

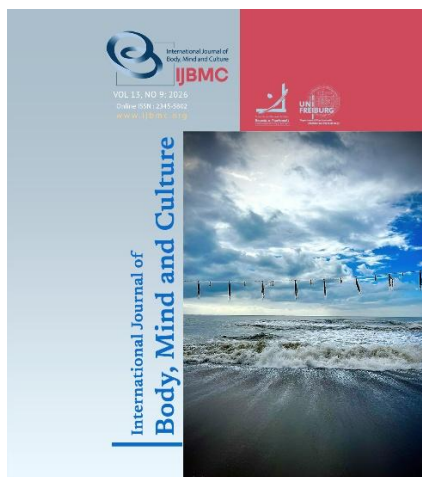
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Comparison of the Effectiveness of Schema Therapy and Mindfulness-Based Cognitive Therapy on Anxiety Sensitivity in Patients with Irritable Bowel Syndrome

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ABSTRACT

Objective: To compare the effectiveness of schema therapy and mindfulness-based cognitive therapy (MBCT) in reducing anxiety sensitivity among patients with irritable bowel syndrome (IBS).

Methods and Materials: This quasi-experimental study used a pretest–posttest design with a control group and a three-month follow-up. Forty-five IBS patients in Isfahan, Iran (2025) who met Rome IV diagnostic criteria were recruited via convenience purposive sampling from treatment centers and randomly assigned to schema therapy (n=15), MBCT (n=15), or a no-treatment control group (n=15). Schema therapy was delivered in a group format according to Young's protocol, and MBCT was delivered in 10 90-minute sessions according to an established mindfulness-based protocol. Anxiety sensitivity was measured using the Anxiety Sensitivity Questionnaire (Taylor & Cox, 1998). Data were analyzed using mixed (between–within) ANOVA with Greenhouse–Geisser correction and Bonferroni post hoc tests (SPSS v26).

Findings: Both interventions reduced anxiety sensitivity relative to the control group at posttest and follow-up. The group × time interaction was significant ($F \approx 21.3$, $p = 0.001$, effect size = 0.50), indicating differential change across groups. Pairwise comparisons showed that MBCT produced larger reductions than schema therapy at posttest and follow-up ($p < 0.05$). Mean anxiety sensitivity decreased from 48.7 ± 5.76 to 33.8 ± 4.64 (follow-up: 34.8 ± 5.06) in the MBCT group, and from 50.3 ± 6.92 to 39.8 ± 6.53 (follow-up: 41.1 ± 7.42) in the schema therapy group, while remaining stable in controls.

Conclusion: Both schema therapy and mindfulness-based interventions may help reduce anxiety sensitivity in IBS, with MBCT showing greater short-term and 3-month benefits. Larger randomized trials with longer follow-up and clearer labeling of the intervention (MBCT vs. MBSR-informed) are recommended.

Keywords: Schema therapy, mindfulness-based cognitive therapy, anxiety sensitivity, irritable bowel syndrome.

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Introduction

Irritable bowel syndrome (IBS) is one of the most common gastrointestinal disorders with a functional nature (Black & Ford, 2020; Nasiri-Dehsorkhi et al., 2022), affecting tens of millions of people worldwide. It is estimated that 4% to 10% of the global population suffer from irritable bowel syndrome and other disorders of gut–brain interaction; these are common chronic conditions that affect tens of millions of people around the world (Shin & Kashyap, 2023). Irritable bowel syndrome, which shares many clinical features with endometriosis, is a gastrointestinal disorder that primarily affects the large intestine and is characterized by a set of symptoms such as changes in bowel movements, abdominal discomfort, pain, and cramping (Nabi et al., 2022). This syndrome occurs more frequently in women than in men (Chen et al., 2022), and women are twice as likely as men to develop IBS. The disorder affects mostly individuals under 35 years of age, although older adults may also experience IBS (Nunan et al., 2022), and a lower prevalence has been observed in patients over 50 years old (Napolitano et al., 2023).

The cause of irritable bowel syndrome is still unknown. However, many factors may contribute to the development of this condition. Altered bowel motility, food sensitivity, genetics, abnormalities in the gut microbiota, and disruption in the bidirectional communication pathways between the gut, its microbiota, and the central nervous system—known as the gut–brain axis—may cause this disorder (IBS, 2017). In addition, bacterial overgrowth or post-infectious changes in the gastrointestinal tract and inflammation are recognized as triggers of IBS. Physical or sexual abuse in childhood, a short period of breastfeeding, food allergies, obesity, or surgical interventions may also lead to the development of this disorder. Patients with IBS are more prone to psychological disorders such as anxiety or depression. This makes them less responsive when IBS treatment is provided alone. Therefore, psychotherapy is recommended for these individuals either as an alternative to medication or as an adjunctive support (Chlebicz-Wójcik & Śliżewska, 2021; Dargahi-Kafshgari et al., 2022).

Risk factors for this disease include younger age, previous gastrointestinal infections, and stressful life events, among others (Napolitano et al., 2023). Depending on symptom severity, individuals experience varying degrees of impairment in quality of life. In a considerable group of patients, this disorder leads to absence from work, disruption in interpersonal relationships, avoidance of sexual intercourse, and even avoidance of social gatherings and travel due to fear of symptom onset. Diet, hormonal changes such as menstruation, psychological stress, and activity level can also exacerbate IBS symptoms (Sahba et al., 2023). Irritable bowel syndrome is often characterized by recurrent abdominal pain, bloating, and altered bowel habits accompanied by diarrhea and/or constipation in the absence of demonstrable organic disease. IBS symptoms may occur due to a combination of factors, including visceral hypersensitivity, altered bowel motility, neurotransmitter imbalance, infection, and psychosocial factors (Chen et al., 2022). According to the Rome IV criteria, this syndrome is characterized by recurrent mild to severe abdominal pain and bloating associated with changes in bowel habits in the absence of organic disease or biochemical abnormalities (Lupu et al., 2023). In addition to altered bowel habits, these patients may also suffer from abdominal pain or discomfort, bloating, nausea, dyspepsia, or reflux (Chlebicz-Wójcik & Śliżewska, 2021). Individuals with IBS often experience recurrent episodes of abdominal pain or discomfort associated with defecation disturbances (Guo et al., 2014).

Anxiety sensitivity refers to an individual's sensitivity to situations that provoke anxiety and the degree of fear associated with these situations. It is characterized by perceiving anxiety-related sensations or behaviors as threatening even when they are not dangerous, which leads to a stronger belief that these sensations and symptoms are harmful (Mrayyan et al., 2022). Anxiety sensitivity is a transdiagnostic cognitive vulnerability factor that reflects the belief that anxiety-related sensations (such as difficulty concentrating) have catastrophic personal consequences (e.g., “I am going crazy”), and it is typically considered to

include three factors related to physical, cognitive, and social concerns (Kauffman et al., 2022). The individual tendency to fear anxiety and anxiety-related bodily sensations (such as rapid heartbeat, sweating, and hand tremors) because of the belief that they may cause illness, embarrassment, or loss of control is described as anxiety sensitivity (Journault et al., 2022). Anxiety sensitivity is distinct from trait anxiety and is more often regarded as a trait than a state, indicating that it is a relatively stable individual characteristic over time (Pearson, 2010). In addition, anxiety sensitivity has been shown to be associated with cognitive symptoms of anxiety, highlighting its role in understanding the foundations of anxiety (Ebrahimi et al., 2015; Sugaya et al., 2012). Some studies emphasize the role of psychological factors in IBS. Alongside psychological exacerbating factors such as anxiety, depression, and tension arising from nervous stimulation, IBS symptoms intensify. In these patients, somatization, anxiety, depression, and impairment in social functioning are significantly higher than in healthy individuals (Nasiri-Dehsorkhi et al., 2022).

Many studies have demonstrated the effectiveness of psychotherapy-based interventions in patients with IBS; however, what is important is that despite important advances in treating IBS, a considerable number of these patients, although they may show symptom reduction after treatment efforts, may not show improvement in outcomes and life functioning. Therefore, other interventions are needed to target indicators of poor prognosis and treatment resistance. These new interventions should address the limitations of current therapeutic approaches (Farzdi et al., 2021). Schema therapy is an effective form of psychotherapy that has been shown to improve mental health outcomes. Schema therapy has emerged as a promising approach for addressing individuals' psychological challenges in various contexts and combines elements from cognitive-behavioral, emotion-focused, attachment, and psychodynamic models (Louis et al., 2021). Schema therapy is a therapeutic approach that aims to address maladaptive patterns of thinking and behavior that are deeply rooted in an individual's cognitive and emotional functioning (Erfan et al., 2018). At the core of schema therapy are the concepts of

early maladaptive schemas and schema modes (Peeters et al., 2022). Schema therapy defines schemas more broadly to include patterned affect, neurobiological responses, and implicit and explicit memory in addition to cognitions or "core beliefs." Schema therapy focuses on 18 early maladaptive schemas and their importance in psychopathology (Louis et al., 2021). These schemas usually do not change outside the therapeutic context (Groot et al., 2022). Early maladaptive schemas are self-defeating emotional and cognitive patterns that develop early in life if children's basic emotional needs (such as safety and autonomy) are not met (Peeters et al., 2022), and they are assumed to fundamentally shape human perception and psychological experiences and play a key role in growth and development (Kopf-Beck et al., 2020). One of the most important elements of contemporary schema therapy is schema modes, which are defined as moment-to-moment mental states that control a person's thinking, feeling, and actions at that moment. Dysfunctional schema modes may arise through the combination of maladaptive schemas and coping styles and often played a functional role in childhood but became maladaptive in adulthood (Groot et al., 2022).

Mindfulness-based cognitive therapy (MBCT) has attracted considerable attention in psychology and mental health. It is a therapeutic approach that combines elements of cognitive therapy with mindfulness practices (Qin et al., 2021). Mindfulness involves bringing nonjudgmental awareness to present-moment experiences (e.g., thoughts, emotions, physical sensations, behavioral urges), and this skill can be cultivated through mindfulness practice. In MBCT, daily mindfulness practice with verbal guidance and therapist-led discussion is combined with cognitive therapy for depression. Mindfulness practice is thought to facilitate greater awareness of the maintenance cycle of depression while fostering a nonjudgmental attitude toward present-moment experiences and recognition of thoughts as mental events (Strauss et al., 2023). By strengthening attention to thoughts, emotions, and bodily sensations, this approach can improve the ability to manage stress, anxiety, depression, pain, and other adverse psychological conditions in youth (Qin et al., 2021).

MBCT has been shown to offer additional benefits beyond traditional cognitive-behavioral interventions, such as reducing symptoms of obsessive-compulsive disorder, depression, and anxiety (Key et al., 2017). It has also been found to reduce psychological distress and enhance well-being in people living with chronic illnesses (McCay et al., 2016). MBCT adds elements of cognitive therapy to treatment in which a decentering perspective facilitates an individual's relationship to thoughts. This decentering approach is also applied to emotions and bodily sensations. In this method, individuals are taught to regard their thoughts and feelings as part of their experience rather than as a direct reflection of reality (Lao et al., 2016).

Irritable bowel syndrome is a common gastrointestinal disorder that significantly affects the quality of life of affected individuals. In addition to physical symptoms, IBS is often associated with psychological conditions such as anxiety sensitivity and poor sleep quality. Although both schema therapy and mindfulness-based cognitive therapy have shown promise in managing these symptoms, there is a lack of comprehensive research comparing the effectiveness of these two therapeutic approaches in the context of IBS. The problem lies in the uncertainty about which treatment—schema therapy or mindfulness-based cognitive therapy—provides a more effective intervention for reducing anxiety sensitivity in patients with IBS. This comparison is crucial for guiding healthcare professionals in making informed decisions when recommending therapeutic interventions and optimizing patient outcomes. The aim of this study was to compare the effectiveness of schema therapy and mindfulness-based cognitive therapy in reducing anxiety sensitivity and improving sleep quality in patients with irritable bowel syndrome. This study seeks to answer the question of whether there is a difference between the effectiveness of schema therapy and mindfulness-based cognitive therapy on anxiety sensitivity in patients with irritable bowel syndrome.

Methods and Materials

Study Design

This study employed a quasi-experimental design with pretest, posttest, and follow-up assessments and a control group. One group was designated as the control group, and the other two groups were assigned as experimental groups. The first experimental group received schema therapy, and the second experimental group received mindfulness-based cognitive therapy (MBCT), while the control group received no treatment. After completion of the intervention sessions, the posttest was administered, and a follow-up assessment was conducted three months later for all three groups.

The statistical population included all patients with irritable bowel syndrome (IBS) in Isfahan in 2025 who had referred to treatment centers in the city. To calculate sample size, the specialized G*Power software (version 3.1) was used. Ultimately, 45 participants were selected through convenience purposive sampling and were randomly assigned to intervention groups of 15 participants each, with another 15 participants placed in the control group.

Inclusion and Exclusion Criteria

Inclusion criteria were: a diagnosis of irritable bowel syndrome based on the Rome IV criteria, confirmed by a gastroenterology specialist, and no concurrent psychotherapy or psychiatric intervention. Exclusion criteria included unwillingness to continue participation, more than 3 absences from treatment sessions, and failure to participate in the pretest, posttest, or follow-up stages. After screening based on the inclusion and exclusion criteria, 45 eligible individuals were identified and randomly assigned to two experimental groups and one control group (3 groups of 15 participants). For experimental and quasi-experimental studies, a minimum sample size of 15 participants per group has been recommended (Delavar et al., 2020).

Instruments

Revised Anxiety Sensitivity Index

This scale was developed by Taylor & Cox (1998) to assess the degree of fear of anxiety symptoms and their consequences. The questionnaire consists of 30 closed-ended items rated on a 5-point Likert scale. It measures four

factors: fear of respiratory symptoms, fear of publicly observable anxiety reactions, fear of cardiovascular symptoms, and fear of cognitive dyscontrol. Taylor and Cox reported internal consistency coefficients (Cronbach's alpha) ranging from 0.83 to 0.94. Research has supported the hierarchical structure, stability, internal consistency, test-retest reliability, and discriminant validity of this scale. In Iran, three methods were used to examine the validity and reliability of this scale—internal consistency, split-half reliability, and test-retest reliability—with coefficients ranging from 0.82 to 0.93, 0.76 to 0.90, and 0.92 to 0.96, respectively (Ahmadi et al., 2023). In the present study, the reported Cronbach's alpha was 0.801.

Procedure

The study procedure was as follows: after obtaining ethical approval from the university ethics committee (ethics code: ...), the sampling process was carried out using convenience purposive sampling from June 2025 to early August 2025 in two specialized gastroenterology centers, Al-Zahra and Shahrak-e Salamat. After coordination with the officials of these centers and providing complete explanations about the aims and procedures of the study to patients مراجعه‌کننده (attending patients), the required sample was selected from individuals who had a confirmed

Schema Therapy Intervention

The schema therapy experimental group received intervention based on Young's schema therapy protocol (Young et al., 2006).

diagnosis of the target condition by a gastroenterology subspecialist based on relevant clinical criteria and who were willing to participate.

After strict application of the inclusion and exclusion criteria and obtaining informed consent, participants were assigned through simple randomization (lot drawing) to two experimental groups and one control group. The pretest stage was conducted before the intervention for all groups. Subsequently, the intervention program was delivered only to the experimental groups across multiple sessions on separate days in such a way that participants from different groups could not meet or exchange information. The interventions were conducted by a therapist with a doctoral degree who had completed specialized training in schema therapy and mindfulness-based cognitive therapy.

One week after completion of the intervention program, the posttest was administered, and the follow-up assessment was conducted three months later. Ethical considerations and confidentiality of participants' information were observed throughout all stages of the study. It should be noted that no sample attrition occurred during the study; all participants remained in the study until completion and stayed in their assigned groups.

Table 1

Young's Schema Therapy Sessions (2012)

Sessions	Session Content
Orientation (Pre-group)	Planning for group formation; Selecting members; Individual consultation with members before group formation; Emphasizing the necessity of attendance and participation in group sessions; Introducing the group counseling format; Agreement with members regarding group meeting time.
Session 1	- Introduction and acquaintance among participants; - Establishing initial communication among group members; - Building trust; - Presenting group rules and the importance of confidentiality; - Explaining goals; - Teaching the concept of schema and schema therapy; administering the Young Schema Questionnaire–Short Form and the Multidimensional Life History Questionnaire as homework for the next session.
Session 2	- Reviewing the completed questionnaires; - Assessing schemas through imagery (explaining the rationale of the technique, answering participants' questions, conducting the

	technique, and discussing what occurred during the technique);
	- Identifying and activating members' schemas;
	- Mental imagery involving significant people in life, including parents, peers, and others who played a role in schema formation;
	- Helping members experience schema-related emotions.
Session 3	- Familiarizing members with coping styles (surrender, avoidance, overcompensation);
	- Reviewing types of coping styles in several group members;
	- Presenting examples of coping styles.
Session 4	- Testing the validity of schemas;
	- Collecting objective evidence confirming the schema;
	- Collecting objective evidence disconfirming the schema;
	- Redefining the schema-confirming evidence.
Session 5	- Evaluating the advantages and disadvantages of members' coping responses;
	- Developing schema flashcards (educational cards);
	- Introducing and completing the schema log form.
Session 6	- Reviewing the schema log form and schema flashcards;
	- Using the dialogue technique between the "healthy side" and the "schema side."
Session 7	- Mental imagery;
	- Childhood imagery;
	- Linking past imagery to the present;
	- Conceptualizing mental imagery in the schema framework.
Session 8	- Conducting an imaginary dialogue with parents in session using the empty-chair technique;
	- Mental imagery for pattern breaking;
	- Writing a letter to parents as homework.
Session 9	- Reviewing homework;
	- Revising the conceptualization of members' problems;
	- Further examination of the disconnection and rejection domain;
	- Identifying specific behaviors as potential targets for change.
Session 10	- Increasing motivation for behavior change;
	- Linking target behavior to its developmental roots in childhood;
	- Reconsidering advantages and disadvantages of continuing the behavior;
	- Preparing schema flashcards;
	- Practicing healthy behaviors through imagery and role-play;
	- Summarizing and reviewing discussions from previous sessions;
	- Evaluating members' views of session content;
	- Receiving feedback;
	- Administering the posttest.

Mindfulness-Based Cognitive Therapy Intervention

In this study, mindfulness-based cognitive therapy was delivered in ten 90-minute sessions according to the therapeutic protocol of ([Kabat-Zinn, 2003](#)).

Table 2

Mindfulness-Based Cognitive Therapy Sessions

Session	Session Content
1	Explaining the goals of the training sessions; introducing members and confidentiality; introducing the mindfulness-based cognitive therapy approach; administering the pretest
2	Automatic pilot; defining mindfulness; staying in the present moment without judgment
3	Dealing with obstacles; teaching the body scan technique; controlling the wandering mind through body scan practice
4	Mindfulness of breathing; practicing mindful breathing followed by reflection in a seated position and seated meditation
5	Staying in the present moment; three-minute breathing space; expanding attention through listening meditation
6	Developing a different relationship with experience; how to cultivate and use acceptance
7	Reviewing the idea that thoughts are not facts and methods for seeing thoughts differently
8	Reviewing self-care; relationship between activity and mood; integrating behavioral activation into activity planning training

9	Using learned skills to achieve self-satisfaction; reviewing previous sessions and summarizing
10	Distributing feedback forms to participants and administering the posttest

Data Analysis

In this study, in the descriptive section, the data collected from the assessments were summarized using frequency distribution tables, central tendency indices, and dispersion indices. For data analysis, and in accordance with the nature of the variables and the study hypotheses, mixed analysis of variance and Bonferroni post hoc tests were used after checking all assumptions, including Shapiro–Wilk, Box’s M, and Levene’s tests, through SPSS software, version 26.

Findings and Results

The minimum age of participants in this study was 28 and the maximum age was 51. In addition, given that the significance level was greater than 0.05, there was no significant difference among the three groups, indicating that the groups were homogeneous in terms of age. Likewise, with a significance level greater than 0.05 ($P > 0.05$), comparison of the three groups showed no significant difference in gender distribution, suggesting that the three groups were also homogeneous in terms of gender.

Table 3

Comparison of the Mean and Standard Deviation of Anxiety Sensitivity Across the Three Groups

Variable	Group	Before Intervention		After Intervention		Follow-up	
		Mean	SD	Mean	SD	Mean	SD
Anxiety sensitivity	Schema therapy	50.3	6.92	39.8	6.53	41.1	7.42
	Mindfulness-based cognitive therapy	48.7	5.76	33.8	4.64	34.8	5.06
	Control group	49.4	8.11	48.8	7.50	49.6	8.35

Table 3 shows the mean anxiety sensitivity scores in the schema therapy group, the mindfulness-based cognitive therapy group, and the control group. As can be seen, there was little difference in mean anxiety sensitivity among the three groups at pretest. However, after the intervention, the intervention groups showed a marked difference compared with the control group relative to pre-intervention levels. This difference was also observable at the follow-up stage.

Because the results of the Shapiro–Wilk test were not significant, it was concluded that the distribution of dependent variable scores was normal. The next assumption for conducting multivariate mixed ANOVA is homogeneity of error variances. In this study, Levene’s test was used to assess this assumption, and the results showed that since the F value was not significant for any of the dependent variables, the assumption of homogeneity of variances between groups was met.

Based on the reported results, because the observed F value in Box’s M test was significant, it was concluded that the assumption of equality of covariance matrices was not met; however, given equal group sizes, this assumption violation could be overlooked. In addition, the chi-square values were significant for all three dependent variables, indicating that the sphericity assumption was not met for any of them. Therefore, Greenhouse–Geisser corrected values were used for degrees of freedom in the ANOVA calculations.

To examine the degree of correlation among the three dependent variables, Pearson’s correlation coefficient was used. Depending on the assessment time, correlations ranged from 0.38 to 0.67 and were significant at the 0.05 alpha level. Accordingly, the assumptions for conducting multivariate mixed ANOVA were considered satisfied. To identify the exact source of differences and test the sub-

hypotheses, univariate analyses were also conducted, and the results are presented in Table 4.

Table 4

Results of Mixed ANOVA for Examining the Effects of Group and Assessment Time on the Dependent Variables

Source	Sum of Squares	df	Mean Square	F	Sig.	Effect Size
Within-subjects						
Time	3733.5	1.01	3697.9	99.2	0.001	0.703
Time × Group	1607.8	2.01	796.2	21.3	0.001	0.504
Error	1579.8	42.4	37.2			
Between-subjects						
Group	3004.8	2	1502.4	18.2	0.001	0.466
Error	3449.3	42	82.1			

According to the mixed ANOVA results in Table 4, the main effect of assessment time and the interaction effect of group × assessment time on the dependent variables were significant, and these are examined in sequence. Based on the results reported in Table 4, the main effect of assessment time on the dependent variables was significant. This means

that anxiety sensitivity scores of all participants, regardless of group membership, differed significantly across pretest, posttest, and follow-up. To examine the source of these differences, Bonferroni post hoc tests were used, and the results are shown in Table 5.

Table 5

Pairwise Comparison of Means of the Intervention Groups Across the Three Study Phases on Anxiety Sensitivity

Variable	Study Phase	Group	Comparison Group	Mean Difference	Significance Level
Anxiety sensitivity	Pretest	Mindfulness-based cognitive therapy	Schema therapy	-0.333	1.000
		Mindfulness-based cognitive therapy	Control	-0.666	1.000
		Schema therapy	Control	-0.333	1.000
	Posttest	Mindfulness-based cognitive therapy	Schema therapy	-8.80*	0.009
		Mindfulness-based cognitive therapy	Control	8.26*	0.015
		Schema therapy	Control	17.06*	0.001
	Follow-up	Mindfulness-based cognitive therapy	Schema therapy	-7.86*	0.020
		Mindfulness-based cognitive therapy	Control	10.06*	0.002
		Schema therapy	Control	17.93*	0.001

The results in Table 5 show that differences at the posttest and follow-up stages between the experimental groups on the anxiety sensitivity variable were statistically significant ($p < 0.05$), whereas at the pretest stage the differences between the intervention groups and the control group were not significant ($p > 0.05$). A significant difference between the two treatments in anxiety sensitivity was reported at posttest and follow-up, and this difference was more evident in the mindfulness-based cognitive therapy group.

Discussion and Conclusion

The results showed that there was a significant difference between the effectiveness of schema therapy and mindfulness-based cognitive therapy (MBCT) on anxiety sensitivity in patients with irritable bowel syndrome (IBS), and that MBCT was more effective than schema therapy. Based on evidence from domestic and international studies, the MBCT approach has demonstrated greater effectiveness than schema therapy in reducing anxiety sensitivity and its related outcomes. In the Iranian literature, the findings of [Ahmadi et al., \(2023\)](#) highlighted the key position of anxiety

sensitivity as a mediating factor in the effect of personality traits on IBS and indicated that increased anxiety sensitivity explains symptom severity. In such a context, MBCT directly reduces the level of anxiety sensitivity (Hatamian et al., 2020; Lao et al., 2016), whereas schema therapy focuses more on modifying deeper underlying structures and, according to the results of Aghili et al., (2022), although it produces a reduction, its magnitude is lower than that of MBCT. In recent experimental studies, Omid et al., (2023) showed that MBCT, compared with emotion regulation training, had a deeper effect on resilience and reduction of perceived stress—a component related to anxiety sensitivity. Dana et al., (2022) and Erfan et al., (2021) also showed that MBCT was not only effective in reducing catastrophizing and rumination, but that its positive effects persisted over time during follow-up. In the international literature, (Henrich et al., 2020; Alsubaie et al., 2017; Martin et al., 2019), and Zernicke et al., (2013) documented that MBCT, through enhancing nonjudgmental awareness and acceptance of emotions, reduces anxiety sensitivity in patients and demonstrates a deeper and more stable effect than cognitive-emotional approaches. These findings are clearly aligned with the studies of Wang et al., (2023) and Xu & Lian (2024) regarding the effectiveness of cognition- and awareness-based treatments for anxiety, and they underscore the efficiency of this approach in addressing body–mind anxiety mechanisms specific to patients with IBS.

Anxiety sensitivity in patients with IBS is not a static structure; rather, it is a dynamic phenomenon that is strongly reinforced by momentary appraisals, fear of physical symptoms, and a catastrophizing mindset (Ahmadi et al., 2023). MBCT, by teaching present-moment awareness and direct observation of emotion, shifts the patient's attentional focus from anticipation and threat-based interpretation of symptoms toward acceptance of experience; this approach disrupts the negative anxiety–body feedback loop (Henrich et al., 2020). This mechanism is fundamentally different from schema therapy, which attempts to change the patient's mental interpretation through exploration of earlier layers and modification of beliefs—a process that requires time and deep

reconstruction and does not offer rapid intervention capacity (Aghili et al., 2022).

One of the fundamental distinctions of MBCT is that it changes the individual's relationship with anxiety. The patient learns that anxiety is merely a transient experience, not an indicator of imminent danger or personal weakness. This rationale is consistent with the findings of Dana et al., (2022), who showed that after treatment, MBCT patients perceived anxiety not as dangerous, but as a tolerable and non-reactive experience. In contrast, schema therapy tends to address the early roots of these beliefs; however, its emphasis on analyzing the past may re-expose patients to vulnerable layers and delay the priority of immediate anxiety reduction.

Contemporary neuroscience has shown that mindfulness practice can reduce activity in brain structures such as the amygdala and the default mode network, which are responsible for persistent rumination and chronic anxiety (Henrich et al., 2020; Song et al., 2022). As a result, threat processing in patients' minds is inhibited, and anxiety sensitivity is noticeably reduced. This neural gain simultaneously increases emotional flexibility and improves management of bodily symptoms (Hatamian et al., 2020; Alsubaie et al., 2017).

Cognitive models indicate that patients with high anxiety sensitivity are trapped in recurrent cognitive-emotional avoidance and terrifying rumination about bodily symptoms (Lao et al., 2016). By creating a space for direct, nonjudgmental observation of thoughts and feelings, MBCT interrupts the cycle of avoidance and rumination and provides a safe internal environment for confronting anxiety (Alsubaie et al., 2017). In contrast, because schema therapy focuses on reconstructing root meanings and because the change process is time-consuming, it usually shows a more delayed effect.

The findings of Omid et al., (2023) showed that MBCT, more than emotion regulation training, was able to enhance resilience and self-compassion; these factors are major moderators of the relationship between anxiety and bodily/cognitive symptoms. In other words, the greater the resilience and self-empathy skills, the more anxiety is

transformed into non-threatening data—an equation on which schema therapy does not rely as strongly.

During IBS-related physical crises, patients need solutions with rapid effects to stop the cycle of anxiety and psychosomatic harm. By focusing on attentional and mental regulation (rather than necessarily changing fundamental beliefs), MBCT offers patients a quickly usable method. This is the same reason [Ahmadpour et al., \(2026\)](#) found in the context of multiple sclerosis, namely that acceptance- and mindfulness-based therapies rapidly strengthen resilience and distress tolerance compared with traditional strategies. A notable achievement of MBCT is reducing threat-laden meaning-making attached to anxiety symptoms. Studies by [Jamshidi et al., \(2023\)](#) and [Erfan et al., \(2021\)](#) in other physical/psychological disorders also suggest that MBCT can neutralize cognitive biases and negative meaning-making related to anxiety and symptoms—even without analyzing identity roots—in a way that increases patients' confidence and sense of mastery over their symptoms.

Evidence from ([Wang et al., 2023](#); [Xu & Lian, 2024](#)), , and [Asadollahi et al., \(2014\)](#) has emphasized the broad effectiveness of cognitive and mindfulness-based therapies for anxiety disorders and the nervous system. This finding indicates that MBCT has high adaptability across different populations and complex conditions, whereas schema therapy tends to work better with populations showing more stable, enduring symptoms and is less suitable for reducing anxiety sensitivity. One of the strengths of MBCT is the maintenance of gains after the end of treatment and increased self-efficacy in symptom management. Studies by [Martin et al., \(2019\)](#) and [Zernicke et al., \(2013\)](#) have shown that after treatment, patients continue to apply anxiety sensitivity management skills in stressful situations, which leads to better stability of their mental health—a mechanism for which schema therapy often requires longer courses to stabilize.

Finally, it must be emphasized that MBCT, with its awareness-based nature, attentional regulation, reduction of negative appraisal of bodily experiences, and strengthening of practical skills, is better aligned than other approaches with the biopsychological profile of IBS patients and their

anxiety sensitivity [Dana et al., \(2022\)](#), [Alsubaie et al., \(2017\)](#); [Lao et al., \(2016\)](#). This is precisely why the present finding is fully consistent with basic and clinical research evidence and shows that, in reducing anxiety sensitivity, the speed and depth of MBCT's impact surpass schema therapy.

Given that only 45 participants (30 in the intervention groups and 15 in the control group) took part in the study, generalization of the findings to the broader population of patients with IBS should be made with caution and requires larger and more diverse samples. Convenience purposive sampling may lead to selection bias and may not fully represent all characteristics of the target population. The data collection tools were largely self-report questionnaires, which increase the possibility of cognitive errors, response bias, and halo effects. The study was conducted only on patients referring to treatment centers in Isfahan, and the specific cultural, social, and economic characteristics of this city may have influenced the findings. Factors such as disease severity, concurrent medication use or other therapeutic interventions, baseline psychological status, and social support were not fully controlled and may have affected the results. The lack of long-term follow-up after the intervention means that the persistence of treatment effectiveness on symptoms, anxiety sensitivity, and sleep quality cannot be determined with certainty, making evaluation of long-term stability challenging.

It is recommended that future studies increase sample size and recruit participants from different cities and regions with varying cultural and social conditions to improve generalizability. Conducting studies using random and stratified sampling methods could increase the validity of results and help prevent selection bias. To increase data accuracy and precision, it is suggested that, in addition to self-report questionnaires, objective and observational tools (such as clinical assessments, sleep monitoring devices, and physiological symptom measurements) be used. Investigating the effectiveness of these approaches in IBS patients in other provinces or even at the national level—especially while considering climatic and cultural differences—is recommended. Future research should control confounding factors such as disease severity,

medication use, level of social support, and the presence of other psychological problems to produce more reliable findings. Researchers are also advised to include long-term follow-up assessments after the intervention in order to properly evaluate the enduring and long-term effects of treatments on symptoms, anxiety sensitivity, and sleep quality. Studies aimed at comparing or combining schema therapy and mindfulness-based cognitive therapy to achieve maximum effectiveness on different IBS-related variables are recommended. Examining the effectiveness of these approaches across different age groups (children, adolescents, older adults) may enrich knowledge in this field.

Based on the results of the study, which indicated different relative levels of effectiveness for each approach, it is recommended that treatment centers develop and implement integrated protocols combining schema therapy and MBCT so that IBS patients can simultaneously benefit from improvements in sleep quality and reductions in symptoms and anxiety sensitivity; implementing such protocols may help improve patients' overall condition. Given differences in patient responses to different approaches, it is recommended that therapists use careful initial assessment—including evaluation of disease symptoms, sleep quality, and anxiety level—to select and implement treatment tailored to each patient's needs. This person-centered approach may optimize treatment effectiveness and prevent waste of resources.

It is also recommended that interdisciplinary workshops and training courses be held for therapists, psychologists, and gastroenterologists so that all professionals become familiar with the principles and techniques of schema therapy and MBCT and can apply these methods effectively in the multidimensional management of IBS. Treatment centers and health organizations are encouraged to design digital treatment packages (applications or specialized websites) containing training in mindfulness techniques, cognitive therapy, and schema modification, and make them available to patients to provide broader access and facilitate independent implementation of psychological interventions. Health authorities and policymakers are further encouraged, based on research findings and the high

yield of psychological interventions, to include these interventions as an essential part of treatment for IBS patients in national health protocols and to provide financial and structural support for expanding their implementation in both public and private sectors.

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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 Helsinki Declaration, which provides guidelines for ethical research involving human participants. Ethical considerations in this study were that participation was entirely optional.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contribute to this study.

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