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Effectiveness of Cognitive - Behavioral Group Therapy in Reducing Positive and Negative Symptoms of Schizophrenia

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ABSTRACT

Schizophrenia is a common psychiatric disorders associated with cognitive, emotional and behavioral abilities; usually the psychological symptoms of schizophrenia are of two types including positive (pathological excesses) and negative symptoms (pathological deficiencies). The purpose of this study was to determine the effectiveness of cognitive - behavioral group therapy in reducing positive and negative symptoms in schizophrenic patients.
Method: The research was based on pretest- post test semi-experimental method with a control group. The study population included all patients with schizophrenia hospitalized in the Razi Psychiatric Center in 2014. The sample group included 30 patients who were diagnosed to be schizophrenic based on TR-DSM IV and they were selected based on convenience sampling and randomly classified into the experimental and test groups. Research tools included Assessment of positive symptoms (PANS) and Assessment of negative symptoms of Anderson (SANS). The intervention classes were 16 sessions and both experimental and control groups were tested by measurement tools. Covariance analysis was used to analyze the data.
Findings: Statistical analysis showed that there is a significant difference between patients in both control and experimental groups in the reduction of negative symptoms, therefore the group cognitive - behavioral therapy can reduce positive and negative symptoms in schizophrenic patients.
Conclusion: The findings showed that cognitive - behavioral group therapy is effective in reducing positive and negative symptoms in schizophrenic patients.
KEY WORDS: schizophrenia, cognitive-behavioral therapy, positive and negative symptoms

INTRODUCTION

The existence of 24 million cases of schizophrenia in the world has made schizophrenia a severe mental illness that has serious effects on social function and there is a chance that it may become chronic which imposes high costs to the mental health system Ulrich et al., 2007). In addition to the possibility of chronic schizophrenia it also tends to worsen which is associated with incomplete remission and varying degrees of dysfunction, social dysfunction, high comorbidity associated with drug use, and reduced life expectancy (Matcheri et al., 2009, Saduk and Saduk, 2010). All these factors severely affect their families as well (Davidson et al., 2009) and cause the greatest impact among psychotic disorders to people and health care system (Sarason and Sarason, 2011).

Schizophrenia is considered a multifactorial disorder and the biological - psychological and social model has exiplained it in the best way possible. In this model it is assumed that there are degrees of biological vulnerability, psychological processes and social environment that can lead to the development of schizophrenia. The fact that a person is vulnerable to schizophrenia, probably but not necessarily, refers to genetic factors or cognitive neurological development. In fact, there is a biological vulnerability associated with childhood, social, psychological experience and stressful life events. When a person is faced with a series of great stresses schizophrenia occurs. Stressful life events can also be social, psychological and biological such as conflicting environment, important transitional life stages (growth transitions) or drug use. A series of factors can contribute to the prolonged period of the disease (eg, meaning that the person gives to his experiences, lack of social roles and drug use). Therefore vulnerable people may give up under the pervasive levels of challenge, tension or conflict in their lives (Garety et al. 2005). People with schizophrenia show a series of psychiatric symptoms the most regular ones of which include hallucinations (especially auditory, visual and physical hallucinations), disordered thinking and lack of vision. These symptoms are usually associated with negative symptoms such as flat emotional disruption, lack of motivation,

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social withdrawal, and passivity that might be primary or secondary to depression or the side effects of the drugs (Turkington et al., 2008).

Schizophrenia process is associated with exacerbation and remission and followed by each relapse; heavier degradations appear in patient's psychological and social functions and over time, positive symptoms such as delusions and hallucinations are reduced and negative symptoms that defect the patient socially become severer (Morrison et al., 2008).According to the definition of Halgin et al., negative symptoms refer to symptoms that reduce or eliminate normal behavior (these symptoms are contrary to positive symptoms such as hallucinations and delusions, that indicate the severity sensory perceptions and thoughts). These pervasive symptoms are persistent to therapy and have a huge impact on patients' quality of life. These symptoms are called negative symptoms because they indicate the lack of a property (Halgin et al., 2002, translated by Seyed Mohammadi, 2007).

There are compelling evidences for the role of drug therapy on the relief of symptoms of this annoying disorder. At the same time it should be noted that drug therapy will not cure the disorder but only alleviate the symptoms. Considering that this disorder includes all life aspects such as thinking, feeling and behavior, the therapy must be comprehensive and include medical, cognitive, behavioral treatment and rehabilitation (Hertz and Marder, 2008). On the other hand there is no valid theory that suggests schizophrenia is merely the result of psychological phenomena such as life experiences, developmental problems, emotional problems, interpersonal and conflict. However, cognitive theorists have provided valuable information about how the symptoms of the disorder affect the patients' lives and the way the psychological principles can be used for the treatment (Halgin and Whitbourne, 2003).

New psychological and pharmacological treatments are effective of schizophrenia, however, only about 20% of the patients completely recover, 20% experience the relapse while they do not have serious problem of the collapse, the disorder in 40% is associated with backwardness and the remaining 40% maintain their problem and it become chronic and remains uncured (Turkington et al., 2008).

Most of the deficiencies remain persistent and as the time passes it is less likely to be cures. At least 67% of patients have experienced a relapse. So the person who has experience schizophrenia once, he will not recover completely and with each time of the relapse the risk of persistent symptoms and the chance of suicide increases and experiencing numerous relapses lead to the disappearance of the functions and deinstitutionalization. Deinstitutionalization is a factor for higher inability of the patient (Bellack, 2003). Psychological treatments to improve function, reduce symptoms and prevent of relapse were presented to prevent further collapse. Various treatments are presented for these patients, social education, family, behavioral, cognitive-behavioral, supportive, cognitive rehabilitation or the integrated perspective therapies; many experts believe that the most effective approach to treatment is achieved by the combination of pharmacological and psychological interventions. Several studies suggest that the integrated intervention including drug, psychological therapy and social support provides the best areas to help people with schizophrenia (Kopelowicz and Liberman, 1998). Among the existing psychological treatments the social skills training, cognitive rehabilitation, mental training intervention focused on coping skills to family and relatives, supportive treatments and cognitive behavioral therapy are effective treatments that can be associated with medication (Pfammatter, Junghan and Brenner, 2006). Pfammatter, Junghan and Brenner (2006) reviewing various studies concluded that cognitive - behavioral therapy are effective in reducing positive symptoms, cognitive rehabilitation affect improve short-term cognitive function, family therapy decreases relapse and re-hospitalization and teaching social skills has an impact on achieving social skills, but the actions taken are still at the beginning of their way.

Right now the health care services do not merely focus on reducing the symptoms but they are also focused on getting rid of the disease and maximizing performance and developing a sense of self in normal adult roles.

Due to these problems, the need for non-drug therapies, especially psychological treatment for these patients is a priority. In this regard, along with the interpretation of paranoid delusions by Beck's cognitive therapy, experimental support for cognitive-behavioral therapy (CBT) is widely established for the treatment of symptoms of mental-emotional distress (Beck, 1952). The first goal of applying CBT for the treatment of psychosis is to train the patient to examine and evaluate ideas and assumptions in certain circumstances and evaluate the thoughts and assumptions based on objective evidence and external and real events. Challenging the thinking of delusional patients may stimulate him to evaluate other alternative performance. These ideas lead to distortions in the processing of new information which, in turn, causes the patients' maintenance of delusive beliefs and hearing hallucinations. Evidences to challenge delusional knowledge may be collected in different ways (Turkington et al., 2006). Behavioral experience and verbal strategies such as automatic thoughts and guided discovery can be used to collect the evidence. Three main aims of using behavioral experience in treating the psychotic symptoms are to formulate and make the special hypotheses testable for the reliability of the hypotheses and creation of new and

operational hypotheses and ideas. Accordingly the purpose of this study is to investigate the effectiveness of cognitive-behavioral group therapy on positive and negative symptoms in patients with schizophrenia.

METHOD

This semi-experimental research is designed based on pretest – posttest and control group. In this study the cognitive-behavioral group therapy intervention is the independent variable and positive and negative symptoms are the dependent variables based on which the cognitive-behavioral group therapy intervention effect is studied and analyzed.

The population under study includes all patients with schizophrenia disorder in Razi psychiatric hospital in Tehran in 2014.

Since the research design is based on the semi-experimental designs in this study, 30 male volunteers were selected based on convenience sampling and assigned in two 15 member experimental and control groups. Since the research is semi-experimental and using Cohen table with the effect size 0.50, 0.05 alpha and the test ability 97, the sample size of 30 was selected.

Methods and structure of therapy sessions

Treatment guidelines was extracted from the book "cognitive-behavioral group therapy" of Michael Frey and case study guide of cognitive behavior in psychotic patients of King and Turkington (2000, 2002 and2006) which is one of the most prestigious cognitive - behavioral therapy programs for schizophrenia and deals with delusions and hallucinations and many studies have been conducted on it and it has been widely used in the USA. This program is applicable on groups of individuals. Instructions therapy consists of a 16 session treatment program (45 minutes per session) which was held in group classes. After the end of the therapy sessions, the post-test questionnaires of negative symptoms were distributed among the subjects.

The guideline subject of the cognitive-behavioral group therapy

Cognitive - behavioral therapy is one of the interventions used in this study. The purpose of the program is to improve the behavior and thinking patterns. In this method, it is assumed that symptoms change following the change in the way of thinking. This treatment program is designed to identify the initial underlying maladaptive assumptions and wants to change thinking patterns. Thoughts, beliefs and mental images that patients experience are the core of cognitive-behavioral therapy. The content of the therapy include the identification of thoughts and beliefs, reviewing the evidence and self-monitoring of knowledge and thoughts that are related to mood and behavior. The treatment program of each session is as

Follows

First session: establishment of a therapeutic alliance and determining the treatment objectives, introducing the members to each other, describing the treatment program and reducing the label stress by normalization of schizophrenia and reducing the stress caused by the schizophrenia stigma.

Second session: formation model of schizophrenia, cognitive behavioral therapy role in the treatment and understanding of A- B- C of the therapy.

Third session: the treatment of schizophrenia, describing the behavioral performance improvement model through the activity program, hierarchy of activities and developing the scope of activities and improving self-care programs. Coping with sounds, describing the vulnerability to hearing voices, modifying the beliefs about the power and authority of voices, providing functional interventions like Walkman or personal tape recorder, ear plugs, indexing: watching and naming, murmuring or sublingual singing,…

Fourth session: identification of stressful situations and cognitive errors

Fifth session: coping with social situations, the effect of schizophrenia on the sense of self and fear of recurrence as a major source of stress Sixth session: coping with cognitive errors and manage stress through relaxation training

Seventh session: Evaluation of evidence such as "it is only voice, it cannot do anything" so "if the voices make mistakes, they cannot be knowledgeable and have power and authority" and… interpretation and normalization of automatic thoughts by focusing techniques… believe in change that is the underlying deep meaning of delusional beliefs and the use of strategies to weaken delusions.

Eighth session: logical reasoning, such as the assessment of evidence to test reality based on evidences… omitting the supportive evidences providing alternative explanations...

Ninth session: Test of reality about power and knowledge of voice, challenging the voices, mocking voices and modifying the responses to commands.

Tenth session: Interpretation and normalization of automatic thoughts, taking the control of the thoughts by different methods of focusing.

Eleventh session: Believing the change that is the underlying deep meaning of delusional beliefs. Analyzing which fundamental beliefs are linked by a discussion with the patient, changing the underlying belief by the interaction between the assessment of evidence, logical reasoning and reality testing

Twelfth session: the use of strategies, analyzing the evidence supporting delusions and removing them and reality evaluation.

The thirteenth session: Acting of limited self-concept and low self-esteem and PSOB cognitive strategies (post-self-on-back) to train better self analysis

Fourteenth session: training distractions activities such as changing environment and changing other people. Fifteenth session: ways to deal with the fear of relapse

Sixteenth session: the prevention of relapse and training how to deal with permanent relapse, emphasizing the importance of drug therapy, the person is asked to suppose that the symptoms are back. What would he do? The exercise outside of the sessions will be explained and we will encouraged them to be in contact with a mental health professional.

Tools

The tools of the study included inventory of Assessment of positive symptoms (PANS) and Assessment of negative symptoms of Anderson (SANS): This scale was designed by Anderson and has 35 items.

The scale is designed for the accurate assessment of a patient's positive symptoms and includes five symptoms including hallucinations, delusions and weird behaviors and impaired positive thinking. Each item is based on zero (lack of the symptom) to six scales (severe symptoms). Also, in order to obtain a total score the subscale scores should be summed up. The higher the score means that the frequency and the severity of symptoms are higher. The scale in comparison to other similar tools is considered valid and it is used to assess efficacy in clinical research and phenomenology of symptoms of mental breakdown (Saduk, 2009) The internal consistency of this scale was 0.83, reliability of the pre-test and post-test was 0.88 and the reliability of scoring was reported as 0.87 . The lowest score in this test is 0-24 which is considered as the health range (Yasrebi, 2007).

2. Anderson's assessment of negative symptoms (SANS) scale: The negative symptoms scale includes 24 items. This scale was presented by Anderson to assess the negative symptoms in patients and it is used to assess the efficiency of the therapy and other symptoms. The scale analyzes the negative symptoms in five areas of shallow and slow emotions, lack of speech, apathy, passivity (lack of pleasure), sociopath and attention. Scoring this scale is the same as scoring the positive symptoms. Each item is based on zero (lack of the symptom) to six scales (severe symptoms). The higher the score means that the frequency and the severity of symptoms are higher. The scale in comparison to other similar tools is considered valid and it is used to assess efficacy in clinical research and phenomenology of symptoms of mental breakdown (Saduk, 2009) The internal consistency of this scale for patients with mental breakdowns was 0.94, reliability of the pre-test and post-test was 0.92 and the reliability of scoring was reported as 0.89 . The lowest score in this test is 0-24 which is considered as the health range (Yasrebi, 2007; Ali Beigi, 2010).

RESULTS

In the first part using descriptive statistics on the scope of central measures and dispersion, we will discuss the characteristics of the experimental and control groups. Then the additional analyses will be conducted based on inferential statistics by covariance statistic model.

Results associated with descriptive analysis research

Table 1. Descriptive analysis of the positive symptoms of schizophrenia in the experimental and control groups

Group	Variable	No	Mean	The mean standard error	Variance	Standard Deviation
Trial	Pretest	15	65.13	1.19	21.26	4.61
	Posttest	15	63.20	1.35	27.45	5.23
Control	Pretest	15	68.53	1.35	27.69	5.26
	Posttest	15	68.13	1.35	27.69	5.26

Table 1provides the descriptive analysis associated with "positive symptoms" of the subjects and presents the statistics such as mean, variance, standard deviation, in each pretest and post test in experimental and control groups.

Table 2. Descriptive analysis of the negative symptoms of schizophrenia in the experimental and control group

Group	Variable	No	Mean	The mean standard error	Variance	Standard Deviation
Trial	Pretest	15	60.60	0.79	9.54	3.08
	Posttest	15	58.06	0.81	9.92	3.15
Control	Pretest	15	61.33	0.69	7.23	2.69
	Posttest	15	61.26	0.71	2.76	2.76

Table 2 provides the descriptive analysis associated with "negative symptoms" of the subjects and presents the statistics such as mean, variance, standard deviation, in each pretest and post test in experimental and control groups.

The analytical results of research

According to the study, the design is based on pretest - posttest control group. In section 2 of the chapter four comprehensive analyses has been made on the effectiveness of the effect of cognitive - behavioral therapy on each of the positive/ negative symptoms using analysis of covariance.

Hypothesis 1: Cognitive-behavioral group therapy affects the positive symptoms in schizophrenia patients

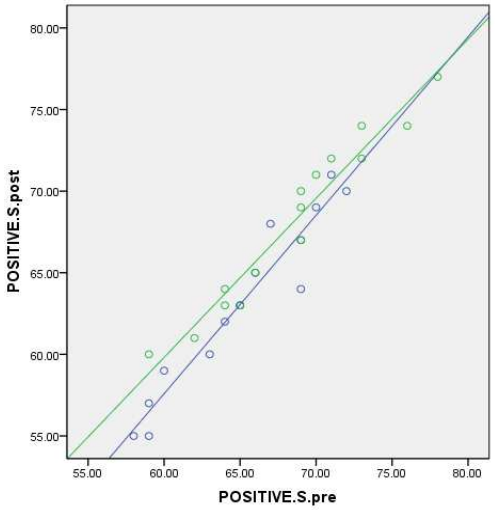

Figure 1 The homogeneity of regression slopes in positive symptoms

Table 3 The analysis of Leven Test in "positive symptoms"

F	DOF 1	DOF 2	Confidence level.
0.13	1	28	0.71

According to the table above, the F = 0/13 Leuven which is not statistically significant. So the homogeneity of variance in the positive symptoms of schizophrenia has been met and there is the possibility of using analysis of covariance.

Table 4. covariance analysis associated with the effect of cognitive - behavioral therapy on "positive signs" in the post-test

The source of changes	Total squares	Degree of freedom	Mean square	F	Confidence level.	Eta coefficient
Pretest	722.07	1	722.07	389.47	0.00	0.93
Group	13.87	1	13.87	7.48	0.01	0.21
Error	50.05	27	50.05	_	_	_

As it is observed after excluding the effect of pre-test and analysis of covariance F = 7/48 which is statistically significant at p <0/05 and thus the null hypothesis is rejected and the main hypothesis is accepted. Therefore, we can say cognitive - behavioral group therapy intervention can reduce positive symptoms in schizophrenic patients.

Hypothesis 2: cognitive - behavioral group therapy method affects the negative symptoms in schizophrenia patients.

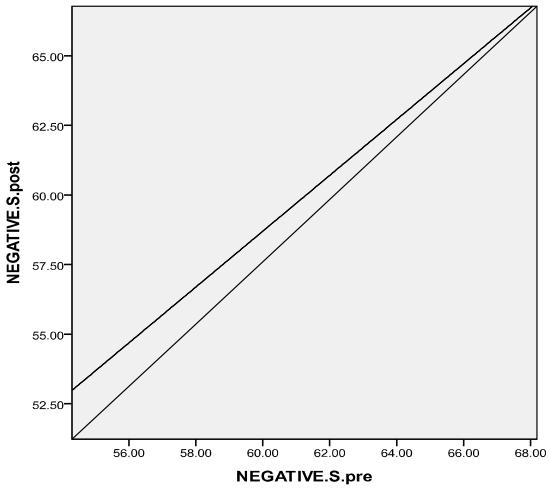

Figure 2 The homogeneity of regression slopes in negative symptoms

Table5 The analysis of Leven Test in "negative symptoms"

F	DOF 1	DOF 2	Confidence level.
0.01	1	28	0.97

According to the table above, F = 0/01 Leuven which is not statistically significant. So the homogeneity of variance in the positive symptoms of schizophrenia has been met and there is the possibility of using analysis of covariance.

Table 6. covariance analysis associated with the effect of cognitive - behavioral therapy on "negative signs" in the post-test

The source of changes	Total squares	Degree of freedom	Mean square	F	Confidence level.	Eta coefficient
Pretest	209.90	1	209.90	157.59	0.01	0.85
Group	46.33	1	46.33	43.78	0.00	0.56
Error	35.96	27	1.33	_	_	_

CONCLUSION

The results showed that the cognitive - behavioral group therapy affects positive symptoms in schizophrenia patients. After elimination of the pre-test and analysis of covariance F = 7/48, which is significant at p <0/05 level so the null hypothesis was rejected and the main hypothesis is accepted. Therefore, we can say, cognitive - behavioral group intervention reduced positive symptoms in schizophrenic patients.

The above finding is consistent with Freeman et al. (2014), Heins et al. (2013), Chilcot and Morris (2013), Dunn et al. (2011), Waller et al. (2011), Perivoliotis et al (2010), Morrison and Barratt (2010), Gumley et al. (2010), Naeem, Kingdon and Turkington (2008), Wylks, Steel et al (2007), Qi et al. (2007), Kington and Turkington(2005), Eddington and Gleason (2005), Trier (2004), Neil et al.(2003), Durham et al. (2003), Rector and Beck (2001), Sensky et al (2000) and Nelson (1991) on the efficacy of cognitive-behavioral therapy in reducing positive symptoms in patients with schizophrenia.

The results showed that the cognitive - behavioral therapy is effective in reducing positive symptoms of schizophrenia. When using cognitive techniques for patients with this disorder several factors should be considered. An important point is the IG of the patient because this factor affects the ability of abstract and analytical thinking. In general the schizophrenic patients have relatively new process of thinking especially in self analysis in comparison with other clients and the therapies are expected to be divided into easier stages so that the patients could use them easily so the best thing to do is to stop putting the abstract concepts in the mind of the patients. Another important issue is the ability to analyze individual differences in treatment which may affect the outcome of the results. The results have shown that the use of cognitive - behavioral therapy reduces positive symptoms in patients with schizophrenia. It can be said that the in believe change method the patient is subject to strategies to challenge his delusions and hallucinations. First information about the conditions facilitating the emergence of these

symptoms is presented. These symptoms are methods of coping with critical life situations that the patient wants to get rid of the tensions he cannot tolerate using them but since this method is inefficient after a while these coping methods become the main problem of the patient. The results confirmed that cognitive therapy has a potential ability as a complementary treatment also a study of cognitive behavioral therapy indicated that this treatment has a better result compared to the mental health education on positive symptoms. Since the cognitive - behavioral therapy used in this study is used to reduce the positive symptoms uses the two techniques of belief and coping, so the components of these two techniques that have reduced the positive symptoms should be considered. The results of this study indicate that cognitive - behavioral therapy based on which the explanation about the nature of hallucinations and delusion and helping the patient to identify the methods of challenging them and proper decision making about their accuracy, although it seems too hard for the patients but since in this method direct facing and challenging of the system is achieved, most patient have understood the discussions considerably. Also as the sessions passed the members became more motivated to take part as many patients were interested in having more sessions. Bental et al (1982) believe that the positive symptoms act as psychological defense mechanisms against depression and low self-esteem and they are obtained by the memory errors and selective attention. Thus the person's concerns about a specific issue leads to selective attention to threat-related stimuli, also it acts biased in reminding the symptoms associated with memory threats. This bias interfere the style of intervention and cause negative consequences attributed to external causes. The negative automatic thoughts contents are involved in positive symptoms and they are not based on the reality and lead to this biased information-processing. In treatment, negative automatic thoughts contents must be extracted and evaluated. In cognitive behavioral therapy working on cognitive errors leads them toward realistic reference and shaking the deep delusional beliefs (Turkington et al., 2008).

Methods of cognitive - behavioral therapy affect reducing negative symptoms in schizophrenia patients. After elimination of the pre-test and analysis of covariance F =34/78 which is significant at p <0/05 level so the null hypothesis was rejected and the main hypothesis is accepted. Therefore, we can say, cognitive - behavioral group intervention reduced negative symptoms in schizophrenic patients.

The above finding is consistent with Freeman et al. (2014), Morrison et al. (2012), Kumari et al (2012), Turkington et al. (2008), Wylks et al. (2008), Naeem, Kingdon and Turkington (2008), Garety et al. (2008), Brad Claw et al. (2006), Granhelm et al. (2006), Morrison et al (2004), Chadwick et al. (2003), Gumley et al. (2010), Durham et al. (2003), Rector and Beck (2001), Pilling et al. (2002), Sensky et al (2000), Nelson (1991), Drury et al. (1996).

Many of the techniques offered in cognitive-behavioral treatment program address delusions and hallucinations, however, the negative symptoms are also affected. The paradox is that despite the plan for positive symptoms how the negative symptoms are affected? How the techniques used in cognitive behavioral therapy involve activation, recording thoughts emotional labeling and home tasks are associated with negative symptoms? It is probable that the technique leas to changes in the frontal cortex and brain mechanism. Cognitive behavioral therapy can be effective through reducing social isolation and the stigma of mental illness. Also the patients who deal with their avoidance behavior can do more activities and use better ways, however the isolated cases of persistent negative symptoms that have benefited from this treatment may experience relapse of the symptoms. However, we can say that the effect of CBT on the depression symptoms and improving the patient's motivation can improve some negative symptoms that have similarity in behavior with depressive symptoms and deal with deinstitutionalization in the patients. Drury et al (2001) did not report permanent effectiveness regarding the negative symptoms. The results indicate efficacy in improving negative symptoms; it can be said that the psychological interventions have more effect on negative symptoms. The process of schizophrenia is associated with ups and downs and after each relapse a heavier destruction occurs in psychological and social performances and as the time passes the positive symptoms such as hallucinations and delusions are reduced but the negative symptoms that defects that people socially become more severe (Morrison et al., 2008). Cognitive therapy is a mental health system that tries to reduce the emotional reactions and self - injurious behavior by modifying the maladaptive thoughts and beliefs that are the basis for these reactions (Morrison et al., 2003). This method of treatment is an organized way of psychotherapy designed to reduce and help the patients to learn better to obtain more effective ways to deal with the problems that are causing him discomfort. The characteristic of treatment with this method is that all efforts are directed to solve the problem (Neil and Davison, 2009).

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