Effectiveness of Mindfulness-Based Cognitive Therapy and Schema Therapy on Emotion-Focused Coping Strategies and Craving in Individuals with Stimulant Substance Use Disorder

Abstract

Aims: The high relapse rate among individuals with stimulant use disorder necessitates effective psychological interventions to manage core challenges like craving and maladaptive coping strategies. this study aimed to compare the effectiveness of mindfulness-based cognitive therapy and schema therapy on emotion-focused coping strategies and craving in this population.

Materials & Methods: This clinical trial utilized an extensive pre-test, post-test, and follow-up design. The statistical population included all individuals with stimulant use disorder at residential centers in Ahvaz in 2024. A convenience sample of 45 individuals was selected and randomly assigned to two experimental groups (n=15 for mindfulness-based cognitive therapy schema therapy, n=15 for) and a control group (n=15) that received no treatment. Data were collected using the Lazarus and Coping Strategies Questionnaire and the Instantaneous Substance Craving Questionnaire. Both experimental groups participated in eight 90-minute sessions. Data were analyzed using repeated measures analysis of variance in SPSS software.

Findings: Both mindfulness-based cognitive therapy and schema therapy were effective in significantly reducing emotion-focused coping strategies and craving in the experimental groups, with these effects sustained at follow-up ($P<0.001$). While both approaches were equally effective on emotion-focused coping strategies, schema therapy demonstrated a relative superiority in reducing craving compared to mindfulness-based cognitive therapy.

Conclusion: Both mindfulness-based cognitive therapy and schema therapy are effective interventions for reducing emotion-focused coping strategies and craving in individuals with stimulant use disorder.

Keywords: Mindfulness-based cognitive therapy, Schema therapy, Coping strategies, Craving, Stimulant use disorder

Introduction

Stimulant use disorder, characterized by a pattern of compulsive use of substances like methamphetamine, cocaine, and prescription stimulants, poses a significant global public health crisis [1]. The prevalence of this disorder is on the rise, leading to devastating consequences for individuals, families, and communities. From a clinical perspective, individuals with stimulant use disorder often present with a range of severe psychological and behavioral challenges, including a high risk of relapse, cognitive impairment, emotional dysregulation, and social and occupational dysfunction [2, 3]. The chronic nature of the disorder and its high comorbidity with other mental health conditions, such as depression, anxiety, and personality disorders, further complicates treatment and recovery [4]. Effective interventions are therefore urgently needed to address the core mechanisms that perpetuate the cycle of addiction and relapse.

The ability to effectively manage stress and difficult emotional states is a critical determinant of successful recovery from addiction [5]. Coping strategies are the behavioral and psychological efforts individuals use to tolerate, reduce, or minimize stress. Research categorizes these strategies into two primary types: problem-focused and emotion-focused coping [6]. Problem-focused coping involves actively addressing the source of stress, while emotion-focused coping focuses on regulating the emotional response to stress. In individuals with stimulant use disorder, maladaptive coping patterns, such as avoidance, denial, and wishful thinking, are prevalent and strongly associated with continued substance use and relapse [7, 8]. The over-reliance on emotion-focused coping—which can often be avoidant and passive—is particularly relevant in this population. Therapeutic interventions, therefore, must aim to modify these ineffective emotion-focused strategies.

Craving is an intense desire or urge to use a substance and is recognized as a central feature of stimulant use disorder [9]. It is a powerful predictor of relapse, often triggered by a complex interplay of internal and external cues, including stress, emotional states, and environmental stimuli [10].

In Press

Craving is a multifaceted phenomenon with neurobiological, psychological, and behavioral components. From a psychological perspective, craving can be understood as a conditioned response that becomes ingrained through repeated substance use, making it a formidable obstacle to sustained abstinence [11]. Given its direct link to relapse, effective treatment for stimulant use disorder must include strategies specifically designed to manage and reduce the intensity and frequency of craving. Mindfulness-based cognitive therapy, originally developed to prevent depressive relapse, integrates mindfulness meditation practices with principles from cognitive therapy [12]. Mindfulness-based cognitive therapy teaches participants to become more aware of their thoughts, feelings, and bodily sensations, observing them without judgment. By cultivating this non-judgmental awareness, individuals can learn to disengage from automatic, habitual thought patterns and emotional reactions, including the intense urges associated with craving [13]. In the context of addiction, mindfulness-based cognitive therapy helps individuals to respond to triggers and cravings with mindful awareness rather than with an automatic, conditioned response of substance use [14]. This approach provides a practical framework for developing acceptance, self-compassion, and a non-reactive stance towards difficult internal experiences [15].

Schema therapy, developed by Jeffrey Young, is an integrative therapeutic approach that combines elements of cognitive-behavioral therapy, attachment theory, and gestalt therapy [16]. Schema therapy targets deeply ingrained, pervasive cognitive and emotional patterns, known as early maladaptive schemas, which are believed to originate in childhood due to unmet core needs [17]. These schemas often lead to maladaptive coping styles that manifest in adulthood, particularly in individuals with chronic mental health conditions and substance use disorders [18]. By identifying and modifying these schemas, schema therapy aims to create fundamental and lasting changes in an individual's thoughts, feelings, and behaviors, thereby improving emotional regulation, coping skills, and reducing the psychological vulnerabilities that drive substance use [19, 20].

Despite the acknowledged effectiveness of various psychological interventions for stimulant use disorder, a gap remains in the literature regarding a direct comparison of mindfulness-based cognitive therapy and schema therapy on key clinical outcomes like emotion-focused coping and craving. Both interventions offer unique but potentially complementary mechanisms for change. While schema therapy focuses on addressing core psychological vulnerabilities, mindfulness-based cognitive therapy provides a powerful set of skills for present-moment awareness and non-reactivity. The current research is thus necessary to systematically compare these two distinct but promising therapeutic modalities. The findings will provide valuable insights for clinicians, enabling them to make more informed decisions when selecting an evidence-based intervention. Therefore, the primary objective of this study was to compare the effectiveness of mindfulness-based cognitive therapy and schema therapy on emotion-focused coping strategies and craving in individuals with stimulant use disorder.

Materials and Methods

Design and Participants

This study employed a clinical trial design with an extensive pre-test, post-test, and follow-up structure to compare the effectiveness of two therapeutic interventions. The statistical population included all individuals with stimulant use disorder who were referred to residential treatment centers in Ahvaz in 2024. From this population, a convenience sample of 45 individuals was selected and randomly assigned to three groups of 15 each: two experimental groups (mindfulness-based cognitive therapy and schema therapy) and one control group that received no treatment. Inclusion criteria for participation were: a diagnosis of stimulant use disorder based on the DSM-5, an age range of 20 to 45 years, at least basic literacy, and the absence of severe psychiatric illnesses such as schizophrenia or bipolar disorder. Exclusion criteria included missing more than two therapy sessions or a relapse into substance use during the study period. Before the study commenced, ethical considerations were meticulously followed, including obtaining informed consent from all participants and ensuring the complete confidentiality of their personal information.

Procedure

After participants were assigned to their respective groups, a pre-test was administered to all three groups to collect baseline data. The experimental groups (mindfulness-based cognitive therapy and schema therapy) then received their respective interventions over eight weekly 90-minute sessions. The control group received no treatment during this period. Following the completion of the sessions, a post-test was administered to all three groups. Finally, follow-up data were collected one month

In Press

after the intervention concluded. The content of the sessions for both interventions is summarized in Table 1.

Table 1. Summary of schema therapy and mindfulness-based cognitive therapy session programs

Session	Mindfulness-based cognitive therapy sessions	Schema therapy sessions
1	Introduction to the concept of mindfulness and the "autopilot" state; practicing the "body scan" exercise.	Introduction to the schema therapy model, the concept of early maladaptive schemas, and setting therapeutic goals.
2	Practicing mindful focus on breathing and awareness of thought patterns; accepting and letting go of thoughts.	Identifying internalized maladaptive schemas and their connection to childhood experiences.
3	Practicing mindfulness in daily activities (e.g., eating and walking) and awareness of momentary sensations.	Exploring ineffective coping styles (avoidance, overcompensation, and surrender) and their link to craving.
4	Mindfully managing difficult thoughts, emotions, and cravings without judgment.	Practicing cognitive techniques to challenge schema-related thoughts and cravings.
5	Focusing on acceptance and allowing unpleasant experiences, including cravings, to be present without reacting.	Using experiential techniques (e.g., imagery) to connect with emotions.
6	Exploring how mindfulness relates to stress management and effective coping strategies.	Practicing new behavioral skills to cope with craving and activate healthy schemas.
7	Practicing self-compassion and discussing challenges to continuing practice.	The concept of the "limited reparenting" and practicing it to meet unmet core needs.
8	Review of principles and practices, and explaining the importance of mindfulness for relapse prevention and sustained recovery.	Review of key concepts, relapse prevention, and developing a plan for future life without substance use.

Research Instruments

Ways of Coping Questionnaire (WCQ)

This is a widely used instrument for measuring coping strategies, consisting of 66 items scored on a 4-point Likert scale (0=not at all, 3=a great deal). It assesses two main coping strategies: problem-focused coping and emotion-focused coping. In this study, only the emotion-focused subscale, which contains 40 items, was utilized to measure the dependent variable. The score range for this subscale is from 0 to 120, with higher scores indicating greater use of emotion-focused strategies [21]. In Farsi-language studies, the Cronbach's alpha for this questionnaire is typically reported as above 0.85 [22]. In the present study, the overall reliability of the questionnaire was found to be 0.89 using Cronbach's alpha.

Instantaneous Substance Craving Questionnaire (ISCQ)

This 14-item questionnaire is designed to evaluate the intensity and frequency of craving over a specific time period. The items cover components such as intensity of desire, thinking about substance use, and planning to use. Responses are scored on a 4-point Likert scale (1=strongly disagree to 4=strongly agree), with scores ranging from 14 to 56. Higher scores indicate more severe craving [23]. This tool is widely used in clinical settings due to its brevity and accuracy. In previous studies, the reliability of this questionnaire was reported with a Cronbach's alpha of approximately 0.90 [24]. In the present study, the Cronbach's alpha for this instrument was 0.87, demonstrating its acceptable reliability.

Data Analysis

The collected data were analyzed using Repeated Measures Analysis of Variance (Repeated Measures ANOVA) in SPSS software, version 26. This method was used to compare the mean scores of the groups across three time points: pre-test, post-test, and follow-up.

Findings

In Press

The study included 45 male participants diagnosed with stimulant use disorder. Their average age was 32.5 years (SD=6.8), ranging from 20 to 45 years. Educational levels differed, with 40% having completed high school, 35% holding a diploma or equivalent qualification, and 25% having obtained higher education degrees. On average, participants had been using stimulants for 5.2 years (SD=3.1) and had undergone 1.8 previous treatment attempts (SD=1.2).

Table 2 displays the mean scores and standard deviations for emotion-focused coping and craving for the mindfulness-based cognitive therapy group, schema therapy group, and control group at pre-test, post-test, and follow-up. For emotion-focused coping, the mindfulness-based cognitive therapy group exhibited a decline from a pre-test mean of 56.73 (SD=4.74) to 48.26 (SD=4.90) at post-test, with a follow-up mean of 48.53 (SD=4.92). The schema therapy group showed a reduction from 58.66 (SD=4.33) at pre-test to 50.86 (SD=4.50) at post-test, with a follow-up mean of 54.00 (SD=4.29). The control group displayed minimal variation, with means of 56.33 (SD=4.79), 55.80 (SD=5.36), and 56.26 (SD=5.50) across the three phases. For craving, the mindfulness-based cognitive therapy group's mean decreased from 62.60 (SD=5.22) at pre-test to 54.73 (SD=5.20) at post-test, stabilizing at 55.33 (SD=4.70) at follow-up. The schema therapy group demonstrated a more substantial reduction, from 65.73 (SD=5.67) at pre-test to 53.13 (SD=5.75) at post-test, and 53.53 (SD=5.61) at follow-up. The control group's craving scores remained largely unchanged, with means of 61.06 (SD=6.04), 61.13 (SD=5.87), and 61.26 (SD=5.88). These findings suggest that both mindfulness-based cognitive therapy and schema therapy effectively reduced both outcomes, with effects sustained at follow-up, whereas the control group showed no notable improvements.

Table 2. Descriptive statistics for emotion-focused coping and craving across intervention groups and time points

Variable	Stage	Mindfulness-based cognitive therapy	Schema therapy	Control
		Mean ± SD	Mean ± SD	Mean ± SD
Emotion-focused coping	Pre-test	56.73 ± 4.74	58.66 ± 4.33	56.33 ± 4.79
	Post-test	48.26 ± 4.90	50.86 ± 4.50	55.80 ± 5.36
	Follow-up	48.53 ± 4.92	54.00 ± 4.29	56.26 ± 5.50
Craving	Pre-test	62.60 ± 5.22	65.73 ± 5.67	61.06 ± 6.04
	Post-test	54.73 ± 5.20	53.13 ± 5.75	61.13 ± 5.87
	Follow-up	55.33 ± 4.70	53.53 ± 5.61	61.26 ± 5.88

Table 3 presents the results of the repeated measures ANOVA, evaluating the effects of time, group, and their interaction on emotion-focused coping and craving. For emotion-focused coping, a significant main effect of time was observed (F=438.79, P<0.001, η^2=0.91), indicating significant changes across the assessment phases. The group-by-time interaction was also significant (F=98.30, P<0.001, η^2=0.82), suggesting that the interventions had distinct effects over time. The main effect of group was significant (F=14.06, P<0.001, η^2=0.40), highlighting differences across the groups. For craving, a significant main effect of time was found (F=660.00, P<0.001, η^2=0.94), with a significant group-by-time interaction (F=200.83, P<0.001, η^2=0.90) and a significant group effect (F=22.70, P<0.001, η^2=0.51). The large effect sizes indicate the robust impact of mindfulness-based cognitive therapy and schema therapy, with the interaction effects demonstrating that the changes in outcomes differed significantly between the intervention groups and the control group across time points.

Table 3. Repeated measures ANOVA results for emotion-focused coping and craving outcomes

Variable	Source	SS	df	MS	F	P	η^2
Emotion-focused coping	Time	894.77	1.39	637.71	438.79	0.001	0.91
	Group × Time	40.91	2.78	98.30	98.30	0.001	0.82
	Group	553.17	2	14.06	14.06	0.001	0.40
Craving	Time	1314.41	1.44	909.22	660.00	0.001	0.94
	Group × Time	799.94	2.89	276.67	200.83	0.001	0.90
	Group	398.63	2	199.31	22.70	0.001	0.51

Table 4 details the within-group mean differences and their statistical significance for emotion-focused coping and craving across pre-test, post-test, and follow-up. For emotion-focused coping, the mindfulness-based cognitive therapy group exhibited significant reductions from pre-test to post-test (mean difference=8.46, P<0.001) and from pre-test to follow-up (mean difference=8.20,

In Press

P<0.001), with no significant change between post-test and follow-up (mean difference=0.26, P=0.820). The schema therapy group showed comparable reductions from pre-test to post-test (mean difference=7.80, P<0.001) and pre-test to follow-up (mean difference=7.66, P<0.001), with no significant change from post-test to follow-up (mean difference=0.13, P=0.999). The control group showed no significant changes across any phase (P>0.05). For craving, the mindfulness-based cognitive therapy group demonstrated significant reductions from pre-test to post-test (mean difference=7.86, P<0.001) and pre-test to follow-up (mean difference=7.26, P<0.001), with no significant change from post-test to follow-up (P=0.282). The schema therapy group exhibited larger reductions from pre-test to post-test (mean difference=12.60, P<0.001) and pre-test to follow-up (mean difference=12.20, P<0.001), with no significant change between post-test and follow-up (P=0.403). The control group showed no significant changes (P>0.05). These results confirm that both interventions produced significant and sustained improvements in emotion-focused coping and craving.

Table 4. Within-group comparisons of emotion-focused coping and craving across assessment phases

Variable	Time	Mindfulness-based cognitive therapy		Schema therapy		Control	
		Mean Difference	P	Mean Difference	P	Mean Difference	P
Emotion-focused coping	Post-test and Pre-test	8.46	0.001	7.80	0.001	0.53	0.481
	Follow-up and Pre-test	8.20	0.001	7.66	0.001	0.06	0.999
	Follow-up and Post-test	0.26	0.820	0.13	0.999	0.46	0.183
Craving	Post-test and Pre-test	7.86	0.001	12.60	0.001	0.06	0.999
	Follow-up and Pre-test	7.26	0.001	12.20	0.001	0.20	0.999
	Follow-up and Post-test	0.60	0.282	0.40	0.403	0.13	0.999

Table 5 summarizes the between-group comparisons for emotion-focused coping and craving at each assessment phase. For emotion-focused coping, no significant differences were found between the mindfulness-based cognitive therapy and schema therapy groups at pre-test (mean difference=1.93, P=0.771), post-test (mean difference=1.60, P=0.474), or follow-up (mean difference=1.46, P=0.534), indicating similar efficacy. Both intervention groups significantly outperformed the control group at post-test (mindfulness-based cognitive therapy vs. control: mean difference=7.53, P<0.001; schema therapy vs. control: mean difference=5.93, P<0.001) and follow-up (mindfulness-based cognitive therapy vs. control: mean difference=7.73, P<0.001; schema therapy vs. control: mean difference=6.26, P<0.001). For craving, no significant difference was observed between mindfulness-based cognitive therapy and schema therapy at pre-test (mean difference=3.13, P=0.412), but schema therapy showed a statistically significant advantage at post-test (mean difference=5.60, P=0.013) and follow-up (mean difference=5.80, P=0.024). Both interventions significantly reduced craving compared to the control group at post-test (mindfulness-based cognitive therapy vs. control: mean difference=6.40, P<0.001; Schema Therapy vs. control: mean difference=12.00, P<0.001) and follow-up (mindfulness-based cognitive therapy vs. control: mean difference=5.93, P=0.011; Schema Therapy vs. control: mean difference=11.73, P<0.001). These findings underscore the effectiveness of both interventions, with schema therapy demonstrating a slight superiority in reducing craving.

Table 5. Between-group comparisons of emotion-focused coping and craving across assessment phases

Variable	Groups	Pre-test		Post-test		Follow-up	
		Mean Difference	P	Mean Difference	P	Mean Difference	P
Emotion-focused coping	Schema therapy and Mindfulness-based cognitive therapy	1.93	0.771	1.60	0.474	1.46	0.534
	Schema therapy and Control	2.33	0.523	5.93	0.001	6.26	0.001
	Mindfulness-based cognitive therapy and Control	0.40	0.999	7.53	0.001	7.73	0.001

In Press

Craving	Schema therapy and Mindfulness-based cognitive therapy	3.13	0.412	5.60	0.013	5.80	0.024
	Schema therapy and Control	4.66	0.09	12.00	0.001	11.73	0.001
	Mindfulness-based cognitive therapy and Control	1.53	0.999	6.40	0.001	5.93	0.011

Discussion

The findings of this clinical trial provide robust evidence for the efficacy of both mindfulness-based cognitive therapy and schema therapy in addressing two critical dimensions of stimulant use disorder: emotion-focused coping strategies and craving. Both interventions significantly reduced these outcomes compared to the control group, with effects sustained at the one-month follow-up, underscoring their potential as durable, non-pharmacological treatment options. These results align with the hypothesis that targeting maladaptive emotional regulation and craving can disrupt the cycle of addiction, offering valuable insights for clinical practice and future research.

The primary finding regarding the reduction of emotion-focused coping strategies in the treatment groups aligns with the hypothesis that addiction often serves as a maladaptive strategy for managing difficult emotions. Emotion-focused coping strategies, such as avoidance and denial, often lead to a temporary suppression of emotional distress rather than a fundamental resolution of the problem, which in turn reinforces craving and the risk of relapse [8]. Our results indicate that both interventions effectively help individuals shift away from these ineffective patterns and confront their emotions in a more adaptive manner. This finding is consistent with prior research showing that mindfulness-based interventions can improve emotional regulation skills and reduce automatic reactions to negative emotions [25, 26]. Specifically, mindfulness-based cognitive therapy facilitates the development of non-judgmental awareness, enabling individuals to observe emotional triggers without resorting to maladaptive coping mechanisms. Similarly, schema therapy addresses the underlying schemas that perpetuate these ineffective strategies, fostering healthier emotional processing through cognitive restructuring and experiential techniques. The comparable efficacy of both interventions in reducing emotion-focused coping (as shown in Table 5, with no significant differences between mindfulness-based cognitive therapy and schema therapy at post-test or follow-up) suggests that they target overlapping mechanisms of emotional regulation, albeit through distinct therapeutic pathways.

The significant reduction in craving across both experimental groups is a critical finding, given craving's role as a primary driver of relapse in stimulant use disorder [11]. The observed superiority of schema therapy over mindfulness-based cognitive therapy in reducing craving may be attributed to its focus on early maladaptive schemas, which are deeply rooted cognitive and emotional patterns often linked to chronic vulnerabilities in addiction [19, 27]. Schema therapy's integrative approach, combining cognitive, behavioral, and experiential techniques, likely addresses the multifaceted nature of craving, including its emotional and developmental origins. For instance, techniques such as imagery rescripting and limited reparenting may help reframe the emotional triggers that exacerbate craving, offering a more profound restructuring of maladaptive patterns compared to mindfulness-based cognitive therapy's emphasis on present-moment awareness [18, 28]. Mindfulness-based cognitive therapy, while effective, primarily targets the immediate experience of craving through mindfulness practices, which may be less intensive in addressing longstanding psychological vulnerabilities [14, 15]. This difference is supported by prior studies, such as Seyedasiaban et al. [28], which reported greater efficacy of schema therapy over mindfulness-based approaches in reducing psychosomatic symptoms in stimulant users.

The sustained effects of both interventions at the one-month follow-up highlight their potential for long-term impact. The lack of significant changes between post-test and follow-up (Table 4, $P>0.05$ for both interventions) suggests that the skills and insights gained during the eight-week programs were retained, potentially reducing the likelihood of relapse. For mindfulness-based cognitive therapy, this durability may stem from the cultivation of mindfulness skills that participants can continue to apply in daily life, fostering resilience against craving and emotional distress [13]. For schema therapy, the focus on modifying core schemas and developing adaptive coping strategies may create lasting changes in how individuals perceive and respond to stressors [20]. These findings are

In Press

consistent with meta-analyses indicating that both mindfulness-based interventions and schema therapy yield sustained benefits in addiction treatment [14, 19].

From a clinical perspective, these results suggest that both mindfulness-based cognitive therapy and schema therapy are viable options for treating stimulant use disorder, with schema therapy potentially offering an advantage for individuals with intense craving driven by deep-seated emotional patterns. Clinicians may consider tailoring treatment based on patient characteristics, such as the presence of personality disorders or trauma, which may align more closely with schema therapy's schema-focused approach [18]. Conversely, mindfulness-based cognitive therapy may be more suitable for individuals seeking practical, skill-based interventions to manage acute craving and stress [15]. The complementary nature of these therapies also raises the possibility of integrating elements of both approaches, such as combining mindfulness practices with schema-focused techniques, to maximize therapeutic outcomes.

This study underscores the efficacy of mindfulness-based cognitive therapy and schema therapy as evidence-based interventions for reducing emotion-focused coping strategies and craving in individuals with stimulant use disorder. The findings contribute to the growing literature on non-pharmacological treatments for addiction, highlighting the potential of both therapies to address core psychological mechanisms of relapse. By offering clinicians evidence to guide treatment selection, this research supports the development of personalized, effective interventions for stimulant use disorder.

This study has some limitations that should be considered when generalizing the results. The relatively small sample size and the use of convenience sampling may limit the generalizability of the findings to other populations. Additionally, the study was focused solely on male participants, and it is recommended that future research include diverse age and gender groups. Further limitations include the short follow-up period of one month, which restricts insights into the long-term efficacy of these interventions, and the lack of assessment of co-occurring mental health conditions, which could influence treatment outcomes [4]. Future studies should employ larger, more diverse samples, extend follow-up durations, and explore the moderating effects of comorbidities. Additionally, investigating the specific mechanisms of change (e.g., schema modification in schema therapy or mindfulness skill acquisition in mindfulness-based cognitive therapy) could clarify why schema therapy showed a slight advantage in reducing craving.

Conclusion

The findings of this study demonstrate that both schema therapy and mindfulness-based cognitive therapy are effective interventions for reducing emotion-focused coping strategies and craving in individuals with stimulant use disorder. This effectiveness was sustained at the one-month follow-up, suggesting the durability of the therapeutic effects. While both approaches were equally effective in improving emotion-focused coping strategies, schema therapy showed a relative superiority in reducing craving. These results underscore the importance of both therapies as viable non-pharmacological options for managing key symptoms of stimulant use disorder and can inform clinical decision-making.

In Press