



## Research paper

### Effect of group problem-solving skills training on the severity of aggression in patients with bipolar I disorder

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#### ABSTRACT

**Introduction:** Psychological interventions can help prevent patients' problems by increasing insight.

**Aim:** This study was aimed to determine the effect of problem-solving skills training on the severity of aggression in patients with bipolar I disorder.

**Material and methods:** In this randomized controlled trial, we enrolled 60 patients with bipolar I disorder admitted to Ibn Sina Psychiatric Hospital in Mashhad during 2018. The patients were assigned to the two groups of intervention ( $n = 30$ ) and control ( $n = 30$ ). In addition to pharmacological therapy, the intervention group attended six 45-minute problem-solving group training sessions, while the control group received medication alone. The data collection instrument was the Buss and Perry aggression questionnaire (BPAQ), which was filled out before and a month after the intervention.

**Results and discussion:** In the pre-intervention phase, there was no significant difference in the mean score of aggression between the problem-solving skills training and control groups ( $119 \pm 5.6$  vs.  $120.5 \pm 8.5$ ;  $P = 0.222$ ); while, the total score of aggression after the intervention was significantly different between two groups ( $86.9 \pm 5.5$  vs.  $120.2 \pm 5.8$ ;  $P < 0.001$ ).

**Conclusions:** Problem-solving skills training can reduce the severity of aggression in patients with bipolar disorder. It is recommended that these skills used in individual and family care for patients with bipolar I disorder.

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## 1. INTRODUCTION

Bipolar disorder (BD) is a chronic and recurrent mood disorder that results in severe occupational and social dysfunction and imposes heavy costs to the patient, family, and community.<sup>1–3</sup> This disorder has a wide range of types, the most important of which are bipolar I and II disorders.<sup>4</sup> The difference between the two disorders is the period of mania occurring in the first type, while the episodes of semi-manicure is a feature of BD type II.<sup>5</sup> The 12-month international prevalence of BD type II is about 0.2%.<sup>6</sup> Also, the prevalence of mood disorders in Iran is 4.29% and the prevalence of the BD is 0.16%.<sup>7</sup> These patients have longer periods of illness and shorter recovery periods compared to other mood patients.<sup>8</sup> The prognosis of patients with BD type I is worse than that of patients with major depression. About 20%–40% of patients with BD type I may experience a second episode of mania 2 years following the first one.<sup>9</sup>

Aggression is one of the key clinical indicators associated with the BD.<sup>10</sup> A study in the United States of 3,800 people with psychiatric disorders found that half of them had moderate to severe levels of anger, and 20% experienced moderate to severe levels of aggression.<sup>11</sup> Researchers in Ethiopia also reported that 29.4% of the 411 people with the BD have aggression.<sup>12</sup> Aggression in people with the BD is associated with the severity of mood swings in the period of mania and the presence of personality disorder along with the main diagnosis.<sup>13</sup> Aggression affects the BD people with brain damage, leading to substance and alcohol abuse, and impaired social functioning.<sup>14</sup>

Poor economic status, unemployment, job loss, marital discord, dropping out of school or college, aggression, and multiple hospitalizations in psychiatric centers are some of the problems caused by BD type I.<sup>15,16</sup> This disorder can be treated with a regular treatment plan comprising pharmacotherapy and psychotherapy. So far, various drugs have been introduced as mood stabilizers; lithium is one of the most widely used drugs in the treatment of the BD.<sup>17,18</sup> Non-pharmacological psychological therapy is also used in patients with the BD. One of these types of treatment is cognitive-behavioral psychotherapy. In cognitive-behavioral methods, dysfunctional attitudes are reconstructed through specific techniques. In so doing, the therapist first examines and identifies them with the help of the client and then tries to change them by challenging thoughts. On the other hand, the client is also encouraged to identify and reject his/her thoughts. Cognitive behavioral therapy (CBT) encourages patients to actively solve problems and conflicts and emphasizes on the individual's ability to interpret and modify events appropriately.<sup>19</sup>

One of the types of the CBT is problem-solving skills training, through which people identify effective strategies for dealing with problematic situations in life.<sup>20,21</sup> A step by step problem-solving approach to train patients with the BD as a group can be used as a therapeutic approach along with other methods.<sup>22</sup> This approach is a simple process that can be easily learned. In problem-solving approach, the person learns how to define and explore the problem in appropriate

and efficient ways and take action to solve it.<sup>23,24</sup> Moreover, this approach can be effective in mental health and treatment of some neurological disorders such as patients with schizophrenia and as well as patients with other chronic mental disorders.<sup>23</sup> Behavioral-cognitive approaches have been widely used in the treatment of neurological disorders, and most research suggests that these therapeutic approaches are more effective in combination with pharmacological approaches than when used alone.<sup>25</sup> The use of an interventional and practical training method, especially by nurses, seems to be necessary. The special situation of mental patients and patients with BD type I and their special conditions in terms of educability doubles the need to study and evaluate the effectiveness of cognitive-behavioral interventions.

## 2. AIM

The aim of this study was to determine the effect of problem-solving skills training on the severity of aggression in patients with BD type I.

## 3. MATERIAL AND METHODS

This was a randomized controlled trial with a pre-test and post-test design performed in Ibn Sina Psychiatric Hospital in Mashhad in 2018 (April to June) among patients with BD type I. The sample size was estimated as 28 cases per group based on a preliminary study and using the formula of comparing the mean and standard deviation (SD) of the two communities by calculating the mean and SD of the total aggression score in the intervention and control groups with 95% confidence and 85% test power. Considering sample attrition, 32 patients in each group were studied.

In the intervention group, 2 patients withdrew from the study due to disturbing the sessions. In the control group, 2 patients were discharged from the hospital and refused to participate in the post-test. Thus, the sample size was considered 60 individuals.

The inclusion criteria included willingness to participate in the study, age 18 to 60 years, having at least a junior high school diploma, no speech or vision problems (based on self-report and previous hospital records), no history of participating in a previous problem-solving skills training workshop, lack of other psychiatric disorders (based on psychiatrist's approval), no chronic illness or physical disability, acute phase of the disease, and no signs of psychosis. The exclusion criteria were not doing the practices in the problem-solving skills group or not responding to necessary follow-ups, absence from the problem-solving skills training for more than 25% of the time, withdrawal or unwillingness to continue participating in the study, group intolerance and disruption of the group, and having aggression and violence.

The tools used in this study included a demographic checklist and the Buss and Perry aggression questionnaire (BPAQ). The demographic checklist consisted of 14 items in

the two parts of personal and job information, which were prepared according to the latest resources and related articles.

The BPAQ contains 29 items rated based on a 5-point Likert scale ranging from completely contrary to my char-

acter (score 1) to completely show my hostility (score 5). The score range is 29 to 145, and items 7 and 4 are reverse scored.

The content validity of both questionnaires was reviewed and confirmed by 10 faculty members of the Nursing Department

**Table 1. Content of problem-solving skills training sessions.**

Sessions	Content of problem-solving skills training sessions
First	Definition of the BD, signs and symptoms, course of the disease, etiology, prognosis, warning signs of recurrence, patient interaction with family members, available mental health services, having realistic expectations, providing practical advice for correct orientation towards problems.
Second	Identifying and describing problems that lead to patients' aggression and trying to enable patients to come up with a correct formulation of the problems raised in the session and practice.
Third	Providing the right solution and decision in times of crisis and problem, and asking the patients to review a problem that has recently led to their aggression based on the learned skills and provide the right decision.
Fourth	Practically of the provided decisions and practicing the acquired skills, as well as the use of street drugs and substances that can aggravate aggression or other mental disorders.
Fifth	Consideration of consequences and decision-making and role-playing: Participants expressed their inner feelings by role playing, and learned to control their emotions by controlled expression of their anger.
Sixth	In this session, patients were instructed to plan to test their chosen solution and accurately describe the steps to be taken, and to be sensitive to the fundamental effect of this strategy, which is to increase the feeling and perception of personal control. Finally, by providing the necessary information about the source of control, it was conveyed to them that a greater sense of confidence and responsibility reduces aggression.

**Table 2. Comparison of the frequency of patients with BD type I in terms of sex, level of education, occupation, and marital status in the intervention and control groups.**

Variable	Intervention group, n(%)	Control group, n(%)	P
Gender			
Female	15(50)	15(50)	
Male	15(50)	15(50)	N/A
Total	30(100)	30(100)	
Level of education			
Junior high school diploma	7(23.3)	8(26.7)	
Diploma	15(50)	14(46.7)	
Associate's degree	3(10)	3(10)	$U = 0.439$
Bachelor's degree	5(16.7)	5(16.7)	$P = 0.861^a$
Master's degree and above	0(0)	0(0)	
Total	30(100)	30(100)	
Occupation			
Employee	2(6.7)	2(6.7)	
Laborer	7(23.3)	10(33.3)	
Retired	0(0)	0(0)	
Self-employed	4(13.3)	4(13.3)	$\chi^2 = 3.7$
Housewife (unemployed)	16(53.3)	10(33.3)	$df = 4$
Retired	1(3.3)	4(13.3)	$P = 0.476^b$
Total	30(100)	30(100)	
Marital status			
Single	8 (26.7)	14(46.7)	
Married	15 (50)	9(30)	$\chi^2 = 3.1$
Divorced	7 (23.3)	7(23.3)	$df = 2$
Widow	0 (0)	0(0)	$P = 0.208^b$
Total	30 (100)	30(100)	

Comments: <sup>a</sup> Mann-Whitney test, <sup>b</sup> Chi square test.

of Mashhad, School of Nursing and Midwifery. Mohammadi examined the validity of the BPAQ using factor analysis, concurrent validity, and convergent validity. He reported four important factors (i.e., hostility, anger, physical aggression and verbal aggression) with eigenvalues greater than one. The validity coefficients were ranged between 0.38 and 0.60. In addition, each of the factors had a high correlation with the whole questionnaire, the minimum and maximum of which were 0.68 and 0.81, respectively.<sup>14</sup> Its reliability by Samani was investigated by the test-retest, descriptive, and internal consistency methods. In the retest method, the reliability coefficient of the aggression questionnaire was reported to be 0.78, in the descriptive method, the Spearman–Brown correlation coefficient was reported for the whole scale, and in the internal consistency method, the Cronbach's  $\alpha$  index was reported for the whole questionnaire.<sup>26</sup>

Sampling was first performed by the non-probabilistic method (convenience sampling) among patients admitted to Ibn Sina Psychiatric Hospital in Mashhad. Then, by the patients' psychiatrist, the eligibility to enter the training group was assessed through interviews with the patients. After expressing willingness to participate, confirming eligibility, and obtaining written consent, the patients were invited to participate in the study; as well as they were divided

randomly into two groups of intervention, and control by throwing coins. The intervention group received problem-solving skill training according to Goldfried and Davidson model (Table 1). Finally, a month after hospital discharge, the research units were invited to the patient's ward and asked to complete the BPAQ again.

In all stages of the research, all research ethics points approved by the Vice-Chancellery for Research and Technology of Mashhad University of Medical Sciences related to the present study, including obtaining a written consent from the university ethics committee, obtaining a written referral letter from the School of Nursing and Midwifery and presenting it to the director of Ibn Sina Psychiatric Hospital, obtaining informed written consent from the participants, coding the questionnaire to keep the participants' data confidential, and assuring the participants that they can withdraw from the study at any time, were observed.

Data were analyzed using SPSS v. 20. In order to investigate the normal distribution of quantitative data, Kolmogorov–Smirnov test was used, and to evaluate the homogeneity of qualitative and quantitative variables,  $\chi^2$  test, Fisher's exact test and independent  $t$ -test were run. Finally, for intergroup and intragroup comparisons independent  $t$ -test and paired  $t$ -test were employed, respectively.

**Table 3. Comparison of aggression and its dimensions in patients with the BD in the intervention and control groups**

Aggression factors and its' scale	Pre-intervention, mean $\pm$ SD	One month post-intervention, mean $\pm$ SD	Different in assessment stage, mean $\pm$ SD	$P$ value <sup>a</sup>
<b>Physical</b>				
Intervention group	84.7 $\pm$ 6.4	46.8 $\pm$ 4.6	-37.8 $\pm$ 1.4	$df = 29, t = 23.6, P < 0.001$
Control group	84.4 $\pm$ 6.0	81.3 $\pm$ 4.6	-3.3 $\pm$ 1.4	$df = 29, t = 2.2, P = 0.038$
$P$ value <sup>b</sup>	$df = 58, t = 0.1, P = 0.891$	$df = 58, t = -28.5, P < 0.001$	$df = 58, t = -16.4, P < 0.001$	-
<b>Verbal</b>				
Intervention group	82 $\pm$ 8.8	53.6 $\pm$ 9.2	-43.4 $\pm$ 0.4	$df = 29, t = 12.4, P < 0.001$
Control group	81.6 $\pm$ 9.6	77.6 $\pm$ 8.4	-13.2 $\pm$ 0.4	$df = 29, t = 1.7, P = 0.104$
$P$ value <sup>b</sup>	$df = 58, t = 0.1, P = 0.912$	$df = 58, t = -10.4, P < 0.001$	$df = 58, t = -7.3, P < 0.001$	-
<b>Anger</b>				
Intervention group	82.2 $\pm$ 9.1	41.5 $\pm$ 7.4	-40.7 $\pm$ 1.7	$df = 29, t = 16.3, P < 0.001$
Control group	84.6 $\pm$ 8.8	83.1 $\pm$ 6.8	-3.7 $\pm$ 1.5	$df = 29, t = 0.9, P = 0.395$
$P$ value <sup>b</sup>	$df = 58, t = -1.0, P = 0.334$	$df = 58, t = -22.6, P < 0.001$	$df = 58, t = -12.6, P < 0.001$	-
<b>Hostility</b>				
Intervention group	79.6 $\pm$ 8.2	44.7 $\pm$ 2.5	-34.9 $\pm$ 5.7	$df = 29, t = 17.5, P < 0.001$
Control group	82.0 $\pm$ 7.2	87.1 $\pm$ 6.5	5.1 $\pm$ 1.4	$df = 29, t = 3.2, P = 0.004$
$P$ value <sup>b</sup>	$df = 58, t = -1.5, P = 0.148$	$df = 58, t = -23.5, P < 0.001$	$df = 58, t = -14.9, P < 0.001$	-
<b>Total</b>				
Intervention group	119.0 $\pm$ 5.6	66.9 $\pm$ 5.5	-52.2 $\pm$ 8.6	$df = 29, t = 33.2, P < 0.001$
Control group	12.8 $\pm$ 5.5	120.2 $\pm$ 5.8	-6.9 $\pm$ 0.5	$df = 29, t = 0.4, P = 0.663$
$P$ value <sup>b</sup>	$df = 58, t = -1.2, P = 0.222$	$df = 58, t = -36.6, P < 0.001$	$df = 58, t = -25.7, P < 0.001$	-

Comments: <sup>a</sup> Independent  $t$ -test; <sup>b</sup> Paired  $t$ -test.

## 4. RESULTS

The results of homogenization of the two groups regarding the intervening variables (i.e., age, sex, level of education, occupation, and marital status) and their control, as well as the results of statistical tests, are presented in detail in Table 2. As shown in the table, there was no significant difference between the two groups regarding these variables ( $P = 0.1$ ). The mean and SD of aggression and its dimensions before the intervention were not significantly different between the experimental and control groups. But after the intervention, the level of aggression and its dimensions decreased significantly in the experimental group ( $P < 0.001$ ). As can be observed (descriptive statistics table), after the intervention, the reduction of the total aggression score in the intervention group was  $-52.2 \pm 8.6$  less than the control group  $-0.5 \pm 6.9$  (Table 3).

## 5. DISCUSSION

The aim of this study was to investigate the effectiveness of problem-solving skills training on the severity of aggression in patients with BD type I hospitalized in the Ibn Sina Psychiatric Hospital in Mashhad. The results of the present study showed that problem-solving skills training reduced aggression and its dimensions (i.e., physical, verbal, anger, and hostility) in all patients with BD type I, and this reduction was sustained in one-month follow-up.

Regarding the effectiveness of problem-solving skills training on aggression in patients with the BD, it can be stated that the CBTs include various strategies, one of which is problem-solving skills training. In fact, a significant reduction in aggression score after training in the intervention group in comparison with the control group indicates that the patients in the intervention group learned to first evaluate the problem in the face of troubles and choose the best and most appropriate solution according to the existing conditions and adopt the skills acquired in this training course. The findings of this study are consistent with the results of previous studies.<sup>27–30</sup> In contrast, it is inconsistent with the research of Hatami Fard et al.<sup>31</sup> A study of 24 patients with the BD showed that dialectical behavior therapy, which is one of the CBTs, reduces impulsivity in patients with the BD, which is in line with the results of the present study.<sup>32</sup>

In a study by Chibanda et al., the results showed that after a period of 3–6 sessions of undergoing cognitive problem-solving skills therapy, the mean score decreased from 5.6 to 3.11. It was recommended that the benefits of problem-solving skills treatment should be used in primary health care.<sup>30</sup>

It is worth noting that these types of trainings are also effective in reducing hostility, which is the basis of aggressive behaviors. Hostility is an aggressive attitude that leads one to aggressive behaviors. On the other side, aggression is the observable behavior with the intent to harm.<sup>10</sup> In fact, anger is an emotion, hostility is an attitude, and aggression is a

behavior. The research findings are also noteworthy from the point of view that aggression has a significant relationship with the control of impulses and the perception and recognition of the feelings and emotions of others. Since the main problem-solving practices are the psychological indices of controlling emotions and impulse through role-playing training to sympathize and empathize with the feelings of others, such as recognizing one's gestures and postures while feeling angry and using relaxation strategies, they significantly reduced aggression. On the other hand, lack of a significant reduction in the hostility factor can be considered as a relatively fundamental feature of this variable. Hostility is psychologically more related to introverted contexts where inner feelings are deeper. While aggression is more based on extraversion and is more easily affected by external stimuli. Hostility is therefore accompanied by more intense conflicts.<sup>28</sup>

### Limitations

Discharge of patients during the training period and withdrawal from the study, as well as ensuring that problem-solving practices were performed during the one month that the patients were at home, were among the limitations of this study. However, we tried to ensure that the patients performed the exercises by contacting them.

## 5. CONCLUSIONS

Problem-solving skills training was effective in reducing the severity of aggression in patients with the BD. Social skills training may be able to help people with mental illnesses such as the BD to manage stressful events, solve problems and challenges, and improve psychiatric and therapeutic interventions. The skills training can lead to the substitution of aggression with correct solutions in the face of problems by determining and formulating the problem, creating solutions, and finally, making the right decision. Problem-solving skills training can be included in individual and family care for patients with BD type I to reduce aggressive behaviors, anger, and hostility.

### Conflicts of interest

The authors declare that there are no conflicts of interests regarding the publication of this article.

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## Ethics

This article was extracted from a Master's degree thesis in Psychiatry, which was approved by the Ethics Committee of Mashhad University of Medical Sciences with the code of ethics IR.MUMS.REC.1395.619, and it was registered in the Iranian Registry of Clinical Trials with IRCT code: 2017051633994N1IRCT.

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