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Comparing the Effectiveness of Cognitive-Behavioral Therapy and Emotional Schema Therapy on Difficulties in Emotion Regulation and Positive and Negative Affect in Students with Anxiety Disorders

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ABSTRACT

Objective: The objective of the present investigation was to evaluate the comparative efficacy of cognitive-behavioral therapy and emotional schema therapy on difficulties in emotion regulation and positive and negative affect among students diagnosed with anxiety disorders in the urban context of Sari.

Methods: The current study was classified as applied research, and utilized a quasi-experimental design featuring pre-test and post-test assessments alongside a control group. The research sample comprised 45 students who had been clinically diagnosed with anxiety disorders by the psychologist affiliated with the consultation center of the Sari Education Department. Participants were randomly assigned to three distinct groups (first experimental group: 15 individuals; second experimental group: 15 individuals; control group: 15 individuals). The first experimental cohort underwent training in the CBT, whereas the second experimental cohort engaged in the EST, with the control group receiving no specialized intervention. Data collection was conducted utilizing the Emotion Regulation Questionnaire in conjunction with the Positive and Negative Affect Schedule (PANAS). The analysis of the collected data was executed using SPSS software, encompassing analysis of covariance.

Results: The findings indicated that while both therapeutic modalities demonstrated effectiveness, EST exhibited superior efficacy compared to CBT in alleviating difficulties in emotion regulation. Furthermore, additional findings revealed that EST proved to be more effective in enhancing positive and negative affect than CBT.

Conclusions: The results substantiate the efficacy of emotion-focused interventions concerning the emotional states and affective experiences of students diagnosed with anxiety disorders.

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Introduction

Anxiety constitutes a detrimental emotional state that impedes cognitive processes, disrupts the attentional system, and engenders feelings of apprehension and fear, ultimately compromising the efficacy of an individual's performance across various life domains (Millroth & Frey, 2021). Anxiety disorders encompass a spectrum of conditions, including generalized anxiety disorder, social anxiety disorder, agoraphobia, specific phobias, and panic disorder. Among diverse demographic cohorts, anxiety disorder ranks as one of the most prevalent psychological conditions, particularly among adolescents (Pandey et al., 2022). Adolescent learners afflicted by anxiety disorders encounter impairments across multiple dimensions of psychological and emotional functioning, with the primary challenges being the regulation of emotions and the experience of both positive and negative affect. The duality of positive and negative affect represents the foundational emotional constructs that are susceptible to dysfunction in adolescents diagnosed with anxiety disorders (Pandey et al., 2022). Emotions can be categorized into two distinct groups: positive emotions, which encompass happiness and joy, and negative emotions, which include fear, guilt, or shame. While all individuals experience both positive and negative emotions, the extent to which certain emotions become entrenched in a person's enduring mood is contingent upon their emotional regulatory strategies (Gharehdaghi & Komeylipour, 2019). Individuals with anxiety disorders frequently manifest a markedly diminished capacity for experiencing positive emotions, instead exhibiting heightened engagement with negative emotions such as fear and concern (Abbasi et al., 2019). Deficits in the management and regulation of these emotional states serve as a contributing factor to the persistence and exacerbation of anxiety symptoms within this population (Mazaheri & Bahramian, 2016). Gaining insight into the regulatory deficits of this cohort regarding positive and negative emotions is a critical initial step towards effectively addressing these disorders (Moafi et al., 2019). In their investigation, Twardowska-Staszek et al. (2021) posited that an enhancement in individuals' capacity to foster positive emotions, coupled with increased efficacy in managing negative emotions, correlates with a reduced likelihood of experiencing anxiety and mood disorders. The successful intervention of anxiety disorders is contingent upon an augmented experience of positive emotions among affected individuals, while simultaneously achieving a reduction or effective management of their negative emotional experiences (Liu et al., 2021). Moreover, individuals diagnosed with anxiety

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disorders also exhibit a deficiency in the regulation of their internal emotional states (Zhu et al., 2021).

Emotion regulation pertains to the array of processes individuals employ to modulate and manage their emotional states in alignment with their personal needs and objectives (Ebrahimi et al., 2022; Salimi et al., 2023). This regulation represents a form of adjustment or modification concerning the manifestation or continuity of internal emotional experiences as they relate to both internal and external stimuli. Scholars contend that individuals who struggle to regulate their emotions in response to quotidian occurrences frequently receive diagnoses of mood disorders, particularly anxiety disorders (Waterschoot et al., 2022). The majority of anxiety-related tensions are influenced by the inability to regulate emotions, with a pronounced effect on negative emotional states. Enhancing one's capacity for emotional regulation is significantly influential in diminishing the severity and duration of anxiety; thus, the disruption of emotion regulation is recognized as a predictive factor for anxiety disorders (Eres et al., 2021).

A considerable proportion of individuals afflicted with anxiety disorders find themselves incapable of effectively managing their internal emotional landscape; this deficiency precipitates both the emergence and exacerbation of anxiety symptoms, thereby perpetuating their persistence (Zhu et al., 2021). Shahamatinejad (2021) articulated in his investigation that numerous individuals suffering from anxiety disorders report substantial recovery when their capacity to recognize and manage the emotional manifestations of this condition is enhanced.

From the perspective of emotional schema therapy, incompatible emotional schemas are implicated in the development of maladaptive emotions, including fear, anxiety, shame, and guilt, which in turn undermine the emotional and psychological well-being of individuals (Arntz & Jacob, 2017). If the underlying schemas that govern individuals' emotional responses can be identified and amended, it is anticipated that their overall functionality across various life domains will experience considerable enhancement (Abbasi et al., 2019). Anxiety is classified as a negative emotional state that is facilitated by emotional patterns such as cognitive rumination and a lack of acceptance, which serve as foundational elements for its emergence, escalation, and persistence (Kianipour et al., 2018). Masumi Tabar et al. (2020) underscored in their research that the identification of incompatible emotional schemas is a crucial initial step in ameliorating the symptoms associated with this detrimental disorder. When incompatible emotional schemas are

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identified and rectified, individuals within this demographic are more likely to embrace rather than evade their emotional experiences, resulting in a reduction of the intensity of negative emotions encountered in such contexts (Emam Zamani et al., 2019). Despite existing research on the efficacy of emotional schema therapy in addressing anxiety disorders, there remains a dearth of studies exploring the impact of this therapeutic modality on comorbid conditions related to anxiety disorders, such as difficulties in emotional regulation and the management of both positive and negative emotions, leading to a prevailing ambiguity in this area of study.

Cognitive-behavioral therapy (CBT) serves as an alternative intervention that can significantly mitigate the manifestations of comorbidity by delving into the cognitive frameworks of individuals afflicted with anxiety disorders, in addition to schema-emotional therapy (Kaczkurkin & Foa, 2015). The cognitive-behavioral paradigm was initially conceptualized by eminent theorists such as Ellis and Beck. This psychotherapeutic methodology scrutinizes the underlying causes of various psychological issues and functional deficits across multiple dimensions, particularly targeting maladaptive and detrimental cognitions and beliefs (James et al., 2020). When an individual becomes entrenched in non-constructive and negative belief systems, it creates a conducive environment for the development of harmful emotional and behavioral dysfunctions. Within this framework, the irrational beliefs held by individuals are systematically challenged, thereby facilitating emotional recalibration. Techniques such as goal-setting, cognitive appraisal and restructuring, self-monitoring, enhancement of self-regulation, Socratic and goal-oriented dialogues, problem-solving, behavioral modification, and the management of internal emotional states constitute some of the most prevalent strategies employed in this therapeutic domain.

Cognitive-behavioral therapy is highly efficacious in ameliorating the symptoms associated with anxiety disorders. Research conducted by Bogucki et al. (2021) indicates that this therapeutic modality significantly attenuates the severity of anxiety disorders by altering the cognitive frameworks of affected individuals. This therapeutic intervention enhances an individual's capacity to regulate their beliefs and fosters greater control over their emotional responses (James et al., 2020). Additionally, Kaczkurkin and Foa (2015) corroborated the beneficial effects of this therapeutic method on the alleviation of anxiety symptoms. Symptoms such as anxiety sensitivity, intolerance of ambiguity, challenges in emotional regulation, as well as both positive and negative emotional experiences, are associated with anxiety disorders, and it is anticipated that a cognitive-

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behavioral approach would effectively diminish their severity and impact among affected individuals.

Overall, previous research findings have elucidated that difficulties in the regulation of positive and negative emotions represent one of the deleterious symptoms prevalent among individuals suffering from anxiety disorders. Alleviating the intensity of these symptoms can enhance an individual's capacity to surmount their anxiety disorder. A variety of interventions exist to address anxiety disorders, among which cognitive-behavioral therapy and emotional schema therapy have been predominantly utilized in this area. Nevertheless, a comparative analysis of the effects of these two approaches on the co-occurrence of anxiety disorders, specifically the challenges related to emotional regulation and the management of positive and negative emotions, has yet to be undertaken. This research endeavors to address this gap. In essence, the objective of this study is to compare the efficacy of cognitive-behavioral therapy and emotional schema therapy concerning the challenges of regulating positive and negative emotions in students diagnosed with anxiety disorders.

Material and Methods

The present investigation constitutes an applied research endeavor with respect to its objectives, while in terms of methodology, it employed a quasi-experimental framework characterized by a pre-test and post-test design, inclusive of a control group. The statistical population pertinent to this study encompassed all high school students diagnosed with anxiety disorders in Sari during the year 2022, with the research sample comprising 45 students who had been identified by the psychologist at the Sari Education Department's counseling center; these individuals were selected utilizing an accessible sampling technique and subsequently randomized into three distinct groups (first experimental group: 15 individuals; second experimental group: 15 individuals; control group: 15 individuals). The inaugural experimental cohort received training in a cognitive-behavioral therapy program, whereas the second experimental cohort was trained in an emotional schema therapy program, and the control group did not partake in any specialized intervention.

The assessment instruments utilized in this research included Gertz and Roemer's Emotion Regulation Difficulty Scale (DERS) alongside the Positive and Negative Affect Scale (PANAS).

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Difficulties in Emotion Regulation Scale (DERS): This original scale comprises 41 items structured as a self-report instrument intended to clinically assess difficulties in emotion regulation, as devised by Gratz and Roemer (2004). The items constituting this scale were meticulously compiled and selected through extensive discussions with colleagues well-versed in the literature on emotion regulation. The Generalized Expectancy Scale of Negative Emotional Regulation ((Gratz & Roemer, 2004)) served as a foundational model in the development of this scale. To evaluate the challenges associated with regulating emotions in periods of agitation (when emotion regulation strategies are deemed essential), numerous DERS items akin to NMR were formulated to commence with the phrase "when I am agitated." Responses were categorized on a Likert scale ranging from 1 to 5, wherein one signifies "almost never" (0-10%), two represents "sometimes" (11-35%), three denotes "half the time" (36-65%), four indicates "most of the time" (66-90%), and five connotes "almost always" (91 to 100 percent). One item was excluded due to its minimal correlation with the overall scale, along with four items that exhibited low or dual factor loading across two factors. Consequently, 36 items persisted from the original 41 items of the scale.

Factor analysis revealed the presence of six factors, namely non-acceptance of emotional responses, challenges in executing purposeful behaviors, difficulties in impulse control, deficiencies in emotional awareness, restricted access to emotional regulation strategies, and a lack of emotional clarity. The findings affirm that this scale possesses a high internal consistency coefficient of 0.93 (Gratz & Roemer, 2004). Each of the six DERS subscales exhibits a Cronbach's alpha exceeding 0.80. Furthermore, DERS demonstrates a significant correlation with both the NMR scale and the Acceptance and Action Questionnaire (AAQ, Hayes et al.). According to data obtained by Shams et al. (2010), the Cronbach's alpha for this questionnaire was assessed to be 0.92.

Positive and Negative Affect Scale (PANAS): The instrument in question is a self-evaluation tool consisting of 20 items, meticulously crafted to assess two distinct dimensions of mood, namely negative affect and positive affect (Watson et al., 1988). Each of the subscales comprises 10 items, which respondents evaluate utilizing a five-point Likert scale (1=very low to 5=very high). The Positive and Negative Affect Schedule (PANAS) serves as a self-assessment instrument that permits the measurement of both the state and trait components by modifying the provided

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instructions. When the temporal reference pertains to the individual's current mood state and the preceding week, the emotional state component is evaluated; conversely, if a more prolonged timeframe is considered, the characteristic component is assessed. The authors have reported the scale's validity and reliability as being notably favorable (Watson et al., 1988).

The internal validity and consistency, as indicated by the Cronbach's alpha coefficients, for the positive affect scales ranged between 0.86 and 0.90, while the negative affect scales exhibited a range from 0.84 to 0.87. Within the context of Iranian culture, Bakhshipour and Dezhkam (2006) have documented satisfactory reliability and validity for this particular scale.

Treatment protocols

Table 1. Summary of schema-emotional therapy sessions by Leahy et al. (2015)

Session	Aims	Content
1	Introducing the group members to each other and the therapist, answering the possible questions of the group members, explaining the purpose and necessity of the meetings	Empowering group members to determine the allocation of goals related to their problem
2	Familiarizing patients with existing theoretical models in the field of psychological aspects of anxiety disorders.	Educating patients on the nature of anxiety disorders, investigating how to adapt theoretical models to personal experiences in the field of anxiety disorders.
3	Introducing the members of the emotional schema therapy conceptual model	Description of the basics of the conceptual model of schema-emotional therapy by the therapist
4	Acquainting the members with the mentality of their schemas and their response and coping in facing anxiety-provoking situations and other situations in life.	Teaching prevalence of exposure to anxiety-provoking situations and other situations
5	Familiarizing people with the concept of communication and situational rules	Using a questionnaire to determine the schema of each person and functional training in the field of anxiety management.
6	Familiarizing with the anti-schema process	Writing a life scenario based on a schema model and showing incompatible schemas in the written scenarios to eliminate them.
7	Introducing the cognitive strategies of schema-therapy with emphasis on the role of primary emotions	Training and practice of schema-therapeutic cognitive strategies with emphasis on the role of primary emotions
8	Introducing the cognitive strategies of schema therapy with emphasis on the role of emotions in anxiety disorders	Teaching the practice of schema-therapeutic cognitive strategies with emphasis on the role of emotions in the occurrence of anxiety.
9	Acquainting the participants with emotional strategies	Training and training participants with emotional strategies
10	Acquainting the participants with emotional strategies	Training and training participants with emotional strategies
11	Acquainting members with the role of emotions and rules in behavioral patterns, identifying strategies for breaking behavioral patterns with emphasis on doubts and rules of life and emotions	Teaching and practicing the role of emotions and rules of life in behavioral patterns, teaching and practicing strategies for breaking behavioral patterns with emphasis on adjusting the rules of life and emotions
12	An overview of the content presented throughout the course and its achievements	Examining the achievements of the participants during the course

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Table 2. Summary of cognitive behavioral sessions Hazlett-Stevens (2008)

Session	Aims	Content
1	Getting to know anxiety, correcting misconceptions.	Psychological education, normalization of worry
2	Identify areas of concern.	The ability to control thoughts
3	attention to the correction of thoughts	Paying attention to awareness, identifying areas of concern, anxiety-provoking thoughts and challenges with spontaneous thoughts.
4	Solving communication problems	Teaching courage and communication skills, identifying, challenging spontaneous thoughts, creating alternative interpretations and predictions.
5	Paying attention to and correcting thoughts and cognitive errors and creating new strategies	Reward planning, activity scheduling to monitor the feeling of pleasure, control anxiety and resolve conflicts.
6	Modifying thoughts, discovering the underpinnings of dysfunctional thoughts	Identifying, challenging spontaneous thoughts, creating alternative interpretations and predictions, using acceptance and metacognitive strategies.
7	Discovering everyday problems and how to deal with or adapt to them.	Examining the stressful sources of the patient's life, generalizing the attention of awareness to new situations, identifying the basic ineffective assumptions.
8	Reducing anxiety through exposure.	Teaching problem solving skills, identifying basic inefficient assumptions, distinguishing between probability of occurrence, possibility of occurrence and reasonableness.
9	Discovering the underpinnings of ineffective thoughts, facing and controlling negative emotions.	Facing the avoided situations, identifying and challenging fundamental ineffective assumptions, predicting the worst situation.
10	Paying attention to and correcting the foundation of ineffective thoughts.	Identifying fundamental inefficient assumptions, creating a new perspective, explaining the relationship between worry and schemas.

Results

Table 3 presents the descriptive statistics associated with the mean and standard deviation of scores pertaining to difficulties in emotion regulation, as well as its constituent elements, distinctly categorized for individuals in control groups, cognitive-behavioral therapy, and emotional schema therapy, across two distinct phases of assessment (pre-test and post-test).

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Table 3. Statistical description of emotion regulation difficulty scores in two stages of measurement by group

Group	Variable	Pretest		Posttest	
		Mean	SD	Mean	SD
Control	Nonacceptance of Emotional Responses	19.27	3.615	19.01	3.324
	Difficulties Engaging in Goal-Directed	16.13	3.021	15.79	3.739
	Impulse Control Difficulties	20.67	4.820	20.54	4.757
	: Lack of Emotional Awareness	18.67	4.877	19.01	4.291
	Limited Access to Emotion Regulation Strategies	26.12	5.012	25.75	4.774
	Lack of Emotional Clarity	14.13	3.475	13.86	3.028
	Total	114.99	13.017	113.96	13.242
CBT	Nonacceptance of Emotional Responses	18.93	3.474	16.13	3.390
	Difficulties Engaging in Goal-Directed	17.07	4.314	14.23	3.713
	Impulse Control Difficulties	20.80	4.927	17.2	4.586
	: Lack of Emotional Awareness	19.47	3.031	17.14	2.897
	Limited Access to Emotion Regulation Strategies	27.13	4.839	24.89	3.841
	Lack of Emotional Clarity	14.58	3.061	11.49	3.150
	Total	117.98	14.443	101.08	13.627
EST	Nonacceptance of Emotional Responses	19.07	3.634	14.01	3.067
	Difficulties Engaging in Goal-Directed	17.20	4.366	12.07	4.198
	Impulse Control Difficulties	21.13	3.800	14.86	3.112
	: Lack of Emotional Awareness	19.02	3.773	15.09	3.314
	Limited Access to Emotion Regulation Strategies	26.37	5.302	22.97	4.598
	Lack of Emotional Clarity	15.73	3.251	10.59	3.997
	Total	118.52	14.674	89.59	13.580

In Table 4, the descriptive statistics pertaining to the mean and standard deviation of positive and negative affect scores are presented distinctly for individuals within the control groups, as well as those undergoing cognitive-behavioral therapy and emotional schema therapy, across two separate measurement intervals (pre-test and post-test).

Table 4. Statistical description of positive and negative affect scores in two stages of measurement by group

Group	Variable	Pretest		Posttest	
		Mean	SD	Mean	SD
Control	Positive affect	26.67	5.877	26.33	4.291
	Negative affect	21.47	4.900	22.07	4.240
CBT	Positive affect	26.47	6.031	28.73	5.011
	Negative affect	21.67	4.716	26.80	3.867
EST	Positive affect	27.31	5.773	31.31	4.449
	Negative affect	21.60	3.586	30.60	3.469

In order to evaluate the comparative efficacy of cognitive-behavioral therapy versus emotional schema therapy with respect to the challenges of emotion regulation among students diagnosed with anxiety disorders, multivariate analysis of covariance (MANCOVA) was employed. Prior to

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the application of MANCOVA, its underlying assumptions, which encompass the homogeneity of the covariance matrix, the homogeneity of variances, and the normality of the variable score distributions, were systematically scrutinized, yielding results that substantiated the validity of these assumptions. The findings derived from the multivariate analysis of covariance concerning the difficulties of emotion regulation are delineated in Table 5.

Table 5. Results of multivariate covariance analysis for the difficulty of emotion regulation in treatment and control groups

Effect	Test	Value	F	DF1	DF2	P	Effect size
Group	Pillai's trace	0.897	4.335	12	64	0.001	0.448
	Wilks' lambda	0.110	10.388	12	62	0.001	0.668
	Hotelling's trace	7.999	19.997	12	60	0.001	0.800
	Roy's largest root	7.991	42.618	6	32	0.001	0.889

According to Table 5, the significance thresholds for all four pertinent multivariate statistics, specifically Pillai's trace, Wilks' lambda, Hotelling's trace, and the Roy's largest root, are observed to be below 0.01 ($p<0.01$). Consequently, the statistical null hypothesis is invalidated, indicating a statistically significant difference among the emotion regulation difficulty scores across the control groups, cognitive behavioral therapy, and emotional schema therapy during the post-test phase. To examine the disparities among the groups concerning each component of emotion regulation difficulty, a between-subjects analysis was conducted, with the findings delineated in Table 6.

Table 6. Test of between-subject effects to compare the components of emotion regulation difficulty in the treatment and control groups in the post-test

Variable	Source	SS	DF	MS	F	P	Effect size
Nonacceptance of Emotional Responses	Between group	209.833	2	104.917	21.370	0.001	0.543
	Error	176.742	36	4.910			
Difficulties Engaging in Goal-Directed	Between group	190.308	2	95.154	14.534	0.001	0.447
	Error	235.693	36	6.547			
Impulse Control Difficulties	Between group	228.224	2	114.112	22.679	0.001	0.558
	Error	181.137	36	5.032			
Lack of Emotional Awareness	Between group	133.900	2	66.950	20.905	0.001	0.537
	Error	115.291	36	3.203			
Limited Access to Emotion Regulation Strategies	Between group	60.695	2	30.348	24.784	0.001	0.579
	Error	44.082	36	1.224			
Lack of Emotional Clarity	Between group	157.404	2	78.702	20.810	0.001	0.536
	Error	136.149	36	3.782			

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Table 6 delineates the findings of the between-subjects effects analysis conducted to evaluate the differential components of emotional regulation difficulties among the control groups, cognitive behavioral therapy, and emotional schema therapy during the post-test phase. The data depicted in Table 6 indicate that the F value computed for all components attains significance at the 0.01 threshold ($P<0.01$). Consequently, the null hypothesis is dismissed, thereby substantiating the research hypothesis. To facilitate the comparison of group pairs, Bonferroni's post hoc test was employed, and the resulting data is illustrated in Table 7.

Table 7. Bonferroni's post hoc test in order to compare pairs of groups in the components of emotion regulation difficulty

Variable	Group 1	Group 2	Mean difference	Std. error	P
Nonacceptance of Emotional Responses	Control	CBT	3.460	0.876	0.001
		EST	5.750	0.880	0.000
	CBT	EST	2.290	0.816	0.024
Difficulties Engaging in Goal-Directed	Control	CBT	3.011	1.011	0.016
		EST	5.480	1.017	0.000
	CBT	EST	2.469	0.942	0.038
Impulse Control Difficulties	Control	CBT	3.174	0.887	0.003
		EST	5.996	0.891	0.000
	CBT	EST	2.822	0.826	0.005
Lack of Emotional Awareness	Control	CBT	2.663	0.707	0.002
		EST	4.597	0.711	0.000
	CBT	EST	1.934	0.659	0.017
Limited Access to Emotion Regulation Strategies	Control	CBT	1.841	0.437	0.000
		EST	3.093	0.440	0.000
	CBT	EST	1.253	0.408	0.012
Lack of Emotional Clarity	Control	CBT	2.933	0.769	0.002
		EST	4.983	0.773	0.000
	CBT	EST	2.050	0.716	0.021

According to the findings derived from the post-test administered to Bonferroni's post hoc test, the mean scores reflecting the challenges associated with emotion regulation within both the cognitive-behavioral therapy and emotional schema therapy cohorts at the post-test phase are markedly lower than the mean scores of the control group, thus indicating the efficacy of both therapeutic modalities in alleviating the challenges of emotion regulation among students diagnosed with anxiety disorders. The distinction between the two cognitive-behavioral methodologies and emotional schema therapy is also statistically significant, revealing that

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emotional schema therapy demonstrates greater efficacy in mitigating the difficulties associated with emotion regulation compared to cognitive-behavioral therapy.

To assess the comparative effectiveness of cognitive-behavioral therapy and emotional schema therapy on the positive and negative emotional states of students experiencing anxiety disorders, the multivariate analysis of covariance (MANCOVA) statistical test was employed (Table 8).

Table 8. Results of multivariate covariance analysis for positive and negative affect in treatment and control groups

Effect	Test	Value	F	DF1	DF2	P	Effect size
Group	Pillai's trace	0.661	9.881	4	80	0.001	0.331
	Wilks' lambda	0.339	14.003	4	78	0.001	0.418
	Hotelling's trace	1.951	18.539	4	76	0.001	0.494
	Roy's largest root	1.951	39.025	2	40	0.001	0.661

According to Table 8, the significance levels of the four pertinent multivariate statistics—namely Pillai's trace, Wilks' lambda, Hotelling's trace, and the Roy's largest root —are all below 0.01 ($p<0.01$). Consequently, the null hypothesis is rejected, indicating a statistically significant disparity between the positive and negative affect scores across the control, cognitive behavioral therapy, and emotional schema therapy groups at the post-test phase. To further examine the differences among the groups concerning the dimensions of positive and negative emotions, the between-subjects effects analysis was employed, with the resulting data delineated in Table 9.

Table 9. Test of between-subject effects to compare positive and negative affect in the treatment and control groups in the post-test

Variable	Source	SS	DF	MS	F	P	Effect size
Positive affect	Between group	146.802	2	73.401	19.167	0.001	0.489
	Error	153.183	40	3.830			
Negative affect	Between group	515.700	2	257.850	21.212	0.001	0.515
	Error	486.227	40	12.156			

Table 9 delineates the findings from the inter-subject effects analysis conducted to compare positive and negative affect among the control groups, cognitive behavioral therapy, and emotional schema therapy during the post-test phase. The data illustrated in Table 9 indicates that the F value

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derived for both variables is statistically significant at the 0.01 level (P<0.01). Consequently, the null hypothesis is dismissed, thereby substantiating the research hypothesis. To facilitate pairwise comparisons among the groups under investigation, Bonferroni's post hoc test was employed, with the corresponding results displayed in Table 10.

Table 10. Results of Bonferroni's post hoc test in order to pairwise compare groups in positive and negative emotions

Variable	Group 1	Group 2	Mean difference	Std. error	P
Positive affect	Control	CBT	-2.543	0.715	0.003
		EST	-4.419	0.717	0.001
	CBT	EST	-1.876	0.720	0.038
Negative affect	Control	CBT	-4.625	1.275	0.002
		EST	-8.296	1.277	0.001
	CBT	EST	-3.671	1.282	0.020

In accordance with the findings derived from the Bonferroni's post hoc test, the mean scores pertaining to both positive and negative emotional states within the cohorts undergoing cognitive-behavioral therapy and emotional schema therapy during the post-test phase exhibit a statistically significant elevation when juxtaposed with the mean scores of the control group, thereby indicating the efficacy of both therapeutic modalities in the enhancement of positive emotional experiences. Moreover, this outcome is particularly adverse for students diagnosed with anxiety disorders. The disparity observed between the two cognitive-behavioral approaches and emotional schema therapy is also noteworthy, as emotional schema therapy demonstrates a greater degree of efficacy in ameliorating both positive and negative emotional states compared to cognitive-behavioral therapy.

Discussion

The findings indicated that both therapeutic interventions were efficacious in alleviating the challenges associated with emotion regulation among students diagnosed with anxiety disorders. Furthermore, the distinction between the two cognitive-behavioral modalities and emotional schema therapy is markedly significant, as emotional schema therapy demonstrates superior efficacy in mitigating the difficulties of emotion regulation compared to cognitive-behavioral therapy.

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In the context of emotional schema therapy exhibiting greater efficacy than cognitive-behavioral therapy in the realm of emotion regulation for students afflicted with anxiety disorders, empirical studies have evidenced that this assertion aligns closely with the outcomes of the research conducted by Soleymani et al. (2020), Sharifi et al. (2020), Shulman et al. (2018) and Farokhzadian et al. (2018). To elucidate the pronounced effect of emotional schema therapy over cognitive-behavioral therapy on the emotion regulation of students grappling with anxiety disorders, it can be posited that one of the pivotal components of emotion regulation resides within the cognitive content and processes of individuals. When an individual possesses mastery and governance over their mental and cognitive landscape, they are better equipped to modulate their internal emotional states and avert the exacerbation of maladaptive emotions. Within the cognitive-behavioral framework, the influence of cognition on the emergence and persistence of various emotional states was elucidated. Participants comprehended that affirmative beliefs engender constructive emotions, while detrimental and destructive beliefs precipitate maladaptive emotional responses. Additionally, they recognized that an individual's capacity to manage both positive and negative emotions, as well as their strategies for addressing these emotions, is largely contingent upon their cognitive perceptions and beliefs regarding these emotional states.

Moreover, the outcomes revealed that both therapeutic modalities were effective in enhancing the positive and negative emotional experiences of students with anxiety disorders. The variance between the two cognitive-behavioral techniques and emotional schema therapy is also noteworthy, with emotional schema therapy exhibiting greater efficacy in improving both positive and negative emotions in comparison to cognitive-behavioral therapy. Regarding the enhanced effectiveness of emotional schema therapy relative to cognitive-behavioral therapy on the positive and negative emotions of students with anxiety disorders, empirical investigations have demonstrated that this conclusion is largely congruent with the findings of Farokhzadian et al. (2018), Arntz and Jacob (2017), Sharifi et al. (2020) and Shulman et al. (2018).

In elucidating the superior efficacy of emotional schema therapy in comparison to cognitive-behavioral therapy concerning the management of both positive and negative emotions in students afflicted with anxiety disorders, the following can be articulated: The elucidation of the influence exerted by the cognitive-behavioral methodology on the modulation of positive and negative emotions mirrors the exposition of the antecedent hypothesis regarding the efficacy of this

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methodology, which is recognized as an effective means of regulating internal emotional states. The engagement with positive and negative emotions, along with their constructive acknowledgment, constitutes an integral component of the emotion regulation process, which is examined as a discrete aspect of the aforementioned variable due to its considerable significance. Positive and negative emotions represent inherent experiences that individuals navigate on a quotidian basis throughout their lifespan. The therapist underscored to the participants that the expectation of never encountering negative emotions and exclusively experiencing positive emotions is a misconception; such aspirations are unattainable in any conceivable manner. The participants gradually came to acknowledge that both positive and negative emotions are an intrinsic facet of human existence, universally encountered on a daily basis. In fact, they comprehended that evasion of experiences such as anger, sadness, and guilt is implausible, and these emotions cannot be circumvented. This cognizance facilitated the participants' readiness to embrace negative emotions in conjunction with positive ones. The acceptance of these sentiments afforded the participants the opportunity to articulate them in a constructive manner.

Each iteration of cognitive-behavioral therapy and emotion-oriented schema therapy contributed to the enhancement of the experience of positive and negative emotions; however, emotion-oriented schema therapy exhibited a more pronounced effect on the amelioration of this variable. Cognitive-behavioral therapy concentrated on deconstructing maladaptive cognitions that exacerbate the intolerability of negative emotions. In contrast, emotional schema therapy prioritized the identification and dismantling of dysfunctional emotional schemas that contribute to the intolerance of negative emotions. Another point of convergence was the promotion of healthy expression and acceptance of positive and negative emotions, which was a focus in both therapeutic modalities. Furthermore, both approaches included the formulation of value-centric programs aimed at augmenting the experience of positive emotions. Nonetheless, a distinguishing factor between the two therapeutic approaches, which elucidates the enhanced efficacy of emotion-oriented therapy, was that during the schema-emotional therapy, in addition to cognitive and behavioral processes, maladaptive emotional strategies were identified and supplanted with adaptive emotional strategies. This process significantly augmented the manageability of negative emotions.

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Despite the insightful findings, this study is subject to several limitations. First, the sample size was relatively small, comprising only 45 participants, which limits the generalizability of the results to broader populations. The participants were also all students from the urban context of Sari, potentially restricting the applicability of the findings to other demographics or geographic locations. Additionally, the study's quasi-experimental design, while practical, may introduce biases related to the non-random assignment to treatment conditions. The lack of long-term follow-up also restricts the understanding of the sustained impact of both cognitive-behavioral therapy (CBT) and emotional schema therapy (EST) on emotion regulation and affective experiences. Lastly, the reliance on self-report measures, such as the Emotion Regulation Questionnaire and PANAS, might introduce response biases, affecting the accuracy of the reported outcomes.

Future research should aim to address these limitations by employing larger, more diverse samples to enhance the generalizability of the findings across different populations and settings. It would also be beneficial to incorporate a randomized controlled trial (RCT) design to minimize potential biases and establish a more robust causal relationship between the interventions and the observed outcomes. Including long-term follow-up assessments could provide valuable insights into the durability of the therapeutic effects of CBT and EST on emotion regulation and affective experiences. Moreover, future studies might consider using a combination of self-report and objective measures, such as physiological indicators of emotional regulation, to triangulate the findings and reduce the reliance on subjective data. Exploring the mechanisms underlying the differential effectiveness of EST over CBT in various contexts could further refine therapeutic approaches for students diagnosed with anxiety disorders.

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Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by ethics committee of Islamic Azad University.

Author contributions

All authors contributed to the study conception and design, material preparation, data collection and analysis. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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