



Comparing Mindfulness-Based Stress Reduction (MBSR) and Emotional Schema Therapy (EST) in Effects on Rumination and Anxiety Sensitivity in Students with Clinical Symptoms of Social Anxiety

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Abstract

Background: Social anxiety is one of the most prevalent and debilitating anxiety disorders. Students with social anxiety are faced with countless problems, e.g., dropping out of school at a young age, showing avoidance behavior in social situations, and experiencing lower levels of social support and mental health. This study aimed to compare the effectiveness of mindfulness-based stress reduction (MBSR) and emotional schema therapy on rumination and anxiety sensitivity in students with social anxiety disorder (SAD).

Methods: This quasi-experimental research adopted a pretest-posttest control group design with a follow-up stage. The statistical population included the female senior high school students of Ahvaz, Khuzestan Province (Iran) in 2022–2023. Random sampling was employed to select 75 out of 120 listed students, randomly assigned to three 25-member groups (i.e., two experimental groups and a control group). The research instruments included the Rumination Response Scale (RRS), and Anxiety Sensitivity Index (ASI). The ANCOVA was then used for data analysis.

Results: According to the results, both therapies affected rumination and anxiety sensitivity in students with SAD (P -value <0.001). However, MBSR had greater effects than emotional schema therapy on anxiety sensitivity. In addition, two therapies had no significant differences regarding effects on rumination.

Conclusions: The MBSR and EST can alleviate rumination and anxiety in female students with social anxiety. Given the positive effects of MBSR and emotional schema therapy, it is recommended that they be used in schools, psychotherapy centers, and counseling clinics to help students with SAD.

Keywords: Mindfulness-based stress reduction, Schema therapy, Rumination, Anxiety, Students.

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Introduction

The growth and development of society depend on the education system. Accordingly, countries spend substantial amounts of their revenues on education. However, certain factors waste some of these investments¹. Regarding the causes of this phenomenon, research studies have shown that the psychosocial dimensions of students, e.g., their needs, incentives, attitudes, tendencies, and special talents, must be

taken into account in addition to educational, managerial, and structural factors. Those psychosocial dimensions can act as causes and effects in the learning process^{2,3}.

Anxiety disorders are classified as the sixth most important cause of nonlethal health loss worldwide. Having various forms, they are also among the first ten causes of disability in life all over the world⁴. An instance of anxiety disorder is social anxiety disorder (SAD) which refers to the constant fear of social situations and the resultant avoidance of these situations, especially when an individual is performing a task or experiencing the presence of strangers⁵. Correlated with a high dropout rate, SAD is a pervasive disorder^{6,7}. Playing a key role in SAD, rumination is defined as repetitive concentration on negative thoughts and emotions regarding a stressful factor⁸. Rumination makes a person spontaneously concentrate on negative, pessimistic thoughts and tend to pay attention to negative stimuli⁹.

Anxiety sensitivity is another factor affecting social anxiety in students. It is a cognitive component that indicates the fear of anxiety symptoms¹⁰. Moreover, anxiety sensitivity makes a person think that anxiety symptoms jeopardize his/her health and can have detrimental outcomes¹¹. In this form of anxiety, a person fears that the symptoms of anxiety, e.g., palpitations and dizziness, increase social, cognitive, and physical outcomes and lead to trauma^{12,13}.

Mindfulness-based stress reduction training (MBSR) is a non-pharmacological training intervention for social anxiety¹⁴. Mindfulness is a meditation method for increasing knowledge about present goals with no preconceptions. It is a mental capacity that can be enhanced through different methods. Training this intervention can reduce stress and anxiety^{15,16}. Mostafazadeh et al.,¹⁷ reported that school-based mindfulness training was effective in reducing depression and stress in high school students. Parsons et al.,¹⁸ reported that incorporating mindfulness-based programs into curricula can be an effective approach to help manage depression in students. Furthermore, emotional schema therapy is an effective treatment for anxiety¹⁹. Emotional schema therapy refers to a set of fundamental beliefs and intellectual patterns formed in a person's mind about a specific topic, leading to the emergence of specific behaviors²⁰. Schema therapy focuses on early maladaptive schemas, which are informally referred to as life



traps²¹. Sakhaie Ardakani et al.,²² reported that schema therapy significantly reduced academic procrastination in students. Younesi et al.,²³ reported that schema therapy significantly reduced students' educational stress perception in students.

High school students encounter many changes due to experiencing transition from childhood to adolescence and consequent transformations. These changes can lead to different sources of stress and anxiety that affect their academic achievement and success in the present and future. Therefore, high school students must have high levels of assertiveness, general self-efficacy, academic self-efficacy, and creativity so that they can cope with serious life challenges and handle homework assignments. The most important academic problems that students now face are a lack of assertiveness, social anxiety, lack of creativity, and academic self-inefficacy. In other words, a major concern of school psychology is to perceive how students attempt to encounter academic and social problems. Therefore, according to the background of the research, this study aimed to investigate the effects of MBSR and emotional schema therapy on rumination and anxiety sensitivity in students with SAD.

Materials and Methods

This quasi-experimental research adopted a pretest-posttest control group design with a one-month follow-up stage. A pretest was administered to all participants in both the experimental and control groups to establish a baseline measure before the intervention. Subsequently, the intervention was implemented only in the experimental group. Following the intervention period, both groups were evaluated again using research questionnaires in a posttest design. The statistical population included the female senior high school students of Ahvaz, Khuzestan Province (Iran) in 2022–2023. Random sampling was employed to list 120 students whose scores on the social anxiety checklist were one standard deviation higher than the mean and exhibited social anxiety symptoms in clinical interviews. Then 75 students were randomly selected for participation in this study. They were then assigned randomly to three 25-member groups, labeled randomly as two experimental groups and one control group. The inclusion

criteria were having no serious physical diseases, not participating in any other psychotherapy sessions for at least one month before this study, acquiring a score of at least one standard deviation higher than the mean in social anxiety, having no severe psychological disorders such as obsessive-compulsive disorder (OCD), generalized anxiety disorder (GAD), agoraphobia, anxiety induced by physical diseases, anxiety induced by substance abuse, and psychosis. The exclusion criteria were being absent for more than two sessions, participating in other psychotherapy sessions, and being unwilling to continue therapy.

Rumination Response Scale (RRS): Developed by Nolen-Hoekseman et al.,²⁴ the Rumination Response Scale (RRS) evaluates negative mood reactions. It consists of two subscales called ruminative responses and distractive responses, each of which includes 11 items. This questionnaire includes 22 items scored on a Likert scale ranging from 1 (never) to 4 (sometimes). The minimum and maximum scores are 22 and 88, respectively. Aghebati et al.,²⁵ reported an alpha Cronbach coefficient of 0.90 for the RRS.

Anxiety Sensitivity Index (ASI): The Anxiety Sensitivity Index (ASI) developed by Floyd et al.,²⁶ was employed to evaluate anxiety sensitivity. This index has 16 items scored on a five-point Likert scale (ranging from 1 for “very low” to 5 for “very high”). The minimum and maximum scores are 16 and 80, respectively. Higher scores indicate higher levels of anxiety sensitivity. Foroughi et al.,²⁷ reported an alpha Cronbach coefficient of 0.90 for the ASI.

Jon Kabat-Zinn's method²⁸ was employed to design MBSR training sessions. Therefore, MBSR training was implemented in eight 90-minute sessions twice a week for one month. Moreover, emotional schema therapy sessions were designed concerning the emotional schema therapy protocol adapted from Robert L. Leahy's method²⁹. Thus, emotional schema therapy was implemented in ten 90-minute sessions twice a week for one and a half months. Tables 1 and 2 present the overviews of MBSR training sessions and emotional schema therapy sessions.

Table 1. Mindfulness-based stress reduction sessions

Session	Content
1	Implementing pretest; establishing relationships and conceptualizing; necessity of using mindfulness education; learning relaxation
2	Teaching how to relax 19 groups of muscles: Encouraging participants to practice sedentary relaxation; performing a mindfulness task as a pleasant event and performing sedentary relaxation; performing a body check
3	Teaching how to relax 6 groups of muscles: This session started by training participants in seeing and listening and continued with sedentary relaxation and breathing by paying attention to physical senses.
4	Teaching how to breathe mindfully: Teaching the inhalation-exhalation technique with peace and without thinking and performing mindfulness assignments for pre-sleep breathing for 24 minutes.
5	Teaching the body check technique: Teaching the technique of attending to body movements while breathing and focusing on body parts and their movements
6	Teaching thought mindfulness: Teaching participants to attend to the mind, positive and negative thoughts, pleasantness and unpleasantness of thoughts and to write down positive and negative experiences without any preconceptions

- 7 Complete mindfulness: Repeating the tasks in Sessions 4, 5, and 6 for 20–30 minutes each
- 8 Drawing a conclusion and presenting an overview of sessions; implementing posttest

Table 2. Emotional schema therapy sessions

Session	Content
1	Introduction, explanation of group rules, asking members' reasons for participating in this training and their concerns, acknowledging the emotions, psychoeducation regarding generalized anxiety disorder, pretest
2	Granting feelings validity; psychological instruction on emotion, how it differs from thought and behavior, and the reasoning behind EST; describing emotional schemas and how they affect people's attitudes and actions. describing how schemas contribute to people's anxiety
3	Emotion normalization, muscle relaxation technique, exercising the transience of emotions, muscle relaxation exercises
4	Correct definition of acceptance and its effects; explanation about acceptance of emotions, especially anxiety, using the guest metaphor to accept anxiety and the technique of riding the wave of anxiety
5	Challenging beliefs about mixed emotions, exercises for dealing with mixed feelings
6	Challenging false beliefs about emotion and teaching advocate techniques to challenge them (rumination control)
7	Challenging false beliefs about emotion and performing the technique of examining the evidence (rationalism), encouraging participants to give examples of the usefulness of using emotion alongside logic for decision-making, and examining the evidence for the effect of emotion in decision-making
8	Examining problematic de-validation styles, practicing the technique of confirming one's feelings; instructing others on how to properly accept credit from them; and using the compassionate mindfulness technique
9	Challenging false beliefs about emotion (guilt and superior values), employing the technique of climbing the value ladder, positive and negative metaphors, and employing the technique of reviewing evidence to challenge guilt about emotion
10	Talking about obstacles and setbacks can help consolidate the state of new learning, examining the goals and their accomplishments, discussing and expressing feelings about the end of treatment, posttest

Descriptive statistics (i.e., mean and standard deviation) and inferential statistics (i.e., ANCOVA) were used for data analysis in SPSS 23. The significance level was considered 0.05 in this study.

Results

According to the results, the mean age of students was 16.25 ± 1.80 years in all three groups, i.e., MBSR, emotional schema therapy, and control. Moreover, the economic status was evaluated as average in a large percentage of their families. Table 3 reports the descriptive statistics of dependent variables in the two experimental groups and the control group at the pretest, posttest, and follow-up stages.

Table 3. Mean (\pm SD) of rumination and anxiety sensitivity in experimental and control groups

Variables	Phases	MBSR	Emotional schema therapy	Control
		Mean \pm SD	Mean \pm SD	Mean \pm SD
Rumination	Pretest	67.31 \pm 3.67	69.60 \pm 3.07	66.47 \pm 3.91
	Posttest	36.80 \pm 7.12	35.65 \pm 7.51	65.42 \pm 4.01
	Follow-up	36.41 \pm 7.35	35.78 \pm 8.02	64.89 \pm 4.63
Anxiety sensitivity	Pretest	52.43 \pm 1.71	50.41 \pm 2.18	52.67 \pm 1.31
	Posttest	30.56 \pm 4.81	38.49 \pm 4.06	51.80 \pm 2.19
	Follow-up	31.68 \pm 3.90	38.53 \pm 3.85	50.90 \pm 2.78

The results indicated that the three groups had significant differences in terms of at least one dependent variable (i.e., rumination or anxiety sensitivity) by controlling the pretest. In other words, the posttests of groups had significant differences as the pretest was controlled, a finding that indicated the

effectiveness of interventions in at least one of the dependent variables (P -value $<$ 0.001). According to Table 4, the three groups had significant differences in terms of rumination ($F=17.34$, P -value $<$ 0.001) and anxiety sensitivity ($F=20.15$, P -value $<$ 0.001).



Table 4. The results of analysis of covariance on variables in experimental and control groups

Variables	SS	df	MS	F	P-value	η^2	Power
Rumination	421.16	2	210.58	17.34	0.001	0.72	1.00
Anxiety sensitivity	582.71	2	29.14	20.15	0.001	0.80	1.00

According to Table 5, the adjusted means and the standard errors of dependent variables were significant in all three groups. Regarding sensitivity anxiety, there was a significant difference between the adjusted mean of the MBSR training group and that of the emotional schema therapy group (P-value<0.01). In conclusion, MBSR training had greater effects than schema therapy on the anxiety sensitivity of female students with social anxiety. Moreover, there were significant differences between the two experimental groups and the

control group in favor of therapies. Regarding rumination, there were no significant differences between the adjusted mean of the MBSR training group and the emotional schema therapy group at the posttest. Hence, there were no significant differences between the two therapies in terms of their effects on rumination in female students with social anxiety. However, there was a significant difference between the two experimental groups and the control group in terms of effects on rumination (P-value<0.01).

Table 5. Bonferroni post-hoc test for paired comparison of the research variables

Variables	Groups	Mean difference	SE	P-value
Rumination	MBSR - Emotional schema therapy	0.69	1.10	0.141
	MBSR - Control	-29.17	3.03	0.001
	Emotional schema therapy - Control	-29.86	3.78	0.004
Anxiety sensitivity	MBSR - Emotional schema therapy	-7.65	2.85	0.003
	MBSR - Control	-21.72	3.78	0.002
	Emotional schema therapy - Control	-14.18	2.04	0.001

Discussion

This study aimed to compare the effects of MBSR and EST on rumination and anxiety sensitivity in students with SAD. The findings indicated that MBSR and EST managed to reduce rumination in students with social anxiety. This improvement lasted at the one-month follow-up stage. The results are consistent with the findings reported by Mostafazadeh et al.,¹⁷ and Sakhaie Ardakani et al.,²². In these interventions, students with social anxiety were trained to observe their thoughts and feelings without any judgments and consider them simply mental events that would come and go instead of regarding them as parts of themselves or reflections of reality. This kind of attitude to problem-related cognition prevents the exacerbation of negative thoughts in the rumination patterns of students. In mindfulness training, students are trained regularly to make sure of whatever occurs in their surroundings and ensues from their experiences¹⁴. Additionally, mindfulness makes students with social anxiety aware of the present moment and reduces their rumination by adopting certain techniques such as training relaxation, accepting the current situation without judgments, and being self-aware (which are the fundamental concepts of this approach)¹⁶. According to the research findings, using MBSR techniques such as training cognitive flexibility, improving attention, practicing decentralization, enriching the mind, and modifying positive and negative thoughts can reduce rumination in students. In other words, this therapy helps students with social anxiety pay less attention to negative thoughts and repeat those thoughts less often by focusing on the present and considering positive thoughts¹⁸. As a result, they can better control their rumination symptoms. Mindfulness necessitates becoming free of

subjective content and experiencing the present moment completely with no judgments. The students who tried to control and eliminate emotions in the face of unpleasant emotions caused by rumination managed to learn mindfulness. Therefore, instead of confronting their emotions and trying to eliminate, suppress, or avoid those emotions, they experience the emotions and focus on the present moment instead of ruminating on those emotions. After this intervention, the members of the experimental group reported that they were lost in their rumination less often by focusing on the present moment; therefore, they could attend to the other tasks, unlike in the past when rumination used to take up much time.

The findings also indicated that MBSR and EST reduced the anxiety sensitivity of students with social anxiety. The difference lasted at the one-month follow-up stage. The results are consistent with the findings reported by Parsons et al.,¹⁸ and Straarup et al.,²¹. Mindfulness is considered an innate human ability or capacity that can be improved through a range of exercises such as mindfulness meditation and certain interventions such as MBSR. Participation in the MBSR intervention can reduce stress because it trains students with social anxiety in the correct ways of dealing with stressful situations. In this intervention, students learn to distance themselves from their default automation mode in difficult situations and identify their spontaneous thoughts to control events and reduce tension by accepting problems. Moreover, mental preoccupation with past and future thoughts can cause many stresses²⁸. Hence, the MBSR method teaches participants to expand their awareness of the current location and the present time and to pay full attention to their minds and bodies so that they can benefit from every moment of life and be free



of pain^{18,30}. As a result of performing mindful yoga training, students with social anxiety become aware of subtle interactions between mind and body, thereby learning how to prevent tension in the neck muscles, shoulders, and other parts of their bodies. Therefore, physical relaxation in the body through the foregoing exercises will lead to satisfactory mental states free of stress.

Schemas are sets of beliefs, memories, physical feelings, and emotional feelings about a specific topic. They emerge and become maladaptive due to the suppression or over-satisfaction of needs in childhood²¹. For instance, a person who has developed the schema of vulnerability to loss or disease is excessively afraid that a catastrophe is going to happen any minute now and cannot be prevented. Such fears are focused on several aspects²³. Therefore, changing early maladaptive schemas can reduce students' fears of breathing symptoms, publicly observable symptoms of anxiety, cardiovascular symptoms, and cognitive non-inhibition. As a result, students experience lower levels of anxiety sensitivity. What drives anxiety sensitivity toward the psychopathology of anxiety depends partially on how people monitor and manage psychical, cognitive, and behavioral symptoms of anxiety. In other words, as long as people can tolerate negative emotional cognition and states (without needing to avoid them), the presence of high anxiety sensitivity cannot be problematic. Emotional schema therapy deals with the foregoing conditions through certain techniques. Given all aspects and further emphasis on anxiety sensitivity reduction, MBSR training had acceptable effects on anxiety sensitivity in comparison with emotional schema therapy.

A limitation of this study is that findings can be generalized only to female eligible students. In other words, research findings cannot be generalized to the people who differ from participants in terms of demographics and inclusion criteria.

The MBSR intervention and emotional schema therapy can alleviate rumination in female students with social anxiety. These interventions can also mitigate the anxiety sensitivity of these students. Therefore, given the positive effects of MBSR training and emotional schema therapy, it is recommended that they be used in schools, psychotherapy centers, and counseling clinics to help people with SAD.

Ethical Considerations

The Ethics Review Board of Islamic Azad University-Ahvaz Branch, approved the present study (code: IR.IAU.AHVAZ.REC.1402.003).

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Conflict of Interest

No conflicts of interest declared.

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