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Effectiveness of Emotional Schema Therapy on Anxiety Symptoms, Emotion Regulation, and Marital Satisfaction in Women with Anxiety Disorders: A Preliminary Study

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Abstract

Anxiety disorders are common psychiatric conditions, and the lack of timely interventions in married adults can adversely affect marital satisfaction. This study aimed to investigate the effectiveness of emotional schema therapy on anxiety symptoms, emotion regulation strategies, and marital satisfaction in women with anxiety disorders. A single-case experimental A-B-A design was used, with a sample of ten women diagnosed with at least one anxiety disorder who also reported marital dissatisfaction. Emotional schema therapy was administered in 12 weekly 90-min individual sessions, with evaluations conducted in three phases: a multiple baseline, during therapy (sessions 1, 4, 8, and 12), and 2-month follow-up. Visual graph analysis was used to interpret the data, alongside the improvement rate, reliable change index (RCI), and Cohen's *d*. The findings demonstrated that emotional schema therapy effectively mitigates anxiety symptoms, adjusts emotion regulation strategies, and enhances marital satisfaction in women with anxiety disorders. These results support the efficacy of emotional schema therapy and contribute to the growing body of literature suggesting this treatment is beneficial for managing anxiety symptoms, emotion regulation, and marital satisfaction in women with anxiety disorders.

Keywords Anxiety disorders · Emotional schema therapy · Emotion regulation · Marital satisfaction · Married women

Highlights

- Emotional schema therapy significantly affects emotional schemas in women with anxiety disorders.
- Emotional schema therapy significantly mitigated anxiety indicators.
- Emotional schema therapy significantly increased the marital satisfaction.
- This therapy had a statistically significant effect on emotion regulation.
- This therapy had a statistically significant effect on anxiety sensitivity.

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Introduction

Anxiety disorders are among the most prevalent psychiatric disorders in the general population, specifically affecting individuals' personal, social, and interpersonal functions as well as quality of life (American Psychiatric Association, 2022). The 12-month prevalence of anxiety disorders is 21.3 in the USA (Kessler et al., 2012) and 31.8 in Iran in the general population, with a prevalence of 19.4 in women (Hajebi et al., 2018). Due to the chronic nature, high prevalence, relapse and recurrence (Revicki et al., 2012), and the high comorbidity of these disorders with other psychiatric disorders (Kessler et al., 2012), they have been proposed as one of the most debilitating psychiatric disorders in adults and are the focus of many pharmacological and psychological interventions (Bandelow et al., 2017; Beheshti et al., 2018; Carl et al., 2020).

For bio-psycho-social reasons and a complex constellation of factors, including a higher likelihood of violence, experiencing childhood maltreatment, and revictimization, as well as societal vulnerabilities, women suffer from anxiety disorders twice as often as men (Jalnapurkar et al., 2018; Heshmati et al., 2022; McLeon et al., 2011; Zemestani et al., 2021). Women with anxiety disorders are more likely than their male counterparts to report psychiatric comorbidity, feelings of shame or guilt, difficulties regulating emotions, interpersonal problems with their partner, and marital dissatisfaction (Dubé et al., 2019; Kasalova et al., 2017; Pankiewicz et al., 2012).

The development of pathological symptoms of anxiety and mood disorders associated with stressful life events and the subsequent inability of couples to effectively deal with these problems gradually diminish their relationship satisfaction and could eventually lead to breakup and separation (Bodenmann, 2007; Randall et al., 2017; Zemestani & Mozaffari, 2020). Moreover, due to their neuroticism nature, anxiety disorders markedly reduce a person's resilience in tolerating their spouse's opposing opinion, which is a negative prognosis for marital satisfaction (Davila et al., 2003; Zemestani, et al., 2022). These effects seem to be mutual, as research evidence shows that much like other psychological disorders, these disorders may occur or persist as a result of marital conflicts (Machell et al., 2016; McLeod, 1994; Zaider et al., 2010), and their consequences are more destructive for married women than for married men (Pall, 2017; Rao, 2017).

The high correlation of some anxiety disorders, especially generalized anxiety disorder, panic disorder, and social anxiety disorder, with lower levels of marital satisfaction indicates the destructive effects of these disorders on marital relations and satisfaction (Durães et al., 2020; Halford, 2003; Pankiewicz et al., 2012). Married women with social anxiety disorder experience problems in their intimate relationships due to their fear of criticism and rejection by their husbands, also exerting a negative impact on their marital satisfaction and the course of the disorder (Porter et al., 2019). Based on another explanation, women with agoraphobia often have less ability to solve interpersonal problems due to their negative excitability and higher behavioral inhibition; as a result, they often complain more about the quality of their relationship with their spouse (Marcaurelle et al., 2005).

Moreover, there is substantial evidence of the fundamental role of emotion regulation in the incidence and persistence of anxiety disorders in married women (Manikandan et al., 2016; Marques, 2018; Nielsen et al., 2017). Emotion regulation also plays an important role in interpersonal functions (Zaki & Williams, 2013). Similarly, in research on 77 couples aged 30 to 86 years, the results reported moderate to high correlations between positive emotion regulation strategies and marital satisfaction (Mazzuca et al., 2019). Based on research findings, therapies focused on emotion regulation, especially in married women with marital dissatisfaction, are a more effective indicator in predicting increased marital satisfaction in the long term, as women are more capable of managing their negative emotions than men (Bloch et al., 2014; Nolen-Hoeksema, et al., 2012; Zemestani & Fazeli Nikoo, 2020). For example, in a research on the role of emotion regulation in married women with generalized anxiety disorder, the results demonstrated a significant reduction in the worry and anxiety symptoms of the experimental group (O'Toole et al., 2019).

Among the empirically sound emotion-focused psychotherapies for adults is emotional schema therapy (Leahy, 2002). Emotional schemas are a person's individualized and core beliefs about emotions and emotional processes (Leahy, 2002, 2022). The emotional schema model (Leahy, 2002) is a social-cognitive model of how individuals perceive, interpret, evaluate, and respond to their emotions and emotions of others. This model proposes that people differ in their theories about emotion and emotion regulation and that these psychological theories give rise to maladaptive strategies for coping with emotions, such as avoidance, suppression, rumination, and self or other blaming. These individuals also score higher on the emotional schemas scale associated with negative beliefs about emotions related to anxiety and worry (Leahy, 2016). According to emotional schema therapy, people differ from each other in their beliefs about emotions in 14 dimensions, including validation, expression, duration, need for control, emphasis on rationality, comprehensibility, consensus with others, guilt, simplistic view of emotion, numbness, acceptance, relation to higher values, blame, and rumination (Leahy, 2018, 2019; Leahy et al., 2011; Hassas et al., 2023). This model's emphasis on emotions and the content of these dimensions of emotional schemas put emotional experiences at the center of psychological treatment (Leahy, 2019).

The emotional schema therapy is a process-based treatment that focuses on the content of thoughts about emotional schemas. This therapy is influenced by Beck's cognitive therapy, Young's schema therapy, Wells' metacognitive therapy, and acceptance-based approaches (Leahy, 2015). The emotional schema therapy provides an integrated and comprehensive model of emotion regulation with a combination of different third-wave psychotherapeutic techniques including identifying and correcting misconceptions about emotions, emotional validation, emotional processing, self-compassion, and mindfulness- and acceptance-based skills. This treatment is helpful in expressing and processing emotions and reducing the difficulties in regulating emotions (Leahy, 2002, 2018, 2022). This therapy is centered on the emotional experience and its misinterpretation, and to exert its effectiveness, it emphasizes validation and normalization (the fact that emotions will not last long, are not dangerous, one will not be ashamed of experiencing them, and will be under one's control), creating, expanding, and differentiating emotions; linking them to

other meanings; and correcting the beliefs about increasing the acceptance of mixed emotions; in this respect, this model is unique among the third-wave psychotherapies (Leahy, 2019).

Findings have shown that emotional schemas are related to various psychological disorders and symptoms. These schemas are a very effective indicator in explaining generalized anxiety disorder (Boogar et al., 2013), social anxiety (Tashkeh & Bazani, 2015) and panic disorder (Oguz et al., 2019). The emotional schema therapy has effectively treated generalized anxiety disorder (Khaleghi et al., 2017; Rezaee et al., 2017), social anxiety) Morvaridi et al., 2019), obsessive–compulsive disorder (Ghovati et al., 2021), post-traumatic stress disorder (Daneshmandi et al., 2014; Naderi et al., 2015), bipolar disorder (Hassas et al., 2023), suicide and self-harm behavior (Khaleghi et al., 2021), migraine headaches in women (Shahsavani et al., 2020), and self-mutilation and parasuicidal behavior in military soldiers (Shahtoori et al., 2020).

Maladaptive emotional schemas are inherently interpersonal and often emerge within intimate relational contexts. Addressing these schemas in relational problems allows for a systematic understanding of the emotional, cognitive, and behavioral dynamics in couples' relationships (Eken, 2017; Mehrpouya, Jajarmi, & Mousavi, 2022). Research indicates a significant positive relationship between maladaptive emotional schemas and couples' intimacy and marital satisfaction (Eftekhari et al., 2018; Greeff et al., 2001). Studies suggest that individuals with fewer maladaptive emotional schemas engage in more adaptive behaviors in their marital relationships, leading to greater marital satisfaction (Afshari et al., 2015). Since maladaptive emotional schemas are key contributors to marital dissatisfaction (Karami, 2017), emotional schema therapy may help mitigate their detrimental effects, reduce marital conflicts, and enhance marital satisfaction (Hatami & Fadayi, 2015). Recent research efforts have focused on the role of maladaptive emotional schemas in interpersonal relationships, showing that emotional schema therapy has positive applications in addressing relationship issues (Asgari & Goudarzi, 2019; Hayes & Parsonnet, 2016; Hedayatimoghadam & Bakhshipour, 2022; Masumi Tabar et al., 2021).

This study was conducted in response to the negative effects of anxiety disorders on marital satisfaction and quality of life, the strong correlation between emotional schemas and symptoms of anxiety disorders, and the lack of a study to directly examine the effectiveness of emotional schema therapy in women with anxiety disorders. The present study seeks to examine whether this therapy can reduce anxiety symptoms, improve emotion regulation strategies, and increase marital satisfaction in women with anxiety disorders.

Method

Participants

The statistical population of the study comprised all married women aged 18 to 45 years who visited private psychological clinics in Mashhad, Iran, during 2020–2021. Considering the higher mental health literacy among younger adults

(Farrer et al., 2008; Klinger et al., 2023) and the higher rates of mental health treatment seeking in this age group compared to older adults (Conner et al., 2010; Mitchell et al., 2017), the age range of the study sample was restricted to 18–45 years. The inclusion criteria were as follows: female sex, age between 18 and 45 years, diagnosis of an anxiety disorder according to DSM-5 criteria, and no ongoing psychological or pharmacological treatments. Exclusion criteria included comorbidity with other mental disorders, presence of psychotic symptoms (hallucinations or delusions), physical illness, and mental disability. Semi-structured clinical interviews were conducted by a trained clinical psychologist with volunteers who expressed interest in participating in the study. Based on scores from research instruments, thirty-four women were identified with symptoms of anxiety disorder and marital dissatisfaction. Due to COVID-19 restrictions, ten eligible patients were conveniently selected and allocated to the baseline assessment phase.

Procedure

This study employed a single-case experimental A-B-A design, with findings reported using the single-case reporting guidelines in behavioral interventions (SCRIBE; Tate et al., 2016). The study consisted of three phases: a multiple baseline phase, a treatment phase, and a 2-month follow-up phase. To control for time-related effects and potential external confounds, participants were assigned to the multiple baseline assessment phase, which included a waiting period with three groups: four patients with two baselines, four patients with four baselines, and two patients with six baselines. No treatment was provided during this baseline period. Following the baseline phase, participants received 12 weekly 90-min individual sessions of emotional schema therapy, with assessments conducted at the beginning, during, and end of therapy (sessions 1, 4, 8, and 12). A 2-month follow-up phase was then conducted to evaluate the maintenance of treatment gains. Throughout all stages—multiple baseline phase, treatment phase (sessions 1, 4, 8, and 12), and the 2-month follow-up phase—research instruments were administered to measure the effects of the therapy. The study was approved by the University of Kurdistan ethical review board which followed the ethical standards outlined in the Declaration of Helsinki. Informed consent was obtained from all individual participants included in the study.

Treatment

In emotional schema therapy, to examine and alter each of the 14 emotional schemas, we utilized specific interventions, skills, and questions. For example, we put approval on the agenda as the first examination. After collecting the patients' data, we followed four stages of re-summing-up, empathizing, establishing trust, and exploration. We used the Sherlock Holmes approach—that is, we paid attention to the patient's appearance to discover her emotional experiences. To investigate and interpret the meaning of invalidation, we used the profit and loss technique, confirming and refuting evidence, double standards, and recommendations to a friend.

Finally, we employed the scary fantasy technique for self-validation, in which we acted and told the patient in an unrealistic way that self-compassion could cause trouble. In examining duration, we posed the following key questions to the patients: Have you experienced intense emotions? Do you hope that this emotion changes? What are the costs and benefits of having these emotional beliefs? Do your emotions last for days and weeks? What should happen in order for your current emotion to change? In examining comprehensibility, we asked relevant questions and then examined the automatic and fundamental thoughts about it. In the dimension of shame and guilt, we normalized emotions, and in the dimension of acceptance, we employed metacognitive techniques, e.g., removal from consciousness and meditation. In the dimension of a simplistic view of emotion, we examined the pros and cons of not tolerating ambivalence for the patients and their cognitive distortions. In the dimension of values, we utilized negative visualization, negative metaphors, and positive metaphors; this is over, revealing values, climbing up the value ladder, a month of gratitude, and becoming the person you admire. In examining the other schemas, we used skills and techniques similar to the ones mentioned, depending on the schema. Please see Appendix 1 in Table 3 for a summary of emotional schema therapy content.

Measures

Leahy's Emotional Schema Scale (LESS)

This scale was designed to evaluate people's strategies against emotions and emotional schemas (Leahy, 2002). The LESS is a 50-item self-report questionnaire that comprises two dimensions for the assessment of adaptive emotional schemas (7 dimensions including validation, comprehensibility, values, control, consensus, acceptance, expression) and maladaptive emotional schemas (7 dimensions including guilt, simplistic view of emotion, numbness, rationality, duration, rumination, blame). Each item is scored on a 6-point Likert scale from 1 (*very untrue of me)* to 6 (*very true of me)*. Due to the presence of sub-dimensions measuring functional and non-functional attitudes, the total score of the scale cannot be calculated, and two dimensions of adaptive and maladaptive emotional schemas are evaluated separately (Leahy, 2002). In the current study, we used only maladaptive emotional schema dimensions with higher scores indicative of higher maladaptive emotional schemas and improvement in therapy demonstrating a reduction in scores. In the original version of the LESS, Cronbach's alpha was 0.80 for 1286 participants (Leahy, 2002). The reliability of the Persian version of the LESS in 2 weeks for a full scale is reported to be 0.78 and for subscales ranging from 0.56 to 0.71 (Khanzadeh et al., 2013).

Anxiety Sensitivity Index-Revised (ASI-R)

This scale was developed by Floyd et al. (2005) as a self-report questionnaire with 16 items scored on a 5-point Likert scale (0, *very little*, to 4, *very much*). The scores

range from 0 to 64, and the index has a high internal consistency (Cronbach's alpha (0.80–0.90). Its test–retest validity was 0.75 after 2 weeks and 0.71 for 3 years (Reiss et al., 1986). The Persian version of the ASI-R was used in the current study with internal consistency, test–retest reliability, and split-half reliability of scale being reported as 93%, 95%, and 97%, respectively (Mooradi Manesh, Mir Jafari, Goodarzi & Mohammadi, 2007).

Emotion Regulation Questionnaire (ERQ)

This 10-item self-report questionnaire comprises two subscales for two different mechanisms of emotion regulation: reappraisal (6 items) and suppression (4 items) (Gross, 2002). These items are scored on a 7-point Likert scale from *strongly agree* to *strongly disagree*. Cronbach's alpha is 0.79 for reappraisal and 0.73 for suppression, and the test–retest reliability for the entire scale is 0.69. In the Iranian version, validity has been examined through principal component analysis with Varimax rotation; the correlation between the two subscales was 0.13, and the criterion validity was reported to be optimal (Mashhadi et al., 2013).

The ENRICH Marital Satisfaction (EMS)

This scale was used to assess marital satisfaction. It is a 75-item and a five-degree responding scale (to not at all = 1, very much = 5). This questionnaire is a *T*-score scale where the average is 50, and the standard deviation is 10. A score less than 30 indicates severe dissatisfaction, scores between 30 and 40 indicate dissatisfaction, scores between 40 and 60 indicate rather satisfaction, scores between 60 and 70 indicate high satisfaction, and scores above 70 indicate great satisfaction from marital relationships (Fowers & Olson, 1989).

Beck Anxiety Inventory (BAI)

The development of a 21-item self-report inventory for measuring the severity of anxiety in psychiatric populations is described. The BAI is a 21-item scale that showed high internal consistency ($a = 0.92$) and test–retest reliability over 1 week ($r = 0.75$). The BAI discriminated anxious diagnostic groups (panic disorder, generalized anxiety disorder, etc.) from nonanxious diagnostic groups (major depression, dysthymic disorder, etc.) (Beck et al., 1988). The psychometric properties of the Iranian version were reported with a validity of 0.72, reliability of 0.83, and internal consistency (Cronbach's alpha) of 0.92, which are considered favorable (Kaviani & Moosavi, 2008).

Positive Affect Negative Affect Scale (PANAS)

This scale has 20 items and was developed to measure positive–negative mood dimensions. Each item is scored on a 5-point scale. Cronbach's alpha of the positive affect and negative affect subscales has been reported as 0.86–0.90 and 0.87–0.84, respectively, and the retest reliability at different times within 8 weeks has been

0.47–0.68 and 0.39–0.71 for positive and negative affect, respectively (Watson et al., 1988). The Persian version of the PANAS was used in the current study with Cronbach's alphas of the positive and negative affect scales of 0.81 and 0.80 respectively (Joshanloo & Bakhshi, 2016).

Speilberger's State-Trait Anxiety Inventory (STAI)

The Spielberger State-Trait Anxiety Inventory (STAI) (Spielberger, 1983) is a 40-item self-report measure of anxiety using a 4-point Likert-type scale (from 0 to 3 points) for each item. It has two subscales: state anxiety, i.e. how one feels at the moment, and trait anxiety, i.e., how one generally feels. Both subscales consist of 20 items. The state subscale has 10 reverse-scored items, and the trait subscale has 7 items. The inventory has been shown to have excellent psychometric properties (Barnes et al., 2002).

Data Analysis

The data were analyzed using visual graph analysis and the improvement rate, reliable change index (RCI), and Cohen's *d*. The data are analyzed separately for each participant and each variable. Cohen's *d* effect size estimates were used to quantify the magnitude of changes. By convention, values >0.80 indicate large, 0.50 medium, and <0.20 small effect sizes (Cohen, 1992). The data were analyzed in Microsoft Excel 2019.

Results

The study sample included ten married women with a mean age of 39 years ($SD=13.61$). The frequency of anxiety disorders in the sample was as follows: four cases with generalized anxiety disorder, three cases with social anxiety disorder, two cases with specific phobia, and one case with panic disorder, based on the preliminary diagnoses. Some of these participants had one or more comorbid anxiety disorders as well. Four participants were on optimal and stable doses of psychotropic medications (SSRIs and SNRIs) and monitored by psychiatrists.

The scores of ten subjects are presented as RCI in Table 1 separately for each variable. Based on Table 1, each subject scored 4 points on RCI (baseline–pre-intervention, pre-intervention–post-intervention, post-intervention–follow-up, and pre-intervention–follow-up) for each variable. Examining the results from the pre-intervention phase (baseline 3) to the post-intervention phase (session 12 of therapy) shows that the therapeutic intervention led to a significant decrease in anxiety symptoms except in the following cases: patient 9 in state anxiety, patient 4 in trait anxiety, patient 1 on Beck's Anxiety Inventory. Thus, the intervention was effective for most of the subjects. In assessing the effectiveness of the therapy on reducing anxiety sensitivity, among the ten patients, anxiety sensitivity decreased significantly in six. As for positive affect, among the ten patients, the score significantly increased in

Table 1 Improvement rate reliable change index (RCI)

		State anxiety	Trait anxiety	Positive affect	Negative affect	Marital satisfaction	Emotional schemas	Suppression	Reappraisal	Beck's Anxiety Inventory	Anxiety sensitivity
	Standard error of difference	3.61	3.50	3.26	2.58	3.01	4.19	2.37	3.52	2.50	3.44
Patient 1	Baseline–pre-intervention	-	−1.24	−0.50	−0.95	−0.44	−1.68	−1.47	1.47	−1.47	1.89
	Pre-intervention–post-intervention	2.60*	3.50*	−2.77*	3.16*	−2.47*	2.52*	2.94*	−4.41*	1.47	1.57
	Post-intervention–follow-up	0.29	-	-	−0.95	-	−0.67	−2.94*	1.47	−0.74	−0.94
	Pre-intervention–follow-up	2.89*	3.50*	−2.77*	2.21*	−2.47*	1.84	-	−2.94*	0.74	0.63
Patient 2	Baseline–pre-intervention	−1.45	-	−0.63	1.63	−0.54	0.92	2.44*	1.91	-	2.27*
	Pre-intervention–post-intervention	3.53*	3.83*	−3.14*	-	−2.68*	1.93	1.53	−2.76*	2.33*	2.27*
	Post-intervention–follow-up	−0.41	−2.03*	1.57	−1.63	2.68*	0.83	0.61	−1.70	0.47	−0.45
	Pre-intervention–follow-up	3.12*	1.80	−1.57	−1.63	-	2.75*	2.14*	−4.47*	2.79*	1.82

Table 1 (continued)

		State anxiety	Trait anxiety	Positive affect	Negative affect	Marital satisfaction	Emotional schemas	Suppression	Reappraisal	Beck's Anxiety Inventory	Anxiety sensitivity
Patient 3	Baseline–pre-intervention	−2.60*	−3.50*	−2.07*	0.84	0.59	−2.35*	−1.23	0.19	−0.56	1.46
	Pre-intervention–post-intervention	4.33*	2.96*	−1.55	2.11*	−3.52*	4.15*	2.87*	−2.68*	2.23*	2.08*
	Post-intervention–follow-up	−3.46*	0.54	-	0.42	1.47	−1.81	−0.82	0.38	-	0.42
	Pre-intervention–follow-up	0.87*	3.50*	−1.55	2.53*	−2.05*	2.35*	2.05*	−2.30*	2.23*	2.50*
Patient 4	Baseline–pre-intervention	0.62	2.01*	−1.46	0.97	2.36*	1.59	-	−3.13*	2.34*	1.42
	Pre-intervention–post-intervention	2.79*	1.76	−2.93*	2.43*	−4.73*	2.78*	3.71*	−1.39	2.34*	1.42
	Post-intervention–follow-up	0.31	0.50	0.29	0.49	1.42	0.20	-	−0.34	0.47	−0.85
	Pre-intervention–follow-up	3.10*	2.26*	−2.63*	2.92*	−3.31*	2.97*	3.71*	−1.74	2.81*	0.57

Table 1 (continued)

		State anxiety	Trait anxiety	Positive affect	Negative affect	Marital satisfaction	Emotional schemas	Suppression	Reappraisal	Beck's Anxiety Inventory	Anxiety sensitivity
Patient 5	Baseline–pre-intervention	1.28	0.60	−2.61*	2.79*	0.36	−2.34*	−1.71	0.48	−1.78	−1.02
	Pre-intervention–post-intervention	2.09*	3.29*	-	-	−4.00*	3.21*	2.56*	−2.90*	3.56*	−0.68
	Post-intervention–follow-up	0.48	−2.10*	−0.43	0.56	2.91*	0.15	0.43	-	0.59	1.02
	Pre-intervention–follow-up	2.57*	1.20	−0.43	0.56	−1.09	3.36*	2.99*	−2.90*	4.15*	0.34
Patient 6	Baseline–pre-intervention	−0.27	1.46	−1.48	−0.45	0.29	0.64	-	0.85	−0.99	−1.55
	Pre-intervention–post-intervention	2.70*	2.37*	−1.90	2.68*	−3.15*	3.19*	−1.43*	−2.85*	2.47*	2.79*
	Post-intervention–follow-up	0.81	−0.36	−0.42	-	3.44*	−0.64	1.43	−0.28	0.49	0.93
	Pre-intervention–follow-up	3.51*	2.00*	−2.32*	2.68*	0.29	2.55*	-	−3.14*	2.97*	3.72*

Table 1 (continued)

		State anxiety	Trait anxiety	Positive affect	Negative affect	Marital satisfaction	Emotional schemas	Suppression	Reappraisal	Beck's Anxiety Inventory	Anxiety sensitivity
Patient 7	Baseline–pre-intervention	−3.03*	0.92	0.76	−2.01*	−1.08	−1.07	−0.96	−2.83*	−1.39	−0.66
	Pre-intervention–post-intervention	2.01*	2.14*	−3.80*	3.01*	−2.52*	−2.15*	3.84*	-	4.17*	2.97*
	Post-intervention–follow-up	1.00	0.61	1.14	-	0.36	−0.64	−0.48	3.15*	−2.32	0.33
	Pre-intervention–follow-up	3.03*	2.75*	−2.66*	3.01*	−2.16*	−2.79*	3.36*	3.15*	1.85	3.30*
Patient 8	Baseline–pre-intervention	−1.81	1.49	3.76*	−0.64	−0.21	−0.30	−1.34	-	−1.69	−0.29
	Pre-intervention–post-intervention	3.82*	2.39*	−2.63*	2.54*	−3.21*	2.71*	3.14*	−2.74*	3.38*	2.95*
	Post-intervention–follow-up	−0.40	-	−1.50	−3.18*	0.85	0.75	-	-	−3.94*	-
	Pre-intervention–follow-up	3.42*	2.39*	−4.13*	−0.64	−2.35*	3.46*	3.14*	−2.74*	−0.56	2.95*

Table 1 (continued)

		State anxiety	Trait anxiety	Positive affect	Negative affect	Marital satisfaction	Emotional schemas	Suppression	Reappraisal	Beck's Anxiety Inventory	Anxiety sensitivity
Patient 9	Baseline–pre-intervention	−1.37	0.87	4.84*	-	2.46*	−0.72	−0.33	−	−1.99*	−0.16
	Pre-intervention–post-intervention	−1.83	3.49*	−2.42*	3.66*	1.23	3.01*	−3.27*	−3.60*	4.65*	3.00*
	Post-intervention–follow-up	-	−1.74	−0.69	−	−2.46*	0.43	0.65	−0.36	−2.66*	0.16
	Pre-intervention–follow-up	−1.83	1.74	−3.11*	3.66*	−1.23	3.44*	−2.62*	−3.96*	1.99*	3.16*
Patient 10	Baseline–pre-intervention	0.35	0.43	4.39*	-	−2.51*	−0.30	-	0.46	-	−3.27*
	Pre-intervention–post-intervention	3.82*	2.99*	−4.39*	3.37*	5.27*	4.82*	−5.00*	−4.58*	4.02*	1.46
	Post-intervention–follow-up	−1.39	0.43	0.40	1.12	−1.76	−1.66	5.00*	4.58*	−4.83*	0.73
	Pre-intervention–follow-up	2.43*	3.42*	−4.00*	4.50*	3.52*	3.17*	-	-	−0.80	2.18*

Table 2 Mean, standard deviation, Cohen's *d* effect sizes for primary and secondary outcomes

Scale	Baseline	Pre-intervention	Post-intervention	Follow-up	Baseline to pre-intervention	Pre to post-intervention	Post-intervention follow-up	Pre-intervention follow-up
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	*Cohen's d* [95% CI]	*Cohen's d* [95% CI]	*Cohen's d* [95% CI]	*Cohen's d* [95% CI]
State anxiety	48.7 (7.2)	51.7 (4.4)	40.7 (5.4)	42.0 (7.6)	−0.48 [−1.37, 0.41]	1.48 [0.62, 1.94]	−0.19 [−1.13, 0.76]	1.11 [0.49, 1.67]
Trait anxiety	50.8 (7.0)	49.8 (6.2)	39.2 (4.6)	40.7 (5.2)	0.14 [−0.73, 1.02]	1.46 [0.63, 1.91]	−0.29 [−1.17, 0.59]	1.22 [0.52, 1.72]
Positive affect	27.8 (8.4)	27.1 (4.8)	35.2 (4.3)	35.1 (4.0)	0.10 [−0.78, 0.97]	−1.20 [−1.72, −0.68]	0.02 [−0.85, 0.90]	−1.22 [−1.75, −0.69]
Negative affect	19.0 (3.4)	18.8 (3.9)	13.7 (2.3)	13.9 (3.1)	0.05 [−0.82, 0.93]	1.11 [0.52, 1.61]	−0.07 [−0.95, 0.81]	1.03 [0.36, 1.50]
Marital satisfaction	37.9 (7.6)	38.8 (8.2)	46.5 (6.5)	43.2 (7.1)	0.11 [−0.99, 0.77]	0.99 [−1.92, −0.06]	0.46 [−0.43, 1.35]	0.55 [−1.44, 0.34]
Emotional schemas	74.5 (18.6)	77.5 (17.0)	59.4 (15.2)	60.8 (17.3)	−0.16 [−1.04, 0.72]	1.07 [0.13, 2.01]	−0.08 [−0.96, 0.79]	0.93 [0.01, 1.85]
Suppression	17.8 (4.3)	18.7 (2.7)	15.4 (5.0)	15.3 (4.8)	−0.24 [−1.12, 0.64]	0.79 [−0.12, 1.70]	0.02 [−0.86, 0.90]	0.83 [−0.09, 1.74]

Table 2 (continued)

Scale	Baseline	Pre-intervention	Post-intervention	Follow-up	Baseline to pre-intervention	Pre to post-intervention	Post-intervention follow-up	Pre-intervention follow-up
Reappraisal	21.3 (2.4)	21.0 (5.2)	30.8 (2.4)	29.2 (5.7)	0.07 [−0.81, 0.95]	−1.40 [−2.13, −0.97]	0.35 [−0.54, 1.23]	−1.12 [−2.00, −0.44]
Beck's Anxiety Inventory	19.2 (3.3)	20.4 (3.3)	15.0 (2.8)	16.9 (5.1)	−0.35 [−1.23, 0.54]	1.27 [0.65, 1.99]	−0.44 [−1.33, 0.45]	0.78 [−0.13, 1.69]
Anxiety sensitivity	33.8 (7.4)	33.6 (4.9)	26.2 (4.9)	25.7 (5.6)	0.03 [−0.85, 0.91]	1.33 [0.44, 2.11]	0.09 [−0.79, 0.97]	1.32 [0.44, 2.10]

all the patients except for patients 3 and 6, whose scores increased non-significantly, and patient 5, who scored 0 (neither improved nor deteriorated). As for negative affect, the scores of all the patients decreased significantly except for patients 2 and 5, who had an RCI of 0 (neither improved nor deteriorated). Therefore, the results suggest that emotional schema therapy has effectively increased positive affect and decreased negative affect. As for suppression, out of the ten patients, the scores decreased significantly in all, except for patient 2 (who showed a non-significant reduction), patient 6 (non-significant increase), and patients 9 and 10 (significant increase, contrary to our expectations of the therapy). Therefore, emotional schema therapy successfully reduced the suppression scores in the majority of the participants. As for reappraisal, out of the ten patients, the intervention demonstrated significant effectiveness for all patients, except for patients 4 (non-significant increase) and 7 (with an RCI of 0, i.e., neither improved nor deteriorated). Thus, emotional schema therapy increased the scores significantly. As for positive and negative emotional schemas, out of ten patients, the intervention effectively reduced negative and increased positive emotional schemas, except for patients 2 (non-significant reduction) and 7 (significant increase). As for marital satisfaction, the intervention was significantly effective for all patients except for patient 9. In all these cases, emotional schema therapy was significantly effective in reducing or increasing the variables of interest. The absolute value of RCI was greater than the value of 1.96; therefore, it can be argued with 95% confidence that the changes observed were not due to chance or accidental, and the intervention has in fact led to these significant decreases or increases.

Based on Table 2 for Cohen's *d*, since this value was obtained from the mean and standard deviation of the samples, it cannot be presented individually for each participant like RCI; rather, it presents an overall value for each subscale. By convention, values > 0.80 indicate large, 0.50 medium, and < 0.20 small effect sizes (Cohen, 1992). Accordingly, a large effect size was estimated for anxiety symptoms, negative affect, and negative emotional schemas, and a medium effect size was obtained for suppression.

Discussion

The aim of this study was to examine the effects of emotional schema therapy on anxiety symptoms, emotion regulation strategies, and marital satisfaction in women with anxiety disorders. The findings at the group level revealed that emotional schema therapy had a statistically significant effect on anxiety symptoms, emotion regulation strategies (including emotion suppression and reappraisal), anxiety sensitivity, positive and negative affect, negative emotional schemas, and marital satisfaction in women with anxiety disorders. Overall, findings show that this therapy significantly reduced anxiety indicators, improved emotion regulation strategies, reduced negative emotional schemas, and enhanced marital satisfaction among the participants.

Since emotional schemas develop from interpersonal interaction and can result in pathological reactions, they can be an important mechanism (Sebastiano et al.,

2023). Difficulties in reappraisal could be seen as encompassing an emotional dimension as well as a motivational and a behavioral dimension. When Beck introduced the concept of mode, it had the goal to represent a complex organization of schemas relevant to expectations, self-assessments, rules, and memories (Dasilva et al., 2023). Difficulties in reappraisal and negative evaluation of emotions are considered the strongest mediator in the relationship between emotional invalidation and psychological distress (Sebastiano et al., 2023).

Given the lack of similar studies to the current one, and since there are few case studies on this therapeutic approach, it is not possible to accurately compare these findings with those of other studies. Nevertheless, the results of similar studies will be used for discussion purposes. In confirming the effectiveness of emotional schema therapy, the findings are aligned with those of Khaleghi et al. (2017), reporting the effectiveness of emotional schema therapy in reducing worry and signs and symptoms of anxiety in patients with a generalized anxiety disorder (a case study); O'Toole et al. (2019), demonstrating the role of emotion regulation in women with generalized anxiety disorder and, as a result, a significant reduction in worry and anxiety in the experimental group; Morvaridi et al. (2019), reporting the effectiveness of emotional schema therapy in reducing negative emotional schemas and increasing positive emotional schemas among women with social anxiety; and studies by Boogar et al. (2013), Tashkeh and Bazani (2015), Bakhshaie et al. (2017), and Oguz et al. (2019), all focusing on the role of negative emotional schemas in the occurrence of panic disorders, generalized anxiety, and social anxiety, respectively.

Moreover, the results reported by Bloch et al. (2014) show that a treatment protocol aiming to reduce the harmful effects of maladaptive schemas on couples' relationships generally increases intimacy and reduces conflicts, and couples who can adjust and control their negative emotions more successfully during therapeutic interventions use more effective strategies to resolve conflicts between themselves too. Furthermore, Fischer et al. (2016) noted that in married women with anxiety disorder, the quality of the relationship and marital satisfaction were higher as the strongest predictors of therapeutic outcomes and improvement in anxiety symptoms.

Overall long-term emotional avoidance makes people believe that if they experience emotions such as sadness or anger, they may be overwhelmed by these feelings and cannot eliminate them (Shahsavani et al., 2020). And since people with anxiety disorders experience a lot of problems in managing their emotions, therefore, by focusing the treatment on modifying these beliefs, patients would learn how to experience their emotions correctly, rather than ignoring them. As a result of these changes, not only the patients would gain control over their emotions, but also, they would be able to accept and confirm them. And also since the validation of emotional experience in each session was an important component of the therapy for the women, this therapy helped to normalize emotion and reduce the sense of incompatibility by facilitating awareness that others have similar problems using emotion regulation strategies.

Although large effect sizes were observed for most outcomes over time, there were no significant improvements at the group level in some outcomes, and only medium effect sizes were found for certain outcomes, such as suppression. One possible explanation for this is that the techniques used in emotional schema therapy

may indirectly influence these variables, suggesting that these constructs could be resistant to treatment and may require more time to change. Alternatively, individuals with anxiety disorders might report more socially desirable responses or underestimate their regulatory abilities, potentially biasing our findings.

This study had some limitations including the small sample size, restricting the age range of the participants to 18–45 years, and the fact that some data were collected via self-report instruments, which may have led to inaccurate responses in some sections. Moreover, we did not incorporate a randomized controlled trial or comparison conditions. And lastly, the intervention was delivered by a single therapist, and her characteristics or distinctive style might have affected the outcome. Future research should implement randomized controlled trial or comparison conditions with larger samples and different age groups and with multiple therapists of varying backgrounds to increase the generalizability of findings.

The above limitations notwithstanding, this study provides preliminary support for the effectiveness of emotional schema therapy on anxiety symptoms, emotion regulation, and marital satisfaction in women with anxiety disorders. The findings of the present study add important implications about the impact of emotional schema therapy on anxiety disorder symptoms and core cognitive and emotional factors associated with anxiety disorders. Findings are promising as they suggest that emotional schema therapy as a brief and emotion-focused CBT approach can reduce anxiety disorder symptoms and related underlying mechanism. Moreover, it should be noted that this study was conducted in an understudied population of women patients in a low- and middle-income Middle East country; as such, findings may provide diverse cultural evidence in support of emotional schema therapy as an intervention that targets anxiety disorder symptoms and associated underlying cognitive and emotional mechanisms among a non-Western population. While further research on potential underlying mechanisms of emotional schema therapy is warranted, these findings add to the growing body of literature examining emotional schema therapy for anxiety disorders. We hope our research will pave the way for randomized controlled trials with larger sample sizes in low- and middle-income countries.

Appendix

Table 3 A summary of the emotional schema therapy sessions

Session 1	Introduction, stating the rules, signing the behavioral contract for participation in the study, stating the objectives of the sessions, establishing a relationship and preparations, psychological training on anxiety disorders in women, gaining familiarity with the concept of family and factors that threaten marital satisfaction Assignment: Filling out the *Objectives and Expectations of the Therapy* sheet
Session 2	Reviewing the assignments, psychological training on emotions, distinguishing emotions from thoughts and behaviors, discussing the function of emotions, psychological training on the types of emotional schemas and their impact on one's belief and behavior, validating emotions, explaining emotional schema therapy and the logic behind it Assignment: Filling out the *Distinguishing Thought and Behavior from Emotion* sheet
Session 3	Reviewing the assignments, using the muscle relaxation technique, familiarizing the participants with theoretical perspectives and factors and symptoms that aggravate anxiety disorders and marital dissatisfaction in women, explaining the consequences of each factor in the individual's life, validating emotions, and emphasizing their impact on people's beliefs and behavior Assignment: Performing muscle relaxation exercises, drawing up a list of underlying and revealing factors influencing marital dissatisfaction, recording anxiety-provoking situations and rating them
Session 4	Explaining the formation and role of emotional schemas in the occurrence of anxiety disorders and marital dissatisfaction by recounting examples and examining related schemas that are often dominant in each anxiety disorder and marital dissatisfaction, normalizing emotions, and practicing the transience of emotions Assignment: Practicing muscle relaxation, practicing the advantages and disadvantages of thinking that emotions are abnormal, and drawing up a list of maladaptive emotional schemas influencing the participant's anxiety disorder and marital dissatisfaction
Session 5	Reviewing the assignments, teaching mindfulness, familiarizing the participants with methods of validating emotions, labeling emotions, and practicing the acceptance of emotions, especially in anxiety and marital conflicts, familiarizing the participants with methods of reducing marital conflicts and symptoms of anxiety disorders, such as using the guest metaphor in the acceptance of anxiety or the technique of riding the wave of anxiety Assignment: Performing mindfulness exercises and emotion acceptance, examining their advantages and disadvantages
Session 6	Reviewing the assignments, cognitive restructuring, explaining evidence checking as a technique, validating, dealing with emotional schemas in any anxiety disorder and marital dissatisfaction Assignment: Performing evidence checking, preparing a list of aggravating and preventive factors for anxiety disorder and marital dissatisfaction
Session 7	Reviewing the assignments, self-compassionate mindfulness, validation, challenging false beliefs about mixed feelings and emotions, performing relevant exercises, and training on the Devil's advocate technique to challenge control and rumination schemas Assignment: Completing the *Pros and Cons of Accepting Mixed Emotions* sheet, examining the costs and benefits, evidence checking
Session 8	Reviewing the assignments, examining problematic styles of invalidation and examining adaptive strategies to overcome invalidation, challenging false beliefs about emotions regarding anxiety disorder and marital dissatisfaction, performing evidence checking, encouraging the participants to give examples of the usefulness of using emotions along with logic for decision-making, checking the evidence for the influence of emotions on decision-making Assignment: Pros and cons of using emotions correctly in decision-making, performing the Devil's advocate technique

Table 3 (continued)

Session 9	Reviewing the assignments, performing the emotion validation technique, teaching the correct way to receive validation from others, self-compassionate mindfulness, and using the Devil's advocate technique to deal with automatic thoughts in different situations Assignment: Practicing self-compassionate mindfulness, self-validation technique, expressing validations that can help receive validation
Session 10	Reviewing the assignments, challenging the false beliefs about emotional schemas (guilt and higher values), the climbing-up the value ladder technique, positive and negative metaphors, the evidence-checking technique as a means to challenge one's sense of guilt about emotional experiences Assignment: Practicing climbing up the value ladder and positive–negative metaphors
Session 11	Reviewing the assignments, continuing challenging false beliefs about the emotions concerning the problem, and evidence checking Assignment: Cost–benefit analysis, checking the evidence about emotions
Session 12	Summary of the materials presented in the sessions, receiving feedback from the participants about the way the sessions were held, discussing the obstacles to continuing the exercises after the end of therapy and finding solutions to overcome them so that the treatment outcomes can persist, reviewing the objectives set out in the beginning and the degree of achievement of each, discussing participants' feelings after the end of the therapy sessions, re-administering the tests

Author Contribution MR: literature searches, investigation, project administration, data curation, formal analysis. MZ: conceptualization, investigation, methodology, supervision, writing—original draft, writing—review and editing. AM: supervision, validation, visualization, data curation. All authors contributed significantly to the study and approved the final version of the manuscript.

Data Availability Data will be made available upon reasonable request when the project is completed and data is fully anonymized.

Declarations

Ethical Approval The study was approved by the University of Kurdistan ethical review board which followed the ethical standards outlined in the Declaration of Helsinki.

Consent to Participate Informed consent was obtained from all individual participants included in the study.

Conflict of Interest The authors declare no competing interests.

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