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Comparative Effects of Cognitive Bias Modification and MBCT on Cognitive Avoidance and Negative Self-Talk in University Students with Social Anxiety

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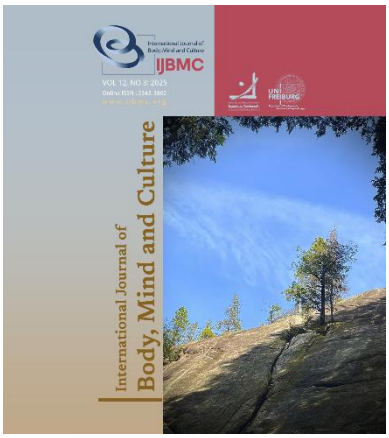

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ABSTRACT

Objective: This study aimed to compare the effectiveness of CBM and MBCT in reducing cognitive avoidance and negative self-talk in students with social anxiety disorder.

Methods and Materials: A quasi-experimental pre-test–post-test control group design was employed, using 60 students diagnosed with social anxiety disorder selected from Farhangian University (Shiraz, 2022–23). The students were randomly assigned to three groups (CBM, MBCT, and control; n = 20 per group). The CBM group received seven 90-minute sessions, and the MBCT group received eight sessions. The Social Anxiety Questionnaire (Connor et al., 2000), Cognitive Avoidance Questionnaire (Sexton & Dugas, 2004), and Self-Talk Scale (Calvete et al., 2005) were administered. Data were analyzed using ANCOVA and Bonferroni post hoc tests.

Findings: Both interventions significantly reduced cognitive avoidance and negative self-talk compared to the control group ($p < 0.001$). There was no statistically significant difference in effectiveness between CBM and MBCT. The largest effect sizes were observed in the reduction of total cognitive avoidance ($\eta^2 = .54$) and negative self-talk ($\eta^2 = .63$).

Conclusion: CBM and MBCT are equally effective interventions for reducing maladaptive cognitive patterns in students with social anxiety. These findings suggest that both approaches may be valuable tools for university counseling centers aiming to address anxiety-related cognitive distortions.

Keywords: Social anxiety, CBM, MBCT, Cognitive Avoidance, Negative Self-talk.

Introduction

Social anxiety disorder, as one of the most prevalent psychological disorders, significantly affects an individual's functioning and is characterized by an intense and noticeable fear of being evaluated by others in social situations. According to DSM-5-TR, this disorder involves a severe fear or anxiety concerning one or more social situations where the individual is exposed to scrutiny by others. Examples include social interactions, being observed, or performing in front of others (Chelbianlou et al., 2018). Entering university requires young adults to undergo numerous changes in expectations and social roles, which often involve stress and anxiety, affecting their performance and efficiency (Kim et al., 2022). In social anxiety disorder, the fear of

rejection and criticism is a key aspect. The 12-month prevalence of this disorder among adults has been reported to range between 2% and 5% (Chelbianlou et al., 2018).

Some individuals attempt to reduce their anxiety by avoiding negative emotional experiences. Cognitive avoidance is a type of cognitive strategy used by individuals to escape the worries and anxiety associated with social situations. It encompasses various mental strategies through which individuals alter their thoughts during social interactions (Froböse & Cools, 2018). Cognitive avoidance is a cognitive strategy used by psychologically vulnerable individuals to process information in challenging situations. Through this strategy, they attempt to modify their thoughts and perceptions to alleviate environmental concerns (Hong et al., 2017). However, cognitive avoidance impedes effective responses to emotional stimuli and the appropriate management of emotions (Naoko et al., 2022).

A fundamental principle in preventing and treating any disorder is the identification of its contributing and sustaining factors, enabling more effective management. Emotional-cognitive theorists argue that biases in information processing play a decisive role in the persistence and potentially the development of anxiety and mood disorders. Among these factors, self-talk is considered a crucial element in the emergence and maintenance of emotional problems (Alavi et al., 2013).

Self-talk in adults is regarded as a form of internal dialogue. According to Aristotle, thinking is equivalent to internal speech, and self-talk is a narrative feature of the mind (Zhu et al., 2017). Vygotsky viewed self-talk as a series of verbal statements that influence behavioral regulation through cognitive mediation (Simsek & Serin, 2017). Self-talk can be either positive (thoughts with a positive impact) or negative (thoughts with an adverse effect) (Carr et al., 2019). Negative self-talk increases self-doubt and anxiety in learning, ultimately leading to lower performance. Negative self-talk refers to statements that involve self-criticism and obsessive thinking, significantly impacting psychological functioning. It is particularly evident in anxious children, as studies have shown that children with higher situational anxiety exhibit more negative self-talk than those with lower anxiety (Dana, 2018).

Mindfulness-based cognitive-behavioral therapy (MBCT) improves resilience against automatic negative thoughts by modifying maladaptive thinking patterns and teaching attention control skills. This approach allows individuals to perceive automatic negative thoughts as transient rather than absolute realities (Carr et al., 2019). Various studies have highlighted the positive impact of MBCT on multiple psychological factors, demonstrating its effectiveness in reducing aggression, depression, and anxiety (Zahedi et al., 2023).

Cognitive theories of anxiety propose that biases in information processing play a fundamental role in the etiology and persistence of emotional disorders. Cognitive bias refers to the phenomenon of selective attention in information processing, where individuals focus on certain environmental stimuli while ignoring others (Arsanjani et al., 2021). These biases are automatic processes that persist despite being contrary to individuals' conscious goals (Wiers & Wiers, 2017). Cognitive bias modification (CBM) refers to a set of training tasks designed to alter automatic or impulsive responses to stimuli associated with a disorder. CBM training is typically administered via computer programs and aims to retrain cognitive biases through extensive practice rather than explicit instruction (Koster et al., 2009). It focuses on modifying automatic cognitive processes such as attention and interpretation, which contribute to psychological distress (Pakizeh et al., 2024; Pchajek et al., 2022).

Several studies have examined the effectiveness of cognitive-behavioral therapy (CBT) and CBM in treating cognitive avoidance, emotional regulation, and negative self-talk. Afshar, Asghari Pourzahmati, and Alidousti (2024) found significant differences in rumination, emotional regulation, and cognitive avoidance between test and control groups (Afshar et al., 2024). Similarly, Esoudi Ghosheh Gonbadi, Bakhshipoor, and Akbari Amraghan (2023) concluded that both MBCT and behavioral activation therapy effectively reduced cognitive avoidance and improved emotional regulation, with no significant differences in their effectiveness (Esoudi Ghosheh Gonbadi et al., 2023). Research by Shahini, Ghorbani Nejad, Kamkar, and Naeem Abadi (2023) indicated that MBCT significantly reduced cognitive avoidance and maladaptive cognitive emotion regulation strategies, while increasing adaptive cognitive emotion regulation strategies, as measured in

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post-test assessments (Shahini et al., 2023). Pimbari, Mansoubi Far, Hovasi Soumar, Tari Moradi, and Balyad (2022) found that participating in MBCT sessions significantly reduced negative automatic thoughts, rumination, and self-criticism in students who had experienced emotional failure (Pimbari et al., 2022).

Moreover, studies by Salmani et al. (2020) compared the effectiveness of mindfulness training and attention bias modification in reducing social anxiety in female students. The results demonstrated that both methods were effective, though mindfulness-based stress reduction was more beneficial due to its group-based implementation and continuous home assignments (Salmani Choulabi et al., 2020). Zeinali (2018) found that mindfulness improved irrational beliefs, self-talk, and self-regulation (Zeinali, 2018). Similarly, Tarkhan (2018) highlighted the effectiveness of MBCT in reducing negative automatic thoughts and aggression among students (Tarkhan, 2018). Additionally, research by Ebrahimi, Moheb, and Alivani Vafa (2024) indicated that both CBT and acceptance and commitment therapy significantly impacted cognitive distortions and rumination in adolescents (Ebrahimi et al., 2024).

Various studies investigating CBT and CBM suggest that, given the consequences of disorders like social anxiety and cognitive avoidance, finding effective treatments and preventive strategies for behavioral and cognitive impairments remains a crucial research focus. Several interventions have been employed to treat these disorders, including MBCT and CBM. The widespread prevalence of social anxiety, along with its psychological, emotional, and economic burdens on individuals and society, highlights the necessity of exploring explanatory models and therapeutic approaches for this disorder (Mirzaei et al., 2023). Social anxiety disorder among students manifests in issues such as low self-confidence, feelings of embarrassment, difficulties in relationships with roommates and peers, and discomfort in university settings. As a social condition, it remains a critical issue among university students (Arai et al., 2022). Social anxiety disorder is considered one of the most impactful conditions in psychopathology, increasingly recognized as a public health concern in recent years (Mohammadyfar et al., 2018).

Most previous studies have either examined the effects of these treatments separately or, in limited cases, combined both methods, but with restricted treatment protocols. There is a noticeable gap in the number of sessions, treatment duration, and content in these studies. No comprehensive research has been conducted in Iran to address these limitations while enriching the treatment process. Therefore, this study aims to compare two therapeutic approaches—CBT and CBM—to systematically target behavioral outcomes and various factors, including social anxiety and cognitive avoidance, to enhance the effectiveness of treatments for these disorders.

In conclusion, despite extensive research on social anxiety disorder, the lack of a comprehensive and integrative approach to its underlying factors has limited the ability to assist affected individuals in alleviating symptoms and preventing relapse. Thus, this study seeks to answer the question: Is there a difference in the effectiveness of cognitive bias modification therapy and mindfulness-based cognitive-behavioral therapy on cognitive avoidance and negative self-talk in students with social anxiety?

Methods and Materials

Study Design and Participants

This study employed a quasi-experimental design with pre-test, post-test, and control group phases to compare the effectiveness of Cognitive Bias Modification (CBM) and Mindfulness-Based Cognitive-Behavioral Therapy (MBCT) on cognitive avoidance and negative self-talk in students diagnosed with social anxiety disorder. A follow-up assessment was also conducted four weeks after the post-test to evaluate the durability of treatment effects.

The statistical population consisted of all students diagnosed with social anxiety disorder at Farhangian University in Shiraz during the 2022–23 academic year. Following a public call for participation in group therapy, 60 eligible students were recruited through purposive sampling. Eligibility was established using the Social Phobia Inventory, with a cut-off score of 19 or higher, followed by a clinical interview conducted by licensed psychologists based on DSM-5 criteria. Participants were randomly assigned to one of three groups: the CBM group (n = 20), the MBCT group (n = 20), or a no-treatment control group (n = 20). Randomization was performed using a computer-generated sequence by an independent researcher to reduce selection bias.

Inclusion criteria were: (1) diagnosis of social anxiety disorder according to DSM-5; (2) age between 20 and 40 years; (3) no current use of psychiatric medications or psychological treatment; (4) no major psychiatric or organic disorders (e.g., psychosis); (5) no history of substance abuse; (6) ability to attend at least six of the eight sessions. Exclusion criteria included: (1) more than two absences from therapy sessions; (2) withdrawal from the study; (3) participation in concurrent psychological interventions; and (4) failure to complete the post-test or follow-up assessments.

After initial screening and informed consent, participants completed baseline questionnaires (pre-test). The interventions were conducted over a 7– to 8-week period, depending on the group allocation. All assessments (pre-test, post-test, and 4-week follow-up) were conducted in person and administered by blinded research assistants to avoid bias. Participants in the control group did not receive any intervention during the study period but were assessed at the same intervals (pre-test, post-test, and follow-up). They were offered the opportunity to participate in therapy after completing the study.

Instruments

Social Anxiety Scale: This self-report scale, developed by Connor et al. (2000), consists of 17 items rated on a 5-point Likert scale (1 = "very little," 5 = "very much"). A higher score indicates greater social anxiety. The scale includes three subscales: fear (6 items), avoidance (7 items), and physiological discomfort (4 items). The total social anxiety score is obtained by summing all responses. Connor et al. (2000) confirmed the factor structure of the scale for screening social anxiety disorder. The test-retest reliability over a two-week period was reported as 0.78, and Cronbach's alpha was 0.94. A cut-off score of 19 distinguishes individuals with social anxiety disorder. The psychometric properties, including internal consistency, test-retest reliability, convergent and divergent validity, and sensitivity to clinical changes, have been validated. Construct validity was assessed by correlating the items with four scales: the Social Phobia subscale of the Symptom Checklist-90-Revised (SCL-90-R), the Cognitive Errors Questionnaire (CEQ), the Self-Esteem Rating Scale (SERS), and the Multidimensional Body-Self Relations Questionnaire (MBRSQ). Exploratory and confirmatory factor analyses were conducted to validate the SPIN scale (Ebrahimi et al., 2024). In the present study, Cronbach's alpha for the total social anxiety score was 0.90.

Cognitive Avoidance Questionnaire (CAQ): Developed by Sexton and Dugas (2004), this questionnaire comprises 25 items that measure cognitive avoidance across five dimensions: thought suppression, replacing worrying thoughts with positive ones, attentional distraction, avoidance of worry-inducing situations, and converting mental images into verbal thoughts. It is rated on a 5-point Likert scale (1 = completely false, 5 = completely true). Hamidpour, Andouz, and Akbari (2008) reported a Cronbach's alpha of 0.86. The overall cognitive avoidance reliability was 0.91, with subscale reliabilities ranging from 0.71 to 0.90. The validity of the scale was confirmed through its correlation with the White Bear Suppression Inventory (correlation coefficient = 0.48) (Afshar et al., 2024; Shahini et al., 2023).

Calvete Self-Talk Questionnaire: Developed by Calvete et al. (2005), this self-report tool assesses positive and negative self-talk in adults. The questionnaire includes two subscales: positive and negative self-talk. Cronbach's alpha for negative self-talk was reported as 0.90, and for positive self-talk, 0.80. Convergent validity was demonstrated through significant correlations between self-talk scores and measures of depression, anxiety, and stress. Participants were asked to imagine specific situations and rate 52 statements on a 4-point Likert scale. The total score for negative self-talk (ranging from 26 to 104) indicates the frequency and severity of negative self-statements. This study focused only on negative self-talk. Calvete et al. (2005) determined that in clinical populations, a negative self-talk score of 60 or higher was standard. The validity and reliability of this questionnaire in Iran were confirmed by Jolai Majidi (2014) and Alavi et al. (2013), with Cronbach's alpha of 0.81 for negative self-talk and 0.72 for positive self-talk. Additionally, negative self-talk showed significant positive correlations with depression and anxiety (Dana, 2018; Zeinali, 2018).

Interventions

Cognitive Bias Modification (CBM): Participants in the CBM group received seven 90-minute sessions focused on modifying cognitive distortions related to social anxiety. The intervention was based on the dot-probe task, designed to shift participants' attention away from

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threatening stimuli toward neutral stimuli. The proportion of neutral-target trials was gradually increased across sessions from 80% to 100%, following protocols adapted from Koster et al. (2009) and Khodadadi et al. (2021). The training used stimuli (words) validated by content experts using Lawshe's CVR method (CVR = 0.91). A pilot study with 10 participants ensured the appropriateness of stimulus valence. Sessions were delivered individually using a computerized task, with increasing difficulty and attentional redirection.

Session 1: Participants completed the dot probe task with 80% neutral stimulus responses.

Session 2: Participants completed the dot probe task with 80% neutral stimulus responses.

Session 3: Participants completed the dot probe task with 85% neutral stimulus responses.

Session 4: Participants completed the dot probe task with 90% neutral stimulus responses.

Session 5: Participants completed the dot probe task with 95% neutral stimulus responses.

Session 6: Participants completed the dot probe task with 100% neutral stimulus responses.

Session 7: Participants completed the dot probe task with 100% neutral stimulus responses.

Mindfulness-Based Cognitive-Behavioral Therapy (MBCT): Participants in the MBCT group attended eight 90-minute group sessions based on the Fleming and Kokoski (2007) protocol, tailored to the needs of socially anxious students. The intervention emphasized core mindfulness and CBT techniques, including attention control, acceptance, emotional regulation, and interpersonal effectiveness.

Session 1: Introduction, pre-test, importance of mindfulness, observation, description, and participation techniques

Session 2: Strengthening the wise mind, fundamental acceptance, applying mindfulness effectively in daily life, overcoming obstacles

Session 3: Basic acceptance techniques, breath observation, awareness training, self-soothing, and positive imagery

Session 4: Relaxation techniques, present-moment awareness, cost-benefit analysis, coping strategies

Session 5: Dimensions of emotions, emotion classification, functions of emotions, emotion analysis

Session 6: Identifying emotions in the moment, reducing physical and cognitive vulnerability, increasing positive emotions, emotional exposure, acting against emotional impulses, problem-solving

Session 7: Behavioral styles, unhealthy emotional habits, inability to identify needs, destructive relationships, incorrect beliefs

Session 8: Awareness of events, making requests, assertiveness, active listening, saying no, negotiation and conflict resolution, final review, post-test

Data Analysis

Data were analyzed using SPSS version 24. Descriptive statistics (mean, SD) were calculated, and Multivariate Analysis of Covariance (MANCOVA) was used to examine group differences, controlling for pre-test scores. The assumptions of normality (Shapiro-Wilk), homogeneity of variances (Levene's test), and covariance matrices (Box's M test) were verified. Post-hoc Bonferroni tests were conducted to identify pairwise differences. Significance was set at $p< 0.05$. Effect sizes were reported using partial eta squared (η^2).

Findings and Results

Table 1 presents the mean and standard deviation (SD) scores for cognitive avoidance and its subcomponents, as well as negative self-talk, across the three study groups (CBM, MBCT, and control) at both the pre-test and post-test stages.

Table 1

Means and Standard Deviations of Main Variables (Pre-Test and Post-Test)

Variable	Group	Pre-Test Mean (SD)	Post-Test Mean (SD)
Negative Self-Talk	CBM	54.90 (9.88)	44.30 (4.57)
	MBCT	55.55 (8.57)	45.30 (5.09)
	Control	53.80 (7.86)	54.65 (7.46)
Cognitive Avoidance	CBM	67.20 (7.66)	88.75 (12.11)
	MBCT	68.15 (6.71)	86.95 (14.08)

	Control	76.40 (11.58)	75.90 (12.96)
Thought Suppression	CBM	13.40 (2.31)	17.80 (2.81)
	MBCT	13.25 (2.60)	17.45 (2.70)
	Control	14.10 (2.89)	13.90 (2.85)
Thought Substitution	CBM	12.90 (2.42)	16.70 (2.91)
	MBCT	13.10 (2.38)	16.10 (2.76)
	Control	13.50 (2.55)	13.20 (2.61)
Attentional Distraction	CBM	13.00 (2.50)	17.30 (2.89)
	MBCT	13.10 (2.45)	16.95 (3.01)
	Control	14.00 (2.60)	13.85 (2.58)
Avoidance of Situations	CBM	14.20 (2.91)	16.80 (3.00)
	MBCT	14.30 (3.02)	16.30 (3.15)
	Control	15.20 (3.21)	15.10 (3.18)
Mental Image Change	CBM	13.70 (2.65)	17.00 (2.88)
	MBCT	13.85 (2.51)	16.80 (2.97)
	Control	14.60 (2.71)	14.40 (2.73)

As shown in Table 1, both intervention groups demonstrated significant improvements in cognitive avoidance and negative self-talk, whereas the control group showed no meaningful change. To assess the overall treatment effect, a MANCOVA was conducted on the post-test scores of all dependent variables, controlling for pre-test scores.

Table 2

MANCOVA Results for Post-Test Scores (Controlling for Pre-Test)

Multivariate Test	Value	F	df	p-value	Partial η^2
Pillai's Trace	0.85	7.32	12,102	< .001	0.43
Wilks' Lambda	0.29	8.22	12,100	< .001	0.46
Hotelling's Trace	1.95	9.15	12,98	< .001	0.49
Roy's Largest Root	1.64	16.08	6,51	< .001	0.62

The results of Table 2 indicate significant group differences in the combination of dependent variables, justifying follow-up univariate analyses. ANCOVA was conducted to determine specific group differences for cognitive avoidance and its subcomponents. Pre-test scores were used as covariates.

Table 3

ANCOVA Results for Cognitive Avoidance and Subcomponents

Variable	F	p-value	Partial η^2
Thought Suppression	23.21	< .001	0.47
Thought Substitution	16.67	< .001	0.39
Attentional Distraction	27.35	< .001	0.51
Avoidance of Situations	5.78	0.005	0.18
Mental Image Change	12.21	< .001	0.32
Total Cognitive Avoidance	31.13	< .001	0.54

The intervention groups showed significantly greater reductions in all subcomponents of cognitive avoidance compared to the control group (Table 3).

Table 4

ANCOVA for Negative Self-Talk

Source	F	p-value	Partial η^2	Interpretation
Group	46.94	< .001	0.63	Substantial effect

Both CBM and MBCT led to significant reductions in negative self-talk compared to the control group. Post-hoc Bonferroni tests were conducted to identify pairwise group differences (Table 4).

Table 5

Bonferroni Post-Hoc Comparisons (Post-Test)

Variable	Comparison	Mean Difference	p-value
Cognitive Avoidance	CBM vs. Control	12.85	< .001
	MBCT vs. Control	11.05	< .001
	CBM vs. MBCT	1.80	.42
Negative Self-Talk	CBM vs. Control	-10.35	< .001
	MBCT vs. Control	-9.35	< .001
	CBM vs. MBCT	-1.00	.61
Thought Suppression	CBM vs. Control	3.90	< .001
	MBCT vs. Control	3.35	< .001
	CBM vs. MBCT	0.55	.884
Thought Substitution	CBM vs. Control	3.20	< .001
	MBCT vs. Control	2.60	.004
	CBM vs. MBCT	0.60	.723
Attentional Distraction	CBM vs. Control	4.30	< .001
	MBCT vs. Control	3.90	< .001
	CBM vs. MBCT	0.40	.912
Avoidance of Situations	CBM vs. Control	1.70	.017
	MBCT vs. Control	1.20	.086
	CBM vs. MBCT	0.50	.724
Mental Image Change	CBM vs. Control	2.60	.003
	MBCT vs. Control	2.40	.006
	CBM vs. MBCT	0.20	.956

CBM and MBCT were both significantly more effective than the control group, with no significant difference between the two treatments. Cognitive Avoidance (η^2 = .54) and Negative Self-Talk (η^2 = .63) both reflect substantial effects. These findings suggest clinically meaningful improvements in maladaptive cognitive patterns (Table 5).

Discussion and Conclusion

The results of the covariance analysis, after adjusting for the pre-test effect, showed a significant difference between the three groups. Additionally, these findings indicate that cognitive-behavioral therapy and mindfulness-based therapy had similar effectiveness in reducing cognitive avoidance and its components (except for the thought substitution component). These findings are consistent with the prior research (Afshar et al., 2024; Shahini et al., 2023).

Regarding the impact of mindfulness-based cognitive therapy on cognitive avoidance, the modification of individuals' ineffective coping strategies is particularly significant. Although these maladaptive coping strategies are perceived as positive in the individual's mind, they may, in reality, disrupt the necessary cognitive monitoring for achieving psychological tranquility, leading to increased stress in threatening situations. This approach, by introducing mindfulness-based coping strategies, distress tolerance, and techniques such as cognitive reappraisal, focusing on positive aspects, and allowing thoughts to pass, provides better cognitive oversight for individuals, ultimately reducing stress and cognitive avoidance (Baer, 2015).

Cognitive avoidance encompasses various mental strategies through which individuals modify their perceptions during social interactions. In other words, people attempt to modify their thoughts and ideas to create conditions that help them escape environmental concerns. Cognitive avoidance involves suppressing unpleasant thoughts and memories, distracting oneself, avoiding threatening stimuli, and converting mental imagery into thoughts to divert attention from distressing ideas. Therefore, this treatment approach facilitates a reduction in cognitive avoidance. By incorporating mindfulness-based cognitive therapy techniques, such as cognitive flexibility training, attention improvement, decentering, cognitive enrichment, and modifying positive and negative beliefs about rumination, individuals can become less preoccupied with threatening thoughts and worries. As a

result, worry decreases, and cognitive avoidance strategies are reduced (Gharibdoost et al., 2022).

Based on the findings of this study, mindful awareness of the present moment, exposure to unpleasant thoughts and emotions, and avoidance of avoidance behaviors contribute to cognitive change, ultimately leading to a reduction in psychological symptoms. One of the core principles of mindfulness training is shifting coping strategies from avoidance to acceptance of emotions and thoughts. Learning to observe thoughts and emotions without judgment and adopting a receptive stance instead of avoiding or obsessing over them enhances awareness of experiences, fosters conscious and adaptive responses, and improves control over distressing thoughts and emotions. Consequently, consistent mindfulness practice leads to behavioral changes that promote better self-care (Asi Kouchsafhani & Baradaran, 2022). In this regard, Ebrahimi et al. (2018) suggest that mindfulness activates mechanisms that simultaneously optimize psychological functioning and improve experiential avoidance.

Regarding the effectiveness of cognitive bias modification therapy, it can be stated that the more negative an individual's interpretation and attention toward events and others' behavior, the more their negative attitude is reinforced. Cognitive biases are often automatic, uncontrollable thought patterns that can be regarded as habitual cognitive responses. However, these biases can be directly and effectively modified through repeated experimental exercises in the form of rapid-processing tasks (Browning et al., 2010). Cognitive biases target the formation of negative thoughts at early cognitive processing stages, often at a subconscious level. This intervention requires no insight or awareness, yet its modifications lead to improvements in cognitive avoidance.

Furthermore, the findings confirmed that both therapies significantly reduced negative self-talk. The results indicate that mindfulness-based cognitive therapy and cognitive bias modification therapy had similar effectiveness in addressing negative self-talk. No prior study directly compared these two approaches concerning negative self-talk. However, Zeinali (2018) found that mindfulness improved irrational beliefs, self-talk, and self-regulation (Zeinali, 2018). Similarly, Pimbari et al. (2022) demonstrated that mindfulness-based cognitive therapy significantly reduced negative automatic thoughts, rumination, and self-criticism in students with emotional distress (Pimbari et al., 2022).

The effectiveness of mindfulness-based cognitive therapy can be attributed to its core techniques, including describing, observing, acting with awareness, non-judgment, and non-reactivity. These techniques train participants to describe their inner experiences, actively observe them, act consciously, accept symptoms of social anxiety and negative self-talk without judgment, and allow negative thoughts to enter and exit their minds without reaction. As a result, these techniques reduce social anxiety symptoms, as they encourage acceptance of negative self-talk symptoms without judgment, which is a source of distress for individuals with social anxiety. From this perspective, a lack of mindfulness fosters negative self-talk, which plays a crucial role in self-evaluation and ultimately contributes to low self-efficacy (Falkenstrom, 2010).

Individuals with social anxiety disorder tend to perceive the world as a dangerous place due to their negative self-beliefs, leading them to experience cognitive, physiological, and behavioral symptoms of anxiety (Pchajek et al., 2022). Therefore, the intervention process comprises three stages: mindfulness training (first stage), distress tolerance (second stage), and emotional regulation (third stage). By focusing on the present moment, individuals learn to establish a connection with their ongoing experiences rather than being preoccupied with past or future concerns. Mindfulness allows individuals to observe their thoughts, emotions, and physical sensations without judgment, fostering acceptance rather than avoidance. Consequently, acceptance reduces excessive focus on and sensitivity to anxiety symptoms, making social environments feel less threatening (Strating & Pascual-Leone, 2019). This explains the effectiveness of mindfulness-based therapy in reducing negative self-talk in students with social anxiety disorder.

In the present study, mindfulness-based cognitive therapy helped students develop a greater sense of competence and efficacy in their daily responsibilities and life challenges. It also enhanced stress management, problem-solving, decision-making, conflict resolution, self-regulation, leadership skills, conscientiousness, and positive behavioral changes, leading to improvements in negative self-talk. One key mechanism underlying cognitive bias modification therapy is attentional

control, which plays a fundamental role in the effectiveness of bias modification techniques. Attentional control refers to the ability to regulate attention allocation, meaning individuals with poor attentional control tend to be hyper-vigilant toward social anxiety-related stimuli. In contrast, those with strong attentional control can effectively shift focus from anxiety-related to neutral stimuli. In cognitive bias modification therapy, presenting a probe after a neutral stimulus enhances attentional control, thereby reducing hyper-vigilance toward social anxiety-related stimuli and leading to a significant decrease in social anxiety scores.

Cognitive bias modification therapy helps students adopt different reasoning patterns, develop a more positive perspective on their abilities, and set realistic goals (Avirbach et al., 2019). This intervention modifies students' information-processing patterns by reducing focus on anxiety-related concepts, helping them adjust their biased and maladaptive cognitions (Cristea et al., 2015) and redefine perfectionist performance standards (Curran & Hill, 2019). As a natural outcome of this cognitive restructuring process, students set more realistic goals, avoid extreme behaviors, and reduce their exposure to anxiety-provoking situations. This automatic corrective process (Khodadadi Arkouni et al., 2021) helps students effectively challenge and reduce their negative self-talk in response to anxiety.

The limitations of this study must be considered when generalizing the findings. These limitations include: The use of self-report measures instead of behavioral assessments, which are susceptible to social desirability bias and recall errors. Future research could benefit from tools that assess each variable in real-life situations through alternative measurement approaches. The temporal and geographical constraints of the study, which was conducted among Farhangian University students in Shiraz during Spring 2023. Thus, the findings cannot be generalized to other individuals or locations, and caution should be exercised in generalizing the results.

Conduct similar studies in other cities and cultures to enhance comparability and generalizability. Encourage counselors and psychologists to implement mindfulness-based cognitive therapy and cognitive bias modification therapy to reduce social anxiety, negative self-talk, and cognitive avoidance in students. Utilize these findings for developing therapeutic programs in university counseling centers, offering mindfulness-based workshops and cognitive bias modification programs to support students with social anxiety disorder.

In conclusion, both CBM and MBCT were found to be effective interventions for reducing cognitive avoidance and negative self-talk in students with social anxiety. Despite their distinct theoretical foundations and delivery methods, their comparable efficacy suggests that both approaches successfully target maladaptive cognitive patterns. These findings underscore the value of integrating CBM and MBCT into university mental health services to support students' emotional resilience and cognitive well-being.

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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 Declaration of Helsinki, which provides guidelines for ethical research involving human participants. Ethical considerations in this study included the fact that participation was entirely optional. The study received ethical approval from the Ethics Committee of the Islamic Azad University of Bushehr (IR.BPUMS.REC.1401.062).

Transparency of Data

By 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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Authors' Contributions

All authors equally contribute to this study.

References

Afshar, S., Asghari Pour Zahmati, N., & Alidousti, F. (2024). Effectiveness of mindfulness-based cognitive therapy on cognitive avoidance, rumination, and emotional regulation in depressed individuals. *Journal of Mental Health Principles*, *26*(2), 123-131. https://journals.mums.ac.ir/article_24350.html

Alavi, K., Amirpour, L., & Modarres Gharavi, M. (2013). The Relationship Between Self-Talk Style and Emotional Problems in Students. *Journal of Mental Health Principles*, *1*(58), 118-126. https://ensani.ir/fa/article/321391/

Arai, H., Ishikawa, S. I., Okawa, S., Kishida, K., Korte, K. J., & Schmidt, N. B. (2022). Safety aid elimination as a brief, preventative intervention for social anxiety: A randomized controlled trial in university students. *Current Psychology*, *3*(1), 23-30. https://link.springer.com/article/10.1007/s12144-022-02981-8

Arsanjani, M., Zargham Hajebi, M., & Mirzahosseini, H. (2021). The effectiveness of threatening cognitive bias Modification on the reduction of test anxiety in twelfth-grade students. *Educational Strategy in Medical Sciences*, *14*(3), 130-138. https://edcbmj.ir/browse.php?a_code=A-10-2324-2&sid=1&slc_lang=fa

Asi Kouchsafhani, A., & Baradaran, M. (2022). The effectiveness of mindfulness training on cognitive emotion regulation, experiential avoidance, and methadone dosage reduction in patients undergoing methadone treatment. *Scientific Quarterly Journal of Addiction Research*, *16*(66), 291-310. https://doi.org/10.52547/etiadpajohi.16.66.291

Avirbach, N., Perlman, B., & Mor, N. (2019). Cognitive bias modification for inferential style. *Cognition and Emotion*, *33*(4), 816-824. https://doi.org/10.1080/02699931.2018.1476321

Baer, R. A. (2015). *Mindfulness-Based Treatment Approaches: Clinician's Guide to the Evidence Base and Applications*. Netherlands: Elsevier. https://books.google.com/books?hl=en&lr=&id=4NrK3IGkOg8C&oi=fnd&pg=PR3&dq=Baer,+R.+A.+(2015).+Mindfulness-based+treatment+approaches:+Clinician%27s+guide+to+evidence+base+and+applications,+Netherlands:+Elsevier.+%09&ots=5wen6HkxC5&sig=bCv4nf1M4gY9LYdaUvo8-0S3uwY

Browning, M., Holmes, E. A., & Harmer, C. J. (2010). The modification of attentional bias to emotional information: A review of the techniques, mechanisms, and relevance to emotional disorders. *Cognition and Emotion*, *10*(1), 8-20. https://doi.org/10.3758/CABN.10.1.8

Carr, W. A., Rosenfeld, B., & Rotter, M. (2019). Criminal Thinking as a Risk Factor for Psychiatric Inpatient Aggression. *International Journal of Forensic Mental Health*, 1-11. https://doi.org/10.1080/14999013.2019.1604584

Chelbianlou, G., Abdi, R., & Sheikh, S. (2018). The role of a combined model of emotional temperament in predicting social anxiety disorder symptoms in students. *Journal of Health and Care*, *20*(1), 57-71. https://doi.org/10.29252/jhc.20.1.57

Cristea, I. A., Kok, R. N., & Cuijpers, P. (2015). Efficacy of cognitive bias modification interventions in anxiety and depression: meta-analysis. *The British Journal of Psychiatry*, *206*(1), 7-16. https://doi.org/10.1192/bjp.bp.114.146761

Curran, T., & Hill, A. P. (2019). Perfectionism is increasing over time: A meta-analysis of birth cohort differences from 1989 to 2016. *Psychological bulletin*, *145*(4), 410. https://doi.org/10.1037/bul0000138

Dana, A. (2018). The effect of instructional and motivational self-talk on motor performance in skilled and novice basketball players. *Sports Management and Motor Behavior Research Journal*, *14*(27), 167-176. https://msb.journals.umz.ac.ir/article_1968.html

Ebrahimi, S., Moheb, N., & Alivani Vafa, M. (2024). Comparison of the Effectiveness of Cognitive-behavioral Therapy and Acceptance and Commitment Therapy on Cognitive Distortions and Rumination in Adolescents With Social Anxiety Disorder. *Journal of Practice in Clinical Psychology*, *12*(1), 81-94. https://doi.org/10.32598/jpcp.12.1.922.1

Esoudi Ghosheh Gonbadi, J., Bakhshipoor, A., & Akbari Amraghan, H. (2023). Comparison of the effectiveness of mindfulness-based cognitive therapy and behavioral activation therapy on cognitive avoidance and emotional regulation in individuals with generalized anxiety disorder. *Sabzevar University of Medical Sciences Journal*, *30*(4), 428-441. https://jsums.medsab.ac.ir/article_1575.html

Falkenstrom, F. (2010). Studying mindfulness in experienced mediators: A quasi-experimental approach. *Personality and individual differences*, *48*, 305-315. https://doi.org/10.1016/j.paid.2009.10.022

Froböse, M. I., & Cools, R. (2018). Chemical Neuromodulation of Cognitive Control Avoidance. *Current Opinion in Behavioral Sciences*, *22*, 121-127. https://doi.org/10.1016/j.cobeha.2018.01.027

Gharibdoost, M. N., Behfar, K., & Tayebi, A. (2022). Determining the effectiveness of mindfulness-based cognitive therapy on cognitive avoidance and marital intimacy in women with obsessive-compulsive disorder. *Disability Studies Journal*, *12*(260), 1-8. https://jdisabilstud.org/browse.php?a_id=1974&sid=1&slc_lang=fa&ftxt=0

Hong, J. S., Kim, S. M., Jung, H. Y., Kang, K. D., Min, K. J., & Han, D. H. (2017). Cognitive Avoidance and Aversive Cues Related to Tobacco in Male Smokers. *Addictive behaviors*, *73*, 158-164. https://doi.org/10.1016/j.addbeh.2017.05.003

Khodadadi Arkouni, S., Khodadadi, M., & Davoodi, H. (2021). A review of cognitive therapy for psychological disorders based on bias modification. *Shafa Khatam Neuroscience*, *9*(3), 140-150. https://doi.org/10.52547/shefa.9.3.140

Kim, S. S. Y., Liu, M., & Miller, L. C. (2022). I Want to Be Alone, but I Don't Want to Be Lonely: Uncertainty Management Regarding Social Situations among College Students with Social Anxiety Disorder. *Health Communication*, *37*(13), 1650-1660. https://doi.org/10.1080/10410236.2021.1912890

Koster, E. H., Fox, E., & MacLeod, C. (2009). Introduction to the special section on cognitive bias modification in emotional disorders. *Journal of abnormal psychology*, *118*(1), 1. https://doi.org/10.1037/a0014379

Mirzaei, L., Boghouli, H., Javidi, H., & Barzegar, M. (2023). Comparison of the effectiveness of cognitive-behavioral therapy and mindfulness therapy on negative rumination and social self-efficacy in individuals with social anxiety disorder. *Razi Medical Sciences Journal*, *7*(30), 1-12. https://doi.org/10.47176/rjms.30.204

Mohammadyfar, M. A., Azizpour, M., Najafi, M., & Nooripour, R. (2018). Comparison of audiovisual short-term and active memory in multiple sclerosis patients and non-patients regarding their depression, stress, and anxiety level. *Nordic Psychology*, *70*(2), 115-128. https://doi.org/10.1080/19012276.2017.1362989

Naoko, K., Hiroshi, M., María, M. G., Barrera-Caballero, S., Carlos, V. G., Elien, H., Milena, C., & Losada Andrés, L. B. (2022). Family Carers of People with Dementia in Japan, Spain, and the UK: A Cross-Cultural Comparison of the Relationships between Experiential Avoidance, Cognitive Fusion, and Carer Depression. *Journal of Geriatric Psychiatry and Neurology*, 8919887221130269. https://doi.org/10.1177/08919887221130269

Pakizeh, A., Mahmoudzadeh, S., & Mehroosh, Y. (2024). The Impact of Cognitive Bias Modification on Resilience and Perfectionism in Perfectionist Athlete Students. *Quarterly Journal of Modern Psychological Research*, *19*(74), 147-155. https://psychologyj.tabrizu.ac.ir/article_18177_en.html

Pchajek, J., Edgerton, J. D., Sanscartier, M., & Keough, M. (2022). Exploring the impact of shame and guilt on coping with gambling problems among emerging adult gamblers. *Canadian Journal of Behavioral Science*, 78-85. https://psycnet.apa.org/fulltext/2022-80470-001.html

Pimbari, M., Mansoubi Far, M., Hovasi Soumar, N., Tari Moradi, A., & Balyad, M. (2022). The effectiveness of mindfulness-based cognitive therapy on negative automatic thoughts, self-criticism, and rumination in students with emotional failure experiences. *Nurse and Physician in War*, *9*(32), 6-17. https://npwjm.ajaums.ac.ir/article-1-834-fa.html

Salmani Choulabi, S., Hakim Jowadi, M., & Soltani Shal, R. (2020). Comparison of the effectiveness of mindfulness training and attention bias modification in reducing social anxiety in female students. *Quarterly Journal of Child Mental Health*, *7*(1), 32-43. https://doi.org/10.29252/jcmh.7.1.4

Shahini, M., Ghorbani Nejad, M., Kamkar, M., & Naeem Abadi, Z. (2023). The effect of mindfulness-based cognitive therapy on autobiographical memory retrieval, cognitive avoidance, and cognitive emotion regulation in patients with major depressive disorder. *Journal of psychiatric nursing*, *11*(3), 82-93. https://ijpn.ir/browse.php?a_id=2185&sid=1&slc_lang=fa&ftxt=0

Simsek, A. H., & Serin, N. B. (2017). Negative automatic thoughts, emotional intelligence, and demographic variables affecting university students. *College Student Journal*, *51*(3), 391-397. https://www.ingentaconnect.com/content/prin/csj/2017/00000051/00000003/art00009

Strating, M. A., & Pascual-Leone, A. (2019). *Emotion-Based Case Formulation for Personality Disorders*. In: Case Formulation for Personality Disorders. https://doi.org/10.1016/B978-0-12-813521-1.01002-X

Tarkhan, M. (2018). The effectiveness of group mindfulness-based cognitive therapy on negative automatic thoughts, aggression, and maladaptive attitudes in aggressive students. *Psychological studies*, *14*(2), 161-177. https://psychstudies.alzahra.ac.ir/article_3123.html?lang=en

Wiers, C. E., & Wiers, R. W. (2017). Imagining the neural effects of cognitive bias modification training. *Neuroimaging*, *151*, 81-91. https://doi.org/10.1016/j.neuroimage.2016.07.041

Zahedi, M., Shariatnia, K., & Khajvand, A. (2023). Examining the effectiveness of mindfulness-based cognitive therapy in preventing relapse in individuals with substance use disorder. *Razi Medical Sciences Journal*, *30*(4), 1-10. https://doi.org/10.47176/rjms.30.174

Zeinali, S. (2018). The impact of mindfulness-based cognitive therapy on dysfunctional beliefs, self-talk, and self-regulation in cancer patients. *Thought and Behavior in Clinical Psychology*, *13*(48), 57-66.

Zhu, Y., Zhang, S., & Metaxas, D. (2017). Interactive reinforcement learning for object grounding via self-talking. *ArXiv*, arXiv:1712.00576. https://arxiv.org/abs/1712.00576