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Original Article

Effectiveness of Emotion- and Compassion-focused Therapies on Loneliness and Cognitive Flexibility in Women with Substance Use Disorder

Maedeh Yazdanipour[1], Kobra Kazemian Moghadam[2*], Masoud Shahbazi[3]

1. Department of Counseling, Ahv.C., Islamic Azad University, Ahvaz, Iran
2. Department of Psychology, Dez.C., Islamic Azad University, Dezful, Iran
3. Department of Counseling, MaS.C., Islamic Azad University, Masjed Soleiman, Iran

***Corresponding author:**
Kobra Kazemian Moghadam, Department of Psychology, Dez.C., Islamic Azad University, Dezful, Iran
Tel: +98-61-42420606
Email: Kazemian174@iau.ac.ir

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Abstract

Background and Objective: Women with substance use disorder (SUD) often face considerable psychosocial difficulties, notably intense feelings of loneliness and deficits in cognitive flexibility, both of which can impede their progress toward recovery. The present study aimed to evaluate the efficacy of Emotion-Focused Therapy (EFT) and Compassion-Focused Therapy (CFT) in ameliorating these critical challenges in women with SUD.

Materials and Methods: The present quasi-experimental study was conducted in 2023 among women undergoing treatment for SUD in Ahvaz, Iran. A total of 45 eligible participants were recruited using convenience sampling and then randomly assigned to one of three groups: EFT, CFT, or a control group, with 15 participants in each. The experimental groups received eight 90-minute therapy sessions every week specific to their respective modalities. In contrast, the control group received standard treatment as usual. Data on loneliness and cognitive flexibility were collected at baseline, post-intervention, and a three-month follow-up using validated instruments. Repeated measures analysis of variance (ANOVA) was the primary statistical method employed for data analysis.

Results: The results revealed statistically significant improvements in both loneliness and cognitive flexibility within the EFT and CFT groups compared to the control group ($P<0.001$). These therapeutic benefits were robust and maintained at the three-month follow-up assessment. No significant differences in efficacy were observed between the EFT and CFT interventions.

Conclusion: This work concludes that both EFT and CFT are effective in reducing loneliness and enhancing cognitive flexibility in women with SUD. Their sustained positive impact suggests that integrating these therapeutic approaches into comprehensive addiction treatment can promote improved coping mechanisms and facilitate lasting recovery.

Keywords: Cognitive flexibility, Compassion-focused therapy, Emotion-focused therapy, Loneliness, Substance use disorders

Background

Substance Use Disorder (SUD) continues to be a formidable global public health challenge, with particular complexities arising when examining its impact on women. Women affected by SUD, especially opioid dependence, frequently navigate a unique landscape of social and psychological vulnerabilities that profoundly influence their recovery trajectory [1]. Beyond the physiological grip of addiction, many women endure heightened societal stigma, disproportionate caregiving burdens, and a greater propensity for co-occurring mental health conditions such as trauma and mood disorders [2]. These interwoven stressors often culminate in pervasive feelings of loneliness and significant impairments in cognitive flexibility. Loneliness can intensify cravings and erode motivation for treatment, while rigid thinking patterns impede the adoption of new coping strategies, thus collectively presenting formidable barriers to sustained remission and overall well-being [3].

Loneliness, often defined as a subjective and distressing feeling of perceived social isolation or a discrepancy between desired and actual social connections, is a pervasive issue for individuals with SUD [4]. For women in recovery, the experience of loneliness can be particularly acute, exacerbated by damaged relationships, social stigma, and the loss of pro-social networks. This profound sense of isolation is not merely a symptom but a significant risk factor for relapse, as individuals may turn to substance use as a maladaptive coping mechanism to alleviate emotional pain or fill a perceived void [5]. Therefore, addressing loneliness is paramount in fostering a supportive environment conducive to

recovery, enabling individuals to build healthier relationships and integrate more effectively into pro-social communities.

Cognitive flexibility refers to an individual's capacity to adjust their thinking or behavior in response to changing environmental demands, to consider multiple perspectives, and to fluidly switch between different mental sets or strategies [6]. In the context of SUD, robust cognitive flexibility is an essential executive function that underpins successful recovery. It enables individuals to break free from rigid, addiction-driven thought patterns, adapt to new problem-solving approaches, and pivot away from automatic, substance-seeking behaviors in the face of triggers or stressors [7]. Impairments in cognitive flexibility can therefore impede a person's ability to learn new coping skills, manage cravings effectively, and make adaptive decisions necessary for maintaining sobriety, thus representing a significant barrier to therapeutic progress.

Compassion-Focused Therapy (CFT) is an empirically informed psychotherapeutic approach centered on cultivating compassion towards oneself and others, alongside developing the capacity to receive compassion [8]. Grounded in an understanding of human emotional regulation systems, CFT specifically aims to mitigate feelings of shame, self-criticism, and inadequacy, which are often deeply ingrained in individuals struggling with addiction and contribute to feelings of isolation and loneliness [9]. By nurturing a compassionate internal dialogue and fostering a sense of warmth and kindness towards one's struggles, CFT can create a psychologically safer internal environment [10]. These enhanced internal safety and reduced self-judgment can, in turn, facilitate greater cognitive openness and flexibility, allowing individuals to explore alternative perspectives and adaptive responses more readily [11, 12].

On the other hand, Emotion-Focused Therapy (EFT) is a humanistic and empirically supported psychotherapy that emphasizes the adaptive potential of emotions and helps individuals identify, experience, understand, and transform maladaptive emotional states [13]. For individuals dealing with SUD, many maladaptive behaviors are rooted in an attempt to avoid or suppress painful primary emotions. By guiding clients to safely access and process these complicated feelings (e.g., sadness and fear of abandonment that can underlie loneliness), EFT facilitates profound emotional processing and regulation [14]. This process of emotional engagement enables a shift from rigid, avoidant thinking patterns to more flexible and adaptive cognitive responses, thereby directly enhancing cognitive flexibility and providing healthier ways to manage distress that might otherwise lead to loneliness or substance seeking [15, 16].

Despite the recognized prevalence and significant impact of loneliness and impaired cognitive flexibility on women with SUD, there remains a notable paucity of targeted research investigating the specific effectiveness of modern psychotherapeutic approaches like EFT and CFT in addressing these particular challenges, especially within specific cultural contexts such as Iran. Given the profound implications of these variables for sustained recovery and overall quality of life, empirical investigation into efficacious interventions is critically important. Addressing these core psychological vulnerabilities holds substantial promise for improving treatment outcomes and fostering enduring well-being.

Objectives

The present study aimed to evaluate the effectiveness of EFT and CFT in reducing loneliness and enhancing cognitive flexibility among women diagnosed with SUD.

Materials and Methods

Design and Participants

The present work followed a quasi-experimental design, incorporating baseline, post-intervention, and a three-month follow-up assessment, alongside a control group. The participants were women diagnosed with SUD who were seeking treatment at specialized addiction clinics in Ahvaz, Iran, during 2023. A total of 45 eligible women were recruited using convenience sampling. These participants were then randomly assigned to one of three equally sized groups: two experimental groups (EFT and CFT) and one control group, each comprising 15 individuals. Inclusion criteria were being diagnosed with a formal SUD, being between 18 and 50 years old, providing voluntary informed consent, and not experiencing severe co-occurring psychiatric conditions (e.g., psychosis and active suicidal ideation). Exclusion criteria involved cognitive impairment or participation in concurrent psychological interventions. All participants provided written informed consent, and the study received institutional ethical approval from the University.

Instruments

UCLA Loneliness Scale (ULS): Loneliness was assessed using a 20-item UCLA Loneliness Scale (ULS) [17]. This frequently employed self-report measure uses a 4-point Likert scale, with higher scores (ranging from 20 to 80) indicating greater perceived loneliness. Previous research has revealed the ULS to have high internal consistency, with a reported Cronbach's alpha coefficient of 0.89 [18]. In

the present study, the ULS demonstrated strong internal consistency as well, with a Cronbach's alpha of 0.88.s

Cognitive Flexibility Inventory (CFI): Cognitive flexibility was measured using the 20-item Cognitive Flexibility Inventory (CFI) [19]. This self-report instrument assesses an individual's perceived ability to identify alternative solutions and their self-efficacy in adapting to new situations. Items are rated on a 6-point Likert scale, where higher scores reflect greater cognitive flexibility. In an Iranian sample, the overall scale demonstrated strong internal consistency, with a Cronbach's alpha coefficient of 0.90, as reported by Feizollahi et al. [20]. The CFI also exhibited appropriate internal consistency in our current sample, with a Cronbach's alpha of 0.85.

Interventions

The therapeutic interventions comprised two distinct modalities: EFT and CFT. Both programs were delivered systematically over eight weekly sessions, each lasting 90 minutes. Experienced clinical psychologists proficient in their respective approaches facilitated these sessions. Participants in the control group received treatment as usual, which typically included standard pharmacological management and supportive counseling provided by the treatment center. The core components, session themes, and specific aims of each intervention are detailed in Table 1 (for EFT) and Table 2 (for CFT).

Data Analysis

Statistical analyses were conducted using SPSS (version 27) software. Descriptive statistics (means, standard deviations) were computed for all study variables. To assess intervention effects over time and across groups, a Repeated Measures Analysis of Variance (ANOVA) was performed after rigorously verifying assumptions like normality, homogeneity of variance, and sphericity. Significant main or interaction effects were further explored via Bonferroni-corrected post-hoc tests to pinpoint specific group differences.

Table 1. Summary of EFT session content

Session	Core Components and Aims
1	Introduction to EFT principles; fostering emotional awareness and expression; establishing a safe therapeutic alliance.
2	Differentiating primary adaptive from maladaptive emotions; learning to track and articulate emotional responses.
3	Accessing and deepening core painful emotions (e.g., sadness, fear) related to loneliness or past experiences.
4	Working with specific emotional schemas; processing unresolved emotional experiences; understanding emotional needs.
5	Facilitating emotional transformation; developing new emotional responses to old situations.
6	Enhancing emotion regulation skills; practicing adaptive emotional self-soothing and self-validation.
7	Addressing emotional avoidance patterns; integrating newfound emotional processing abilities into daily life.
8	Consolidating therapeutic gains; reviewing progress; developing strategies for maintaining emotional well-being post-therapy.

Table 2. Summary of CFT session content

Session	Core Components and Aims
1	Introduction to CFT; understanding the three emotion regulation systems (threat, drive, soothing).
2	Exploring the origins of self-criticism and shame; cultivating an understanding of the compassionate mind.
3	Developing compassionate attention and thinking (e.g., imagery, thought exercises); distinguishing "wise mind" from "critical mind".
4	Cultivating compassionate feelings (e.g., warmth, kindness); practicing compassionate body posture and breath.
5	Addressing internal blocks to compassion; working with fears of compassion towards self and others.
6	Developing a compassionate self-identity; fostering a sense of inner warmth and safeness.
7	Applying compassion to difficult emotions and life challenges; integrating compassionate responses to triggers and cravings.
8	Consolidating compassion skills; creating a compassionate action plan for maintaining well-being and managing setbacks with kindness.

Results

A total of 45 women diagnosed with SUD participated in this study, equally distributed across three groups: EFT, CFT, and a control group, each comprising 15 individuals. Demographic analysis indicated mean ages of 32.4 years (SD=6.8) for the CFT group, 33.1 years (SD=7.2) for the EFT group, and 31.9 years (SD=6.5) for the control group, with no significant age differences (P>0.05), confirming baseline comparability. Table 3 presents the mean scores and standard deviations for loneliness and cognitive flexibility across the CFT, EFT, and control groups at pre-test, post-test, and three-month follow-up. For loneliness, the CFT group

demonstrated a reduction from 54.13±4.01 at pre-test to 45.86±4.18 at post-test and 46.20±4.07 at follow-up, while the EFT group decreased from 53.86±4.18 at pre-test to 44.80±4.26 and 45.06±4.14 at post-test and follow-up, respectively. The control group remained relatively stable (52.86±3.85 at pre-test to 52.46±3.94 at post-test and 52.86±4.17 at follow-up). For cognitive flexibility, the CFT group improved from 63.26±4.84 at pre-test to 72.60±5.51 at post-test and 72.26±5.58 at follow-up, while the EFT group increased from 62.33±4.82 at pre-test to 71.53±5.37 at post-test and 71.13±5.09 at follow-up. The control group showed minimal change (63.13±5.01 at pre-test to 63.20±5.10 at post-test and 62.73±5.06 at follow-up) (Figure 1).

Table 3. Descriptive statistics for loneliness and cognitive flexibility across groups and time points

Variable	Stage	CFT Group	EFT Group	Control Group
		Mean±SD	Mean±SD	Mean±SD
Loneliness	Pre-test	54.13±4.01	53.86±4.18	52.86±3.85
	Post-test	45.86±4.18	44.80±4.26	52.46±3.94
	Follow-up	46.20±4.07	45.06±4.14	52.86±4.17
Cognitive Flexibility	Pre-test	63.26±4.84	62.33±4.82	63.13±5.01
	Post-test	72.60±5.51	71.53±5.37	63.20±5.10
	Follow-up	72.26±5.58	71.13±5.09	62.73±5.06

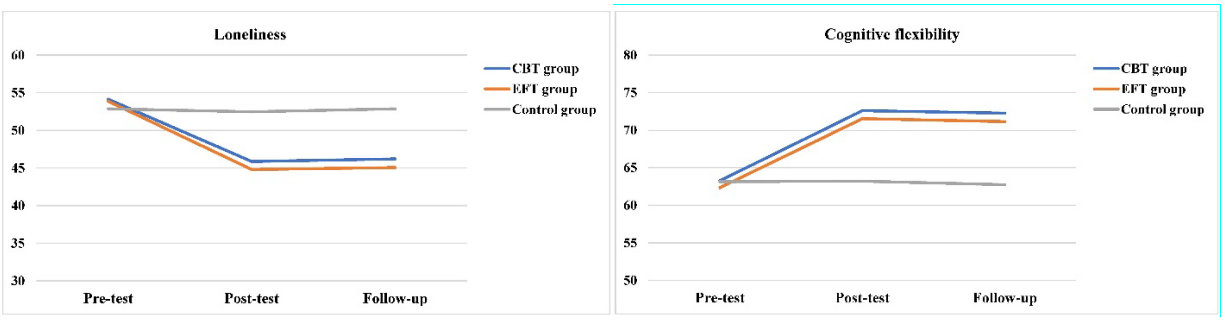

Figure 1. Change in loneliness and cognitive flexibility over time by group.

Data normality was assessed using the Shapiro-Wilk test, alongside skewness and kurtosis evaluations, confirming that loneliness and cognitive flexibility scores met normality assumptions across all groups and time points (P>0.05). Levene's test verified homogeneity of variance (P>0.05), and Mauchly's test confirmed sphericity (P>0.05), supporting the use of Repeated Measures ANOVA; Table 4 summarizes the Repeated Measures ANOVA results. For loneliness, significant effects were found for time (P<0.001), group-by-time interaction (P<0.001), and group (P=0.005), indicating substantial changes over time and differential effects across groups. For cognitive flexibility, significant effects were observed for time (P<0.001), group-by-time interaction (P<0.001), and group (P=0.003), confirming significant improvements and group differences.

Table 4. Repeated measures ANOVA results for loneliness and cognitive flexibility

Variable	Source	SS	df	MS	F	P	η^2
Loneliness	Time	992.45	2	534.10	496.23	0.001	0.97
	Group × Time	464.65	4	116.16	372.11	0.001	0.94
	Group	598.94	2	299.47	6.02	0.005	0.22
Cognitive Flexibility	Time	1083.60	1.42	758.98	1144.13	0.001	0.96
	Group × Time	570.62	2.85	199.84	301.25	0.001	0.93
	Group	1045.37	2	522.68	6.61	0.003	0.24

Bonferroni-corrected post-hoc tests (Table 5) revealed significant within-group changes. For loneliness, both CFT and EFT groups exhibited significant reductions from pre-test to post-test (P<0.001 for both) and pre-test to follow-up (P<0.001 for both). Changes between post-test and

follow-up were non-significant (CFT: P=0.883; EFT: P=0.563). Similarly, for cognitive flexibility, both intervention groups showed significant improvements from pre-test to post-test (P<0.001 for both) and pre-test to follow-up (P<0.001 for both), with stable gains thereafter (CFT: P=0.772; EFT: P=0.563). The control group showed no significant temporal changes in either variable (P>0.05).

Table 5. Within-group comparisons of loneliness and cognitive flexibility across time points

Variable	Time	CFT Group		EFT Group		Control Group	
		Mean Difference	P	Mean Difference	P	Mean Difference	P
Loneliness	Post-test and Pre-test	8.26	0.001	9.06	0.001	0.07	0.999
	Follow-up and Pre-test	7.93	0.001	8.81	0.001	0.40	0.613
	Follow-up and Post-test	0.33	0.883	0.26	0.563	0.40	0.610
Cognitive Flexibility	Post-test and Pre-test	9.33	0.001	9.20	0.001	0.06	0.99
	Follow-up and Pre-test	9.00	0.001	8.80	0.001	0.40	0.624
	Follow-up and Post-test	0.33	0.772	0.42	0.563	0.46	0.531

Table 6 presents the details of the between-group comparisons. At pre-test, no significant differences were evident across groups for either variable. At post-test and follow-up, both CFT and EFT groups exhibited significantly lower loneliness scores than that in the control group (all P<0.001). For cognitive flexibility, intervention groups significantly outperformed the control group at post-test (CFT vs. Control: P=0.011; EFT vs. Control: P<0.001) and follow-up (CFT vs. Control: P<0.001; EFT vs. Control: P<0.001). No significant differences were observed between CFT and EFT groups for any variable at any time point.

Table 6. Between-group comparisons of loneliness and cognitive flexibility across time points

Variable	Group	Pre-test		Post-test		Follow-up	
		Mean Difference	P	Mean Difference	P	Mean Difference	P
Loneliness	CFT and EFT	0.26	0.999	1.06	0.999	1.13	0.999
	CFT and Control	1.26	0.999	6.60	0.001	6.66	0.001
	EFT and Control	1.00	0.999	7.66	0.001	7.80	0.001
Cognitive Flexibility	CFT and EFT	0.93	0.999	1.06	0.999	1.13	0.999
	CFT and Control	0.13	0.999	9.40	0.011	9.53	0.001
	EFT and Control	0.90	0.999	8.33	0.001	8.41	0.001

Discussion

The present work investigated the effectiveness of EFT and CFT in the reduction of loneliness and improvement of cognitive flexibility among women with SUD. The findings strongly indicate that both therapeutic approaches significantly reduced reported loneliness and considerably enhanced cognitive flexibility in the intervention groups compared to the control group. These positive effects were sustained at the three-month follow-up, highlighting the lasting benefits of these interventions. In addition, no significant differences in efficacy were observed between EFT and CFT across any time point or variable, suggesting that both therapies are comparably effective for the measured outcomes.

The observed reduction in loneliness following both EFT and CFT aligns with theoretical expectations and previous research. Pervasive feelings of loneliness are a common, yet often unaddressed, vulnerability for individuals with SUD, frequently serving as a powerful trigger for relapse [21]. The EFT, by focusing on accessing, processing, and transforming core maladaptive emotions, enables individuals to confront the painful underlying feelings (e.g., abandonment and shame) that contribute to chronic loneliness [22]. Providing a safe space to experience and express these emotions helps clients reorganize their internal emotional experience, fostering a sense of self-connection and reducing the desperate search for external validation through substances.

Similarly, the CFT emphasizes cultivation of self-compassion, which directly counters the self-criticism and shame often associated with loneliness and addiction [9]. By developing a compassionate self-relationship, individuals become less reliant on external validation and better equipped to manage feelings of isolation, thereby diminishing the intensity of their loneliness and fostering healthier attachments. These findings are consistent with prior research, such as Kemmis et al. [22], which demonstrated that EFT facilitated significant reductions in emotional distress and loneliness among individuals with co-occurring SUD and post-traumatic stress disorder by promoting adaptive emotional processing. Similarly, Carlyle et al. [9] found that CFT effectively reduced feelings of isolation in individuals with opioid use disorder, highlighting the role of self-compassion in alleviating loneliness and supporting recovery.

The significant improvement in cognitive flexibility—the capacity to adapt thoughts and behaviors to changing situations—observed in both intervention groups is equally vital for recovery. Cognitive flexibility is often compromised in individuals with SUD, leading to rigid thinking and difficulty developing new coping strategies [23]; the EFT facilitates this by helping clients move beyond rigid emotional schemas, allowing for more adaptive processing of information and emotional experiences. When individuals are less overwhelmed by or avoidant of their emotions, they can engage more flexibly with their thoughts and behaviors, considering alternative actions rather than reverting to habitual substance use patterns [14].

The CFT contributes by fostering a compassionate and non-judgmental stance toward one's thoughts and feelings. This self-kindness reduces the threat response associated with internal distress, enabling a more open and flexible engagement with challenging thoughts and situations, thereby promoting a willingness to experiment with new, recovery-oriented behaviors [11]. These results align with research by Stellern et al. [13], which reported that EFT enhanced cognitive flexibility in individuals with SUD by fostering adaptive emotion regulation, enabling more flexible responses to stressors. Additionally, Ma et al. [11] demonstrated that CFT interventions improved cognitive flexibility among individuals with SUD, as self-compassion reduced rigid self-critical thought patterns, supporting the present study's findings.

The finding that EFT and CFT demonstrated comparable effectiveness is consistent with the notion that both are process-experiential therapies sharing common therapeutic factors, such as emphasizing emotional processing, experiential learning, and the therapeutic relationship. While their theoretical pathways diverge, both aim to foster healthier internal relationships and adaptive coping mechanisms, which are highly relevant for addressing complex issues like loneliness and cognitive rigidity in SUD [24, 25]. This issue suggests that the choice between EFT and CFT may depend more on client preference, therapist expertise, or specific clinical presentations, as both appear to offer robust benefits for the target outcomes. The sustained nature of the improvements at follow-up further reinforces their potential for fostering long-term recovery, highlighting their capacity to equip individuals with lasting psychological resources.

From a clinical standpoint, these findings underscore the critical importance of integrating psychologically informed interventions into comprehensive treatment programs for women with SUD. Addressing loneliness and enhancing cognitive flexibility through therapies like EFT and CFT can significantly bolster resilience, improve treatment engagement, and ultimately reduce the risk of relapse. These therapies provide invaluable tools for promoting adaptive emotional regulation and cognitive restructuring, which are foundational for sustained sobriety and improved quality of life.

The generalizability of this study is limited by its specific regional sample and reliance on self-report measures. The absence of a follow-up period beyond three months restricts conclusions about longer-term effects. Additionally, while the quasi-experimental design is robust, it does not permit full causal inference. Future research could benefit from larger, more diverse samples and extended follow-up assessments to evaluate the durability of treatment effects. Investigation of specific mechanisms of change within each therapy, the use of mixed-methods approaches, and the conduct of comparative effectiveness studies against other evidence-based therapies would also be valuable.

Conclusion

The present study unequivocally demonstrates the significant effectiveness of both EFT and CFT in the reduction of loneliness and enhancement of cognitive flexibility among women with SUD. These therapeutic benefits were not only immediate but also sustained at follow-up, proving substantially superior to the control condition. The comparable efficacy observed between EFT and CFT suggests that either approach offers a valuable pathway for addressing these critical psychological vulnerabilities. These findings underscore the vital role of psychologically informed interventions in fostering comprehensive recovery and improved adaptive functioning within this population.

Ethical Considerations

This study complied with the ethical standards approved by the Ethics Committee of Islamic Azad University of Ahvaz Branch, Ahvaz, Iran (Approval Code: IR.IAU.AHVAZ.REC.1404.052).

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Authors' Contributions

All authors were involved in drafting and revising the manuscript and take responsibility for its content.

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Conflicts of Interest

The authors declare that there is no conflicts of interest.

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