



Early maladaptive schemas and suicidal risk in inpatients with bipolar disorder

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ABSTRACT

The present study aimed to assess the associations of early maladaptive schemas (EMSs) and clinical factors (hypomanic/manic and depressive symptoms) with suicidal risk (current suicidal ideation and lifetime suicide attempts) in inpatients with bipolar disorder (BD). One hundred inpatients with BD completed the Young Schema Questionnaire-Short Form (YSQ-SF), the Bipolar Depression Rating Scale (BDRS), the Young Mania Rating Scale (YMRS), and the Beck Scale for Suicide Ideation (BSSI). 59% of patients had lifetime suicide attempts and 59% showed high suicidal risk (BSSI \geq 6). BD patients with lifetime suicide attempts had higher scores on the entitlement and social isolation schemas, depression, and hypomanic/manic symptoms than those without such attempts. Patients with high suicidal risk had higher levels of depressive and hypomanic/manic symptoms as well as some EMSs than those without high suicidal risk. Logistic regression analyses revealed that hypomanic/manic symptoms as well as the entitlement and defectiveness schemas were significantly associated with current suicidal ideation. Also, the entitlement and social isolation schemas were associated with lifetime suicide attempts. These results suggest that the entitlement, social isolation, and defectiveness schemas may relate to suicidal risk in patients with BD.

1. Introduction

Patients with bipolar disorder (BD) have an elevated risk of dying by suicide (Pompili et al., 2013). Also, research has shown that approximately 59% and 25–56% of BD patients have suicidal ideation and suicide attempts respectively (Abreu et al., 2009). Further, several factors have been found to associate with suicide behaviors in BD including a family history of suicide, early age at onset, depressive and psychotic symptoms, mixed affective states, a history of rapid cycling, comorbidity, alcohol and substance use, hopelessness, and childhood trauma (Aaltonen et al., 2016; Bobo et al., 2018; Harvey et al., 2018; Hawton et al., 2005; McGrady et al., 2017). In addition, early maladaptive schemas (EMSs) may be risk factors related to suicidality in BD.

According to Young's schema theory (1990), individuals who are exposed to harmful events during childhood and adolescence may develop EMSs. EMSs are defined as broad patterns of memories, emotions, cognitions, and bodily sensations concerning oneself and one's

relationship with others (Young et al., 2003). They are stable and deep cognitive patterns that affect the individual's experiences and are activated in different situations (Young et al., 2003). Young (1998) and Young et al. (2003) developed a short version of the 250-item Young Schema Questionnaire (YSQ; Young and Brown, 1994) named the Young Schema Questionnaire-Short Form (YSQ-SF) to evaluate EMSs. The 75-item YSQ-SF assesses fifteen EMSs which are categorized within five domains including disconnection/rejection (abandonment, mistrust/abuse, emotional deprivation, defectiveness, and social isolation), impaired autonomy/performance (dependence, failure, vulnerability to harm, and enmeshment), impaired limits (entitlement and insufficient self-control), other directedness (subjugation and self-sacrifice), and overvigilance/inhibition (emotional inhibition and unrelenting standards).

EMSs have been shown to link to mental disorders. For example, failure, defectiveness, subjugation, and emotional deprivation have been indicated to relate to attention deficit hyperactivity disorder

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(Philipsen et al., 2017). Also, Kwak and Lee (2015) have reported that vulnerability to harm and self-sacrifice are specific to panic disorder. Further, Renner et al. (2012) have found that failure, emotional deprivation, and abandonment are connected to depressive symptom severity. In addition, it has been shown that enmeshment, failure, subjugation, mistrust/abuse, social isolation, and vulnerability to harm are linked to positive symptoms in schizophrenia (Bortolon et al., 2013). Moreover, defectiveness, social isolation, and failure have been found to be high in obsessive-compulsive disorder (Kim et al., 2014). Also, Khosravani et al. (2019) have revealed that mistrust/abuse and social isolation associate with psychosis symptoms in patients with schizophrenia. Furthermore, a total score of EMSs has been found to be high in individuals with substance use disorders (Khosravani et al., 2016a,b, 2017a,b).

Regarding the EMSs related to BD, it has been reported that BD patients score higher on abandonment, failure, insufficient self-control, subjugation, unrelenting standards, enmeshment, and entitlement than patients with major depressive disorder (Nilsson et al., 2015). Also, studies have suggested that BD patients have higher scores on most EMSs than individuals with anxiety disorders and unipolar depression (Hawke and Provencher, 2012) as well as normal controls (Ak et al., 2012; Nilsson et al., 2010). Further, Hawke et al. (2011) have indicated that entitlement, insufficient self-control, and vulnerability to harm relate to the risk of developing BD. Additionally, Hawke and Provencher (2012) have revealed that approval-seeking and entitlement are high in BD patients after controlling for depression.

Concerning the EMSs associated with suicidality in several psychiatric conditions, a few research studies have shown that EMSs are related to suicidality in individuals with suicide attempts (Dale et al., 2010), depression (Ahmadpanah et al., 2017; Flink et al., 2017), borderline personality features (Sajadi et al., 2015), obsessive-compulsive disorder (Khosravani et al., 2017c), and a history of childhood abuse (Dutra et al., 2008). To the best of our knowledge, only Nilsson (2016) has evaluated the EMSs related to suicide on a small sample of BD patients ($n = 49$). This author has reported that BD patients with prior suicide attempts have higher scores on social isolation, dependence, and entitlement than those without a history of suicide attempts.

EMSs have been shown to link to functional impairment, depression, poor treatment, and difficult course of illness in depressed and/or BD patients (Ball et al., 2003; Newman et al., 2002; Nilsson, 2012; Renner et al., 2012; Rezaei and Ghazanfari, 2016). Additionally, EMSs were found to be stable over a 2.5 to 5-year period even after controlling for depression (Riso et al., 2006). So, it is conceivable that these adverse functional outcomes may increase the risk for suicidality in patients diagnosed with BD. Therefore, recognizing specific EMSs associated with suicidal risk may be helpful to prevent and treat suicide while using effective therapeutic options in BD patients including schema therapy (Young, 1994) and schema-focused cognitive therapy (Ghaderi et al., 2015; Hawke et al., 2013). Accordingly, this study aimed to evaluate the relations of EMSs to current suicidal ideation and lifetime suicide attempts. Also, based on the above-mentioned literature, we hypothesized that the social isolation, dependence, and entitlement schemas would associate with suicidal risk in BD patients.

2. Methods

2.1. Participants

A total of hundred and eighteen BD inpatients in remission [remission is defined by the Young Mania Rating Scale (YMRS) scores ≤ 12] were recruited from the Rahnama psychiatric inpatient center in Tehran, Iran from June 2017 to February 2018. The Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Patient version (SCID-I/P; First et al., 2002) was used to verify a bipolar diagnosis. All participants completed self-report questionnaires, among which 18 individuals were excluded due to incomplete responses to the questionnaires. Finally,

one hundred inpatients (age range = 19–57 years) were included in the study. Neurological and medical diseases were exclusion criteria. Interviews and filling out the questionnaires were performed in the hospital. Patient information such as age of onset, illness duration, lifetime suicide attempts, a family history of suicide attempts, and comorbid psychiatric disorders was obtained from their psychiatric records. BD patients had comorbid disorders such as substance use (33%), anxiety (20%), obsessive-compulsive (13%), posttraumatic stress (12%), and attention deficit hyperactivity (10%) disorders. All participants were in mania phase at the time of hospitalization and were taking medications [e.g., lithium (56%), citalopram (25%), chlorpromazine (10%), and risperidone (2%)] at the time of assessment.

2.2. Procedure

Participants completed self-report scales in pencil-paper format including the YSQ-SF (Young, 1998; Young et al., 2003), the BDRS (Berk et al., 2007), and the YMRS (Young et al., 1978) to examine EMSs, depressive symptoms, and manic symptoms respectively. Further, they completed the Beck Scale for Suicidal Ideation (BSSI; Beck et al., 1979) to characterize individuals at suicidal risk. Furthermore, lifetime suicide attempts were assessed by history taking in this study. All participants agreed to take part in the study and signed written informed consents approved by the ethics committee of Rahnama psychiatric inpatient center in Tehran, Iran. Also, they were studied in accordance with the 1989 revision of the Helsinki Declaration.

2.3. Measures

2.3.1. The YSQ-SF (Young, 1998; Young et al., 2003) is a 75-item scale which evaluates 15 EMSs categorized within five domains, as previously mentioned. The Cronbach's alphas for the YSQ-SF subscales were between 0.76 and 0.93 (Welburn et al., 2002). The discriminant and predictive validity of the scale was acceptable (Oei and Baranoff, 2007). In this study, we used the Persian version of the YSQ-SF (Khosravani et al., 2018) with Cronbach's alpha equal to 0.96 (Khosravani et al., 2017c). Also, the Cronbach's alpha for the total scale was 0.97. Moreover, the Cronbach's alphas for the YSQ-SF domains including disconnection/rejection, impaired autonomy/performance, impaired limits, other directedness, and overvigilance/inhibition were 0.95, 0.95, 0.89, 0.74, and 0.85 respectively. Further, the Cronbach's alphas for the YSQ-SF subscales were 0.60 (subjugation) to 0.90 (failure).

2.3.2. The BDRS (Berk et al., 2007) is a 20-item scale used to rate the severity of depressive episode in BD. The patients' responses on a Likert-type scale are rated from 0 to 3. In the present study, the Persian version of the BDRS (Ebrahimi et al., 2015) was used whose suitable clinical cut-off point was 18 (Ebrahimi et al., 2015). Also, the Cronbach's alpha for the Persian version of the scale was 0.81 (Ebrahimi et al., 2015). In addition, concurrent validity of this version was confirmed via its strong correlations with the Beck Depression Inventory (BDI-II; Beck et al., 1996) ($r = 0.61$) and the Hamilton Depression Rating Scale (HAM-D; Hamilton, 1960) ($r = 0.71$) (Ebrahimi et al., 2015). The Cronbach's alpha for the scale was 0.69 in this study.

2.3.3. The YMRS (Young et al., 1978) is an 11-item scale to assess the presence of manic symptoms over the past week via interview. Concurrent validity of the scale was found to be adequate (Vilela et al., 2005). Also, the Cronbach's alpha and cut-off score for the Persian version of the YMRS was 0.72 and 12.5 (Mohammadi et al., 2018) respectively. The Cronbach's alpha for the scale was 0.88 in the current study.

2.3.4. The BSSI (Beck et al., 1979) is a 19-item scale that measures suicidal ideation in individuals during the past week. Each item is rated on a three-point Likert scale ranging from 0 to 2. According to the BSSI

cut-off scores, a total score ≤ 5 reveals low suicidal risk and that ≥ 6 denotes high suicidal risk (Sokero et al., 2003). Concurrent validity of the scale was confirmed (Chioqueta and Stiles, 2006). In this research, the Persian version of the BSSI (Esfahani et al., 2015) was used whose Cronbach's alpha was 0.95 (Ghorbani et al., 2017). Also, concurrent validity of the Persian version of the scale was satisfactory (Anisi et al., 2005; Esfahani et al., 2015). Further, the Cronbach's alpha for the BSSI in the current study was 0.95.

2.4. Statistical analyses

The socio-demographic and clinical characteristics were compared between BD patients with and without lifetime suicide attempts as well as those with and without high suicidal risk using chi-square and *t*-test. The analyses of variance (ANOVA) and covariance (ANCOVA) were also used to compare EMSs between BD patients with and without lifetime suicide attempts and high suicidal risk. In addition, in order to further evaluate these possible differences, power analysis was computed using the effect size partial eta square (η^2). According to Cohen (1987), a small effect is rated for $\eta^2 > 0.01$, a medium effect for $\eta^2 > 0.06$, and a large effect for $\eta^2 > 0.14$. Further, Pearson's correlation (*r*) was performed to evaluate the relations among variables. To assess the aim of this study, hierarchical logistic regression analyses by the entry method was used. In the regression models, lifetime suicide attempts as a binary variable (with and without a history of lifetime suicide attempts) and suicidal ideation as a binary variable (with and without suicidal risk) were dependent variables. Also, gender, illness duration, age at onset, and frequency of suicide attempts were entered in Step 1 as independent variables. In addition, manic symptoms and depression were entered in Step 2 as independent variables. Finally, hypothesized specific EMSs were entered in Step 3 as independent variables. Data were analyzed using SPSS-22.0 for Windows (IBM Corporation, Armonk, NY, USA). There were no missing values. $p < 0.05$ was considered statistically significant and all tests were two-tailed. The false discovery rate (FDR) correction was used to control type 1 error inflation (Benjamini and Hochberg, 2000).

3. Results

Demographic and clinical variables are presented in Table 1. Among BD patients, 59% had lifetime suicide attempts among which 21% reported a single attempt and 38% had two or more attempts. Further, according to the BSSI cut-off scores, 59% of patients had high suicidal risk while 41% were not at high suicidal risk. The findings revealed that patients with lifetime suicide attempts had more family histories of suicide attempts ($p < 0.05$) and psychiatric disorders as well as higher scores on manic symptoms, depression, and suicidal ideation ($p < 0.001$) than their counterparts without lifetime attempts. Also, patients with high suicidal risk had more family histories of psychiatric disorders and higher scores on manic symptoms, depression, and suicidal ideation compared to those without high suicidal risk ($p < 0.001$) (see Table 1 for more details).

The results of ANOVA revealed that patients with lifetime suicide attempts and high suicidal risk had higher scores on all EMSs than those without lifetime attempts and suicidal risk. The results of ANCOVA showed that patients with lifetime suicide attempts had significantly higher scores on entitlement ($p < 0.001$) and social isolation ($p < 0.01$) than those without such attempts, after controlling for manic symptoms and depression. The group effect sizes for entitlement and social isolation were large ($\eta^2 > 0.14$) and medium ($\eta^2 > 0.06$) respectively (Table 2).

According to the results of ANCOVA, patients with high suicidal risk scored higher on entitlement, defectiveness ($p < 0.001$), emotional deprivation, social isolation, failure, vulnerability to harm, subjugation, emotional inhibition ($p < 0.01$), and dependence ($p < 0.05$) compared to patients without suicidal risk by controlling for manic symptoms and

depression. The effect sizes for entitlement and defectiveness were large ($\eta^2 > 0.14$). In addition, the effect sizes for emotional deprivation, failure, emotional inhibition, and subjugation were medium ($\eta^2 > 0.06$). Further, the effect sizes for social isolation, vulnerability to harm, and dependence were small ($\eta^2 > 0.01$) (Table 2).

The Pearson's correlation showed that social isolation, defectiveness, failure, emotional inhibition, entitlement, depression, and manic symptoms had significant positive relations to current suicidal ideation ($p < 0.01$). Also, abandonment, social isolation, dependence, unrelenting standards, entitlement, and depression were significantly and positively associated with lifetime suicide attempts ($p < 0.01$) (see Table 3 for more details).

The results of logistic regression showed that manic symptoms (95% CI = 0.85 - 0.98, $p < 0.01$), entitlement (95% CI = 0.75 - 0.96, $p < 0.01$), and defectiveness (95% CI = 0.81 - 0.97, $p < 0.05$) significantly related to current suicidal ideation (Δ model $\chi^2 = 55.0$, $p < 0.001$). These factors explained 57% of current suicidal ideation in the regression model. The model correctly classified 81% of cases with current suicidal ideation (see Table 4 for more details). Also, entitlement (95% CI = 0.77 - 0.96, $p < 0.01$) and social isolation (95% CI = 0.79 - 0.92, $p < 0.05$) were associated with lifetime suicide attempts (Δ model $\chi^2 = 28.3$, $p < 0.001$). The model correctly classified 76% of cases with lifetime suicide attempts. In the regression model, entitlement and social isolation explained 33% of lifetime suicide attempts (see Table 5 for more details). According to the findings, the hypothesis of this study was confirmed regarding the relations of entitlement and social isolation, but not dependence, to suicidal risk.

4. Discussion

The present study aimed to investigate the relation of EMSs and clinical factors to suicidal risk in BD patients. The results indicated that the entitlement and defectiveness schemas were associated with current suicidal ideation. In addition, entitlement and social isolation were related to lifetime suicide attempts. These findings were in line with previous studies (e.g., Nilsson, 2016) showing higher scores of social isolation and entitlement in BD patients with suicide attempts than those without such attempts. Also, our additional results confirmed these findings, so that BD patients with lifetime suicide attempts had higher scores on entitlement and social isolation than those without such attempts. Furthermore, compared to patients without high suicidal risk, the effect sizes for entitlement and defectiveness were large in those with high suicidal risk. Of course, dependence associated with suicidality which was reported by Nilsson (2016) in BD patients, was not related to suicidality in our study. However, the results of Nilsson's (2016) study have relied on a small sample.

Entitlement/grandiosity is described as the belief that the individual is superior to others, deserves particular rights and not limited via the usual rules that govern social ties including reciprocity (Young et al., 2003). Wedig et al. (2013) have concluded that interpersonal behaviors such as entitlement and sadism raise suicidal risk up to 1.7 times. Also, Pincus et al. (2009) have suggested that grandiose facets are linked to suicide attempts. Similarly, several studies have shown that narcissistic personality disorder (that resembles the construct of narcissistic grandiosity) associates with suicidal ideation and attempts (Blasco-Fontecilla et al., 2009; Heisel et al., 2007). In addition, Dale et al. (2010) have found that entitlement is correlated with the repetitive risk of suicidal behaviors in suicide attempters. However, it is believed that entitlement is a feature of narcissism (Young et al., 2003) and it is known as a vulnerability factor for developing BD (Hawke and Provencher, 2012; Hawke et al., 2011). Grandiose behaviors are a main characteristic of BD patients (Smith et al., 2017), especially in mania phase. The content of the entitlement/grandiosity schema is similar to the aspects of the hypomanic attitudes defined by Mansell and Jones (2006). So, regardless of the content of the entitlement schema, the relation of this schema to suicidal risk may in fact be due to

Table 1
Demographic and clinical characteristics of BD patients with and without lifetime suicide attempts and high suicidal risk (n = 100).

Characteristics	Lifetime suicide attempts,			Statistics		High suicidal risk		Statistics	
	Total (n = 100)	Yes (n = 59)	No (n = 41)	t or χ^2	p	Yes (n = 59, BSSI ≥ 6)	No (n = 41, BSSI ≤ 5)	t or χ^2	p
	N (%) or mean ± SD	N (%) or mean ± SD	N (%) or mean ± SD			N (%) or mean ± SD	N (%) or mean ± SD		
Male/ Female	57/43	33/26	24/17	0.07	0.80	31/28	26/15	1.2	0.28
Age, year	36.7 ± 8.5	36.0 ± 8.7	37.6 ± 8.3	35.2	0.32	36.7 ± 8.7	36.7 ± 8.8	27.6	0.69
Education, years	9.1 ± 3.1	8.8 ± 2.9	9.6 ± 3.9	1.3	0.21	9.0 ± 3.1	9.3 ± 3.2	0.54	0.59
Marital status				2.5	0.28			0.74	0.69
Single	49(49%)	29%	20%			31%	18%		
Married	35(35%)	18%	17%			19%	16%		
Divorced	16 (16%)	12%	4%			9%	7%		
Family history of psychiatric disorders	43 (43%)	34 (43%)	9 (9%)	12.6	0.000***	35 (35%)	8 (8%)	13.4	0.005**
Family history of suicide attempts	35 (35%)	26 (26%)	9 (9%)	5.2	0.016*	24 (24%)	11 (11%)	2.0	0.15
Age at BD onset, years	26.6 ± 8.2	26.2 ± 8.1	27.0 ± 8.3	0.48	0.63	26.9 ± 7.8	26.1 ± 8.7	0.44	0.66
Illness duration, years	10.2 ± 4.8	10.0 ± 4.3	10.6 ± 5.5	0.61	0.55	9.9 ± 4.3	10.6 ± 5.6	0.73	0.47
Depression scores on the BDRS	12.5 ± 5.8	13.7 ± 5.5	10.7 ± 5.8	2.6	0.003**	15.5 ± 4.3	8.7 ± 4.7	8.2	0.000***
Manic symptoms	7.8 ± 3.8	8.5 ± 3.5	6.4 ± 4.1	2.5	0.004**	9.3 ± 2.8	5.6 ± 4.0	5.5	0.000***
Suicidal ideation	13.3 ± 10.1	16.5 ± 9.4	8.6 ± 9.0	4.2	0.000***	20.4 ± 6.1	2.9 ± 2.8	17.3	0.000***

Note. The Bipolar Depression Rating Scale (BDRS) was used to assess depression; the Young Mania Rating Scale (YMRS) was used to examine manic symptoms; the Beck Scale for Suicide Ideation (BSSI) was used to evaluate suicidal ideation.

BD: bipolar disorder.

* p < 0.05.

** p < 0.01.

*** p < 0.001.

grandiose behaviors related to BD. In other words, suicidal risk may stem from the features of BD because these features and the entitlement schema are more likely to overlap.

Individuals with social isolation believe that they are isolated from

the world and others, are not able to establish close relations to community or others, and are at remarkable vulnerability to social rejection (Young et al., 2003). Furthermore, patients with the defectiveness schema think that they are defective, flawed, inferior, bad, worthless, or

Table 2
Comparison of EMSs between BD patients with and without lifetime suicide attempts and those with and without high suicidal risk (n = 100).

EMSs	Lifetime suicide attempts			High suicidal risk			F ^a	F ^b	η^2 ^c		
	Total (n = 100)	With (n = 59)	Without (n = 41)	With (n = 59, BSSI ≥ 6)	Without (n = 41, BSSI ≤ 5)						
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD						
Emotional deprivation	17.3 ± 7.3	18.8 ± 7.4	15.1 ± 6.8	6.2**	0.53	0.01	20.4 ± 5.9	12.8 ± 6.9	25.4***	8.7**	0.07
Abandonment	18.4 ± 7.3	20.3 ± 7.0	15.7 ± 7.1	10.2**	2.1	0.02	20.2 ± 6.5	15.8 ± 7.8	9.4**	0.01	0.001
Mistrust/abuse	17.2 ± 6.7	19.1 ± 6.1	14.5 ± 6.6	12.8***	2.5	0.03	19.4 ± 5.4	14.1 ± 7.1	18.1***	0.90	0.01
Social isolation	16.5 ± 7.0	18.6 ± 6.6	13.6 ± 6.4	14.4***	5.9**	0.07	21.4 ± 5.0	10.4 ± 9.0	32.4***	6.1**	0.06
Defectiveness	15.8 ± 7.3	17.7 ± 6.7	13.0 ± 7.4	11.0***	2.7	0.03	18.8 ± 6.2	11.5 ± 6.8	35.9***	13.3***	0.15
Failure	15.8 ± 7.4	17.9 ± 6.4	12.7 ± 7.8	13.6***	2.7	0.03	18.8 ± 6.4	11.4 ± 6.7	31.4***	7.4**	0.07
Dependence	15.5 ± 7.4	17.3 ± 6.6	12.9 ± 7.8	9.4**	1.1	0.01	18.6 ± 6.3	11.0 ± 6.6	34.5***	5.1*	0.05
Vulnerability to harm	16.2 ± 7.3	18.1 ± 6.7	13.4 ± 7.2	11.2***	2.1	0.02	19.3 ± 5.9	11.7 ± 6.8	36.0***	6.4**	0.06
Enmeshment	17.2 ± 6.7	19.3 ± 5.2	14.2 ± 7.4	16.6***	2.6	0.03	19.1 ± 6.1	14.4 ± 6.5	13.7***	0.01	0.001
Subjugation	17.5 ± 9.1	19.9 ± 9.3	14.1 ± 7.6	11.1***	3.2	0.03	21.0 ± 8.9	12.6 ± 6.8	26.2***	8.0**	0.08
Self-sacrifice	18.3 ± 6.6	20.5 ± 5.4	15.2 ± 6.9	18.3***	2.3	0.03	19.4 ± 5.9	16.8 ± 7.2	3.9*	1.2	0.01
Emotional inhibition	18.0 ± 6.3	19.5 ± 5.5	15.9 ± 6.7	8.8**	1.9	0.02	20.4 ± 5.2	14.5 ± 6.0	27.8***	7.4**	0.07
Unrelenting standards	19.5 ± 6.1	21.0 ± 4.8	17.3 ± 7.0	10.1**	2.4	0.02	20.5 ± 5.3	18.1 ± 6.9	3.8*	0.01	0.01
Entitlement	18.8 ± 6.2	21.1 ± 5.1	15.6 ± 6.1	23.5***	13.4***	0.15	21.2 ± 4.8	15.5 ± 6.4	38.8***	16.3***	0.18
Insufficient self-control	18.6 ± 6.9	20.9 ± 5.7	15.3 ± 7.1	19.3***	3.0	0.03	20.9 ± 5.6	15.3 ± 7.2	19.3***	3.5	0.04

Note.

Effect sizes were measured by controlling for depression and manic symptoms.

EMSs: early maladaptive schemas; BD: bipolar disorder; BSSI: Beck Scale for Suicide Ideation.

^a Analysis of variance (ANOVA).

^b Analysis of covariance (ANCOVA) by controlling for depression and manic symptoms as covariates.

^c Effect sizes were assessed by partial eta square (η^2).

* p < 0.05.

** p < 0.01.

*** p < 0.001.

Table 3
Pearson's correlations between variables in BD patients (n = 100).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
1- Gender	-																									
2- Age	-0.34**	-																								
3- Education	0.27**	0-0.20	-																							
4- Marital status	-0.11	0.25*	-0.01	-																						
5- Age at BD onset	-0.22*	0.82**	-0.24*	0.15	-																					
6- Illness duration	-0.22*	0.35**	0.06	0.21*	-0.23*	-																				
EMSS																										
7- Emotional deprivation	0.17	0.08	0.13	0.13	0.01	0.13	-																			
8- Abandonment	0.37	0.04	-0.03	0.08	0.05	0.01	0.61**	-																		
9- Mistrust/abuse	0.23*	-0.01	0.05	0.03	-0.01	0.02	0.56*	0.67**	-																	
10- Social isolation	0.04	-0.02	0.01	-0.04	-0.07	0.10	0.58*	0.53*	0.67**	-																
11- Defectiveness	0.20	-0.04	-0.17	-0.05	-0.01	-0.04	0.49*	0.56*	0.63**	0.74**	-															
12- Failure	0.16	-0.11	-0.14	-0.06	-0.01	-0.14	0.41**	0.51**	0.60**	0.69**	0.88**	-														
13- Dependence	0.10	-0.01	-0.25*	-0.02	0.04	-0.07	0.50**	0.55**	0.61**	0.69**	0.74**	0.77**	-													
14- Vulnerability to harm	0.12	-0.02	-0.05	0.16	-0.05	0.06	0.55**	0.54**	0.65**	0.63**	0.65**	0.68**	0.73**	-												
15- Enmeshment	0.27**	-0.15	-0.06	0.09	-0.13	-0.03	0.46*	0.56**	0.60**	0.54**	0.59**	0.62**	0.58**	0.66**	-											
16- Subjugation	0.21*	-0.13	-0.01	0.05	-0.11	-0.03	0.45*	0.46*	0.51**	0.51**	0.59**	0.62**	0.51**	0.58**	0.60**	-										
17- Self-sacrifice	0.17	-0.02	0.11	0.17	-0.01	-0.02	0.37*	0.42*	0.45**	0.33**	0.24*	0.25*	0.26*	0.35*	0.54**	0.40**	-									
18- Emotional inhibition	0.23*	-0.14	0.01	0.07	-0.06	-0.12	0.43**	0.48**	0.52**	0.62**	0.63**	0.63**	0.54**	0.51**	0.62**	0.56**	0.48**	-								
19- Unrelenting standards	0.27**	0.02	0.15	0.17	-0.03	0.10	0.46**	0.50**	0.45**	0.38**	0.35**	0.34**	0.31**	0.40**	0.57**	0.51**	0.63**	0.63**	-							
20- Entitlement	0.25*	-0.12	0.01	0.22*	-0.16	0.07	0.50**	0.43**	0.55**	0.41**	0.43**	0.44**	0.43**	0.53**	0.60**	0.53**	0.59**	0.63**	0.66**	-						
21- Insufficient self-control	0.28**	-0.11	-0.07	0.18	-0.08	-0.03	0.42**	0.58**	0.56**	0.45**	0.57**	0.60**	0.50**	0.57**	0.65**	0.58**	0.51**	0.65**	0.59**	0.77**	-					
22- Depression	0.23*	-0.03	0.04	-0.04	-0.01	-0.03	0.54**	0.56**	0.66**	0.61**	0.53**	0.56**	0.63**	0.61**	0.66**	0.48**	0.57**	0.51**	0.53**	0.58**	0.58**	-				
23- Manic symptoms	0.09	0.09	-0.08	-0.07	0.06	0.06	0.22*	0.27**	0.25*	0.33**	0.32**	0.30**	0.41**	0.39**	0.23*	0.23*	0.13	0.25**	0.13	0.20**	0.18	0.38**	-			
24- Suicidal ideation	0.02	-0.04	-0.07	-0.10	0.02	-0.09	0.12	0.15	0.13	0.29**	0.43**	0.35**	0.11	0.15	0.09	0.15	0.10	0.36**	0.17	0.57**	0.13	0.33**	0.33**	-		
25- Lifetime suicide attempts	-0.03	0.09	0.13	-0.07	0.05	0.06	0.07	0.31**	0.12	0.36**	0.10	0.14	0.30**	0.13	0.15	0.13	0.18	0.16	0.31**	0.48**	0.14	0.35**	0.17	0.39**	-	

Note. EMSS: early maladaptive schemas; BD: bipolar disorder.

* p < 0.05.

** p < 0.01.

Table 4

Hierarchical logistic regression analysis to assess the relations of demographic and clinical factors as well as EMSs to suicidal ideation in patients with BD (*n* = 100).

Risk factors	Δ model χ^2	<i>B</i>	<i>SE</i>	95% CI for Exp (<i>B</i>)		<i>p</i>
				Lower	Upper	
Step 1	14.4, <i>p</i> = 0.006**					
Gender		−0.57	0.48	0.22	1.45	0.24
Age at onset		−0.02	0.03	0.92	1.1	0.46
Illness duration		0.02	0.05	0.93	1.1	0.67
Frequency of suicide attempts		0.45	0.15	0.48	0.85	0.002**
Step 2	41.8, <i>p</i> = 0.000***					
Gender		−0.14	0.59	0.37	3.64	0.81
Age at onset		−0.01	0.03	0.93	1.1	0.88
Illness duration		0.05	0.06	0.94	1.2	0.41
Frequency of suicide attempts		0.20	0.16	0.60	1.1	0.22
Depression		0.08	0.03	0.87	0.98	0.004**
Manic symptoms		0.09	0.03	0.86	0.98	0.007**
Step 3	55.0, <i>p</i> = 0.000***					
Gender		−0.20	0.65	0.35	4.4	0.76
Age at onset		−0.04	0.04	0.90	1.1	0.35
Illness duration		0.09	0.06	0.96	1.2	0.17
Frequency of suicide attempts		0.06	0.16	0.68	1.3	0.72
Depression		0.04	0.04	0.90	1.0	0.26
Manic symptoms		0.10	0.04	0.85	0.98	0.009**
Entitlement		0.16	0.06	0.75	0.96	0.011**
Defectiveness		0.10	0.03	0.81	0.97	0.016*
Social isolation		0.07	0.07	0.81	1.1	0.32

Note. 100 patients [59 with high suicidal risk (BSSI ≥ 6) and 41 without high suicidal risk (BSSI ≤ 5)] were included in the analysis; model summary: - 2 log likelihood = 80.4; nagelkerke R^2 = 0.57; overall percentage of correct classification resulting from the model = 81%; Cox & Snell R squares in Steps 1, 2, and 3 were 0.13, 0.34, and 0.42 respectively; χ^2 diff = (Step 1 vs. Step 2 = 27.3, *p* = 0.000*** and Step 2 vs. Step 3 = 13.2, *p* = 0.004**).

χ^2 diff: Differences between models using the differences in model chi-square; BD: bipolar disorder; BSSI: Beck Scale for Suicide Ideation; EMSs: early maladaptive schemas; χ^2 = chi-square.

* *p* < 0.05.

** *p* < 0.01.

*** *p* < 0.001.

Table 5

Hierarchical logistic regression analysis to assess the relations of demographic and clinical factors as well as EMSs to lifetime suicide attempts in BD patients (*n* = 100).

Risk Factors	Δ model χ^2	<i>B</i>	<i>SE</i>	95% CI for Exp (<i>B</i>)		<i>p</i>
				Lower	Upper	
Step 1	1.77, <i>p</i> = 0.78					
Gender		0.03	0.44	0.43	2.4	0.96
Age at onset		−0.02	0.03	0.97	1.1	0.41
Illness duration		0.05	0.05	0.95	1.2	0.34
Frequency of suicide attempts		0.29	0.30	0.42	1.3	0.33
Step 2	16.1, <i>p</i> = 0.013**					
Gender		0.49	0.50	0.62	4.3	0.32
Age at onset		−0.04	0.03	0.98	1.1	0.23
Illness duration		0.06	0.05	0.96	1.2	0.22
Frequency of suicide attempts		0.41	0.33	0.35	1.3	0.21
Depression		0.06	0.02	0.90	0.98	0.003**
Manic symptoms		0.02	0.03	0.93	1.0	0.44
Step 3	28.3, <i>p</i> = 0.000***					
Gender		0.63	0.55	0.64	5.5	0.26
Age at onset		−0.02	0.03	0.95	1.1	0.65
Illness duration		0.08	0.06	0.97	1.2	0.15
Frequency of suicide attempts		0.10	0.36	0.45	1.8	0.79
Depression		0.01	0.03	0.94	1.1	0.82
Manic symptoms		0.01	0.03	0.94	1.0	0.65
Entitlement		0.15	0.06	0.77	0.96	0.006**
Social isolation		0.08	0.05	0.79	0.92	0.018*
Defectiveness		0.01	0.05	0.90	1.1	0.91

Note. 59 patients with lifetime suicide attempts and 41 without them were included in the analysis; model summary: - 2 log likelihood = 107.1; nagelkerke R^2 = 0.33; overall percentage of correct classification resulting from the model = 76%; Cox & Snell R squares in Steps 1, 2, and 3 were 0.02, 0.15, and 0.25 respectively; χ^2 diff = (Step 1 vs. Step 2 = 14.3, *p* = 0.000*** and Step 2 vs. Step 3 = 12.2, *p* = 0.007**).

BD: bipolar disorder; χ^2 = chi-square; χ^2 diff: Differences between models using the differences in model chi-square.

* *p* < 0.05.

** *p* < 0.01.

*** *p* < 0.001.

unlovable. These patients feel insecure regarding interpersonal relations to other individuals, especially the individuals who are perceived as not defective (Young et al., 2003). According to De Catanzaro (1995) and Joiner et al. (2016), individuals who feel less attached to a particular group, more as a burden to a specific group, and weaker regarding the prospects of becoming integrated within a social group have more tendencies to suicide. These two schemas may interact with each other in relation to suicide in BD patients, because these schemas are located in the disconnection/rejection domain. This domain was found to correlate with suicidal ideation (Valikhani et al., 2017). Individuals with defectiveness and social isolation think that they are rejected by others. Therefore, they may be isolated, dissociable, lonely, depressed, and self-stigmatized. Loneliness that is similar to social isolation has been shown to associate with suicidal behaviors (Chang et al., 2010).

Although our study and several studies have shown the associations of social isolation, defectiveness, and entitlement with suicidal behaviors (e.g., Ahmadpanah et al., 2017; Akbari and Rahbar, 2013; Dale et al., 2010; Dutra et al., 2008), these schemas may be just part of factors related to suicidal risk in BD patient. It is possible that elevated EMSs in BD patients with suicide attempts be the consequences of lifetime suicide attempts, severe depression, manic symptoms, and comorbidity. Furthermore, EMSs may indirectly increase suicidal risk via disorders comorbid with BD or by exacerbating depressive and hypomanic/manic symptoms in BD patients. Although previous studies have shown that BD patients with comorbid substance use disorders, anxiety disorders (Simon et al., 2007), posttraumatic stress disorder (Carter et al., 2017), attention deficit hyperactivity disorder (Lan et al., 2015), and obsessive-compulsive disorder (Saraf et al., 2017) are at high risk for suicide, comorbidity was not controlled in the present study. Also, personality disorders such as borderline personality disorder (BPD) comorbid with BD (McDermid et al., 2015) were not examined in this study. BPD is a known risk factor for suicidal risk in BD patients (Zeng et al., 2015). Further, EMSs have been related to BPD diagnosis (Bach and Farrell, 2018). So, studies are required to clarify the roles of EMSs in suicidal risk by controlling for comorbidity and lifetime attempts in BD.

The present research indicated that manic symptoms, but not depression, were associated with current suicidal ideation. Similarly, Ostacher et al. (2015) have shown the relations of manic symptoms to suicidal ideation. Also, other studies reported the association of mania, particularly mixed states, with suicidal behaviors (Goldberg et al., 1999; Sato et al., 2004). A reason that manic symptoms, but not depression, were related to suicidal ideation in our study may be because patients were in mania phase at the time of hospitalization.

This study may have some clinical and therapeutic implications. The findings suggest that manic symptoms as well as specific EMSs including social isolation, entitlement, and defectiveness emerge as potentially implicated in suicidality in BD patients. Therefore, providing social support in the economic, social, political, cultural, and educational spheres may be a factor in preventing suicide. In the same vein, social rejection, contempt, and low social support have been shown to link to elevated risk of suicide (O'Connor and Nock, 2014). Further, schema therapy (Young, 1994) as a derivation of the Young schema theory to treat a variety of psychiatric disorders may be a possible option to reduce EMSs and consequently prevent BD patients from suicide. This therapy has been found to be a useful treatment to decrease symptoms, the risk of relapse, and EMSs in individuals with BD (Ghaderi et al., 2015; Hawke et al., 2013). Furthermore, a schema-focused cognitive therapy combined with pharmacotherapy may offer new psychotherapeutic options for BD (Ball et al., 2003). On the other hand, given that EMSs result from traumatic experiences such as childhood trauma, the focus of the clinicians on these experiences can be helpful in reducing suicidal risk. In this regard, the skills training in affective and interpersonal regulation (Cloitre et al., 2002) that deals with interpersonal deficits of childhood abuse as well as acceptance and commitment therapy (Hayes et al., 1999) that targets acceptance of

unpleasant experiences may be useful. It has been found that acceptance and commitment therapy decreases suicidal ideation and deliberate self-harm (Tighe et al., 2018) as well as is effective in BD patients (O' Donoghue et al., 2018). The skills training in affective and interpersonal regulation has been found to improve trauma symptoms (MacIntosh et al., 2016).

This study had several limitations. First, personality disorders (e.g., BPD) which are important in the study of schemas and suicidality were not assessed in the present study. Further studies are needed to find the differences between BD patients with and without personality disorders in terms of EMSs. Second, this study had a cross-sectional design which does not allow for an examination of causation and longitudinal research. Third, conclusions drawn from a hospitalized sample may not apply to all patients with BD. Fourth, although Stopa and Waters (2005) have shown the effect of mood on the responses to the YSQ-SF, we did not control the effect of anxiety as a covariate in this study. Fifth, the present study included BD patients with a relatively low educational level. Further studies should be carried out on BD patients with a high educational level. Sixth, BD patients had comorbid psychiatric disorders. Comorbid diseases may affect the results. Therefore, future research should control the effects of comorbidity to further clarify the results of the present study. The last limitation concerns the use of self-report measures since self-report measures may lead to response bias in participants.

Regardless of these limitations, the present research showed that manic symptoms as well as the entitlement and defectiveness schemas were associated with suicidal ideation. In addition, entitlement and social isolation were related to lifetime suicide attempts. Overall, these findings indicated that the entitlement, social isolation, and defectiveness schemas may play a role in suicidality in BD patients.

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Contributors

All authors contributed to and have approved the final manuscript.

Conflict of interest

None declared.

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