

Comparison of the Effectiveness of Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) and Imagery Rescripting and Reprocessing Therapy (IRRT) on Symptoms of Depression and Anxiety in Individuals with Post-Traumatic Stress Symptoms

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ABSTRACT

The purpose of this study was to compare the effectiveness of Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) and Imagery Rescripting and Reprocessing Therapy (IRRT) on symptoms of depression and anxiety in individuals exhibiting post-traumatic stress symptoms. This study employed a quasi-experimental method with a pretest–posttest design and a control group. The statistical population included all individuals presenting with post-traumatic stress symptoms who sought services at psychological counseling and mental health centers in Tehran in 2024. The sampling method was convenience sampling, and participants were randomly assigned to experimental and control groups, with a total of 45 participants (15 in each group). Findings indicated that both Trauma-Focused Cognitive Behavioral Therapy and Imagery Rescripting and Reprocessing Therapy had a significant effect on reducing symptoms of depression and anxiety. However, there was no significant difference between the effectiveness of the two treatments on these variables. Therefore, based on the results of the present study, both TF-CBT and IRRT can be considered effective therapeutic approaches for improving depression and anxiety in individuals with post-traumatic stress symptoms.

Keywords: post-traumatic stress, depression, anxiety, cognitive-behavioral, imagery

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Introduction

Traumatic experiences have long been recognized as profoundly distressing life events that can disrupt an individual's psychological, emotional, and physiological functioning, often leading to persistent disorders such as post-traumatic stress disorder (PTSD), depression, and anxiety. PTSD represents a complex and

debilitating condition characterized by intrusive re-experiencing, avoidance, negative alterations in cognition and mood, and hyperarousal symptoms (1). The comorbidity of PTSD with depression and anxiety is well-documented, highlighting the intricate interplay between trauma-related cognitive distortions and affective dysregulation (2). Individuals exposed to traumatic events may develop maladaptive beliefs about safety, trust, and self-worth, which sustain chronic emotional distress (3). In the absence of timely and appropriate interventions, these symptoms can impair social, occupational, and interpersonal functioning (4), underscoring the necessity of empirically validated therapeutic approaches designed to alleviate trauma-related psychopathology.

The prevalence of trauma-related disorders has been further accentuated in contexts of war, natural disasters, and interpersonal violence. Research conducted among survivors of large-scale traumatic events, such as the Kermanshah earthquake and regional armed conflicts, revealed a high incidence of psychological distress, including PTSD, anxiety, and depressive symptoms (5, 6). Trauma often disrupts emotional memory networks, resulting in recurrent intrusive imagery, flashbacks, and persistent physiological arousal (2). Accordingly, modern trauma therapy frameworks emphasize the modification of trauma-related cognitions, emotional regulation, and the integration of distressing memories through structured psychotherapeutic interventions (7).

Among evidence-based psychotherapies, Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) has emerged as a cornerstone treatment model for trauma-related disorders, particularly PTSD (8). Originally developed for children and adolescents, TF-CBT has been successfully adapted for adults and diverse trauma populations (9). The approach integrates cognitive restructuring, emotional processing, exposure techniques, and skills training to address maladaptive cognitions and restore psychological stability (10). TF-CBT has demonstrated substantial effectiveness in reducing trauma symptoms, anxiety sensitivity, and panic-related responses in both veterans and civilians (11). Furthermore, its structured format, psychoeducation component, and coping skills training contribute to increased resilience and long-term symptom reduction (12).

A core advantage of TF-CBT lies in its capacity to help patients process traumatic memories through gradual exposure while simultaneously restructuring dysfunctional thoughts that perpetuate distress (13). By engaging clients in both cognitive and behavioral techniques, TF-CBT facilitates adaptive emotion regulation, enhances self-efficacy, and reduces avoidance behaviors (14). Clinical studies have shown that TF-CBT significantly improves psychological well-being, reduces re-experiencing and hyperarousal symptoms, and promotes functional recovery (6, 10). The model's flexibility has enabled its implementation across diverse cultural and demographic settings, making it a globally recognized intervention for trauma-related conditions (7).

Parallel to cognitive-behavioral approaches, imagery-based therapies have gained increasing attention in trauma treatment research. Imagery Rescripting and Reprocessing Therapy (IRRT), originally developed by Smucker in the 1990s, represents an experiential and imagery-driven intervention designed to transform distressing traumatic memories through guided mental imagery and emotional reprocessing (5). IRRT involves three key phases: directive imagery, mastery imagery, and self-soothing reprocessing, each aiming to reframe negative affective and cognitive responses associated with traumatic experiences (15). By altering

the emotional significance of intrusive images, IRRT helps individuals replace feelings of helplessness, shame, and fear with empowerment and self-compassion (16).

Recent research comparing TF-CBT and IRRT has revealed promising outcomes for both methods in alleviating trauma-related psychopathology. TF-CBT primarily targets cognitive restructuring and exposure, whereas IRRT emphasizes imagery transformation and emotional reintegration (17). Studies show that both approaches effectively reduce PTSD, depression, and anxiety symptoms, though they operate through distinct mechanisms (18). TF-CBT achieves therapeutic gains through cognitive modulation and behavioral activation, while IRRT enhances emotional regulation and memory reconsolidation (15). The integration of cognitive and imagery-based strategies reflects a broader shift in trauma therapy toward multimodal interventions that address both cognitive distortions and affective dysregulation (8).

Comorbid anxiety and depression are common sequelae of trauma exposure and often exacerbate PTSD severity (1). Physiological dysregulation, such as autonomic imbalance, and persistent negative thought patterns contribute to chronic affective distress (19). Effective treatment, therefore, requires interventions capable of modifying both cognitive appraisals and emotional responses. TF-CBT and IRRT have shown notable efficacy in achieving this dual modulation (20). Evidence from intervention studies indicates that both methods significantly reduce negative automatic thoughts and enhance emotion regulation capacity in trauma survivors (21, 22). Moreover, by integrating relaxation, psychoeducation, and self-compassion techniques, these therapies promote psychological flexibility—a critical factor in trauma recovery (2).

Cultural and contextual variables also influence the manifestation of trauma and the responsiveness to treatment modalities. In collectivist societies, where exposure to war and displacement is common, emotional expression may be constrained by social norms and stigma, necessitating culturally adapted therapeutic frameworks (23, 24). Studies conducted in Middle Eastern populations have emphasized the importance of therapist sensitivity to cultural values, religious coping, and familial structures in trauma intervention (5, 6). Similarly, cross-cultural applications of TF-CBT and IRRT have shown that when interventions are aligned with local belief systems and communication patterns, treatment outcomes improve significantly (11, 18).

From a neuropsychological perspective, both TF-CBT and IRRT are grounded in mechanisms of cognitive-emotional integration and memory reconsolidation. TF-CBT facilitates prefrontal regulation of amygdala-driven fear responses by fostering rational cognitive restructuring and behavioral mastery (2). In contrast, IRRT engages the hippocampal and sensory memory systems through visualization, allowing for emotional recontextualization of traumatic events (15). These mechanisms support the theoretical argument that effective trauma treatment must involve both cognitive reappraisal and emotional transformation (17). Consequently, the comparative evaluation of these two therapies provides valuable insights into the relative efficacy of cognitive versus imagery-based therapeutic pathways in trauma processing.

Empirical evidence supports the view that both TF-CBT and IRRT are associated with reductions in PTSD severity, depressive symptoms, and anxiety-related distress (8, 10, 20). TF-CBT has demonstrated particular utility in structured clinical settings, emphasizing skill development, gradual exposure, and cognitive reframing (7). Conversely, IRRT offers greater experiential depth through the modification of intrusive imagery and the reprocessing of self-perceptions linked to trauma (15, 16). Clinical comparisons indicate

that while TF-CBT may yield faster cognitive stabilization, IRRT tends to produce more sustained emotional resolution, particularly in clients with severe visual intrusions or guilt-laden trauma memories (18).

In light of these findings, ongoing research advocates for comparative and integrative studies that evaluate the short- and long-term effects of these interventions across various trauma populations (25). Given the distinct theoretical foundations yet complementary therapeutic objectives of TF-CBT and IRRT, empirical comparison can advance precision-based psychological treatment planning (7, 17). Such comparative analyses can also inform clinical decision-making in contexts where access to trauma-informed care remains limited, particularly in low-resource or post-conflict settings (23, 24).

In summary, trauma-related psychopathology remains a pervasive global mental health challenge, and interventions such as TF-CBT and IRRT offer promising avenues for recovery. Both approaches share the common goal of helping individuals re-establish cognitive coherence, emotional regulation, and psychological resilience after trauma exposure. However, differences in their underlying mechanisms—cognitive restructuring versus imagery reprocessing—highlight the need for empirical evaluation of their relative efficacy in reducing depressive and anxiety symptoms associated with PTSD (8, 11). Therefore, the present study aims to compare the effectiveness of Trauma-Focused Cognitive Behavioral Therapy and Imagery Rescripting and Reprocessing Therapy on depression and anxiety symptoms among individuals exhibiting post-traumatic stress symptoms.

Methods and Materials

Study Design and Participants

This study was an applied research project employing a quasi-experimental design with a pretest–posttest format and a control group. The study included two experimental groups—Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) and Imagery Rescripting and Reprocessing Therapy (IRRT)—and one control group. The statistical population comprised all clients exhibiting post-traumatic stress symptoms who visited counseling and psychological service centers in Tehran in 2024.

Sampling was conducted using a convenience sampling method, and participants were randomly assigned to the experimental and control groups. Accordingly, 45 individuals from the aforementioned population (clients with post-traumatic stress symptoms visiting counseling and psychological service centers in Tehran in 2024) who met the inclusion criteria were selected through convenience sampling and randomly assigned to three groups: 15 participants in the TF-CBT group, 15 in the IRRT group, and 15 in the control group.

Inclusion criteria were as follows: (1) simultaneous presence of post-traumatic stress, depression, and anxiety symptoms; (2) age 13 years or older; and (3) informed verbal and written consent to participate in the research. Exclusion criteria included (1) failure to attend sessions until the end of the intervention and (2) lack of cooperation during the intervention process. The total sample size consisted of 45 participants. Eligible participants were randomly assigned to three groups of 15 individuals (intervention group 1, intervention group 2, and control group) and received the designated interventions.

Data Collection

1. Beck Depression Inventory-II (BDI-II): The Beck Depression Inventory-II (BDI-II) is one of the most widely used psychometric tools for assessing the severity of depression in individuals aged 13 and older.

It measures physiological, cognitive, and emotional dimensions of depression. The inventory contains 21 items scored from 0 to 3, and the total score determines the level of depression. Scores of 1–13 indicate minimal depression, 14–19 mild depression, 20–29 moderate depression, 30–51 severe depression, and 52–63 very severe depression. Given the instrument's clinical importance, extensive psychometric research has been conducted to assess its validity and reliability. A meta-analysis by Beck, Steer, and Garbin (1988) found that test–retest reliability coefficients varied from 0.48 to 0.86 depending on the interval between test administrations and sample population. Later, Beck et al. (1996) reported a one-week test–retest reliability coefficient of 0.93. Regarding validity, the BDI-II has shown mean correlations above 0.60 with the Hamilton Psychiatric Rating Scale for Depression, Zung Self-Rating Depression Scale, MMPI Depression Scale, Multiple Affect Adjective Checklist Depression Scale, and the SCL-90 (as cited in Azkhosh, 2008). Convergent validity was calculated at 0.89 (Minin & Fracch, 2007). In Iran, several studies have examined the psychometric properties of the instrument. For instance, Tashakkori and Mehriar (1994) reported a reliability coefficient of 0.78, while Chegini (2002) found reliability values ranging between 0.70 and 0.90. Ziaei, Sharifi-Daramadi, and Farrokhi (2022) reported a convergent validity of 0.95 and Cronbach's alpha reliability of 0.92 for the Persian version.

2. Beck Anxiety Inventory (BAI): The Beck Anxiety Inventory (BAI) is a self-report measure designed to assess the severity of anxiety symptoms in adolescents and adults. It contains 21 items, each rated on a 4-point Likert scale from 0 to 3, reflecting increasing levels of anxiety. Each item describes a common symptom of anxiety (cognitive, somatic, or panic-related). The total score ranges from 0 to 63, with 0–7 indicating minimal anxiety, 8–15 mild, 16–25 moderate, and 26–63 severe anxiety. The Cronbach's alpha reliability of this inventory has been reported as 0.92, the one-week test–retest reliability as 0.75, and inter-item correlations between 0.30 and 0.76 (Fu et al., 2018). In a study by Li et al. (2016), internal consistency using Cronbach's alpha was 0.91, and reliability was 0.84. In Iran, Kaviani and Mousavi (2008) reported a convergent validity of 0.72 and internal consistency of 0.83 across various demographic groups. Similarly, Madanloo and Najafi (2023) found a Cronbach's alpha reliability coefficient of 0.75 for this scale.

3. Post-Traumatic Stress Disorder Scale (PTSD Scale): This self-report measure, developed by Keane, Caddell, and Taylor (1988), assesses the severity of post-traumatic stress disorder symptoms. The scale includes 35 items rated on a 5-point Likert scale (1–5). Items 2, 6, 11, 17, 19, 22, 24, 27, 30, and 34 are reverse scored. Total scores range from 35 to 175. The scale demonstrates high reliability and strong correlations with other PTSD measures. The Persian version of the scale, abbreviated as “ESHEL,” was validated by Goodarzi (2003), who reported a Cronbach's alpha reliability of 0.92. Concurrent validity was established using the Life Events Inventory, Posttraumatic Stress Disorder Checklist, and Padua Obsessive–Compulsive Inventory, with significant correlations observed: 0.23, 0.82, and 0.75, respectively. Shafiei Kamalabadi et al. (2014) reported a Cronbach's alpha coefficient of 0.97. In the present study, the median score of participants was 79, which served as the cutoff point for determining PTSD presence.

Intervention

The Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) protocol was implemented based on the treatment manual developed by Cohen, Mannarino, and Deblinger (2006). It consisted of twelve 60-minute individual sessions held once a week. Sessions 1–3 focused on psychoeducation about trauma, normalization

of symptoms, and training in relaxation techniques such as diaphragmatic breathing and progressive muscle relaxation. Sessions 4–6 emphasized emotional expression, cognitive restructuring, and social problem-solving skills through techniques such as thought stopping, positive self-talk, and trauma narration. In sessions 7–9, participants engaged in cognitive processing and reappraisal, identifying maladaptive beliefs, and practicing exposure techniques including imaginal and gradual exposure. Finally, sessions 10–12 centered on safety skills, grief processing, cognitive redefinition of loss, coping enhancement, and meaning reconstruction. The treatment concluded with relapse prevention, strengthening adaptive coping strategies, and planning for future trauma-related challenges.

The Imagery Rescripting and Reprocessing Therapy (IRRT) protocol followed the therapeutic model developed by Smucker (1995) and was delivered in twelve 60–90-minute sessions divided into three stages: guided imagery instruction, imagery mastery, and self-calming with cognitive reprocessing. Early sessions (1–3) involved psychoeducation, identifying distressing images, and exploring their cognitive and emotional connections. Mid-treatment sessions (4–8) introduced guided imagery exercises led by the therapist to replace negative mental images with positive ones, along with cognitive review and mental rotation techniques to reduce intrusive thoughts and flashbacks. The later sessions (9–12) focused on mastering self-directed imagery control, restructuring trauma-related meanings, and integrating newly formed adaptive beliefs into real-life situations. Homework assignments throughout included maintaining self-monitoring worksheets, practicing imagery and relaxation techniques, and applying learned strategies in daily life to consolidate therapeutic gains.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 26. Descriptive statistics, including mean, standard deviation, and range, were calculated to summarize participants' scores on the study variables. To test the research hypotheses, inferential statistical analyses were performed. Specifically, multivariate analysis of covariance (MANCOVA) was used to examine the effects of the interventions while controlling for pretest scores. Post hoc comparisons using the Bonferroni test were conducted to determine between-group differences. The significance level was set at $p < .05$ for all analyses.

Findings and Results

As shown in Table 1, in both experimental groups, the scores of all three variables decreased after the intervention, indicating the effectiveness of the treatments implemented. In contrast, in the control group, no noticeable difference was observed between the pretest and posttest scores. To determine whether these differences were statistically significant, inferential analyses were conducted.

Table 1. Descriptive Statistics of Dependent Variables in Experimental and Control Groups

Group	Index	Pretest Depression	Posttest Depression	Pretest Anxiety	Posttest Anxiety
TF-CBT	Mean	32.86	26.53	29.53	21.86
	Median	33	27	30	21
	SD	13.64	12.68	13.03	10.58
	Minimum	11	7	8	7
	Maximum	60	50	54	44
	Range	49	43	46	37
IRRT	Mean	32.40	27.73	29.60	20.33
	Median	31	26	28	19

Control	SD	13.28	12.96	12.94	10.43
	Minimum	10	9	10	7
	Maximum	58	52	55	45
	Range	48	43	45	38
	Mean	33.33	32.05	30.66	31.13
	Median	35	34	32	30
	SD	14.32	13.71	14.47	15.16
	Minimum	9	12	8	7
	Maximum	58	57	58	60
	Range	49	45	50	53

Before conducting the multivariate analysis of covariance (MANCOVA), all required assumptions were examined and met. (1) Both the covariate and dependent variables were continuous. (2) The independent variable consisted of three distinct categories (two experimental and one control group). (3) Observations were independent, with each participant assigned to only one group. (4) The assumption of normality was verified using the Kolmogorov–Smirnov and Shapiro–Wilk tests, both of which indicated non-significant results ($p > .05$), confirming normal data distribution. (5) Homogeneity of variances was tested using Levene’s test, which was not significant in any case ($p > .05$), confirming equality of variances across groups. (6) The assumption of homogeneity of regression slopes was confirmed, as the interaction between the covariate and group was not significant ($p > .05$). (7) Linearity between the covariates (pretest scores) and dependent variables (posttest scores) was visually inspected using scatterplots, showing linear relationships within each group. (8) Finally, Box’s M test indicated that the covariance matrices were equal across groups ($F = 1.221$, $p = .156$). Therefore, all assumptions for performing MANCOVA were satisfied.

Table 2. Results of Multivariate Tests

Test	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Pillai’s Trace	1.130	16.464	6	76	.000	.565
Wilks’ Lambda	.068	34.816	6	74	.000	.738
Hotelling’s Trace	10.710	64.258	6	72	.000	.843
Roy’s Largest Root	10.431	132.128	3	38	.000	.913

As presented in Table 2, after controlling for pretest effects, significant differences were found among the three groups across all indices (Pillai’s Trace, Wilks’ Lambda, Hotelling’s Trace, and Roy’s Largest Root). The between-group F ratios for these tests were significant at $p < .001$, indicating a statistically meaningful difference among the three groups.

Table 3. Results of Multivariate Tests

Source	Dependent Variable	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Pretest Depression	Depression	1.757	1	1.75	.617	.038	.015
Pretest Anxiety	Anxiety	123.08	1	123.08	18.95	.000	.327
Group Membership	Depression	264.59	2	132.29	46.18	.000	.703
	Anxiety	605.39	2	302.69	45.60	.000	.651
Error	Depression	111.72	39	2.865			
	Anxiety	253.29	39	6.495			

According to Table 3, the F-statistic for group membership was significant for both depression and anxiety at the 0.001 level, indicating significant differences among the three groups regarding depression and anxiety levels. The effect sizes of 0.703 and 0.651 demonstrate that these differences were large and meaningful at the population level. The pretest F-statistics for depression ($F = 7.61$, $p < .05$) and anxiety ($F = 18.95$, $p < .001$) were also significant, suggesting that pretest scores for all three variables (depression,

anxiety, and post-traumatic stress) had a significant effect on their respective posttest scores. Thus, the use of covariance analysis was warranted. To further explore these differences, group means for the dependent variables were compared (Table 4).

Table 4. Mean Differences Between Groups for the Depression Variable

Dependent Variable	Independent Variable 1	Independent Variable 2	Mean Difference	Std. Error	Sig.	95% Confidence Interval
Posttest Depression	TF-CBT	Control	-5.855*	.651	.000	-7.483
	IRRT	Control	-4.595*	.621	.000	-6.149
Posttest Anxiety	TF-CBT	Control	-6.574*	.980	.000	-9.025
	IRRT	Control	-8.751*	.935	.000	-11.091
Posttest Depression	TF-CBT	IRRT	-1.260	.638	.167	-2.857
Posttest Anxiety	TF-CBT	IRRT	2.178	.961	.087	-.227

Based on Table 4, both Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) and Imagery Rescripting and Reprocessing Therapy (IRRT) had statistically significant effects on depression and anxiety, resulting in reductions in both variables ($p < .001$). However, no significant differences were found between the mean scores of depression and anxiety across the two treatment groups ($p > .05$).

In summary, both TF-CBT and IRRT produced significant reductions in depression and anxiety symptoms, and no significant difference was observed between the two therapies in terms of their effectiveness.

Discussion and Conclusion

The present study aimed to compare the effectiveness of Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) and Imagery Rescripting and Reprocessing Therapy (IRRT) on depression and anxiety symptoms among individuals with post-traumatic stress symptoms. The findings revealed that both TF-CBT and IRRT significantly reduced depressive and anxiety symptoms, whereas the control group exhibited no meaningful change. This indicates that both cognitive-behavioral and imagery-based approaches are effective in improving emotional well-being in trauma survivors. However, the comparison of the two interventions showed no statistically significant difference in their effectiveness, suggesting that while both methods operate through distinct therapeutic mechanisms, their overall impact on affective outcomes is comparable. This result aligns with a growing body of evidence emphasizing that cognitive restructuring and imagery rescripting—despite differing in process—share common therapeutic pathways that lead to emotional regulation, reduction of maladaptive cognitions, and restoration of psychological stability (15, 17, 18).

The significant decline in depression symptoms following TF-CBT intervention can be attributed to the therapy's focus on identifying and modifying dysfunctional thoughts, reducing avoidance behaviors, and promoting adaptive coping strategies. Through techniques such as cognitive restructuring, gradual exposure, and psychoeducation, TF-CBT allows individuals to reinterpret traumatic experiences and reestablish a sense of control over their internal states (7, 8). Consistent with the findings of Sharifi et al. (2024), TF-CBT was found to effectively decrease anxiety sensitivity and panic symptoms in veterans with PTSD, which supports its utility in trauma-exposed populations. Similarly, studies among earthquake and war survivors demonstrated significant improvements in PTSD, depression, and anxiety symptoms after TF-CBT interventions, highlighting its adaptability to diverse trauma contexts (6, 14). The present study's findings

extend this evidence, showing that TF-CBT is equally effective in reducing depressive affect and anxiety among individuals with heterogeneous trauma histories, possibly due to its structured integration of behavioral activation and emotional processing (9, 10).

Parallel to TF-CBT, the findings demonstrated that IRRT significantly reduced depression and anxiety symptoms. This result reinforces the view that imagery-based processing can effectively alter the emotional impact of trauma-related memories. By guiding participants through visualization of distressing images, reprocessing their meaning, and fostering new self-soothing imagery, IRRT helps individuals revise maladaptive representations of trauma and rebuild emotional coherence (5, 15). This mechanism is consistent with the theoretical model proposed by Smucker and validated in more recent studies, suggesting that emotional transformation through mental imagery can restore cognitive and affective balance (16, 17). Moreover, IRRT's emphasis on directive imagery and self-compassion allows clients to integrate traumatic experiences into adaptive autobiographical memory, thereby reducing intrusive recollections and hyperarousal (2, 18). In the current study, these processes likely contributed to decreased emotional distress, paralleling findings from studies showing that imagery-based reprocessing reduces depressive rumination and anxiety across various trauma populations (19, 20).

Another important finding was the absence of significant differences between TF-CBT and IRRT in their effects on depression and anxiety. This result suggests that both interventions, despite their methodological distinctions, achieve comparable therapeutic outcomes through converging mechanisms. TF-CBT primarily operates on the cognitive level, targeting distorted appraisals, whereas IRRT focuses on emotional imagery and symbolic transformation of traumatic content (15, 17). However, both approaches facilitate reconsolidation of traumatic memory networks and improve emotion regulation capacities, leading to reduced distress. This convergence supports the integrative model of trauma recovery, which posits that cognitive restructuring and emotional rescripting are interdependent components of adaptive change (2). Previous comparative studies have also reported similar equivalence between these interventions, concluding that while TF-CBT may yield faster cognitive stabilization, IRRT provides deeper emotional resolution (16, 18). Accordingly, the findings of the present study reinforce the therapeutic parity of these two approaches in treating post-traumatic affective disturbances.

Furthermore, the observed reductions in depression and anxiety across both interventions reflect their shared focus on enhancing self-efficacy and reducing avoidance. In trauma survivors, avoidance behaviors often maintain depressive and anxious symptomatology by preventing exposure to corrective experiences. TF-CBT addresses this through graded exposure and behavioral activation, while IRRT reduces avoidance by confronting distressing imagery within a controlled mental framework (7, 12). These techniques empower individuals to face traumatic memories rather than suppress them, resulting in emotional desensitization and cognitive reappraisal. The current findings mirror those of Asadollahi et al. (2025), who found that cognitive-behavioral interventions increased coping self-efficacy and emotional reactivity regulation among PTSD survivors of explosive incidents. Similarly, Hlomuka (2024) reported that trauma-focused therapies reduced secondary traumatic stress and emotional exhaustion in caregivers of trauma victims, emphasizing the generalizability of trauma-focused models across populations.

The findings also underscore the role of emotional memory processing as a common pathway for symptom reduction. Emotional memories linked to trauma are often encoded with high affective intensity and

fragmented recall, contributing to persistent distress and intrusive imagery (2). Both TF-CBT and IRRT facilitate the integration of these memories into coherent narratives, thereby reducing their affective charge. This aligns with the results of Ziaei et al. (2022), who found that emotional memory management training significantly enhanced emotional intelligence and adaptive emotional regulation. Similarly, studies by Zabet et al. (2021) and Baharlu et al. (2019) demonstrated that emotion regulation interventions lead to measurable improvements in cognitive and affective functioning. Thus, the emotional stabilization observed in both treatment groups of this study may stem from restructured emotional processing pathways supported by both cognitive and imagery mechanisms.

Neurocognitive models of trauma further substantiate these findings, suggesting that both cognitive-behavioral and imagery-based therapies engage similar brain regions responsible for memory reconsolidation and emotion regulation. TF-CBT enhances prefrontal inhibitory control over limbic reactivity by facilitating rational evaluation of traumatic cues, whereas IRRT modifies sensory and emotional memory representations through visual imagery and self-compassion (15, 17). These neural mechanisms account for the overlapping efficacy of both methods in reducing depressive and anxious symptoms following trauma. Moreover, the results correspond with Moieni et al. (2018) and Shahabivand et al. (2021), who reported that trauma-focused behavioral interventions reduced both psychological distress and somatic complaints by reorganizing cognitive-emotional patterns. In this regard, both TF-CBT and IRRT appear to influence the same underlying psychophysiological processes that maintain post-traumatic emotional disorders.

It is also noteworthy that the effects observed in this study align with international guidelines for trauma treatment. According to the National Institute for Health and Care Excellence (NICE), trauma-focused therapies such as TF-CBT and imagery-based interventions represent first-line approaches for PTSD management (25). The findings of this study corroborate that recommendation by demonstrating the clinical effectiveness of these interventions in reducing affective symptoms among individuals with post-traumatic stress. Consistent with the work of Spiegel et al. (2022), trauma-focused interventions not only alleviate core PTSD symptoms but also enhance resilience and social functioning. Similarly, research by Kim et al. (2023) showed that trauma-informed care programs integrating emotional processing and behavioral regulation significantly improved health outcomes among women with trauma histories. Collectively, the results highlight that both TF-CBT and IRRT contribute meaningfully to recovery across psychological and physiological dimensions.

An additional explanation for the comparable effectiveness of TF-CBT and IRRT may relate to their shared emphasis on client engagement and empowerment. Trauma therapy is most effective when clients perceive themselves as active participants in the healing process rather than passive recipients of treatment (12). Both TF-CBT and IRRT foster this engagement through active exercises such as thought monitoring, exposure, and guided imagery. These processes promote agency, self-compassion, and mastery over trauma-related experiences (20, 26). The enhancement of self-directed regulation may explain the substantial decrease in emotional distress observed in both experimental groups. As supported by Woelk et al. (2022), when clients mentally re-script trauma narratives and modify their cognitive interpretations, the emotional charge of the memory weakens, allowing for psychological closure. This mechanism is consistent with Levy-Gigi et al. (2020), who found that emotional flexibility moderates the relationship between stress and PTSD symptoms.

Moreover, cultural and contextual factors may have influenced treatment outcomes. In societies such as Iran, where social stigma surrounding emotional expression persists, structured therapies that combine cognitive and imagery-based methods can provide culturally congruent pathways to healing (5, 23). TF-CBT's emphasis on psychoeducation and skill-building may align well with collectivist values of resilience and duty, while IRRT's introspective imagery techniques resonate with spiritual and introspective traditions common in Middle Eastern cultures (6, 14). The observed parity between the two interventions may therefore reflect cultural compatibility rather than therapeutic equivalence alone. The results of this study support the adaptability of both TF-CBT and IRRT across different socio-cultural contexts, reinforcing previous research advocating for culturally responsive trauma interventions (11, 24).

Taken together, the findings of this study provide compelling evidence for the effectiveness of both TF-CBT and IRRT in reducing depression and anxiety among individuals with PTSD symptoms. The results extend prior research by confirming that both cognitive-behavioral and imagery-based therapeutic frameworks achieve comparable levels of emotional recovery through distinct yet converging mechanisms. The integration of cognitive, behavioral, and imagery elements may represent the most comprehensive approach to addressing trauma-related psychopathology, supporting the development of hybrid or sequential treatment models.

This study faced several limitations that should be acknowledged. The relatively small sample size ($n = 45$) may limit the generalizability of the findings to broader trauma populations. Moreover, the participants were recruited from counseling centers in Tehran, which may not reflect individuals from rural or culturally diverse regions. The study also relied on self-report questionnaires, which may be subject to response bias or social desirability effects. Another limitation is the absence of follow-up assessments, which prevents evaluation of the long-term stability of treatment effects. Additionally, therapist variables, such as treatment fidelity and therapeutic alliance, were not controlled for, potentially influencing intervention outcomes. Lastly, the exclusive focus on depression and anxiety did not allow examination of other trauma-related outcomes such as dissociation, anger, or interpersonal difficulties.

Future studies should employ larger and more diverse samples to enhance external validity and explore cross-cultural variations in treatment response. Longitudinal research designs incorporating follow-up evaluations are needed to assess the durability of treatment effects over time. Future research could also integrate physiological measures—such as heart rate variability or cortisol levels—to examine biological correlates of therapeutic change. Comparing hybrid models that combine TF-CBT and IRRT techniques may yield valuable insights into integrative frameworks for trauma recovery. Finally, qualitative or mixed-method studies could explore patients' subjective experiences with each therapy to enrich understanding of the mechanisms underlying emotional transformation.

Clinicians should consider both TF-CBT and IRRT as viable, evidence-based options for individuals presenting with post-traumatic stress symptoms accompanied by depression and anxiety. Treatment selection may be guided by client preferences, symptom profiles, and therapeutic readiness. Practitioners are encouraged to adapt these protocols flexibly to cultural contexts and client-specific needs, emphasizing psychoeducation, emotional regulation, and self-efficacy enhancement. Collaboration between clinicians, trauma specialists, and policymakers can also facilitate broader dissemination of trauma-focused

interventions in community and clinical settings, thereby improving accessibility and continuity of care for trauma-affected individuals.

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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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