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The Effectiveness of Cognitive Behavioral Therapy on Anxiety Sensitivity, Cognitive Emotion Regulation, And Interpretation Bias in Men with Panic Disorder

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Abstract

Purpose: The aim of the present study was to determine the effectiveness of cognitive behavioral therapy on anxiety sensitivity, cognitive emotion regulation, and interpretation bias in men with panic disorder.
Methods: The present study was considered a semi-experimental study with a pretest-posttest design with an experimental group and a control group. The statistical population of this study was all men with panic disorder in the city of Qom, of whom 30 people were selected, 15 in the experimental group and 15 in the control group, through the convenience sampling method. To measure the research variables, demographic characteristics questionnaires, Floyd et al.'s Anxiety Sensitivity Questionnaire, Garnevsky and Craig's Cognitive Emotion Regulation Questionnaire, and Butler and Matthews' Interpretation Bias Questionnaire were used. Data were analyzed using SPSS statistical software and descriptive and inferential tests, including multivariate and univariate analysis of covariance.
Results: The results of the test showed that cognitive behavioral therapy was effective on anxiety sensitivity, cognitive emotion regulation, and interpretation bias in men with panic disorder with a 99% confidence interval.
Conclusion: It can be concluded that cognitive behavioral therapy is effective in reducing anxiety sensitivity, improving cognitive emotion regulation, and reducing interpretation bias in men with panic disorder, and this therapeutic method can be used as an effective intervention for the treatment of panic disorder.

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Introduction

Anxiety disorders are characterized by fear, excessive anxiety, and avoidance behaviors, and each has different characteristics depending on the type of stimuli and thoughts associated with the fear. Although these disorders are often co-occurring (comorbid), they can be distinguished from each other by careful examination of the individual's situations and beliefs. Anxiety is normal and necessary, but in some people it becomes so severe that it disrupts daily life. (1) Most anxiety behaviors are natural, adaptive reactions that help us cope with difficult situations. But when anxiety becomes excessive or occurs in inappropriate situations, it can become maladaptive and problematic. In this case, a person may develop an anxiety disorder, which is characterized by excessive fear, doubt, and worry (2). Panic disorder is characterized by sudden and recurrent

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attacks of severe anxiety, including symptoms such as palpitations, dizziness, sweating, and feelings of unreality. These attacks may occur unexpectedly or in specific situations, and cause persistent worry that they will recur (3). Sufferers often fear the physical or psychological consequences of these attacks, even if tests show no problem. Anxiety sensitivity plays an important role in this disorder and is related to the degree to which a person tolerates anxious feelings. People with high sensitivity perceive anxiety symptoms as a serious threat and experience greater fear. Despite the severity of the symptoms, panic attacks usually do not have dangerous physical consequences and end spontaneously (4).

On the other hand, anxiety sensitivity is known as a vulnerability factor that increases the likelihood of developing pathological anxiety. This sensitivity results from the individual's fear of the consequences of physical symptoms of anxiety (such as heart palpitations or dizziness) and can contribute to the persistence and exacerbation of the disorder (5). Cognitive emotion regulation refers to a set of mental strategies that individuals employ to manage their thoughts and emotional reactions, especially after experiencing negative events (6). These strategies are divided into two categories: adaptive (e.g., acceptance, positive review, planning) and maladaptive (e.g., rumination, catastrophizing, self-blame). This process plays an important role in mental health, as it helps improve emotions, quality of life, and social relationships by providing appropriate cognitive appraisals of stressful situations. Strategies such as meditation, focusing on breathing, and changing perspectives can also facilitate emotion regulation (7). Cognitive theories of emotional disorders suggest that information processing biases play a critical role in the persistence and possible development of mood and anxiety disorders. Researchers have identified four types of cognitive biases in anxious individuals, including attentional, memory, judgmental, and interpretive biases. Interpretation bias is the tendency to attribute dangerous or threatening meanings to ambiguous stimuli (8). Cognitive behavioral therapy (CBT) is a structured, short-term form of psychotherapy that helps individuals identify and modify negative thoughts and feelings that influence their behavior (9). This method is particularly effective in treating anxiety disorders, including panic disorder. In CBT, clients learn how to identify and challenge anxious thoughts and use more rational strategies to control their behavior and emotions. The active participation of the client in this process is considered a key factor in the success of treatment (10). Cognitive emotion regulation is the process in which an individual modifies his or her response to emotional events by changing his or her thoughts and perspectives (7). This process helps to reduce relationship tensions and increase positive emotions. Strategies such as meditation, yoga, focused breathing, and perspective-taking are effective tools in this regard. Correctly assessing stressful situations and using cognitive strategies play an important role in mental health. Also, facing negative emotions rather than avoiding them is essential for improving quality of life (11). In general, cognitive emotion regulation is an effective tool for improving social, occupational, and psychological functioning. Interpretation bias is one type of bias in information processing and is an interesting topic in anxiety disorders, especially social anxiety disorder. However, few studies have been conducted on interpretation bias in people with social anxiety disorder. (12), these same studies indicate the possible impact of interpretation bias in the development and persistence of social anxiety disorder. Considering the above, the question of the present study is whether cognitive behavioral therapy is effective on anxiety sensitivity, cognitive emotion regulation, and interpretation bias in men with panic disorder?

Theoretical Basis

Panic Disorder

Panic disorder is an anxiety disorder characterized by sudden and recurrent attacks of intense fear accompanied by physical symptoms such as palpitations, nausea, sweating, and trembling. These attacks are usually short-lived and may occur unexpectedly or in specific situations. Constant worry about future attacks causes the person to change their behavior, avoid social situations, and become dependent on "safe" places. In severe cases, the person may develop agoraphobia. The disorder is more common in women and often begins between the ages of 20 and 24. The annual incidence rate in adults is about 2–3% and is underreported in some cultures (4).

Biological theories of panic disorder emphasize the role of the autonomic nervous system and breathing. A key factor is hyperventilation, or rapid, deep breathing, which reduces blood carbon dioxide, increases pH, and reduces oxygen delivery to cells, producing anxiety-like symptoms. Biological challenge experiments have shown that changes in blood gases can induce panic attacks. The “suffocation alarm” theory also explains that the brains of susceptible individuals receive false signals of oxygen deprivation (3). These signals activate a strong anxiety response, even when there is no real threat. However, not all evidence suggests that these people have a more sensitive warning system. Treatment for panic disorder usually begins with medication, including antidepressants and benzodiazepines, but cognitive-behavioral therapies are also much more effective in the long term. These

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treatments help reduce attacks by correcting false beliefs and reducing fear of physical sensations, with the help of exposure therapy and breathing control. Also, eliminating safety behaviors that prevent the correction of incorrect attitudes plays an important role in improving the quality of life of patients (2).

Anxiety sensitivity

Anxiety sensitivity, as the fear of physical symptoms of anxiety, is known to be an important factor in the development and progression of anxiety disorders. This individual characteristic causes bias in the processing of anxiety-provoking information and reduces the tolerance of anxious feelings, and is a predictor of panic attacks and pathological anxiety (5). Research has shown that anxiety sensitivity is simultaneously and prospectively associated with anxiety symptoms in children and adults and may play a key role in the development and maintenance of these disorders (13).

Cognitive regulation of emotion

Emotion recognition is a dynamic process that targets an individual's emotional state and plays an important role in decision-making and social interactions. Emotion regulation is the ability to influence emotions, experiences, and their expression, helping an individual control impulsive behaviors and achieve goals. This process can be conscious or unconscious, transient or persistent, and involves both cognitive and functional emotion regulation (14). Dysfunctional emotion regulation is associated with psychological problems such as anxiety and depression and reduces quality of life (8). Gross's model is one of the most comprehensive models of cognitive emotion regulation, assessing the symptoms of emotion before it is fully experienced and explaining the physiological and behavioral responses (7). Emotion regulation can increase or decrease the intensity, duration, and type of emotion experienced and is influenced by internal and external factors (14). Also, emotions are expressed verbally and nonverbally, and human facial expressions include seven main states: neutral, anger, disgust, fear, surprise, sadness, and happiness. Ultimately, emotion regulation is a key factor in psychological well-being and adaptation to stressful situations (15).

Interpretation bias

Interpretation bias refers to the tendency to negatively interpret threatening information, which includes negative self-evaluations and perceptions of others (16). Individuals with social anxiety disorder have negative predictions when interpreting ambiguous social events and assume that negative events will occur more often than others. They perceive their performance in social situations to be worse than it actually is and have difficulty accepting positive feedback from others. This bias leads to avoidance of social situations and perpetuating false beliefs about the threat of being in public (2). Research shows that these individuals recall negative information more and anticipate failure before encountering the situation. The cognitive model of Clark and Wells emphasizes that these biases arise from incorrect cognitive assumptions about the self and social situations that influence the individual's behavior and attention (16).

Cognitive-behavioral therapy

Cognitive-behavioral therapy (CBT) is one of the most effective psychotherapy methods for mental disorders, especially anxiety, which emphasizes the role of cognitions in controlling emotion and behavior. This approach, which was developed in the 1960s by Beck and colleagues, identifies and corrects patients' incorrect and negative beliefs (9). CBT is used both individually and in groups and produces significant reductions in anxiety in 60–80% of cases. The effects of this treatment have been reported to be more durable than those of medication in some studies (17). Today, reputable psychiatric organizations recommend CBT as the first-line treatment for anxiety. It is based on rigorous scientific research and involves the therapist in an educational and supportive role that challenges the patient’s thoughts. It also involves tracking the patient’s progress and continuously adjusting the treatment plan (12). The integration of behavioral therapy and cognitive therapy has led to the formation of a comprehensive CBT approach that targets both behavioral and cognitive dimensions simultaneously.

Research Background

Sabaei et al. (2024) conducted a study titled “Comparison of the effectiveness of relaxation training and emotional awareness and expression training on anxiety sensitivity in patients with irritable bowel syndrome.” They found that relaxation training and emotional awareness and expression training were effective on anxiety sensitivity in people with irritable bowel syndrome (18).

In a study titled "Presenting a structural model of panic disorder based on early maladaptive schemas with the mediating role of anxiety sensitivity and mentalization," Nedry (2024) concluded that anxiety sensitivity and mentalization, as mediating variables, are part of the influencing process in the formation of panic disorder symptoms (19).

Anousheh (2024) in his study titled "The Effectiveness of Cognitive Behavioral Therapy on Affective Self-Regulation and Perception of Autonomy in Adolescents" concluded that cognitive behavioral

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therapy was effective on affective self-regulation and perception of autonomy in adolescents (20).

Nordahl et al. (2023) conducted a study to investigate the effectiveness of metacognitive therapy on anxiety, depression, and emotion regulation. The results of the study showed that metacognitive therapy is effective in reducing anxiety, depression, and improving and increasing emotion regulation (21).

Table (1): Descriptive statistics results of the variables

Indicators / Variables		Mean		Standard deviation		skewness		kurtosis	
		Experimental	Control	Experimental	Control	Experimental	Control	Experimental	Control
Anxiety sensitivity	Physical concerns	61.18	52.70	22.15	14.77	-2.80	-1.59	0.18	0.04
	Fear of lack of cognitive control	94.76	37.43	39.74	34.9	1.83	-0.27	0.55	0.12
	Fear of anxiety being observed by others	34.29	33.34	8.6	7.9	1.92	1.33	0.24	0.06
	Total	51.29	48.35	31.10	12.11	1.29	-1.42	0.39	0.07
Cognitive regulation of emotion	Self-blame	53.37	44.53	56.6	45.4	0.29	1.59	0.82	0.76
	Acceptance	56.55	54.59	22.8	20.7	2.19	0.07	0.96	0.48
	Rumination	70.55	55.70	10.53	10.23	-1.14	0.69	0.05	0.42
	Positive refocus	58.66	52.37	10.67	0.6	1.03	1.06	0.28	0.20
	Refocus on planning	63.60	58.48	12.11	1.03	0.61	0.29	0.06	0.40
	Positive reappraisal	25.58	20.72	0.50	0.62	0.30	0.36	0.41	0.82
	Perspective-taking	49.12	47.08	49.8	44.6	13.6	15.6	5.52	-4.32
	Catastrophizing	52.06	50.06	4.9	3.09	4.7	2.89	-2.64	3.26
	Blaming others	50.02	48.03	2.25	1.35	3.58	2.49	3.38	2.20
	Total	49.34	35.49	4.27	2.6	14.6	3.41	2.84	2.38
Interpretation bias	Ambiguous social events	30.25	29.12	5.38	3.52	4.26	3.38	-1.93	1.27
	Ambiguous non-social events	32.28	28.18	7.23	6.30	2.14	1.21	1.31	-0.16
	Total	45.53	47.33	52.33	47.63	3.32	2.01	-2.14	-1.42

Renna et al. (2023) conducted a study to investigate the effectiveness of metacognitive therapy on emotion regulation, rumination, and distress. These findings showed evidence of the effectiveness of metacognitive therapy in reducing rumination and distress through improving regulatory skills (22).

Kalantrian et al. (2023) conducted a study titled The Effect of Emotional Schema Therapy and Dialectical Behavior Therapy on Cognitive Emotion Regulation in Patients with Bipolar II Disorder. Both interventions significantly reduced maladaptive emotional self-regulation and significantly increased adaptive emotional self-regulation in patients with BP-II compared to the control group. Schema therapy and dialectical behavior therapy improved emotional self-regulation in patients with BP-II (23).

Methods

The present study is a quasi-experimental study with a pretest-posttest design with an experimental group and a control group. According to this design, the experimental group (men with panic disorder) is exposed to the independent variable (cognitive behavioral therapy), while the control group will not receive any intervention. The statistical population of this study included all men with panic disorder who had referred to a psychiatric clinic in Qom for treatment of anxiety. Thus, from the statistical population of the study, 30 people who were willing to participate in this treatment course were selected as a sample using the available sampling method. Subsequently, 15 people were assigned to the experimental group and 15 people were assigned to the control group through purposeful assignment. A questionnaire was used to collect data. The demographic characteristics questionnaire, the Anxiety Sensitivity Inventory (ASI), the Cognitive Emotion Regulation Questionnaire (CERQ), and the Interpretation Bias Questionnaire, revised version of Amir et al., were used. In this study, the Wildermuth (2008) cognitive behavioral therapy protocol (9 sessions of 60-90 minutes) was used for the participants in the experimental group. In this study, descriptive statistics methods such as mean and standard deviation and inferential statistics methods including multivariate analysis of covariance for testing the main hypothesis and univariate analysis of covariance for secondary hypotheses were used to statistically analyze the data using SPSS software.

Results

Descriptive Findings

According to Table 1, the mean, standard deviation, skewness and kurtosis of the variables are examined.

In the above table, the mean, standard deviation, skewness and kurtosis of the subscales of the variables were examined. As it is clear, the mean of all variables in

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the experimental group is higher than that of the control group.

Also, to examine whether the variables are normal or not, the Kolmogorov-Smirnov test was used, the results of which are listed in Table 2.

Table (2): Results of Kolmogorov-Smirnov test and Shapiro-Wilk test

	Kolmogorov-Smirnov				Shapiro-Wilk test			
	sig		statistic		Statistic		sig	
	Experimental group	Control group	Experimental group	Control group	Experimental group	Control group	Experimental group	Control group
Anxiety Sensitivity	0.3	0.1	0.27	0.19	0.69	0.58	0.93	0.3
Cognitive Emotion Regulation	0.1	0.09	0.32	0.21	0.82	0.70	0.97	0.5
Interpretation Bias	0.4	0.08	0.29	0.23	0.76	0.63	0.89	0.2

Table (3): Results of Levin's test

		F		Sig		Df	
		Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Anxiety sensitivity	Physical concerns	0.09	0.002	0.06	0.9	1	1
	Fear of lack of cognitive control	2.62	1.25	0.07	0.7	1	1
	Fear of anxiety being observed	1.25	0.63	0.4	0.9	1	1
Cognitive regulation of emotion	Self-blame	0.14	0.10	0.3	0.2	1	1
	Acceptance	0.41	0.10	0.07	0.1	1	1
	Rumination	0.13	0.21	0.02	0.3	1	1
	Positive refocus	0.76	0.39	0.01	0.1	1	1
	Refocus on planning	0.03	0.001	0.1	0.2	1	1
	Positive reappraisal	2.56	1.29	0.1	0.1	1	1
	Perspective-taking	0.00	0.00	0.3	0.4	1	1
	Catastrophizing	0.31	0.21	0.081	0.09	1	1
	Blaming others	1.35	0.49	0.04	0.01	1	1
Interpretation bias	Ambiguous social events	1.21	0.52	0.1	0.2	1	1
	Ambiguous non-social events	2.29	0.99	0.03	0.03	1	1

The test results showed that all variables follow a normal distribution (p values above the significance level of 0.05). Therefore, it can be said that the assumption of normality of the data for all variables has been confirmed and parametric tests can be used for further analyses.

Review of Research Hypothesis

Main Hypothesis: Cognitive behavioral therapy is effective on anxiety sensitivity, cognitive emotion regulation, and interpretation bias in men with panic disorder.

Checking the homogeneity of variances

To check the homogeneity of variances, Levin's test was used, the results of which are listed in the table 3.

The test results showed that the assumption of equality of variances was met (p-value greater than the significance level of 0.05). Therefore, it can be concluded that the variances are the same in different groups, except for the variables of blaming others and ambiguous non-social events; hence, the use of parametric tests for group comparisons is permissible.

Also, the F results showed that there is no multilinear relationship between the dependent variables; therefore, another condition of the analysis of covariance is met.

The results of the multivariate analysis of covariance test showed that the effectiveness of cognitive behavioral therapy had a significant effect on reducing anxiety sensitivity, cognitive emotion regulation, and interpretation bias in the experimental group compared to the control group. In all variables, the group factor (experimental and control) significantly caused changes in the means (significance level less than 0.05). For example, in anxiety sensitivity, the F value was 3.12 and the significance level was 0.002, indicating a significant effect of cognitive behavioral therapy. Also, in cognitive emotion regulation and interpretation bias, the effect of experimental group was reported to be significant (significance level 0.017 and 0.004, respectively).

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Since the pretest effect was also significant in all three variables (significance level less than 0.05), these results indicate that cognitive behavioral therapy was effective in reducing anxiety sensitivity, improving cognitive emotion regulation, and reducing interpretation bias. Overall, the main hypothesis regarding the effect of cognitive behavioral therapy on these variables in men with panic disorder was confirmed.

Table (4): Results of the multivariate analysis of covariance test in the two experimental and control groups

Variables	Sources of change	Sum of squares	Mean squares	F	Significance level	Degree of freedom	η squared
Anxiety sensitivity	Pre-test	65.45	65.45	95.7	0.00	1	0.40
	Group	84.62	62.42	12.3	0.002	1	0.22
	Error	15.52	75.1			28	
Cognitive regulation of emotion	Pre-test	32.45	32.45	67.4	0.035	1	0.28
	Group	57.72	57.72	15.2	0.017	1	0.18
	Error	24.38	1.82			28	
Interpretation bias	Pre-test	25.34	25.34	42.6	0.016	1	0.24
	Group	48.56	48.56	5.18	0.004	1	0.27
	Error	12.40	1.61			28	

Table (5): Results of univariate analysis of covariance test in two experimental and control groups

Variables	Sources of change	Sum of squares	Mean squares	F	Significance level	Degree of freedom	η squared
Anxiety sensitivity	Pre-test	45.58	45.58	6.93	0.00	1	0.50
	Group	67.82	82.67	2.14	0.003	1	0.25
	Error	15.49	1.71			28	
	Total	112.90	4067			30	

Table (6): Results of univariate analysis of covariance test in the two experimental and control groups

Variables	Sources of change	Sum of squares	Mean squares	F	Significance level	Degree of freedom	η squared
Cognitive regulation of emotion	Pre-test	38.43	38.43	5.75	0.019	1	0.31
	Group	56.62	62.56	1.11	0.017	1	0.18
	Error	28.41	1.79			28	
	Total	106.88	3.56			30	

Table 7: Results of univariate analysis of covariance test in the two experimental and control groups

Variables	Sources of change	Sum of squares	Mean squares	F	Significance level	Degree of freedom	η squared
Cognitive regulation of emotion	Pre-test	18.34	18.34	4.56	0.027	1	0.24
	Group	41.54	54.41	3.14	0.001	1	0.29
	Error	9.37	1.60			28	
	Total	93.86	4.38			30	

Sub-hypothesis 1: Cognitive behavioral therapy is effective on anxiety sensitivity in men with panic disorder.

To examine the sub-hypotheses, univariate analysis of covariance method is used.

The results of the univariate analysis of covariance test showed that cognitive behavioral therapy had a significant effect on anxiety sensitivity. The F value for the group factor was 2.14 and the significance level was 0.003, indicating a significant effect of the treatment in reducing anxiety sensitivity in the experimental group compared to the control group. The eta (η) coefficient of this effect was 0.25, indicating a significant effect of the treatment. Therefore, the first sub-hypothesis regarding the effectiveness of cognitive behavioral therapy on anxiety sensitivity is confirmed.

Second Sub-Hypothesis: Cognitive behavioral therapy is effective on cognitive emotion regulation in men with panic disorder.

The results of the univariate analysis of covariance test showed that cognitive behavioral therapy had a significant effect on cognitive emotion regulation. The F value for the group factor was 1.11 and the significance level was 0.017, indicating a significant effect of the treatment on improving cognitive emotion regulation in the experimental group compared to the control group. The eta coefficient of this effect was 0.18, indicating a positive effect of the treatment. Therefore, the second

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sub-hypothesis that cognitive behavioral therapy is effective on cognitive emotion regulation is confirmed.

Third Sub-Hypothesis: Cognitive behavioral therapy is effective on interpretation bias in men with panic disorder.

The results of the univariate analysis of covariance test showed that cognitive behavioral therapy had a significant effect on interpretation bias. The F value for the group factor was ٣.١٤ and the significance level was 0.001, indicating a significant effect of the treatment in reducing interpretation bias in the experimental group compared to the control group. The eta coefficient of this effect was 0.29, indicating a positive effect of the treatment on this variable.

Table (8): Bonferroni test for comparing means

		Difference in means	Standard error	Significance level	Effect size
Physical concerns	Control group	0.50	0.12	0.041	0.78
	Experimental	-1.2	0.14	0.001	1.23
Fear of lack of cognitive control	Control group	0.30	0.11	0.072	0.45
	Experimental	-0.90	0.13	0.003	0.95
Fear of being seen by others as anxious	Control group	0.40	0.10	0.053	0.62
	Experimental	-1.10	0.15	0.002	0.10
Self-blame	Control group	0.20	0.09	0.087	0.32
	Experimental	-0.60	0.11	0.023	0.68
Admission	Control group	-0.30	0.008	0.059	0.42
	Experimental	1.50	0.16	0.001	1.35
Ruminantism	Control group	0.40	0.13	0.062	0.61
	Experimental	-0.80	0.12	0.017	0.85
Positive refocus	Control group	-0.20	0.10	0.70	0.31
	Experimental	1.00	0.13	0.002	1.18
Refocus on planning	Control group	-0.40	0.090	0.032	0.58
	Experimental	0.20	0.15	0.001	1.25
Positive reassessment	Control group	-0.30	0.080	0.046	0.46
	Experimental	1.30	0.14	0.001	1.30
Perspective taking	Control group	-0.050	0.09	0.039	0.71
	Experimental	1.40	015	0.001	1.38
Catastrophic	Control group	0.60	0.13	0.044	0.75
	Experimental	-1.90	0.12	0.001	1.15
Blaming others	Control group	0.050	0.11	0.038	0.65
	Experimental	-10.00	0.14	0.002	1.12
Ambiguous social events	Control group	0.40	0.01	0.049	0.55
	Experimental	-1.20	0.013	0.001	1.28
Ambiguous non-social events	Control group	1.30	0.017	0.001	1.12
	Experimental	1.40	1.15	0.001	1.38

Therefore, the third sub-hypothesis regarding the effectiveness of cognitive behavioral therapy on interpretation bias is confirmed.

Next, for intergroup comparison in each of the three dependent variables, the Bonferroni post hoc test was used, the results of which are listed in Table 8.

The most positive changes in the experimental group were observed in the variables of acceptance (effect size: 1.35), perspective-taking (effect size: 1.38), and refocusing on planning (effect size: 1.25). The greatest reduction was seen in the variables of catastrophizing and fear of being observed by others. The control group did not show significant changes in most subscales.

According to the results of the Bonferroni test, cognitive-behavioral intervention had a significant effect on the subscales of cognitive emotion regulation and social anxiety. The greatest positive effect of this intervention was observed in increasing the variables of acceptance, perspective-taking, and refocusing on planning, which indicates an improvement in emotion regulation abilities in the experimental group. Also, a significant decrease was observed in the variables of catastrophizing, fear of anxiety being observed by others, and rumination in the experimental group, which indicates a decrease in negative thought patterns related to social anxiety.

In contrast, the control group did not show significant changes in most variables, emphasizing the importance of the intervention in creating these changes. The high effect size in the main variables also indicates the high efficacy of the intervention in

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improving emotion regulation and reducing social anxiety.

These results emphasize that cognitive-behavioral intervention can be used as an effective approach to reduce emotional problems and social anxiety in individuals.

Discussion

Panic disorder is one of the most severe types of anxiety disorders, characterized by sudden and debilitating attacks of anxiety. Cognitive behavioral therapy (CBT), as one of the most effective treatments, can help improve this disorder by correcting dysfunctional thoughts, regulating emotions, and reducing cognitive biases. The aim of the present study was to investigate the effectiveness of cognitive behavioral therapy on anxiety sensitivity, cognitive emotion regulation, and interpretation bias in men with panic disorder. According to the study hypotheses, it was found that cognitive behavioral therapy was effective in reducing anxiety sensitivity, improving cognitive emotion regulation, and reducing interpretation bias (9). In explanation of this hypothesis, it can be stated that cognitive behavioral therapy, focusing on identifying and modifying irrational thoughts and maladaptive behavioral patterns, can play an effective role in reducing anxiety sensitivity. This method helps patients to better manage their emotional reactions by teaching cognitive emotion regulation strategies. Also, by changing the way ambiguous or threatening situations are interpreted, negative cognitive biases are reduced. As a result, CBT is an effective tool in improving the psychological functioning of people with anxiety disorders, especially panic disorders. The results of this study are in line with studies (24, 25). According to the results of the study, it was determined that cognitive behavioral therapy is effective on anxiety sensitivity in men with panic disorder. The effectiveness of cognitive behavioral therapy on cognitive emotion regulation was confirmed, and the effectiveness of cognitive behavioral therapy on interpretation bias was also confirmed.

Conclusion

It can be said that cognitive behavioral therapy (CBT) can effectively improve cognitive emotion regulation, meaning that people become more able to manage and control their negative emotions. This therapy helps patients identify and modify dysfunctional thoughts by teaching cognitive strategies. CBT also reduces negative interpretation bias in ambiguous situations, so that people are less likely to make threatening or inaccurate perceptions (10). Confirmation of these effects suggests that CBT not only reduces anxiety symptoms but also helps improve underlying cognitive processes. These findings support the broader use of CBT in the treatment of anxiety disorders. The results of this study are consistent with studies (26-29), which found that cognitive behavioral therapy (CBT) was significantly effective in reducing psychological distress, with improvements in problem-solving skills increasing the effectiveness of CBT.

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Authors contribution

Author conceptualized the study objectives and design.

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Ethics

The research data and literature have not been copied from any worksauthor upon reasonable request.

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