

## Cognitive-Behavioral Therapy on the Anxiety, Stress and Despair of MS Patients

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### Abstract

**Objective:** The aim of this study was to determine the effectiveness of group therapy of cognitive-behavioral approach on anxiety, stress, and despair of patients with Multiple sclerosis in Tehran.

**Method:** This study was quasi-experimental with a pre-test-post-test design and a control group. Twenty patients who were referred to the available medical centers were selected as the study samples and randomly assigned into two experimental and control groups. In this study, Kalmogorov-Smirnov, Levene, and Covariance tests were used to analyze data through IBM *SPSS* software. Beck Anxiety Inventory Questionnaire, Cohen's Perceived Stress Questionnaire (PSQ), and Beck's Hopelessness Scale questionnaire were used to collect data.

**Results:** The results of the present study showed that there is a significant difference between the experimental and control groups in terms of anxiety, stress, and despair with a 95% confidence level. Therefore, three main hypotheses were confirmed and the null hypothesis was rejected. It was found that cognitive-behavior group therapy was effective in reducing anxiety, stress, and despair in patients with MS.

**Conclusion:** Cognitive-behavioral group therapy reduced stress, anxiety, and despair in patients with MS and improved their mental health. Therefore, this treatment method can be useful in clinics.

**Keywords:** Cognitive-Behavioral Therapy, Anxiety, Stress, Despair, MS.

### Introduction

Cognitive Behavioral Therapy (CBT), which is a combination of cognitive and behavioral approaches, is one of the methods used along with medical therapies (Hawton, Salkovskis, Kirk & Clark1989). Pillai (2012) believes that this treatment can be an effective psychological treatment for major depression in patients with cancer and immune system diseases. The effectiveness of cognitive-behavioral therapy was shown in increasing mental well-being in cardiovascular patients, promoting emotional states, mental well-being, hope in people

with MS, increasing public health in people with asthma, and reducing medical consequences and symptoms of depression and anxiety (Ghalebandi, Ahadi, Pourshahbaz, & Rezaei, 2012).

Anxiety, as a mental illness, plays an important role in most stressful situations and impairs a person's functioning. Anxiety disorders as a diagnostic class affect mental health and are associated with significant negative consequences in personal, academic, and social adjustment (Spence, Barrett, & Turner, 2003). There are some stimuli for stress in life like exams, natural disasters, divorce, hazardous occupations, and illnesses because they force people to take adaptive behaviors to cope with imposed demands, and adapting to such events is difficult and dangerous. It also threatened their health (Peterson, 2000).

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Common problems with chronic diseases, such as MS, bring frustration and depression. In the definition of frustration, it can be said that frustrations prevent a soldier from successfully adapting to the military environment during the first three months of military service (Peterson, 2000). And dejection is caused by depression, which can manifest itself in the form of loss of hope for the future. In this case, the person feels uncomfortable and in severe cases feels that there is no future for him (Snyder, 2000).

Besides, other studies show that mindfulness-based cognitive therapy (MBCT) is one of the effective therapeutic and educational courses which help depressed patients learn how to cope with their negative thoughts and feelings and change them (Mehdipour, Rafiepoor, & Hajjalizade, 2019).

Multiple sclerosis, abbreviated as MS, is an inflammatory illness in which the myelin sheaths of nerve cells in the brain and spinal cord are damaged. This disorder can disturb the ability of parts of the nervous system that are responsible for communication and cause many physical symptoms and signs (Lilly & Braunwald, 2012). MS occurs in several forms, and its new symptoms occur either as a stage recurrent (relapses) or over time (intermittently). During relapse, the symptoms of MS may disappear altogether; however, persistent neurological problems occur, especially as the disease progresses in later stages (Pervichko, Zinchenko, & Martynov, 2013).

Since 2008, between 2 and 2.5 million people around the world have been infected with this disease, while the rate of infection varies widely in different parts of the world and among different communities. MS usually occurs between the ages of 20-50 and occurs twice in women compared to men (Jacobs, Chamoun & Stouffer, 2001). According to previous studies, the prevalence of MS in Iran is between 3.5 to 24.5% of 100,000 people (Abolghasemi, Mikaeili, Khoshnoodnia Chomachaei, & Karimi Yousefi, 2018) the history of MS dates back to 1868 when the French neuroscientist Jean-Martin Charcot was

the first to discover multiple (nervous) Sclerosis as a separate disease. With the help of previous reports and by adding his own pathological and clinical observations, Charcot named the disease to sclerose en plaques. The Triple symptoms of the disease include involuntary eye movement, purposeful tremor, and telegraphic speech (abbreviated speech), although it is important to note that these symptoms are not specific to MS (Jameson, 2018).

MS is the leading cause of noninvasive disability in adults and the most common progressive neurological disease in young people (Fox, Bethoux, Goldman, & Cohen, 2006). MS is rapidly increasing in the world, with the number of people with MS increasing from 2.1 million in 2008 to 2.3 million in 2013 (Thompson et al., 2008).

Many studies have shown that cognitive-behavioral therapy (CBT) has a positive effect in patients diagnosed with MS. For example, fatigue is a common symptom in multiple sclerosis (MS) and often limits their social relationships. Thus, a recent meta-analysis confirmed that CBT has a relatively positive short-term effect on MS fatigue (van den Akker et al., 2017).

Casio et al. (2011) demonstrated the effectiveness of cognitive-behavioral therapy in improving depressive symptoms and quality of life among 127 patients with MS. In another study by Van Cassel et al., comparing the outcomes of cognitive-behavioral group therapy with relaxation therapy (RT) indicated that cognitive-behavioral therapy leads to considerable improvements in fatigue, depression, anxiety, and stress in MS patients (Shareh & Robati, 2018).

Moreover, pilot research on the effectiveness of cognitive-behavioral therapy (CBT) on depression and quality of life for Japanese patients with multiple sclerosis proposed that CBT probably decreases depressive states for Japanese patients with multiple sclerosis (Kikuchi, Niino, Hirotoni, Miyazaki, & Kikuchi, 2019). The aim of the present study was to investigate the effectiveness of cognitive-behavioral

group therapy on anxiety, stress, and frustration in patients with MS.

## Methods

### Participants and Procedure

In this study, initially, after obtaining the necessary consent, 20 people were selected through the convenience sampling method from patients with MS who were referred to a medical center in Tehran (Due to the limited number of clients, the sample size is small). They were randomly divided into two experimental and control groups (n=10 per group). After sampling and determining the experimental and control groups, a pre-test was performed for both groups using standard questionnaires appropriate to the research variables, and 10 behavioral-cognitive group therapy sessions were provided for the experimental group within 15 hours. The control group did not receive treatment. After 10 treatment sessions, both groups were post-tested and the data were analyzed.

All stages of research have been done in compliance with ethical regulations and keeping patients' secrets. The present study followed a practical purpose. It is a quantitative study with a quasi-experimental design with a pretest-post-test and a control group.

### Measures

*Beck Anxiety Questionnaire (BAI)*, Arron T Beck introduced the Beck Anxiety Inventory Questionnaire, which specifically measures the severity of clinical anxiety symptoms in individuals. The Beck Anxiety Questionnaire is a self-report questionnaire designed to measure the severity of anxiety in adolescents and adults. The questionnaire consists of 21 items, which are in the form of a 4- options Likert scale and are scored from zero to 3. The score between zero and 7 shows no anxiety, between 8 and 15 indicated mild anxiety, scores between 16 and 25 implies moderate anxiety and scores between 26 and 63 show severe anxiety. Studies show that this questionnaire has high validity and reliability. Its internal consistency (alpha coefficient) is 0.92, its validity was 0.75 with the retesting method at a weekly interval, and the

correlation of its items varies from 0.30 to 0.76. Five types of content validity, simultaneous, structural, diagnostic, and factor validity have been measured, all of which indicate the high efficiency of this tool in measuring anxiety intensity.

*Cohen's Perceived Stress Questionnaire (PSQ)*, The Perceptual Stress Questionnaire was developed in 1983 by Cohen et al. and has 14 items that are used to measure the amount of stress a person has experienced in their life over the past month. This test is scored based on a 5-point Likert scale (never, very low, medium, relatively high, and very high), and the subject scores between zero and 4 based on the option chosen. The Perceived Stress Questionnaire examines a person's life situations that are stressful in their own right. The perceived stress questionnaire was created for use in normal models with minimal high school education and is easy to understand, the answer options are easy to understand, and in addition, the answers are of a general nature and they are free to be specific to a certain subgroup. Cronbach's alpha coefficient for this scale was calculated in three groups of subjects [two groups of students and another group of heterogeneous], between 0.84 and 0.86. To calculate the validity criterion of this scale, its correlation coefficient with semiotic dimensions between 0.52 and 0.76 has been calculated (Linden, 2004).

*Beck's Hopelessness Scale questionnaire*, The Beck Hopelessness Scale (BHS) was developed by Aaron T. Beck et al. in 1979. This questionnaire contains 20 items that a person must answer true or false by reading each item. The questionnaire measures three dimensions of a person's despair: a person's feelings about the future, lack of motivation, or loss of motivation and expectations. The Beck Hopelessness Scale Questionnaire (BHS) is designed for 17 to 80-year-olds and has a score between 0 and 20, with a higher score indicating more despair.

### Statistical analysis of data

To analyze data, descriptive and inferential statistics, including Covariance, Kolmogorov-Smirnov, and

**Table1. CBT Sessions Program**

components	Strategies and Class activities
Session 1 Welcome Introduction Psychoeducation	<ul style="list-style-type: none"> <li>• statement of group therapy rules,</li> <li>• explanation of the relationship between mind and body</li> <li>• how psychological factors affect medical problems, thinking, feeling, physiological, behavior (cognitive Associates), CBA, holy example, suitcase example.</li> <li>• Guided imaginary relaxation</li> </ul>
Session2 Negative thoughts and other possible facts	<ul style="list-style-type: none"> <li>• Identifying negative thoughts. Cognitive distortions.</li> <li>• Identifying distortions of logical errors.</li> <li>• Identifying logical errors.</li> </ul>
Session 3 The advantage of stopping negative thoughts	<ul style="list-style-type: none"> <li>• Focusing on an object and articulate details</li> <li>• Mental exercises (countdown)</li> <li>• Browsing happy memories and welcome fantasies</li> <li>• fun and interesting activities</li> </ul>
Session 4 Explain emotional processing techniques	<ul style="list-style-type: none"> <li>• The technique of achieving emotions</li> <li>• Relaxing writing technique</li> <li>• Identify blind nodes</li> <li>• Emotional processing improvement technique.</li> </ul>
Session 5 The logic of muscle relaxation	<ul style="list-style-type: none"> <li>• Muscle relaxation for 16 muscle groups, respectively. 1-Lower right hand 2 -Low left hand 3 -Up right hand 4 -Up left hand 5 -Low right foot 6 -Low left foot 7 -Up right foot 8 -Up left foot 9 -Abdominal 10 Chest 11 -Shoulder 12 - Neck 13 - Mouth, jaw, throat 14 - Eyes 15 - Lower forehead 16 - Upper forehead</li> </ul>
Session 6 Review the assignments of the previous session	<ul style="list-style-type: none"> <li>• Gradual muscle relaxation for 8 muscle groups, as follows: 1- Upper and lower arms 2- Upper and lower legs 3- Abdominal 4-Chest 5- Shoulders 6- Neck 7-Eyes 8-Upper and lower forehead.</li> <li>• Gradual muscle relaxation for the 4 muscle groups, respectively. 1- Abdominal 2- Chest 3- Shoulders 4- Upper and lower forehead</li> </ul>
Session 7 Regular desensitization	<ul style="list-style-type: none"> <li>• Regular visual desensitization.</li> <li>• Immersion into virtual reality</li> </ul>
Session 8 Ineffective assumptions and rules	<ul style="list-style-type: none"> <li>• Identify inefficient assumptions and rules, allegory monster lake</li> <li>• Logical analysis.</li> </ul>
Session 9 Incompatible schemas and their relation to dysfunctional assumptions and negative thoughts	<ul style="list-style-type: none"> <li>• Identify dysfunctional schemas using the downward arrow</li> <li>• Injection of thought</li> </ul>
Session 10 Perceptual change Conclusion	<ul style="list-style-type: none"> <li>• Completion of perceptual change worksheets</li> </ul>

Levene's test, were used by using IBM SPSS software. The content validity of this study was confirmed

by the experts and researchers. The Cronbach's alpha for anxiety, stress, and despair was obtained

0.78, 0.81, and 0.84, respectively to ensure their acceptable reliability.

### Results

According to Table 2, in the pretest stage, the mean scores of the experimental and control groups in all three variables of anxiety, stress, and despair are almost the same. In the post-test stage, there is a significant difference between the experimental and control groups. Also, in the experimental group, the mean of post-test scores is less than pre-test scores.

**Table 2.** Descriptive indicators of the studied variables

Variable	group	Mean		Standard Deviation		Number	
		pre	post	pre	post	pre	post
Anxiety	experimental	33.80	21.30	10.32	5.14	10	10
	control	34.30	32.90	9.54	10.58	10	10
Stress	experimental	31.20	22.10	7.08	6.65	10	10
	control	31.20	33.50	5.97	7.80	10	10
Despair	experimental	12.30	9.50	2.21	1.95	10	10
	control	12.50	12.20	2.27	2.20	10	10

The Kolmogorov–Smirnov test was used to determine the normality assumption of the scores. The results showed that the value of Z in the anxiety variable (0.33 and 0.81), stress (0.55 and 0.61), and despair (0.62 and 0.60) is not significant at the level of  $P < 0.05$ , so the data have a normal distribution (Table 3).

**Table 3.** Inferential indicators with Kolmogorov-Smirnov test on the studied variables

Variable	Stage	Number	Z Value	Sig. level
Anxiety	pretest	20	0.53	0.95
	post-test	20	0.81	0.51
Stress	pretest	20	0.55	0.91
	post-test	20	0.61	0.85
Despair	pretest	20	0.62	0.83
	post-test	20	0.60	0.85

The results in Table 4 confirm the homogeneity assumption of the variance. It shows that the F value for the variables (anxiety (0.158), stress (2.338), and despair (1.777)) is not significant at the level of  $P < 0.05$ .

**Table 4.** Levene’s Test Results for Homogeneity of Error Variance

Variable	F	Df1	Df2	Sig. level
Anxiety	0.158	1	18	0.696
Stress	2.338	1	18	0.144
Despair	1.777	1	18	0.199

Table 5 shows that homogeneity of interactive effects has been achieved, because the value of

F calculated in the anxiety variable (13.87), stress (0.30), and despair (0.06) is not significant at the level of  $P < 0.05$ .

**Table 5.** Results of analysis of variance of interactive effects

Variable	SS	DF	MS	F	The significance level
Anxiety	148.98	1	148.98	13.87	0.002
Stress	6.73	1	6.73	0.30	0.590
Despair	0.11	1	0.11	0.06	0.809

The interaction of anxiety pre-test values and groups became significant because the significance value is less than 0.05 (0.001). Therefore, the assumption of homogeneity of regression slopes is not established (Table 6).

**Table6. Tests of Between-group Effects**

Dependent variable: post-test of anxiety					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1781.938a	3	593.979	45.952	.000
Intercept	2.522	1	2.522	.195	.665
Group	42.083	1	42.083	3.256	.090
Precbt	948.266	1	948.266	73.360	.000
Group * Precbt	191.429	1	191.429	14.809	.001
Error	206.819	16	12.926		
Total	16007.270	20			
Corrected Total	1988.758	19			

a. R Squared = .896 (Adjusted R Squared = .877)

**Table7. Tests of Between-Subjects Effects**

Dependent variable: post-stress test					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1270.657a	3	423.552	18.397	.000
Intercept	.360	1	.360	.016	.902
Group	8.904	1	8.904	.387	.543
Precbt	613.572	1	613.572	26.650	.000
Group * Precbt	3.548	1	3.548	.154	.700
Error	368.369	16	23.023		
Total	17223.970	20			
Corrected Total	1639.026	19			

a. R Squared = .775 (Adjusted R Squared = .733)

**Table8. Tests of Between-Subjects Effects**

Dependent variable: post-test of despair					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	83.919a	3	27.973	14.612	.000
Intercept	2.016	1	2.016	1.053	.320
Group	1.694	1	1.694	.885	.361
Precbt	47.445	1	47.445	24.783	.000
Group * Precbt	.116	1	.116	.060	.809
Error	30.631	16	1.914		
Total	2469.000	20			
Corrected Total	114.550	19			

a. R Squared = .733 (Adjusted R Squared = .682)

The interaction of pre-test values of stress and group is not significant because the significant value is greater than 0.05 (0.700). Therefore, the assumption of homogeneity of regression slopes is established (Table 7).

The interaction of despair pre-test values and group is not significant because a significant value greater than 0.05 (0.809) was obtained. Therefore, the assumption of homogeneity of regression slopes is established (Table 8).

According to a Single-variable analysis of covariance (ANCOVA), interactive therapeutic effects on anxiety, stress, and despair, and the comparison of three groups mean pair, three hypotheses can be made. Group therapy in a cognitive-behavioral manner has a different and significant effect on patients' anxiety, stress, and despair because the calculated  $F$  (33.44, 30.37, 18.01) is significant at the level of  $P < 0.05$ . Hence, the main hypothesis is confirmed and the null hypothesis is rejected. Also, the difference between the mean of the two groups (-11.23, -11.40, -2.55) was significant and this significance is in favor of the experimental group. Therefore, it can be concluded that in the reduction of anxiety, stress, and despair in MS patients, group therapy is effective in a cognitive-behavioral manner. In all three research groups, positive effects were seen as the result of cognitive-behavioral therapy on anxiety, stress, and despair for MS patients in Tehran.

### Discussion

One of the important goals of cognitive-behavioral therapy is to reduce stress, anxiety, and despair in the patient. For this purpose, the patient is taught how to diagnose, evaluate, control, and alter negative thoughts related to risk and related behaviors. To achieve this goal, a number of cognitive and behavioral techniques are used (Linden, 2004).

Anxiety is an unpleasant and often vague feeling of anxiety that is accompanied by one or more physical symptoms such as palpitations, shortness of breath, a feeling of emptiness, sweating and restlessness,

and a desire to move (Halgin & Whitbourne, 2007). When a person is faced with a situation in the living environment that is not in line with his or her current capacities and abilities, he or she experiences an imbalance, conflict, and internal conflict called stress (Kalat, 2015). Understanding the concept of depression often refers to negative futuristic cognitions. In other words, losing hope for the future is a bold sign of depression. (Thimm, Holte, Brennen, & Wang, 2013).

The first hypothesis of this study, entitled group cognitive-behavioral therapy, has an effect on the anxiety of MS patients in Tehran. And the second hypothesis, under the heading of group therapy in a cognitive-behavioral way, has an effect on the stress of MS patients in Tehran. The results showed that group cognitive-behavioral therapy has a different and significant effect on the level of anxiety and stress in MS patients. With a 95% confidence level, the main hypothesis was confirmed and the null hypothesis was rejected. Also, the difference between the mean of the two groups was significant in favor of the experimental group. Therefore, it can be concluded that group therapy is effective in reducing anxiety and stress in MS patients.

In a study by Saadat, et al. (2019) examining 24 MS diseases, they showed that cognitive-behavioral therapy reduces stress, anxiety, and psychosis in these patients and increases life expectancy, and improves better relationships with family members. (S Saadat, Kalantari, Kajbaf, & Hosseinezhad, 2020) studied on 120 MS patients and 120 healthy individuals. In this study, the prevalence of psychological disorders in MS patients was three times higher than healthy individuals, and the prevalence of psychological disorders, obsessive-compulsive disorder, anxiety, stress, and depression in them were significantly higher than healthy individuals. By psychoanalysis of these patients in a short period of time, significant results were observed in the improvement of these patients.

Shahabizadeh and Khaje (2018) concluded that

cognitive-behavioral therapy had a positive effect on reducing stress, generalized anxiety disorder, and mild social anxiety in children, and a significant difference was observed between children attending cognitive-behavioral therapy sessions compared to other children. Chesin et al. (2015) found that cognitive-behavioral therapies significantly reduced stress caused by physical illness and negative thoughts, and increased patients' life expectancy. Patients who have received this treatment report more improvement symptoms than other patients.

Alghamdi, Hunt, and Thomas (2015) stated in their research that cognitive-behavioral therapy has a positive effect on reducing stress and anxiety. In this regard, a study of severely cured patients showed that people who received cognitive-behavioral therapy interventions had less stress and anxiety than other patients.

Research shows that cognitive-behavioral therapy affects patients' anxiety and stress, which is consistent with the results of the present study. The result of the third research hypothesis, called group therapy in a cognitive-behavioral manner, has an effect on the despair of MS patients in Tehran. It showed that with a 95% confidence level, the main hypothesis is accepted and the null hypothesis is rejected. Thus, group cognitive-behavioral therapy has a different and significant effect on the despair of MS patients.

Karimi, Kakabaraee, Yazdanbakhsh, and Moradi (2014) showed that cognitive-behavioral therapy caused mental well-being and reduced despair in hospitalized patients. The results of this study significantly reduced despair and increased psychological well-being compared to other patients who did not receive this treatment.

Kissane (2014) conducted a direct study of the possibility of the effect of cognitive therapy on increasing longevity and reducing the despair of cancer patients. They stated that cognitive group therapy with the two combined approaches of Beck cognitive psychotherapy and Yalom existential

psychotherapy has the greatest effect on reducing patients' despair and increasing their longevity. Snyder (2002) also noted that there was a link between high levels of hope, disease recovery, and better physical and mental health, and the effectiveness of psychotherapy methods used to treat disorders.

Nekouei, Yousefy, and Manshaee (2010) concluded that cognitive-behavioral therapy, both individually and concomitantly, was effective in treating chronic diseases and their complications. The results of this study show that cognitive-behavioral therapies can be used as effective techniques in the treatment of chronic diseases and their complications. Aghabagheri, Mohammadkhani, Omrani, and Farahmand (2012) in a study on patients with MS showed that cognitive therapy based on the presence of the mind was effective in increasing mental well-being and reducing the despair of patients with MS.

### **Conclusion**

Pre-test and post-test data show that there is a significant difference between the experimental and control groups for anxiety, stress, and despair with a 95% confidence level. Therefore, all three hypotheses were confirmed and the null hypothesis was rejected. Based on this, it can be concluded that in the reduction of anxiety, stress, and despair of MS patients, group therapy is effective in cognitive and behavioral methods.

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### **Ethical Statement**

This research is not conducted as a clinical trial and it does not need any ethical code, also the identities of the participants in this investigation were ethically confidential.



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