Research Article



The Effectiveness of Emotional Schema Therapy on Academic Selfefficacy, Test Anxiety, Distress Tolerance, and Academic Resilience in Students with Test Anxiety

Asma Moradpour 🔟 ¹, Sasan Bavi 🔟 ^{1,*}

¹ Department of Psychology, Ahv.C., Islamic Azad University, Ahvaz, Iran

*Corresponding Author: Department of Psychology, Ahv.C., Islamic Azad University, Ahvaz, Iran. Email: sassanbavi@gmail.com

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Abstract

Background: Test anxiety significantly impairs academic performance and well-being. Emotional schema therapy (EST), which targets maladaptive emotional beliefs, presents a potential intervention.

Objectives: This study aimed to assess the effectiveness of EST on test anxiety and associated psychological factors – academic self-efficacy, distress tolerance, and academic resilience – in female high school students.

Methods: This study employed an experimental, pre-test/post-test control group design over a 10-week period. The participants were female high school students in Ahvaz, Iran, during the 2023 academic year, with moderate test anxiety, selected via cluster random sampling. Forty eligible students were randomly assigned to either the experimental group (n = 20), which received ten weekly 90-minute EST sessions, or the control group (n = 20), which received no intervention during the study period. Measures included the Test Anxiety Inventory (TAI), Distress Tolerance Scale (DTS), Academic Self-efficacy Questionnaire (ASEQ), and Academic Resilience Questionnaire. Analysis of covariance (ANCOVA) was used for data analysis.

Results: Compared to the control group, the findings indicated that EST significantly increased distress tolerance, academic self-efficacy, and academic resilience, while significantly reducing test anxiety in the experimental group at post-test (P < 0.001).

Conclusions: Emotional schema therapy effectively reduced test anxiety and improved related psychological factors – distress tolerance, self-efficacy, and resilience – in the participating female high school students. The EST shows promise as an intervention for test anxiety in this population, meriting further investigation into its long-term effects and applicability in diverse settings.

Keywords: Test Anxiety, Self-efficacy, Schema Therapy, Resilience, Student

1. Background

The pressure cooker of academic examinations is a familiar, often stressful experience for students worldwide. While examinations are a common tool in many educational systems for evaluating learning and comparing student performance, this reliance frequently triggers significant anxiety and negative feelings, particularly when students feel unable to adequately demonstrate their knowledge. Repeated difficulties in exams, even after dedicated preparation, can foster persistent feelings of inferiority and incompetence (1).

Test anxiety itself is more than just pre-test jitters; it is understood as a form of generalized anxiety involving a mix of internal experiences, physiological reactions, and behaviors linked to the fear of failing in evaluative situations (2). Specifically, it is an emotional state of apprehension and worry about performance assessments (3), manifesting through cognitive worry and negative thoughts about exams, behavioral issues like difficulty concentrating, and physiological stress responses (4).

Several psychological factors are closely intertwined with test anxiety. Distress tolerance, defined as an individual's capacity to withstand negative emotional or

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physical states, is crucial (5). In the context of test anxiety, this refers to a student's ability to manage the discomfort, worry, and physical symptoms associated with exams without resorting to avoidance or dysfunctional coping (6, 7). Low distress tolerance can exacerbate anxiety symptoms and hinder effective studying.

Academic self-efficacy is another key factor, representing an individual's belief in their own ability to successfully complete academic tasks (8). Specifically concerning academics, it reflects a student's confidence in organizing and executing the actions needed for learning and achieving desired exam performance (9). Students with high academic self-efficacy tend to set realistic goals, understand their capabilities, persevere through challenges, and attribute setbacks to controllable factors like effort, leading to better academic outcomes (10, 11). Conversely, low self-efficacy can fuel test anxiety and demotivation.

Furthermore, academic resilience plays a significant role (12). Resilience is broadly the ability of a system, or in this case, an individual, to adapt positively despite adversity or significant stress (13, 14). Academically, resilience refers to a student's capacity to bounce back effectively from poor grades, learning setbacks, or the pressure of evaluations, maintaining motivation and effective study habits (15, 16). It allows students to navigate academic challenges and anxieties without being overwhelmed.

These factors — debilitating test anxiety, low distress tolerance, wavering academic self-efficacy, and insufficient resilience — often interact, creating significant hurdles for students. Low confidence (self-efficacy) can amplify anxiety, while difficulty managing the distress of studying or testing (low distress tolerance) and an inability to rebound from academic setbacks (low resilience) further impede performance. This interplay highlights the need for interventions that address not just the anxiety itself, but also these contributing psychological factors.

Among potential interventions, emotional schema therapy (EST) offers a targeted approach (17). EST focuses on identifying and modifying "emotional schemas" deeply ingrained patterns of thinking, feeling, behaving, and relating to others, often originating in early life experiences (18). The therapy pays particular attention to "early maladaptive schemas", which are selfdefeating emotional and cognitive patterns (sometimes termed "life traps") that disrupt healthy functioning and can fuel issues like anxiety (19, 20). For example, a core belief or schema related to inherent failure could significantly intensify test anxiety. Research suggests EST holds potential for addressing emotional difficulties; for instance, a comparative study by Dehganisoltani and Rezainasab (21) indicated that while both metacognitive therapy and EST reduced depression and anxiety, EST showed a notably strong therapeutic effect. While more research focusing specifically on EST for test anxiety is beneficial, its mechanism of addressing core emotional patterns makes it a relevant candidate for intervention.

Adolescence is a period of significant developmental shifts, often accompanied by increased stress and anxiety that can impede academic progress. Navigating these challenges effectively requires coping skills, assertiveness, and self-belief. Deficits in these areas, compounded by test anxiety and low resilience, can significantly hinder academic success and overall wellbeing. Addressing test anxiety and bolstering related psychological strengths is therefore crucial for supporting students' academic achievement and mental health.

2. Objectives

Therefore, this study was designed to evaluate the efficacy of EST in mitigating test anxiety and enhancing distress tolerance, academic self-efficacy, and academic resilience among female high school students experiencing test anxiety.

3. Methods

This study adopted an experimental pre-test/post-test control group design. The target population comprised female secondary school students, aged 13 to 15 years, residing in Ahvaz, Iran, during the 2023 academic year, who presented with test anxiety. Participant selection employed a multi-stage cluster random sampling methodology. Initially, two educational districts were randomly selected from the four districts within Ahvaz. Subsequently, eight female secondary schools were randomly chosen from each selected district, followed by the random selection of three classes from each school, yielding an initial pool of 320 students.

These students completed the Test Anxiety Inventory (TAI). From those whose scores exceeded one standard deviation above the mean on this inventory and who also exhibited test anxiety symptoms confirmed via a clinical interview, a list of 101 eligible students was generated. Ethical approval was obtained from the relevant institutional review board prior to recruitment. Informed assent was secured from the students, and informed consent was obtained from their legal guardians. All participants were assured of data confidentiality and informed of their right to withdraw from the study at any time without consequence.

From the eligible list, 40 students were randomly selected for study participation. These 40 participants were then randomly assigned to either the experimental group (n = 20) or the control group (n = 20). The experimental group received 10 weekly 90-minute sessions of EST, following a structured protocol (Table 1). To ensure fidelity to the treatment model, all EST sessions were conducted by therapists specifically trained in EST who adhered to the outlined manual. Regular supervision sessions were also conducted to monitor adherence and consistency. The control group was designated as a wait-list control; they received no intervention during the 10-week study period but were offered the EST program upon completion of the posttest data collection.

3.1. Research Tools

3.1.1. Test Anxiety Inventory

The TAI (22) was used. This 23-item scale employs a 4point Likert-type response format (0 = almost never to 3 = almost always), yielding total scores from 0 to 69, where higher scores indicate greater test anxiety. It includes subscales assessing social derogation, cognitive interference, and physiological tension. Previous studies support its psychometric properties, demonstrating good internal consistency (Cronbach's alpha = 0.81) and evidence supporting its construct validity for measuring test anxiety dimensions (23).

3.1.2. Distress Tolerance Scale

The Distress Tolerance Scale (DTS), developed by Simons and Gaher (24), was administered. This 15-item self-report measure assesses an individual's perceived capacity to withstand negative emotional states across four dimensions: Tolerance, absorption, appraisal, and regulation. Items are rated on a 5-point Likert scale (1 = strongly agree to 5 = strongly disagree), with total scores ranging from 15 to 75 (after reverse scoring where appropriate); higher scores reflect greater distress tolerance. The scale has shown acceptable internal consistency (Cronbach's alpha = 0.77) and is recognized as a valid measure of the construct of distress tolerance (25).

3.1.3. Academic Self-efficacy Questionnaire

The Academic Self-efficacy Questionnaire (ASEQ), developed by Jinks and Morgan (26), was used. This 30item instrument assesses students' confidence in their academic capabilities, covering subscales for ability, effort, and context. Responses are given on a 4-point Likert scale, resulting in scores between 30 and 120. The questionnaire has demonstrated good internal consistency reliability (Cronbach's alpha = 0.79) in previous research, and its items are designed to reflect the theoretical underpinnings of academic self-efficacy, supporting its validity (27).

3.1.4. Academic Resilience Scale

The Academic Resilience Scale, a 6-item measure developed by Martin and Marsh (28), was employed. Using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), it assesses students' ability to overcome academic setbacks and challenges. Scores range from 6 to 30, with higher scores indicating greater academic resilience. This scale has shown high internal consistency (Cronbach's alpha = 0.87) and is widely used in educational research, providing evidence of its validity for assessing resilience in academic contexts (29).

3.2. Statistical Analyses

Data analysis for the research was conducted using analysis of covariance (ANCOVA) in SPSS, version 23. The significance level for this study was set at $\alpha = 0.05$.

4. Results

The present study included 40 female high school students, with a mean age of 14.75 years (SD = 1.39). Participants were randomly assigned to either the experimental EST group or the control group. Descriptive statistics for the dependent variables (test anxiety, distress tolerance, academic self-efficacy, academic resilience), stratified by group, are presented in Table 2 for both pre-test and post-test measurements.

To assess baseline equivalence following randomization, independent samples *t*-tests were conducted on pre-test scores for all dependent variables between the experimental and control groups. Although slight numerical differences were observed at pre-test, as indicated in Table 2 (e.g., mean test anxiety: 51.37 vs. 53.52), these differences were not statistically significant (all P > 0.05). This suggests that randomization successfully yielded comparable groups prior to the intervention.

The absence of influential outliers was verified via the Kolmogorov-Smirnov test, confirming the normality of the data distribution. Additionally, Levene's test revealed non-significant results for test anxiety, distress tolerance, academic self-efficacy, and emotional Table 1. A Summary of the Emotional Schema Therapy Session

Sessions	Contents
1	Introduction, group rules, member explanation of group participation goals and concerns; validation of emotions; psychoeducation about generalized anxiety disorder
2	Psychoeducation about emotion; distinguishing it from thought and behavior, and EST and its rationale; discussing the function and evolutionary course of emotions; defining emotional schemas and explaining their impact on individuals' beliefs and behaviors; explaining the role of schemas in individuals' anxiety with examples
3	Teaching muscle relaxation techniques; practice on the transience of emotions; homework: Practice the pros and cons of the thought that emotions are abnormal; performing muscle relaxation exercises
4	Correct definition of acceptance and its effects; explanation of emotional acceptance, especially anxiety; using the metaphor of a guest for anxiety acceptance and the technique of riding the wave of anxiety
5	Challenging beliefs about mixed feelings; practice on mixed feelings; mindfulness training
6	Challenging false beliefs about emotion and teaching the advocate technique to challenge them (control and rumination)
7	Challenging false beliefs about emotion and performing the evidence review technique (rationality); encouraging members to give examples of the usefulness of using emotion alongside logic for decision-making; reviewing evidence for the impact of emotion on decision-making
8	Performing the technique of validating one's emotions; teaching the correct way to receive validation from others; performing the compassionate mindfulness technique
9	Performing the technique of climbing the ladder of values, positive and negative metaphors; performing the evidence review technique to challenge guilt about emotion.
10	Helping to consolidate new learning through talking about obstacles and regressions; talking about obstacles to continuing practice after the end of treatment and finding solutions to overcome obstacles; discussion of methods that help maintain results; reviewing goals and the extent to which they have been achieved; post-test

Abbreviation: EST, emotional schema therapy.

ariables and Phases	Experimental Group	Control Group	P-Value	
est anxiety				
Pre-test	51.37 ± 5.65	53.52 ± 6.12	0.257	
Post-test	24.67 ± 2.06	54.60 ± 6.92	0.001	
Distress tolerance				
Pre-test	20.31 ± 6.38	22.47 ± 5.08	0.244	
Post-test	52.59 ± 4.26	23.52 ± 5.67	0.001	
cademic self-efficacy				
Pre-test	46.85 ± 5.68	43.67 ± 6.18	0.098	
Post-test	72.68 ± 3.41	42.90 ± 6.79	0.001	
cademic resilience				
Pre-test	14.64 ± 6.65	13.87 ± 7.16	0.727	
Post-test	24.14 ± 2.18	12.48 ± 7.03	0.001	

^a Values are expressed as mean ± SD.

resilience. Therefore, the assumption of homogeneity of variances for the research variables was sustained.

The results of the ANCOVA presented in Table 3 demonstrate significant effects of EST on post-test scores across all research variables, after controlling for pretest scores. Test anxiety exhibited a substantial reduction, with an F-value of 66.68 and a P-value less than 0.001, accounting for 71% of the variance ($\eta^2 = 0.71$). Distress tolerance showed a marked improvement, with an F-value of 32.35 and a P-value less than 0.001, yielding an effect size of 0.69. Academic self-efficacy was

significantly enhanced, as indicated by an F-value of 71.49 and a P-value less than 0.001, with an effect size of 0.81. Similarly, academic resilience increased notably, with an F-value of 24.09 and a P-value less than 0.001,

accounting for 74% of the variance ($\eta^2 = 0.74$).

These findings suggest that EST had a robust and statistically significant impact on reducing test anxiety and enhancing distress tolerance, academic self-efficacy, and academic resilience, with large effect sizes indicating substantial practical significance across all measured constructs.

Table 3. Results of Analysis of Covariance on Post-test Scores of Research Variables										
Variables	SS	df	MS	F	P-Value	η^2				
Test anxiety	209.32	1	209.32	66.68	0.001	0.71				
Distress tolerance	521.70	1	521.70	32.35	0.001	0.69				
Academic self-efficacy	417.81	1	417.81	71.49	0.001	0.81				
Academic resilience	216.13	1	216.13	24.09	0.001	0.74				

5. Discussion

This investigation explored the impact of EST on academic self-efficacy, test anxiety, distress tolerance, and academic resilience among female high school students experiencing test anxiety. The findings clearly demonstrated the positive effects of the EST intervention, revealing a significant reduction in test anxiety alongside marked improvements in distress tolerance, academic self-efficacy, and academic resilience. These results suggest that EST effectively ameliorated test anxiety while concurrently fostering these crucial psychological strengths within this student cohort.

These findings align conceptually with previous research highlighting the utility of schema-focused and cognitive-based interventions for emotional difficulties. For instance, studies by Mousavi et al. (17) and Alboushoke et al. (30), likely employing related therapeutic principles targeting core beliefs or maladaptive cognitions, also reported significant improvements in affective constructs like anxiety or depression. While direct comparisons necessitate caution due to potential differences in specific methodologies, populations (e.g., varying age groups or clinical presentations), or nuances in the therapeutic protocols employed, the convergence across studies underscores the potential of interventions that address underlying cognitive and emotional patterns, such as maladaptive schemas, to alleviate anxiety and related concerns in young people.

The observed reduction in test anxiety can be understood through the lens of cognitive theory (4) and schema theory (18, 19). The EST directly targets the maladaptive cognitions and underlying emotional schemas that fuel worry, fear of failure, and physiological arousal associated with evaluative situations. By identifying and modifying schemas related to defectiveness, failure, or vulnerability (21), EST helps students reframe their interpretations of academic challenges, thereby lessening anxiety (31).

The enhancement in distress tolerance aligns with theories of emotion regulation (5). The EST equips

students with skills to mindfully observe, accept, and manage uncomfortable emotions and physiological sensations linked to schemas, rather than resorting to avoidance or maladaptive coping, thus increasing their capacity to tolerate the stress inherent in academic evaluation.

Furthermore, the significant improvement in academic self-efficacy resonates strongly with Bandura's social cognitive theory (8). By challenging and restructuring schemas that may undermine a student's belief in their own competence (e.g., a failure schema), EST fosters a more positive and realistic self-assessment of academic capabilities, thereby enhancing confidence and persistence (11).

Similarly, the increase in academic resilience is consistent with theoretical models emphasizing adaptive coping and positive adjustment despite adversity (13). The EST likely bolsters resilience by replacing maladaptive coping strategies tied to schemas with more functional ones and by altering core beliefs that might otherwise lead to helplessness or giving up when faced with academic setbacks (31).

The mechanisms underlying these improvements involve EST integrative approach. Techniques such as Socratic dialogue, cost-benefit analysis, evidence examination, emotion normalization, validation, and behavioral pattern breaking facilitate cognitive restructuring and emotional processing (31). By validating emotional experiences linked to unmet needs (often stemming from childhood) and normalizing anxiety responses, EST reduces associated shame and guilt, fostering acceptance (20). Muscle relaxation techniques further address the somatic components of anxiety.

As maladaptive schemas — collections of beliefs, memories, emotions, and sensations rooted in unmet needs (18) — are modified, their intensity and frequency of activation diminish (21). This leads to changes in selfperception and evaluations of the environment, reducing emotional intensity and reliance on maladaptive regulation strategies (e.g., rumination). The modification of schemas related to vulnerability, for instance, can lessen apprehension about potential catastrophes (medical, emotional, environmental), contributing directly to reduced test anxiety (21).

The focus of EST extends beyond cognitive challenging to include experiential techniques facilitating the processing and release of emotions linked to schemas, such as anger or sadness related to unmet needs for autonomy or secure attachment (17). This comprehensive approach, targeting cognitions, emotions, sensations, and behaviors, explains its effectiveness in not only reducing test anxiety but also enhancing broader psychological resources like distress tolerance, self-efficacy, and resilience, ultimately contributing to students' overall well-being and adaptive functioning.

However, the findings have limited generalizability due to the specific sample (female Iranian adolescents, N = 40) and small size. Applicability across genders, cultures, or anxiety levels is uncertain. Exclusive reliance on self-report measures introduces potential bias and lacks objective corroboration. Furthermore, potential confounding variables like co-occurring conditions or life stressors were not fully controlled, possibly influencing outcomes and limiting definitive conclusions about the intervention's specific effect.

5.1. Conclusions

In summary, this study provides preliminary evidence that EST was effective in significantly reducing test anxiety while concurrently improving distress tolerance, academic self-efficacy, and resilience among the participating female high school students in Ahvaz, Iran. These findings suggest that EST, by targeting maladaptive emotional schemas, may be a valuable approach for addressing the complex interplay of emotional, cognitive, and behavioral factors contributing to test anxiety.

Based on these initial results, incorporating EST principles or techniques could be considered within school-based mental health services. Educators and school counselors might find value in identifying students potentially struggling with underlying maladaptive schemas contributing to severe test anxiety and collaborating with trained clinicians who can implement EST strategies. However, given the study's specific population and scope, these recommendations should be approached with caution pending further research.

Future research is essential to build upon these findings. Investigating the long-term maintenance of EST effects through follow-up studies is crucial. Replication with larger and more diverse samples is needed, specifically including male students, adolescents across different age ranges (e.g., middle school, early college), students from varied cultural and socioeconomic backgrounds, and individuals presenting with different levels or types of anxiety. Comparing EST to active control treatments [e.g., cognitive-behavioral traditional therapy (CBT), relaxation training] and exploring the feasibility of different delivery formats (e.g., group EST adaptations for schools) would also yield valuable insights for clinical practice and educational settings.

Footnotes

Authors' Contribution: A. M.: Study concept and design, acquisition of data, analysis and interpretation of data, and statistical analysis; S. B.: Administrative, technical, and material support, study supervision; A. M. and S. B.: Critical revision of the manuscript for important intellectual content.

Conflict of Interests Statement: The authors declare no conflict of interest.

Data Availability: The dataset presented in the study is available on request from the corresponding author during submission or after its publication. The data are not publicly available.

Ethical Approval: The present study received approval from the Ethics Committee of Islamic Azad University, Ahvaz Branch (IR.IAU.AHVAZ.REC.1403.175).

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Informed Consent: Questionnaires were filled with the participants' satisfaction and written informed consent was obtained from the participants in this study.

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