

DIFFICULTIES IN EMOTION REGULATION: ARE THEY THE PREVENTABLE CAUSE OF SUICIDE, IMPULSIVITY, AND AGGRESSION IN SCHIZOPHRENIA AND BIPOLAR DISORDER?

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received: 7.7.2022;

revised: 10.10.2022;

accepted: 8.11.2022

SUMMARY

Background: Difficulties in emotion regulation have begun to be seen as the source of psychopathologies. It is one of the underlying factors of patients' suicidality, impulsivity, and aggression. This study aims to determine the difficulties in emotion regulation in schizophrenia (SZ) and bipolar disorder (BD) patients and their relationship with suicidality, aggression, and impulsivity. It also emphasizes the importance of emotion regulation in these patients.

Subjects and methods: 52 healthy individuals, 58 BD, and 55 SZ patients in remission were included in the study. The participants were informed before the study, and their written consent was obtained. Suicide Probability Scale (SPS), Difficulties in Emotion Regulation Scale (DERS), Barratt Impulsivity Scale (BIS-11), and Buss-Perry Aggression Questionnaire (BPAQ) were administered to all three groups.

Results: DERS scores of patients with BD and SZ were higher than healthy individuals. SPS scores of patients with BD and SZ were higher than healthy individuals. The motor and total scores of the Barratt Impulsivity Scale (BIS-11) were higher in patients with BD than in patients with SZ and healthy individuals. According to Spearman correlation analysis, a significant positive relationship was found between all subscales of DERS and all subscales of SPS; physical aggression, anger, and hostility subscales of BPAQ; attention and motor subscales of BIS-11.

Conclusion: Suicidality may increase in patients with schizophrenia and bipolar disorder who have difficulty in emotion regulation. Determining the difficulties of emotion regulation may contribute to the presumption and prevention of suicides in BD and SZ patients with a high risk of death by suicide.

Key words: emotion regulation – suicide – aggression – schizophrenia - bipolar disorder

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INTRODUCTION

In the field of mental health, the definition of emotions, their separation from each other, and how emotional systems work and evolve have become the focus of the attention of clinicians (McLaughlin et al. 2007). In addition to diagnosis by looking at disease symptoms, researchers drew attention to the importance of the causes of maladaptive behaviors that lead to these symptoms and their role in the disease. As a result, difficulties in emotion regulation, which cause the development of different symptoms and maladaptive behaviors that vary from patient to patient, have gained importance (Gross & Muñoz 1995).

Emotion regulation is all coping strategies with positive or negative emotions experienced (Kooze 2009). Difficulties in emotion regulation are the inability to regulate and control one's emotional response in the face of a triggering stimulus. The basic concepts of emotion regulation are emphasizing emotional experience, expressing emotions accurately, and reducing emotional arousal, especially in adverse situations. Cole et al. defined emotional dysregulation as the person's inability to achieve the desired goal due to the deterioration in

any step of emotion regulation strategies (Cole et al. 1994). Gratz and Roemer identified six sub-factors in their description, including different dimensions of emotion regulation difficulties. These include incomprehension of emotional reactions (Clarity), denial of emotional reactions (Non-acceptance), lack of awareness of emotions (Awareness), difficulty in impulse control when experiencing negative emotions (Impulse), difficulty in moving towards goal-oriented behavior while experiencing negative emotions (Goals) and difficulty in reaching the appropriate emotion regulation strategies related to the event (Strategies) (Gratz & Roemer 2004). Effective emotional regulation is the basis and is associated with good mental health. Therefore, difficulties in emotion regulation may lead to various mental disorders (Gross & Muñoz 1995).

It has been noticed that schizophrenia (SZ) patients have deficiencies in defining, experiencing, and expressing emotions. This separation between expression, experience, and perception of emotions has been called the "paradox of emotion." If there is a disconnection between different emotional areas, the process underlying emotion regulation is likely to be affected (Van der Meer et al. 2009). In patients with SZ, positive

symptoms such as hallucinations and delusions and negative symptoms such as withdrawal are associated with maladaptive emotion regulation strategies (Garety & Freeman 2013, Nittel et al. 2018). Emotion regulation difficulties in bipolar disorder (BD) patients have been increasingly recognized in pathophysiology models. It was thought that mood variations and consequent emotional failure might negatively impact patients' functionality, interpersonal relationships, disease course, and treatment compliance (Phillips et al. 2006). It is assumed that BD patients have difficulties in emotion regulation in manic or depressive episodes and euthymic periods (Townsend & Altshuler 2012). In addition, there is a relationship between difficulties in emotion regulation and early onset of the disease and more frequent mood episodes in BD patients (Van Rheenen et al. 2020).

As there is a link between aggression, suicide, and impulsivity, it can be said that these behaviors are associated with emotion regulation difficulties (Van der Meer et al. 2009, Westermann & Lincoln 2011). Furthermore, according to various studies, difficulties in emotion regulation in SZ and BD patients are related to aggression and suicidality (Hatkevich et al. 2019, Maxfield & Pepper 2018, Ouzir 2013). Therefore, this study aims to study the following hypotheses:

- Emotional regulation difficulties are more common in BPD and SZ patients than in healthy controls.
- There is a positive correlation between emotional regulation difficulties and suicide, aggression, and impulsivity in SZ and BD patients.

SUBJECTS AND METHODS

Participants

Patients who were followed up with the diagnosis of SZ and BB between November 21, 2018 and January 10, 2019 in a training and research hospital were included consecutively in the study. The psychiatrist evaluated whether the patients were in remission and then incorporated them. After being informed by the psychiatrist, 3 BD and 7 SZ patients refused to participate. Health workers who volunteered to participate in the study for the healthy control group were included. Depending on the inclusion and exclusion criteria, 58 BD and 55 SZ patients and 52 healthy people were included in the research after obtaining written consent.

Procedures

Inclusion criteria for the patient group were to be diagnosed with SZ or BD in remission by the psychiatrist according to DSM-5. Remission criteria for BD, Young Mania Rating Scale (YMRS) <5 and Hamilton Depression Rating Scale (HDRS) ≤ 7 ; For SZ, patients with a score ≤ 2 for each question on the Scale

for the Assessment of Positive Symptoms (SAPS) and the Scale for the Assessment of Negative Symptoms (SANS). For healthy controls, no previous psychiatric application or history of psychiatric treatment, not having a diagnosis according to DSM-5 in the past or now, being between 18-65 years of age for patients and healthy people, being literate, giving written consent for participation after being informed about the study was determined. In addition, having intellectual disabilities, having neurological diseases such as cognitive disorders (delirium, dementia), cerebrovascular disorders, being diagnosed with alcohol or substance use disorders in the last six months, and having been diagnosed with alcohol or substance abuse in the previous six months were determined as exclusion criteria. Ethics committee approval was obtained for our study on 25.09.2018 with protocol number 219. The sociodemographic data form was filled into all three groups. Suicide Probability Scale (SPS), Difficulties in Emotion Regulation Scale (DERS), Barratt Impulsivity Scale (BIS-11), and Buss-Perry Aggression Scale (BPAO) were given.

The Scale for the Assessment of Positive Symptoms (SAPS)

It includes four subscales and 34 items. Items 1-7 belong to the hallucinations subscale, 8-20 to the delusions subscale, 21-25 to the bizarre behavior subscale, and 26-34 to the positive formal thought disorder subscale. For every item, It is graded as 0: No symptoms, 1: Suspicious, 2: Mild, 3: Moderate, 4: Significant, 5: Severe. Erkoç et al. conducted a validity and reliability study of the Turkish form (Erkoç et al. 1991). The SAPS subscale total score and the overall score of the entire scale reliably rank patients in terms of severity of positive symptoms. It was used in this study to determine remission in SZ patients according to the criteria defined above.

The Scale for the Assessment of Negative Symptoms (SANS)

It includes five subscales and 25 items in total. Items 1-8 belong to the subscales of affective blunting, 9-13 for alogia, 14-17 for apathy, 18-22 for anhedonia, and 23-25 for attention deficit. The total score ranges from 0-125. Erkoç et al. conducted validity and reliability study of the Turkish form (Erkoç et al. 1991).

Young Mania Rating Scale (YMRS)

It consists of 11 items developed by Young et al. (1978) to determine the severity of manic episodes (Young et al. 1978). In addition, Karadağ et al. conducted the Turkish form's validity and reliability study (Karadağ et al. 2002).

Hamilton Depression Rating Scale (HDRS)

It was published by Hamilton in 1960 (Hamilton 1960). It consists of 17 items investigating the symptoms of depression experienced in the last week. 0-7 points indicate no depression, 8-15 points mild de-

pression, 16-28 points moderate depression, 29 and above indicate severe depression. The Turkish validity and reliability study of the scale was conducted by Akdemir et al. (1996).

Difficulties in Emotion Regulation Scale (DERS)

DERS is a self-report scale created by Gratz and Roemer in 2004 with 36 items. It evaluates current and clinically significant emotion regulation difficulties (Gratz & Roemer 2004). Participants were asked to assess the expression's frequency using a 5-point Likert-type scale (1 = almost never, 5 = almost always). It consists of six subscales: 1) Not accepting emotional reactions (Nonacceptance), 2) Failure to engage in goal-oriented behavior while experiencing negative emotions (Goals), 3) Difficulties in impulse control when in distress (Impulse), 4) Lack of awareness of emotions (Awareness), 5) Difficulty in reaching emotion regulation strategies when in distress (Strategies), 6) Lack of emotional clarity (Clarity). In this study, the total DERS score obtained from all items was used so that higher scores indicate worse emotion regulation. In addition, Rugancı and Gençöz conducted the Turkish validity and reliability study of the scale (Rugancı & Gençöz 2010).

Barratt Impulsivity Scale-11 (BIS-11)

It is a self-rating scale developed by Patton and Barratt and used to assess impulsivity (Patton et al. 1995). When evaluating BIS-11, four different subscores are obtained; total score, lack of planning, attention, and motor impulsivity. The higher the total BIS-11 score, the higher the patient's impulsivity. Turkish adaptation study was done by Güleç et al. (2008).

Buss-Perry Aggression Questionnaire (BPAQ)

Developed by Buss and Durkee in 1957, the scale was revised by Buss and Perry in 1992. The scale consists of 4 different subscales: physical aggression, verbal aggression, anger, and hostility. In addition, each of the 29-item is evaluated on a 5-point Likert-type scale (Buss & Perry 1992). The validity and reliability study of the Turkish form was done by Madran (Demirtaş-Madran 2013).

Suicide Probability Scale (SPS)

Cull and Gill (1990) developed this scale to identify adolescents and adults at risk of suicide attempts, and it consists of 36 items and is answered on a 4-point Likert-type scale. SPS has four subscales: suicidal ideation, hopelessness, hostility, and negative self-evaluation (Cull & Gill 1995). Batigün and Şahin (2018) made Turkish adaptation and validity-reliability study.

Statistical analyses

The data's descriptive statistics used mean, standard deviation, median, lowest, highest, frequency, and ratio values. The distribution of variables was measured with

the Kolmogorov-Smirnov test. When a normal distribution is not provided in the analysis of independent quantitative data, the Mann-Whitney U test in binary groups, Kruskal-Wallis, was used in groups of three and above. The Chi-Square test was used to analyze independent qualitative data, and Fischer's Exact Test was used when Chi-Square test conditions were not provided. Finally, Spearman correlation analysis was used to analyze quantitative dependent data because the distributions were not normal. To test our first hypothesis, the Kruskal-Wallis test was used to distinguish whether there are more emotion regulation difficulties in SZ and BD patients compared to healthy controls. Spearman correlation analysis was used to test our second hypothesis that there is a positive relationship between difficulties in emotional regulation and aggression, suicidality, and impulsivity. The data were analyzed using SPSS v22.0. $P < 0.05$ value was considered significant.

RESULTS

The mean age of SZ patients participating in the study was 40.4 ± 11.3 , 35.9 ± 10.1 in BD patients, and 36.3 ± 11.3 in healthy controls. Of the SZ patients participating in the study, 25 (45.5%) were female, and 30 (54.5%) were male. Of the BD patients, 32 (55.2%) were female, and 26 (44.8%) were male. The healthy controls were 25 (48.1%) females and 27 (51.9%) males. No difference was found between the 52 healthy controls, 55 SZ, and 58 BD groups regarding age, gender, and marital status ($p > 0.05$). Educational status was significantly lower in SZ and BD groups than in the healthy group ($p < 0.05$). However, the distribution of education levels did not differ considerably between SZ and BD groups ($p > 0.05$). Socio-demographic data are detailed in Table 1.

According to our first hypothesis, emotion regulation difficulties in BD and SZ patients are higher than in healthy controls. To test this, the Kruskal-Wallis test was used to compare DERS scores between groups. In this context, DERS clarity, awareness, impulsivity, acceptance, goals, strategies, and total scores in SZ and BD groups were significantly higher than in the healthy group ($p < 0.05$). However, DERS clarity, awareness, impulsivity, acceptance, goals, strategies, and the total scores did not differ significantly between SZ and BD groups ($p > 0.05$). The Comparison of the groups according to difficulties in emotion regulation scale is detailed in Table 2.

With our second hypothesis, we suggested that there is a positive correlation between difficulties in emotional regulation scores and suicidality, aggression, and impulsivity in SZ and BPD patients. Spearman correlation analysis was used to test this hypothesis. The relation between difficulties in emotion regulation and impulsivity, aggressiveness, and suicidality is detailed in table 3.

Table 1. Socio-demographic Characteristics of the Participants

	Healthy People		Schizophrenia		Bipolar Disorder		P	
	Mean.±s.d./	Med	Mean.±s.d./	Med	Mean.±s.d./	Med		
Age	36.3±11.3	36.0	40.4±11.3	42.0	35.9±10.1	36.5	0.066	^κ
	n	%	n	%	n	%		
Gender							0.564	χ^2
Woman	25	48.1	25	45.5	32	55.2		
Man	27	51.9	30	54.5	26	44.8		
Marital Status							0.080	χ^2
Married	24	46.2	14	25.5	22	37.9		
Single	22	42.3	33	60.0	30	51.7		
Divorced	4	7.7	7	12.7	4	6.9		
Widow	2	3.8	1	1.8	2	3.4		
Educational Status							0.001	χ^2
Primary School	1	1.9	19	34.5	18	31.0		
Secondary school	3	5.8	10	18.2	11	19.0		
High School	18	34.6	21	38.2	19	32.8		
Undergraduate	18	34.6	5	9.1	10	17.2		
Graduate	7	13.5	0	0.0	0	0.0		
Doctorate	5	9.6	0	0.0	0	0.0		

^κ - Kruskal-Wallis; χ^2 - Chi-Square Test; P<0.05 was considered significant

Table 2. Comparison of The Groups According to Difficulties in Emotion Regulation Scale

	Healthy People		Schizophrenia		Bipolar Disorder		P	
	Mean.±s.d./	Med	Mean.±s.d./	Med	Mean.±s.d./	Med		
Clarity	11.7±1.7	12.0	13.8±3.3	14.0	13.3±3.2	13.0	0.001	^κ
Awareness	11.0±3.0	11.0	14.3±5.0	13.0	13.8±4.5	14.0	0.001	^κ
Impulsivity	9.5±3.3	8.0	12.3±5.2	12.0	13.3±5.5	12.0	0.001	^κ
Acceptance	9.4±3.6	9.0	13.9±6.5	12.0	15.0±7.2	14.5	0.001	^κ
Goals	11.4±3.8	11.0	14.3±5.7	14.0	15.2±5.0	14.5	0.001	^κ
Strategies	13.9±4.7	13.0	19.0±7.9	17.0	19.6±7.6	19.5	0.001	^κ
Total	55.5±11.7	55.0	73.3±21.3	71.0	74.9±21.9	77.0	0.001	^κ

^κ - Kruskal-Wallis (Mann-Whitney u test); P<0.05 was considered significant

According to the first part of our second hypothesis, emotion regulation difficulties are associated with suicidality in SZ and BD patients. To test our hypothesis, the relationship between DERS scores and SPS scores was examined. A significant positive correlation was found between hopelessness, negative self-evaluation, hostility, suicidal ideation, the total score of SPS, and clarity, awareness, impulsivity, acceptance, goals, strategies, and the total score of DERS (p<0.05). (Table 3)

According to the second part of our second hypothesis, emotion regulation difficulties are associated with impulsivity in SZ and BD patients. When the correlation between DERS and BIS-11 is considered, a significant positive correlation was found between BIS-11 attention, motor and total score and DERS clarity, awareness, impulsivity, acceptance, goals, strategies, and the total score (p<0.05). There was a significant positive correlation between the BIS-11 unplanning score and DERS impulsivity and goals score (p<0.05); No significant correlation was found between clarity, awareness, acceptance, strategies, and the total score (p>0.05) (Table 3).

In the last part of our second hypothesis, we suggested emotion regulation difficulties are associated with aggression in SZ and BD patients. Spearman correlation analysis showed a significant positive correlation between BPAQ physical aggression score and DERS clarity, awareness, impulsivity, acceptance, goals, strategies, and the total score. (p<0.05). There was a significant positive correlation between BPAQ verbal aggression and DERS awareness scores (p<0.05). While there was a significant positive correlation between the BPAQ anger score and DERS clarity, impulsivity, acceptance, goals, strategies, and the total score (p<0.05), there was a significant positive correlation between the BPAQ hostility score and DERS clarity, impulsivity, acceptance, goals, strategies, and the total score (p<0.05). There was no significant correlation between the awareness score (p>0.05). There was a significant positive correlation between BPAQ total score and DERS clarity, impulsivity, acceptance, goals, strategies, and the total score (p<0.05), but no significant correlation was found between the DERS awareness score (p>0.05) (Table 3).

Table 3. Difficulties in Emotion Regulation Related to Impulsivity, Aggressiveness, and Possibility of Suicide

		Difficulties in Emotion Regulation Scale						
		Clarity	Awareness	Impulsivity	Acceptance	Goals	Strategies	Total
Barratt Impulsivity Scale								
Inattention	r	0.254	0.168	0.362	0.295	0.327	0.338	0.369
	p	0.001	0.031	0.001	0.001	0.001	0.001	0.001
Motor	r	0.402	0.343	0.441	0.325	0.403	0.364	0.473
	p	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Lack of Planning	r	0.151	-0.003	0.164	0.111	0.225	0.089	0.140
	p	0.053	0.967	0.035	0.157	0.004	0.258	0.073
Total	r	0.360	0.236	0.431	0.314	0.439	0.358	0.440
	p	0.001	0.002	0.001	0.001	0.001	0.001	0.001
Buss-Perry Aggression Scale								
Physical aggression	r	0.260	0.158	0.381	0.200	0.375	0.319	0.349
	p	0.001	0.043	0.001	0.010	0.001	0.001	0.001
Verbal aggression	r	-0.134	0.246	-0.135	-0.118	-0.037	-0.101	-0.182
	p	0.086	0.001	0.085	0.132	0.639	0.197	0.019
Anger	r	0.316	0.048	0.500	0.380	0.468	0.462	0.453
	p	0.001	0.538	0.001	0.001	0.001	0.001	0.001
Hostility	r	0.385	-0.001	0.484	0.444	0.568	0.563	0.494
	p	0.001	0.985	0.001	0.001	0.001	0.001	0.001
Total	r	0.298	-0.015	0.449	0.335	0.496	0.451	0.406
	p	0.001	0.845	0.001	0.001	0.001	0.001	0.001
Suicide Probability Scale								
Hopelessness	r	0.471	0.164	0.600	0.554	0.602	0.651	0.637
	p	0.001	0.035	0.001	0.001	0.001	0.001	0.001
Negative self- evaluation	r	0.265	0.392	0.239	0.183	0.177	0.251	0.318
	p	0.001	0.001	0.002	0.019	0.023	0.001	0.001
Hostility	r	0.549	0.263	0.687	0.613	0.642	0.685	0.720
	p	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Suicide Ideation	r	0.440	0.243	0.550	0.515	0.507	0.582	0.606
	p	0.001	0.002	0.001	0.001	0.001	0.001	0.001
Total	r	0.543	0.370	0.644	0.563	0.585	0.665	0.711
	p	0.001	0.001	0.001	0.001	0.001	0.001	0.001

The Spearman Correlation; P<0.05 was considered significant

DISCUSSION

Since there is not enough research about difficulties in emotion regulation in the literature, it was aimed to study this issue in patients with SZ and BD; and investigate whether there is a relationship between difficulties in emotion regulation and suicide, aggression, and impulsivity. To the best of our knowledge, this study is the first study to investigate the relationship between the ability of emotional regulation, suicide probability, impulsivity, and aggression, evaluating patients with BD and SZ with DERS. All DERS scores of BD and SZ patients were higher than healthy individuals. In addition, a significant relationship was found between all subscales of DERS and all SPS subscales; physical aggression, anger, and hostility subscales of BPAQ; attention and motor subscales of BIS-11.

This study found that educational status was significantly lower in SZ and BD groups than in the healthy

group. However, the distribution of education levels did not differ considerably between SZ and BD groups. According to studies, cognitive functions, intellectual capacities, and education levels of patients with bipolar disorder are reported to be higher when compared to patients with SZ (Vreeker 2016, Trotta 2015). There was no significant difference between BD and SZ patients regarding education level in our study. There may be a number of factors explaining this situation: The hospital where the study was conducted is a mental hospital where the most severe patients were referred. Therefore, the cognitive damage of the patients here may be more. In these patient groups, the symptoms may have started at an earlier age, and this may have affected their education life in a similar way (Holm et al. 2021, Glahn et al. 2006).

In our study, DERS scores of BD and SZ patients were higher than healthy individuals. However, there was no significant difference between BD and SZ groups. According to these findings, patients in both BD

and SZ groups, even if they are in remission, are experiencing difficulties in emotion regulation due to a lack of understanding of emotional reactions (Clarity), lack of acceptance of emotional reactions (Non-acceptance), lack of awareness of emotions (Awareness), difficulty in impulse control (Impulse) when experiencing negative emotions, difficulty in turning to goal-oriented behavior while experiencing negative emotions (Goals) and difficulty in achieving appropriate emotion regulation strategies (Strategy). Difficulties in emotion regulation are one of BD's essential features. It is thought that inability to regulate emotions underlies mood transitions. The difficulty of emotion regulation in BD may be triggering depressive or manic attacks by preventing the mental system from taking, processing, and repressing negative emotions. In addition, emotion regulation difficulties may cause an imbalance between positive and negative feelings in BD patients. They may worsen the prognosis of the disease with the triggering of manic-depressive episodes (Gross & Barrett 2011, Phillips et al. 2006). Other studies similar to ours have reported that BD patients have more emotional regulation difficulties than healthy people (Becerra et al. 2013, Gruber et al. 2012, Oymak Yenilmez et al. 2019, Van Rheenen et al. 2015, Sağlam et al. 2020). Rehabilitation studies on emotion regulation in these patients may be beneficial in slowing mood transitions increasing functionality and interpersonal communication. However, there is not enough literature about emotion regulation rehabilitation.

The subject of difficulties in emotion regulation in SZ has been understudied. Overuse of suppression, which is a part of emotion regulation strategies, is associated with psychopathologies (Dryman & Heimberg 2018). Studies have reported that the SZ group prefers to use the suppression strategy more often and the reappraisal strategy less frequently than the healthy controls. Overusing the suppression strategy in SZ patients is thought to cause even a flattened affect. This situation causes SZ patients to be unable to express their emotions regardless of the event. However, in studies conducted, it was observed that SZ and healthy controls gave the same physiological responses after they felt in the face of different situations. This situation means the paradox of the emotions felt and expressed in SZ patients (Henry et al. 2007, Van der Meer et al. 2009, O'Driscoll et al. 2014). Positive and negative symptoms in SZ patients have been generally associated with maladaptive emotion regulation strategies (Garety & Freeman 2013, Nittel et al. 2018, O'Driscoll et al. 2014, Owens et al. 2013, Westermann & Lincoln 2011). It is known that negative symptoms in patients with schizophrenia reduce their sociability and functionality. Not being aware of emotions, recognizing them, and having difficulty managing negative emotions may cause many problems in interpersonal relationships. As a result, negative symptoms and the course of the disease may worsen (Dowd & Barch 2010, Henry et al.

2007). Unfortunately, there are not enough effective drug treatments, especially for negative symptoms. Therefore, putting into practice rehabilitation studies on emotion regulation can motivate patients. In this way, the suicides we frequently encounter in patients may be prevented, and these people can be connected to life. While there is some literature about emotion regulation rehabilitation in SZ patients, further studies are needed (Nguyen et al. 2016, Moran et al. 2018). For example, the positive emotions program for schizophrenia (PEPS) is an emotion regulation strategy training aimed at intensifying positive emotions. It shows that participation in PEPS is accompanied by a reduction in negative symptoms and improved social functioning (Favrod et al. 2019).

There was a statistically significant relationship between all subscales of DERS and all subscales of SPS in our study. According to this result, if a patient with SZ or BD has difficulty in regulating emotions, it can be said that the probability of suicide is increased. Being low tolerance to stress and impulsiveness, which is part of the difficulty in regulating emotions during stress, is associated with suicidal thinking (Anestis et al. 2011, Weinberg & Klonsky 2009). It has been observed that difficulty in emotion regulation can directly affect suicidal thoughts. Individuals may have an increased possibility of falling into despair and thinking about suicide. Simultaneously, these individuals may be vulnerable to suicidal thoughts and risk of suicidal behavior, as emotion regulation difficulties involve an intense urge to escape from excessive emotional sensations. In this context, the results of many studies show a link between emotion regulation difficulties and suicidality. Our study also supports this literature with its findings (Ammerman et al. 2015, Hatkevich et al. 2019, Law et al. 2015, O'Connor & Nock 2014, Rajappa et al. 2012).

There was a statistically significant relationship between all subscales of DERS and the motor and attention subscales of BIS-11 in our study. It has been reported that difficulties in emotion regulation increase the risk of dysfunctional behavior and cause impulsivity, which is positively associated with suicidal behavior (Gruber et al. 2012, Terzi et al. 2017). The predominance of impulsivity in BD patients leads to the deterioration of reappraisal capacity, one of the emotion regulation strategies (Van Rheenen et al. 2015). An extensive literature on SZ patients suggests impulsivity increases the risk of aggression and suicidal behavior in patients with impaired response inhibition (Amr et al. 2016, Enticott et al. 2008, Ouzir 2013). Our finding is consistent with the literature. Understanding what triggers impulsive behaviors and what they are related to can effectively reduce these behaviors' harm to self and others. Considering the relationship between difficulties in emotion regulation and impulsivity, psychosocial interventions for patients' emotion regulation may be effective.

In our study, a positive correlation was found between all subscales of DERS and the physical aggression, anger, and hostility subscales of BPAQ in both SZ and BD groups. However, There was no difference between these two groups. Inadequate regulation of anger in BD patients plays a vital role in aggression (García-Forero et al. 2009, Green et al. 2007, Thomas et al. 2007). The high physiological arousal, which often accompanies anger, endangers the reappraisal processes that constitute a part of an individual's aggression, reducing the ability to process information. Insufficient regulation of negative emotions may make the individual tired early due to the extra effort to repair, terminate or prevent these emotions, therefore resorting to violence to quickly resolve these feelings. Accordingly, these individuals may experience negative emotions (e.g., anger, shame). Their aggressive behaviors may be their form of emotion regulation (Baumeister et al. 1994). Although few studies on this subject, difficulty in emotion regulation, especially lack of emotional awareness, which is one of the emotion regulation strategies, has been positively associated with anger and aggressive behavior in SZ (Marcel 2018). Also, it is reported that there is a link between aggressive behaviors and violence that may be associated with difficulties in emotion regulation in BD patients (Dodd 2019).

Limitations of the Study

However, this study includes several restrictions. First, although our sample size is sufficient, the number of cases constituting the groups is limited. Second, since our hospital is a training and research hospital that accepts the most severe patients from all over our country, and patients who are directed or admitted to the hospital may be clustered at a low socio-cultural and economic level, our results may not be generalizable to all SZ and BD patients. Another limitation is there is no analysis of the relationship between the residual symptoms and emotion regulation.

CONCLUSION

In conclusion, when people can not accept intense bad feelings related to adverse events and lack strategies that need to be regulated appropriately and implemented to resolve the disturbing situation, they may exhibit suicidal behavior and aggression with increased impulsiveness (Berkowitz 2012, Gratz & Roemer 2008, Wagner & Zimmerman 2006). Identifying difficulties in emotion regulation may predict suicide, and clinicians may take precautions in patients with SZ and BD, who have a high risk of death by suicide. Revealing the invisible part of the iceberg behind suicidal behavior may help predict and prevent suicide. Examples can be given as difficulties in emotion regulation and the relationship between aggression

and impulsivity. Treatments should also aim to develop the capacity to become aware of and accept emotions. Rehabilitation studies on emotion regulation may increase the sociability and functionality of patients and protect these patients from severe and life-threatening acts such as suicide. In this way, we can strengthen our patients' bond and motivation with life. Treatment interventions for emotional regulation difficulties may be beneficial in preventing suicide, aggression, and impulsive behaviors. More research needs to be done on psychosocial interventions for difficulties in emotion regulation in SZ and BPD patients.

Acknowledgements: None.

Conflict of interest: None to declare.

Contribution of individual authors:

Ece Buyuksandalyaci Tunc: study design, data collection, first draft, statistical analysis.

Ozlem Gul: study design.

All authors approved the final version of the manuscript.

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