

Improving Cognitive Regulation in Patients with Bipolar Disorder Using Cyberspace-Based and Family-Centered Intervention

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Abstract

Introduction: Bipolar Affective Disorder is cyclic swinging of mood between mania or hypomania and depression. The present study aimed to examine cognitive regulation in patients with bipolar disorder using the cyberspace-based family-centered intervention.

Method: This study was a quasi-experimental research with a pretest-posttest design and a follow-up period. The statistical population of the study included patients with bipolar disorder and a family member. 30 patients with a family member were selected by convenient sampling method and randomly assigned to experimental and control groups. Garnefski Cognitive Emotion Regulation Questionnaire (CERQ) was the research tool. After administration of the questionnaires, the Miklowitz family-focused therapy was performed for the experimental group using cyberspace. At the end of the course, participants in both groups were evaluated using the research tools. Data were analyzed using SPSS22 software and mixed analysis of variance with the repeated measures.

Result: The results of analysis of variance with repeated measures showed that the Miklowitz model led to a significant difference in the score of emotion regulation with an effect size of 45% in the experimental and control groups ($P < 0.05$). In other words, the cognitive emotion regulation and its subscales have been evident in the experimental group.

Conclusion: As a result, it can be said that the use of the Miklowitz model through cyberspace affects cognitive emotion regulation and subscales of self-blame, acceptance, rumination, positive refocusing, refocusing on planning, positive reappraisal, putting into perspective, catastrophizing, and other-blame.

Declaration of Interest: None

Keywords: Family-Centered intervention, Cyberspace, Emotional cognitive regulation, Bipolar disorder.

Introduction

Bipolar disorder (BD) is a chronic mood disorder characterized by manic or hypomanic episodes alternating or intermixed with episodes of depression (1). BD has an average age at onset of 20 years old, and with each additional mood episode, patients tend to experience an increased severity of symptoms and episodes, as well as an increased risk for recurrence. Diagnosis of type I BD (BD-I, its most severe form) requires a person to have experienced at least one manic episode, which is typically characterized by a decreased need for sleep, rapid thinking, acting spontaneously on ideas, among other symptoms (2). Bipolar Disorder is characterized by cyclic mood swing between mania or hyp-mania and depression. According to World Health Organization, collaborative study conducted in 11 countries, the lifetime prevalence of bipolar disorder came out to be 2.4% worldwide, being highest in the United States (4.4%) and lowest in India (3). Bipolar disorder is a severe, chronic, and almost incurable mood disorder. Preventing the recurrence of the disease is one of the most significant therapeutic goals in this disorder. Although the use of mood stabilizers such as lithium and carbamazepine is effective in dealing with the acute stages and stabilizing mood, many of these individuals still experience recurrent episodes of disease attacks (4). Bipolar disorder is one of the most common psychological disorders. The prevalence of type 1 of the disease is 0.4 to 1.6%, and the

prevalence of type 2 is approximately 5% (5).

Half of the people with type 1 bipolar disorder have severe manic attacks within a year, and only about 25% return to their previous functioning (6). Also, this disorder has less improvement and a higher mortality rate compared to other mood disorders (7). The World Health Organization listed bipolar disorder as the sixth leading cause of lifelong disability among people in the age range of 15 and 44. Bipolar disorder affects the individual and all members of the family. There is a high social cost to care for bipolar patients, indicating a reduction in their effectiveness (8). Therefore, given the prevalence, the recurrence, and the effects on the family members, therapeutic studies for bipolar disorder seem necessary. One of the most prominent biological symptoms of bipolar disorder is emotional instability (8).

During recent years, significant worldwide interest in examining the role of emotion regulation in mental health and development of diseases has emerged. Moreover, role of disorder in regulation of emotion, prevalence and persistence of some diseases such as mental illnesses and psychosomatic diseases such as functional gastrointestinal disorders have been identified (9). Emotion regulation (ER) refers to processes that modify the frequency, intensity, and duration of emotional states (10). Emotion is considered as a bio-cognitive reaction to important or challenging situations in life that have an important role in adapting to life changes and stressful events (11). Although emotions

have a biological basis, individuals can influence how they express these emotions. This ability, called emotion regulation, is an internal and external process responsible for controlling, evaluating, and changing an individual's emotional reactions toward goal achievement (12). Thus, emotion regulation is a fundamental principle in initiating, evaluating, and organizing adaptive behavior and preventing negative emotions and maladaptive behaviors (13). Cognitive emotion regulation strategies consist of 9 strategies divided into two types of negative and positive cognitive emotion regulation strategies. The former includes self-blame, other-blame, catastrophizing, mind rumination, and the latter consists of acceptance, positive refocusing, planning, positive reappraisal, putting into perspective (14).

Studies have shown that failure in cognitive emotion regulation plays a major role in the development of bipolar disorder due to episodes of emotional turmoil in these patients (15). Cognitive emotion regulation can be a factor in the development or severity of the disorder. It is possible to prevent negative emotions and uncompromising behaviors of people with bipolar disorder by increasing their ability to regulate emotion (16). Rezaei and Gholipour examined the strategic role of cognitive emotion regulation and the masculine-feminine gender preferences in adolescent girls' violence. According to the results of the final model, the cognitive regulation strategy of dysfunctional emotion and the subscales of self-blame, rumination, catastrophizing, other-blame, and the role of masculinity could predict the levels of

violence directly. Besides, the cognitive regulation strategy of functional emotion and positive reappraisal could inversely predict the levels of violence (17). The results obtained by Hassani and Miraghaei showed the predictive value of cognitive emotion regulation strategies in suicidal ideation. The results of this study showed that the strategies of self-blame, other-blame, catastrophizing, and rumination had a positive relationship with suicidal ideation. However, acceptance, positive refocusing, refocus on planning, putting into perspective, and positive reappraisal showed inverse relationships with suicidal ideation (18). Also, according to the results of Salehi, Mazaheri, Jahanbazi, and Aghajani, among the scales of cognitive emotion regulation strategy, catastrophizing, acceptance, refocusing on planning, and rumination along with stress were significant predictors of depression, respectively (19).

Since one of the goals of the World Health Organization in the promotion of mental health and treatment of mental illnesses by 2016 is to reduce the length of hospitalization and expand social services, the role of the family in caring for mental disorders has received much attention. Accordingly, systematic training for families has been emphasized to provide care for severe mental illnesses (20). The family of mentally ill individuals caring for the patients has a variety of requirements, whose identification and prioritization can help in meeting the family needs through proper planning and training (21). Therefore, considering the role of cognitive emotion regulation in people with bipolar disorder, it is necessary to use common

therapies to improve cognition and emotional expression while solving problems logically. The Miklowitz family-focused therapy is one of the approaches that may be effective in improving the conditions of patients with bipolar disorder and cognitive regulation.

Family-focused therapy was developed in the mid-1980s to treat bipolar disorder in the family setting. This intervention primarily aims to prevent the recurrence of depressive symptoms and mania in patients with bipolar disorder. Since all family members engage in this intervention, and the focus is on teaching skills such as expressing positive emotions, applying coping strategies, and controlling negative emotions (22), too much involvement with patient care is often associated with a significant burden of care. The caregiver burden is, by definition, the presence of problems or complications that affect the lives of caregivers of patients with various disorders or diseases, including family members (23). The family burden is broadly divided into objective and subjective types. While the concept of purposeful family burden covers measurable problems (such as patients' troublesome behaviors), the idea of mental family burden refers to caregivers' emotions that arise in response to objective problems. Numerous studies have shown worldwide that bipolar disorder is associated with a significant burden of care (24).

Family-focused therapy emerged as a modification of family behavioral management (25,26) and included a nine-

month treatment for schizophrenia patients and their families. Behavioral family management includes psychology training sessions and training of communication and problem-solving skills for patients with schizophrenia and their parents, or in rare cases, their spouse or older siblings. Falloon et al. found that for patients with schizophrenia, who had just been discharged from the hospital, the combination of 9-month family behavioral management and medication was more effective in reducing psychological recurrence and improving social functioning compared to 9 months of individual therapy and neuroleptic support.

The mid-1980s were a turning point for the study of families with major mental illnesses. The biological and genetic findings of the 1960s and 1970s led to a decisive change in the overall framework for working with families. Patients with schizophrenia or bipolar disorder were no longer considered victims of familial pathological environments, but people with genetic disorders living in families that experienced anxiety due to lack of information about effective treatments. Parents who expressed high levels of negative emotions or vague communication reacted to the pressures of living with a person who suffered from schizophrenia (26).

Therefore, the present study aims to examine the effectiveness of the cyberspace-based family-centered intervention on cognitive regulation in patients with bipolar disorder.

Method

The present study was a quasi-experimental with a pretest-posttest design with a control group and a 2-month follow-up period. The statistical population included patients with bipolar disorder and one of their family members. These patients had at least one period of hospitalization and were referred to one of the counseling centers and psychological services to continue treatment after discharge in 2018-2019 in Tehran. A total number of 30 patients (according to previous studies) along with a family member were randomly selected and assigned into an experimental and a control group. Inclusion criteria were Pharmacotherapy for at least 6 months, the patient at the age range of 20 to 35 years, a family member at the age range of 30 to 60 years, minimum literacy of diploma, and familiarity with the use of computer and virtual networks. Exclusion criteria were physical disabilities, illiteracy, and unfamiliarity with the computer. Questionnaires were distributed among the participants of both groups as a pre-test and collected before the treatment sessions.

Measurements:

Cognitive Emotion Regulation Questionnaire (CERQ): This self-report questionnaire was developed by Garnefski et al. (14). This 36-item questionnaire identifies cognitive coping strategies of individuals after experiencing negative events through 9 dimensions of acceptance, self-blame, other-blame, catastrophizing, refocusing on planning, positive refocusing, positive reappraisal, and putting into perspective (or a relative perspective of the

events) (14). The Cronbach's alpha coefficient values of 0.91, 0.87, and 0.93 were obtained respectively for the test reliability in examining the psychometric properties of the Garnefski test; thus, its validity and reliability were reported acceptable in 2001 (14). The reliability of this questionnaire in Iran was reported by Yousefi to be 0.82 for all cognitive scales using Cronbach's alpha coefficient, covering a range of 0.40 to 0.68 with a mean of 0.56, all of which were significant.

The Quality of Relationships Inventory (QRI): Pierce et al. (1991) developed this questionnaire to assess the support received from family members. This questionnaire has 29 items, but 25 items remained after the elimination of 4 items in the next edition. The 4-point Likert scale is used at a range of zero, low, medium, and high to score the items. The QRI has three subscales of Perceived Social Support (7 items), Interpersonal Conflict (12 items), and Relationship Depth (6 items). Also, the individuals must evaluate the quality of their relationship with parents, friends, and spouse in each of the 25 items. Several psychologists, including Hooshmand Layeghi (1997) approved the content and external validity of the questionnaire. The retest method led to reliability of 0.831 for the whole questionnaire and >0.7 for subscales (Hosseini Ghadmagahi, 1997). Another study was conducted by Firoozjaei et al. (2017), which examined the psychometric properties of the QRI between couples. Reliability evaluation showed acceptable stability and internal consistency of the tool using retest (intra-class

correlation of 0.92 and Cronbach's alpha of 0.90, respectively).

The intervention was performed for the experimental group during 21, one-hour sessions. It is noteworthy that the presence of the patient with a family member was mandatory in all sessions. Some of these meetings were in person and some through cyberspace. Accordingly, all the members of the experimental group participated in person in the first session. Then a group was made in WhatsApp to send audio files and short educational videos. Skype was also used to form video conferences as well as question and answer sessions. Besides, certain hours of the day and night were set for the group members to attend virtual meetings and answer the questions. At the

end of the sessions, questionnaires were distributed among patients to collect post-test data. Finally, 2 months after the intervention sessions, the questionnaires were redistributed among the members of the experimental and control groups and collected after completion.

The Miklowitz Family-Focused Psychological Education Protocol:

This protocol had 21 sessions of online and in-person treatment and was performed for one hour with the families of bipolar patients based on the five main sections set by Miklowitz (2010). A group was formed on WhatsApp in the first session, in which the patients and one of the especially important family members attended. Table 1 shows the content of the treatment sessions:

Table 1. *The Miklowitz Family-Focused Psychological Education Protocol*

Section 1: Awareness of Disorder (Sessions 1-6)

The first session is held in person to get to know the members, train and regulate the rules of virtual groups, and establish a deeper connection.

In sessions 2-5, the members receive information on the definition of bipolar disorder, disease prevalence and identification of its triggers, identification of symptoms of the first group (symptoms of mania and hypomania), identification of symptoms of the second group (symptoms of depression and mixed episodes of mania – depression), and evaluation and prognosis of disorders through the audio file and short video of the performer of the intervention. provision of in-person explanations, audio files, and short videos and answering the members' questions are through WhatsApp. A specific hour is set for group communication and conference on the day the session is held.

In session 6, members attend in person to ask questions, resolve any ambiguities, and gain empathy.

Section 2: Drug Therapy (Sessions 7-13)

Sessions 7-12 provide films to familiarize participants with drug therapy versus alternative therapies, risks associated with discontinuation of treatment, mood stabilizers, antipsychotics, and antidepressants. The patients are encouraged to avoid treatment attenuating behaviors, such as misuse of major and minor medications (arbitrarily increasing or decreasing medications), changing the timing of regular medications (skipping one meal and adding another or stopping medications over a period of time), alcohol and substance misuse, etc. to control the symptoms of their disease and perform pregnancy and genetic counseling.

Session 13 on Skype is a supergroup of online sessions to answer questions from participants.

Section 3: Avoiding Substance Abuse (Session 14):

This session is held in person and aims at avoiding psychotic substances, mania-like and hallucinogenic substances, and alcohol.

Section 4: Early Discovery of New Episodes of Disorder (Sessions 15-17)

Original language videos with Persian subtitles along with the image and complementary descriptions are placed in the WhatsApp group as an audio file to acquaint the patient with the early and warning signs of the disease in mania episodes (increase energy, high interest in sexual relations, decreased sleep, talkativeness, extravagance, distraction), hypomania (milder symptoms of mania episodes), and the rare episodes of depression and mixed with their time.

Section 5: Setting Habits and Stress Control (Sessions 18-21)

Habit-setting techniques, stress management, problem-solving strategies, and anger management are performed in sessions 18 to 20 in the online Skype supergroup. Session 21 is held in-person and summarizes the problems faced by clients. Besides, appropriate solutions are provided to the clients' guardians, along with daily planning and adapting the patients' life process to the problems.

The results of the present study were analyzed by SPSS software version 24 at the descriptive level using the indicators of mean dispersion and standard deviation.

Besides, the analysis of variance with repeated measures was used at the inferential level. Ethical principles of this study were followed by obtaining the informed consent of the participants and ensuring confidentiality.

Results

According to the descriptive statistics, 30 subjects (15 in each group) participated in this study. The highest percentage of respondents (46.7%) belonged to the age group of 20-25 years, and the lowest percentage (23.3%) was allocated to the age group of 31-35 years.

Table 2. Descriptive indicators of research variables

Components	group	Pretest		Posttest		Follow-up	
		Mean	SD	Mean	SD	Mean	SD
Self-blame	Control	2.9167	.66592	2.8500	.66009	2.7833	.64688
	Experimental	3.1333	.61866	2.6833	.75277	2.6667	.74202
Acceptance	Control	3.2000	.66279	3.0833	.60257	3.0000	.61237
	Experimental	3.2000	.57632	3.2333	.69736	3.2333	.69736
Rumination	Control	3.6500	.80623	3.5167	.72251	3.4333	.66458
	Experimental	3.0833	.83808	3.1667	.73598	3.1667	.73598
Positive refocusing	Control	2.1333	.74322	2.1000	.76649	2.2167	.77267
	Experimental	1.8500	.60356	2.9500	.59161	2.9500	.59161
Refocusing on planning	Control	1.6833	.46739	1.7167	.39940	1.8333	.40825
	Experimental	1.8500	.47996	3.4167	.67259	3.4167	.67259

Positive reappraisal	Control	1.9667	.78982	2.0167	.67126	2.0333	.66726
	Experimental	2.1667	.74202	3.7500	.70076	3.7500	.70076
Putting into perspective	Control	2.4000	.89043	2.4000	.89043	2.4167	.82195
	Experimental	2.5333	.82303	3.4167	.43983	3.4167	.43983
Catastrophizing	Control	3.0833	1.14434	3.0667	1.08754	3.1333	.99940
	Experimental	3.0500	.90238	2.3333	.81101	2.3333	.81101
Other-blame	Control	2.9000	1.10114	2.8667	1.01712	2.8333	.92421
	Experimental	2.8333	.98046	1.6833	.30570	1.6833	.30570

According to the data in the above table, the mean pretest cognitive emotion regulation indicators were close to each other in the control and experimental groups. However, the mean posttest cognitive emotion regulation indicators showed differences in the control and experimental groups. Also, the mean follow-up cognitive emotion regulation indices were different in the two groups, and the experimental group had almost the highest means ($P < 0.05$).

Also, the results of the default box M test showed that the null hypothesis was not rejected because the value of F (10.89) was not significant at the given error level

(0.564). On the other hand, the rate of $F = 11.41$ and Wilkes's lambda with a value of 0.542 at the level of $P < 0.000$ were statistically significant. In other words, the relationship between the linear combination of dependent variables and the independent variable was significant. Also, considering the ETA squares of 0.45 and 0.56, respectively, it can be concluded that the experimental intervention led to changes in the experimental group, which was 0.45 and 0.56 of the total changes due to the intervention. Therefore, the cyberspace-based family-centered intervention has affected cognitive emotion regulation.

Table 3. Results of analysis of variance with repeated measures of cognitive emotion regulation score in experimental and control groups

Variable	SS (Sum of Squares)	Df.	MS (Mean of Squares)	F value	Sig.	eta ²
Self-blame	6.018	1.395	4.315	4.334	.032	.134
Acceptance	0.104	1.09	.095	.58	.46	.020
Rumination	.068	1.08	.063	.188	.68	.007
Positive refocusing	6.3	1.07	5.9	36.2	.001	.56
Refocusing on planning	13.8	1.08	12.8	74.5	.001	.72

Putting into perspective	13.4	1.03	13.02	41.8	.001	.59
Catastrophizing	3.09	1.06	3.7	15.2	.001	.35
Other-blame	2.4	1.03	5.5	2.3	.024	.13
Total score of cognitive emotion regulation	.461	1.036	.445	23.251	0.0010	.454

The results of the analysis of variance with repeated measures showed a significant difference between the mean pretest, posttest, and follow-up cognitive emotion regulation scores in the two experimental groups of the control group ($P < 0.05$). Also,

Conclusion

The research hypothesis considering the effectiveness of the Miklowitz family-centered intervention on cognitive emotion regulation and subscales of self-blame, acceptance, rumination, positive refocusing, refocusing on planning, positive reappraisal, putting into perspective, catastrophizing, and other-blame in patients with bipolar disorder using analysis of variance with repeated measures showed a significant difference between the mean scores of pretest, posttest, and follow-up in the quality of relationships and its subscales.

These findings are consistent with the results obtained by Ghooshchian Choob Masjedi (27). It is concluded from this study that supplementary treatment of family psychological education along with medication was highly effective in controlling mania symptoms among bipolar patients. Providing family psychological supplementary education along with medication for these patients has been

the significant interaction between the stages with both groups on the scale of cognitive regulation indicates that the mean scores of the experimental group were significantly higher than the control group in the post-test and follow-up stages. These results indicate the effectiveness of the intervention focused on cognitive emotion regulation.

effective in reducing manic episodes only in the short term, which is very promising.

O'Donnell et al. (28) in their study showed that family-focused therapy had more effects on family cohesion and the quality of family relationships than drug therapy for more than 2 years.

Miklovitz et al. (29) showed that a family-centered treatment program using cyberspace increases the response of patients with bipolar disorder to treatment. It also increases parents' understanding of adolescents' symptoms.

Also, the results of Barnes et al. (30) are in line with the results of the present study. Cyberspace-based family-centered psychological education could increase the sense of control (which is based on the same cognitive emotion regulation) in bipolar disorder, reduce family tagging, and improve the understanding of family and caregivers.

Moreover, Hidalgo et al. (31) showed that the therapeutic methods combined with medication are effective and practical in individual management using problem-solving techniques. Such methods increase self-confidence and enhance initial control of symptoms in the semi-manic stage in bipolar type I patients.

Research conducted by Hack (32) showed that family-centered intervention improved coping styles. Besides, patients' skills in response to family conflicts improved significantly. In explaining these findings, it can be said that drugs play undoubtedly a significant role due to the strong bio-hereditary foundation of diseases. Given that the most desirable outcome for these patients is to have symptom stability for a longer period and to minimize the emotional disturbances that contribute to the functioning of their social role, it is natural to have psychotherapy alongside medication and the required skills to reduce the psychological agitations of these patients. The present study has used the Miklowitz family-focused therapy as a group psychological training, including a set of skills such as the expression of emotions in the family, in addition to medication.

Another explanation for the effectiveness of the Miklowitz family-focused therapy in cognitive regulation of bipolar patients' emotions is that some of these sessions assess family tensions and examine the patient's relationship with members, particularly hostile behaviors, which in turn improve emotional behaviors of the patients and their caregivers.

One way of interaction targeted at the Miklowitz family-focused programs is to focus on one problem. However, many patients showed aggression, anger, relentless crying, and accusations against each other instead of focusing on the problem and solving it. The necessary training to select the right emotion along with efficient expression and requesting was the reason for the effectiveness of this intervention on increasing the positive cognitive regulation strategies in people with bipolar disorder.

Finally, it can be said that patients with bipolar disorder in the manic phase have unrestrained and risky behaviors, such as immoral behaviors, irritability, and aggression, reckless driving, extravagance, running away, drinking alcohol, and increasing sexual desire. Patients experience activities with painful consequences (such as sexual negligence) during the acute phase of mania. Patients' families need to learn the necessary information about the nature of the disease and its consequences, how to deal with the disease, relationships within the family, and the factors that lead to the disease recurrence. Daily social therapies, family-focused therapy, and interpersonal therapy, along with medications, are of particular importance. In the meantime, caregivers need to be familiar with the general principles of these interventions (33).

There were several significant limitations in this study, such as the lack of segregation of the sample group in terms of age, gender, duration of illness, etc., which limits the generalization of results. We can also point to the difficulty of accessing people with

bipolar disorder. It was also difficult for these patients to attend sessions when they were recruited . Therefore, due to the limitations of the research, it is suggested that this method of Miklovitz intervention be used in psychiatric facilities and counseling clinics due to the effectiveness of the Miklovitz family-focused intervention on cognitive emotion regulation in patients with bipolar disorder. Another research suggestion is to compare the Miklovitz family-centered intervention with a systemic family therapy intervention. It is also recommended to compare this intervention on men and women with bipolar disorder by gender, age, recurrence periods and duration of the disease.

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