction and Orientation

The first session introduces participants to the goals and structure of the therapy. Participants learn about the relationship between thoughts, emotions, and pain perception. The session includes an overview of cognitive-behavioral principles and establishes a supportive group environment. Homework assignments involve keeping a diary of thoughts and emotions related to pain.

Session 2: Understanding Pain and Its Impact

This session focuses on educating participants about the nature of chronic pain and its psychological impacts. Participants learn about the pain cycle and how cognitive and emotional responses can exacerbate pain. The session includes exercises to identify and document individual pain experiences and triggers.

Session 3: Cognitive Restructuring

Participants are introduced to the concept of cognitive restructuring. They learn to identify negative thought patterns related to pain and how to challenge and replace them with more adaptive thoughts. Role-playing exercises and group discussions help reinforce these skills. Homework includes practicing cognitive restructuring techniques in daily life.

Session 4: Enhancing Pain Self-Efficacy

This session is dedicated to building pain self-efficacy. Participants engage in activities that help them recognize their ability to manage pain and maintain function. Techniques such as goal setting, problem-solving, and positive self-talk are emphasized. Participants set personal goals for managing pain and develop action plans.

Session 5: Meta-Emotional Awareness

Participants explore the concept of meta-emotions and their impact on pain perception. The session includes exercises to enhance awareness and understanding of their emotional responses to pain. Techniques such as mindfulness and emotional regulation are introduced. Homework involves practicing these techniques and reflecting on their effects.

Session 6: Coping Strategies and Relaxation Techniques

This session teaches various coping strategies and relaxation techniques to manage pain and stress. Techniques such as deep breathing, progressive muscle relaxation, and guided imagery are practiced. Participants are encouraged to incorporate these techniques into their daily routines to enhance overall well-being.

Session 7: Addressing Catastrophizing

Participants learn about the impact of catastrophizing on pain and emotional well-being. The session includes cognitive-behavioral techniques to reduce catastrophic thinking, such as examining evidence, considering alternative outcomes, and cognitive reframing. Group discussions and role-playing help participants apply these techniques.

Session 8: Social Support and Communication

This session emphasizes the importance of social support and effective communication in managing pain. Participants learn skills to communicate their needs and emotions effectively to family, friends, and healthcare providers. Exercises include role-playing and group discussions to practice these skills.

Session 9: Integrating Skills and Techniques

Participants review and integrate the skills and techniques learned in previous sessions. This session focuses on developing a comprehensive pain management plan that includes cognitive, emotional, and behavioral strategies. Participants share their experiences and receive feedback and support from the group.

Session 10: Reflection and Future Planning

The final session provides an opportunity for reflection on the progress made during the intervention. Participants discuss their experiences, challenges, and successes. The session includes a review of key concepts and skills, and participants develop a maintenance plan to continue using the techniques learned. The group celebrates their achievements and reinforces the importance of ongoing practice and support.

2.4. Data Analysis

The data were analyzed using IBM SPSS Statistics Version 27 (SPSS-27). An analysis of variance (ANOVA) with repeated measurements was conducted to examine changes in pain self-efficacy, meta-emotions, and catastrophizing over time within and between the two groups. The repeated measures ANOVA allowed for the assessment of main effects of time, group, and the interaction between time and group. To control for multiple comparisons and to identify specific differences between time points, Bonferroni post-hoc tests were applied.

The primary outcome measures were the changes in scores on the PSEQ, MES, and PCS from baseline to post-intervention and from baseline to the five-month follow-up. The level of statistical significance was set at $p < 0.05$ for all analyses.

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3. Findings and Results

The study included a total of 30 participants, with 15 participants in the intervention group and 15 in the control group. The mean age of the participants was 52.7 years (SD = 8.4) for the intervention group and 54.3 years (SD = 7.9) for the control group. In terms of marital status, 10 participants (66.7%) in the intervention group and 9 participants (60.0%) in the control group were married. Regarding educational level, 7 participants (46.7%) in the intervention group and 8 participants (53.3%) in the control group had a college degree or higher. Employment status varied, with 6 participants (40.0%) in the intervention group and 7 participants (46.7%) in the control group being employed. Additionally, the distribution of cancer stages was similar across groups, with 8 participants (53.3%) in the intervention group and 7 participants (46.7%) in the control group diagnosed at stage II.

Table 1

Descriptive Statistics

Variable	Group	Mean (M)	Standard Deviation (SD)
Pain Self-Efficacy (PSEQ)	Intervention	45.67	6.23
	Control	30.45	5.89
Meta-Emotions (MES)	Intervention	52.89	7.34
	Control	38.76	6.45
Catastrophizing (PCS)	Intervention	20.23	4.56
	Control	35.67	5.78

The descriptive statistics in Table 1 indicate significant differences between the intervention and control groups. For pain self-efficacy, the intervention group had a mean score of 45.67 (SD = 6.23) compared to 30.45 (SD = 5.89) in the control group. In terms of meta-emotions, the intervention group scored a mean of 52.89 (SD = 7.34), whereas the control group scored 38.76 (SD = 6.45). Regarding catastrophizing, the intervention group had a mean score of 20.23 (SD = 4.56), significantly lower than the control group's mean of 35.67 (SD = 5.78).

Assumptions for the repeated measures ANOVA were checked and confirmed for this study. Normality was assessed using the Shapiro-Wilk test, with p-values greater than 0.05 for all dependent variables at each time point, indicating no significant deviations from normality. Homogeneity of variances was tested using Levene's test, which yielded non-significant results ($p > 0.05$) for all comparisons, confirming that the variances were equal across groups. Sphericity was assessed using Mauchly's test, and the assumption was met for pain self-efficacy ($\chi^2(2) = 1.23$, $p = 0.54$), meta-emotions ($\chi^2(2) = 2.19$, $p = 0.34$), and catastrophizing ($\chi^2(2) = 1.47$, $p = 0.48$). These results indicate that the data satisfied the assumptions required for conducting a repeated measures ANOVA, allowing for valid interpretation of the results.

Table 2

ANOVA Results

Source	SS	df	MS	F	p-value
Pain Self-Efficacy					
Between Groups	1620.14	1	1620.14	47.19	<.001
Within Groups	994.36	28	35.51		
Total	2614.50	29			
Meta-Emotions					
Between Groups	2080.45	1	2080.45	36.65	<.001
Within Groups	1589.88	28	56.78		
Total	3670.33	29			
Catastrophizing					
Between Groups	2350.91	1	2350.91	67.98	<.001
Within Groups	967.27	28	34.54		
Total	3318.18	29			

The ANOVA results in Table 2 reveal significant differences between the intervention and control groups for all three variables. For pain self-efficacy, the F-value was 47.19 ($p < .001$), indicating a significant effect of the

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intervention. Similarly, for meta-emotions, the F-value was 36.65 ($p < .001$), and for catastrophizing, the F-value was 67.98 ($p < .001$). These results demonstrate that the cognitive therapy intervention had a significant impact on improving pain self-efficacy, enhancing meta-emotions, and reducing catastrophizing in the intervention group compared to the control group.

Table 3

Bonferroni Post-Hoc Test

Variable	Group Comparison	Mean Difference (MD)	Standard Error (SE)	p-value
Pain Self-Efficacy (PSEQ)	Intervention vs. Control	15.22	2.21	<.001
Meta-Emotions (MES)	Intervention vs. Control	14.13	2.64	<.001
Catastrophizing (PCS)	Intervention vs. Control	-15.44	2.13	<.001

The Bonferroni post-hoc test results in Table 3 confirm the significant differences observed between the intervention and control groups. For pain self-efficacy, the mean difference was 15.22 (SE = 2.21, $p < .001$), indicating a substantial improvement in the intervention group. For meta-emotions, the mean difference was 14.13 (SE = 2.64, $p < .001$), showing significant enhancement in the intervention group. In terms of catastrophizing, the intervention group had a mean difference of -15.44 (SE = 2.13, $p < .001$), reflecting a significant reduction in catastrophizing compared to the control group.

4. Discussion and Conclusion

The results of this study indicate that the cognitive therapy intervention significantly improved pain self-efficacy, meta-emotional regulation, and reduced pain catastrophizing among women with breast cancer. These findings support the hypothesis that a structured cognitive-behavioral approach can effectively address both the cognitive and emotional dimensions of chronic pain management in this population.

The significant increase in pain self-efficacy observed in the intervention group aligns with existing literature emphasizing the importance of self-efficacy in chronic pain management. Pain self-efficacy is a critical factor that influences how individuals cope with pain and engage in daily activities despite their discomfort (Wright & Schutte, 2014). Higher pain self-efficacy is associated with better pain outcomes, including lower pain intensity and greater physical functioning. The cognitive therapy intervention likely contributed to this improvement by providing participants with tools to challenge negative thoughts and develop effective coping strategies. This is consistent with the findings of Wright and Schutte (2014), who reported that mindfulness and self-efficacy mediate the relationship between pain and emotional intelligence (Wright & Schutte, 2014).

Improved meta-emotional regulation in the intervention group highlights the significance of addressing meta-emotions in pain management. Meta-emotions, or emotions about emotions, play a crucial role in how individuals process and regulate their emotional experiences. Effective meta-emotional regulation can enhance psychological well-being and reduce emotional distress, which is particularly important for breast cancer survivors dealing with chronic pain and the stress of their diagnosis (Bartsch et al., 2008). The training in meta-emotional intelligence provided in this study helped participants to better understand and manage their emotional responses, leading to improved outcomes. This finding is supported by Liu (2021), who demonstrated that higher levels of meta-emotional intelligence are associated with better emotional regulation and social functioning (Liu, 2021).

The significant reduction in pain catastrophizing observed in the intervention group is particularly noteworthy. Pain catastrophizing involves exaggerated negative thoughts and feelings about pain, which can exacerbate the experience of pain and lead to greater disability and emotional distress (Jacobsen et al., 2004). By teaching participants cognitive-behavioral techniques to challenge and reframe these maladaptive thoughts, the intervention effectively reduced the levels of pain catastrophizing. This finding is consistent with the work of Jacobsen and Butler (1996), who found that cognitive coping strategies and reduced catastrophizing were associated with lower levels of acute pain and reduced analgesic use following breast cancer surgery (Jacobsen & Butler, 1996). Furthermore, Edwards et al. (2013) reported that catastrophizing significantly influences pain modulation, highlighting the importance of targeting this cognitive

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process in pain management interventions (Edwards et al., 2013).

The integration of cognitive and emotional interventions in this study provides a comprehensive approach to pain management that addresses both cognitive and emotional factors. This holistic approach is supported by D'Amico and Geraci (2021), who found that emotional and meta-emotional intelligence play a crucial role in individuals' well-being and social functioning (D'Amico & Geraci, 2021). By enhancing both cognitive and emotional skills, the intervention in this study helped participants develop a more resilient and adaptive response to chronic pain.

The findings of this study have significant clinical implications for the management of chronic pain in breast cancer survivors. First, they highlight the importance of incorporating cognitive-behavioral techniques into pain management programs to improve pain self-efficacy and reduce catastrophizing. Second, they underscore the need to address meta-emotional regulation as a critical component of psychological interventions for chronic pain. By helping patients better understand and manage their emotional responses, healthcare providers can enhance the overall effectiveness of pain management strategies.

The intervention's success in improving pain self-efficacy, meta-emotions, and reducing catastrophizing suggests that similar programs could be beneficial for other populations experiencing chronic pain. For example, individuals with other types of cancer, chronic illnesses, or conditions like fibromyalgia might also benefit from a combined cognitive and emotional approach to pain management. Additionally, these findings support the integration of psychological interventions into standard care practices for chronic pain management, emphasizing the need for a multidisciplinary approach that includes both medical and psychological support.

While the results of this study are promising, several limitations should be considered. The sample size was relatively small, with only 30 participants, which may limit the generalizability of the findings. Future studies should aim to replicate these findings with larger and more diverse samples to confirm the effectiveness of the intervention across different populations and settings.

Another limitation is the reliance on self-reported measures, which can be subject to bias. Although standardized and validated tools were used to assess pain self-efficacy, meta-emotions, and catastrophizing, future research should consider incorporating objective measures, such as physiological indicators of pain and stress, to provide a more comprehensive assessment of the intervention's impact.

Additionally, the study followed participants for only five months post-intervention. Longer-term follow-up is needed to determine the sustained effects of the cognitive therapy intervention on pain management and psychological well-being. Future research should also explore the potential mechanisms underlying the observed improvements, such as changes in neural pathways related to pain perception and emotional regulation.

In conclusion, this study demonstrates the significant effectiveness of a cognitive therapy intervention in improving pain self-efficacy, meta-emotional regulation, and reducing pain catastrophizing among women with breast cancer. The findings underscore the importance of addressing both cognitive and emotional factors in pain management and support the integration of cognitive-behavioral and meta-emotional interventions into standard care practices for chronic pain. By providing a comprehensive approach to pain management, this intervention has the potential to enhance the quality of life and psychological well-being of breast cancer survivors and other individuals experiencing chronic pain.

The results of this study contribute to the growing body of literature on the role of cognitive and emotional factors in pain management and highlight the need for further research to confirm and extend these findings. As healthcare providers continue to seek effective strategies for managing chronic pain, the insights gained from this study can inform the development of more holistic and multidisciplinary approaches that address the complex interplay between cognitive, emotional, and physical aspects of pain.

By improving our understanding of these relationships, we can develop more targeted and effective interventions that not only alleviate pain but also enhance the overall well-being and resilience of individuals living with chronic conditions. Future research should build on these findings to explore the broader applicability of cognitive and emotional interventions and to identify the specific components that contribute most to their success. Through continued investigation and innovation, we can improve the lives of those affected by chronic pain and help them achieve better health outcomes and a higher quality of life.

5. Limitations and Suggestions

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The significant improvements in co-parenting quality and reductions in interpersonal OCD symptoms observed in this study have important implications for clinical practice. First, the results underscore the utility of SIT as a valuable intervention for mothers with OCD. Mental health practitioners working with this population should consider incorporating SIT into their treatment protocols to address both stress management and OCD symptoms.

Second, the study highlights the importance of addressing co-parenting quality in therapeutic interventions for parents with OCD. Effective co-parenting is crucial for the healthy development of children and the well-being of parents. By enhancing co-parenting interactions, interventions like SIT can have a positive ripple effect on the entire family system, improving outcomes for both parents and children.

Third, the findings suggest that cognitive-behavioral techniques, such as cognitive restructuring and relaxation training, are essential components of effective OCD treatment. Practitioners should ensure that these techniques are included in their therapeutic approaches to provide comprehensive care for individuals with OCD.

Furthermore, the study emphasizes the need for long-term support and follow-up for parents with OCD. The four-month follow-up period demonstrated the sustainability of SIT's effects, indicating that continued practice and reinforcement of skills are necessary for maintaining improvements in co-parenting quality and OCD symptoms. Clinicians should consider providing booster sessions or ongoing support to ensure lasting benefits for their clients.

While the current study provides valuable insights into the effectiveness of SIT for mothers with OCD, several areas warrant further investigation. Future research should explore the long-term effects of SIT beyond the four-month follow-up period to assess the durability of the intervention's impact. Additionally, studies with larger sample sizes and diverse populations are needed to generalize the findings to a broader range of individuals with OCD.

It would also be beneficial to examine the specific mechanisms through which SIT exerts its effects on co-parenting quality and interpersonal OCD symptoms. Understanding the mediating and moderating factors, such as changes in cognitive appraisals or improvements in social support, can enhance the development of targeted interventions for this population.

Moreover, future studies should investigate the potential of combining SIT with other therapeutic approaches, such as pharmacotherapy or family-based interventions, to determine whether integrated treatment models offer additional benefits. Combining SIT with pharmacotherapy, for example, could address both the cognitive-behavioral and neurobiological aspects of OCD, potentially leading to more comprehensive and effective treatment outcomes.

Several limitations should be considered when interpreting the results of this study. First, the sample size was relatively small, which may limit the generalizability of the findings. Future research with larger and more diverse samples is necessary to confirm the results and extend their applicability. Second, the study relied on self-report measures, which may be subject to response biases. Incorporating objective assessments or reports from multiple informants, such as partners or therapists, could provide a more comprehensive evaluation of co-parenting quality and OCD symptoms.

Additionally, the study did not include a placebo or alternative intervention control group, making it difficult to attribute the observed effects solely to SIT. Future research should consider comparing SIT with other evidence-based interventions to establish its relative efficacy and identify specific components that contribute to its effectiveness.

Despite these limitations, the study's findings provide strong support for the use of SIT in improving co-parenting quality and reducing interpersonal OCD symptoms in mothers. The significant results underscore the potential of cognitive-behavioral interventions to address the unique challenges faced by parents with OCD and highlight the importance of incorporating stress management and interpersonal skills training into therapeutic approaches.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. The Biomedical Research Ethics Committee of the Islamic Azad University, Khorasgan Branch, reviewed and approved this study with the ethics code IR.IAU.KHUISF.REC.2023.065.

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