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Global functioning and suicide risk in patients with depression and comorbid borderline personality disorder

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ABSTRACT

Background: Borderline personality disorder (BPD) and depression are common disabling mental illnesses that are frequently comorbid. There's limited research investigating specific predictors of suicide in patients with borderline personality disorder and comorbid depression.
Methods: This is a comparative study where 150 patients with depressive disorders and 150 patients with bipolar depression were assessed for the prevalence of BPD. In each group, patients with BPD versus without BPD were evaluated for suicide risk and global functioning. Patients with BPD in the whole sample were also assessed for factors correlated with suicide risk.
Results: 23.3% of patients with DD and 21.3% of patients with bipolar depression had BPD. Among patients with depressive disorders, BPD was associated with higher suicide risk ($p < 0.001$). Among patients with bipolar depression, BPD was associated with lower global functioning ($p = 0.025$) and higher suicide risk ($p = 0.020$). Among the total number of patients with BPD, suicide risk was significantly correlated with higher DSH ($r = 0.331$, $p = 0.006$) and lower global functioning ($r = -0.368$, $p = 0.002$), but only global functioning predicted suicide (beta = -0.280, $p = 0.023$, adjusted $R^2 = 64\%$, $F = 5.433$).
Limitations: Convenience sampling and not excluding patients with other personality disorders.
Conclusions: This study suggests that BPD is associated with higher risk of suicide in patients with different types of depression. Lower global functioning might predict suicide in patients with BPD and depression. This particular finding points to the importance of the assessment and support of global functioning in patients with BPD and depression.

1. Introduction

Borderline personality disorder (BPD) is a disabling mental illness, with a prevalence of 2–3% in the general population. The majority of patients with BPD (83%) have one or more lifetime episode(s) of mood disorder (most commonly major depressive episode or mania) (Tomko, Trull, Wood, & Sher, 2014). On the other hand, Fornaro et al. (2016) found a prevalence of BPD in bipolar disorder (BD) of 21.6%. Friborg et al. (2014) found a mean prevalence of BPD in patients with bipolar disorder, major depressive disorder, and dysthymia of 16%, 14%, and 13% respectively. Although there has been much controversy for years about whether BPD belongs to the bipolar spectrum or not, most studies suggest that bipolar disorder and BPD are two independent disorders (Paris & Black, 2015; Paris, Gunderson, & Weinberg, 2007; Parker, Bayes, McClure, del Moral, & Stevenson, 2016).

Comorbid BPD can affect the course and outcome of mood disorders, for instance leading to earlier onset, more frequent recurrence of depressive episodes (Gunderson et al., 2008), more frequent comorbidity (Hidalgo-Mazzei, Walsh, Rosenstein, & Zimmerman, 2015), and more resistance to medications (Perugi et al., 2013). About half of

Abbreviations: BD, bipolar disorder; BDI, bipolar I disorder; BDII, bipolar II disorder; BD-BS, bipolar disorder diagnosed by bipolar specifier criteria; BIS-11, Barrat's Impulsiveness Scale version 11; BPD, borderline personality disorder; DD, depressive disorders; DSH, deliberate self-harm; DSHI-s, Deliberate Self Harm Inventory-short version; DSM-IV-TR, Diagnostic and Statistical Manual of Mental Disorders (fourth edition, text revised); GAF, global assessment of functioning; GBD, Global Burden of Disease; MADRS, Montgomery- Asberg Depression Rating Scale; MDD, major depressive disorder; MINI, Mini International Neuropsychiatric Interview-Plus; SCID-II, Structured Clinical Interview for DSM-IV-TR Axis II Disorders; SPSS, Statistical Package for the Social Sciences

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patients with BPD attempt suicide, and 3%–10% die by suicide (Zanarini et al., 2008). BPD comorbid with depression may increase the risk of suicide in the latter (Perugi, Fornaro, & Akiskal, 2011; Stringer et al., 2013; Zeng et al., 2015).

Several risk factors for suicide in BPD were suggested in previous research. Among those are deliberate self- harm (Oumaya et al., 2008), aggression, negative affect, hospitalization, coming from a minority race, and unstable employment (Soloff & Chiappetta, 2017). Previous research has also shown that previous suicide attempts, lower global functioning, severity of depression, hopelessness, alcohol use disorders, lower perceived social support, and younger age may predict suicide in depression (Sokero et al., 2003). On the other hand, in bipolar disorder, previous suicide attempts, early onset of the disorder, first- degree family history of suicide, comorbidity, and bipolar II rather than bipolar I disorder were found to be associated with completed suicide (Plans et al., 2019). However, there's limited research investigating specific predictors of suicide in patients with borderline personality disorder and comorbid mood disorders (Fornaro et al., 2016). Given the relatively high prevalence of this comorbidity and the high prevalence of suicide in those patients, searching for potential predictors of suicide in them would be of extreme clinical importance.

Suicide rates in lower- and middle- income countries of the Middle East reached up to 5 per 100,000 people in 2015 (Global Burden of Disease (GBD), 2015). Ahmed, Omar, and Elamaim, (2016) found a prevalence of 12.75% of significant suicide ideation in a sample of Egyptian students. Studies assessing suicide rates in the Egyptian population and in Egyptian patients with depression or BPD are scarce.

This study aimed to investigate the effects of BPD on the outcomes of depression. It also aimed to correlate specific features of BPD such as impulsivity and DSH with suicide risk in patients with BPD and depression. We hypothesized that BPD in patients with depressive disorders (DD) or bipolar depression is associated with worse outcomes, for example, lower global functioning and higher suicide risk, in the latter disorders.

1.1. Specific aims of the study

Assessing the prevalence of BPD in a sample of patients with depressive disorders (DD) and a sample of patients with bipolar disorder (BD).

Assessing and comparing suicide risk and global functioning in patients with and without BPD in each group.

Assessing factors correlated with suicide risk in patients with BPD in the whole sample.

2. Material and methods

2.1. Participants

We sought patients who had received a diagnosis of current depression (major depressive disorder (MDD), bipolar depression or dysthymia) in Kasr Al Ainy adult psychiatry outpatient clinics. Patients were recruited using convenience sampling. All participants were aged 18–50 years and met the Diagnostic and Statistical Manual of Mental Disorders (fourth edition, text revised) (DSM-IV-TR) diagnostic criteria for a current major depressive episode or dysthymia (American Psychiatric Association, 2000) as diagnosed by the interviewer administering the Mini International Neuropsychiatric Interview-Plus (MINI) (Sheehan et al., 1998). All participants provided written informed consent. Age 18 was chosen as the lower limit, since the diagnosis of all personality disorders, including BPD, cannot be confirmed before the age of 18; while age 50 was chosen as the upper limit based on the findings of Paris (2005), who stated that 90% of patients with BPD will have recovered by age 50. Patients diagnosed clinically with intellectual disability and patients presenting with a current mixed episode were not included in this study. Patients with a current depressive episode with psychotic features were also excluded, so that we ensure that the participants have intact judgement while responding to the questions of the psychometric scales.

Participants confirmed by the MINI to have bipolar I or II disorder (current major depressive episode), or participants confirmed by the MINI to have a current major depressive episode and fulfilling the bipolar specifier criteria were allocated to the 'bipolar disorder' (BD) group. All other included participants (participants with major depressive disorder and participants with dysthymia) were allocated to the 'depressive disorders' (DD) group. A predetermined number of 150 participants was requested in each group. Recruitment was completed over a period of 20 months from mid-February 2015 until mid-October 2016. All interviews were done by a psychiatrist of 4 years' experience in psychiatry. A psychiatry trainee assisted in the administration of the scales.

Bipolar specifier criteria (Angst et al., 2013) include the following:

(1) 'Increased activity' solely can suffice for criterion "A" of a manic episode (therefore, a current major depressive episode and past history of an episode of increased activity with at least 3 of the symptoms listed under criterion B can lead to the diagnosis of bipolar disorder).
(2) Criterion F in the diagnosis of a manic episode is not applied (therefore, a current major depressive episode and past history of a full manic episode (for 1 week or more) during antidepressant treatment, a medical condition, or during substance intoxication/withdrawal leads to a diagnosis of bipolar disorder).
(3) Patients with a current major depressive episode and past history of full manic symptoms of a duration of one day or more were considered to have bipolar disorder.

Site ethical approval was ratified by Kasr Al Ainy Psychiatry Department Research Ethics Committee and Kasr Al Ainy Human Research Ethics Committee (Faculty of Medicine, Cairo University) before the beginning of the study. The confidentiality of participants' data was safeguarded using appropriate measures.

2.2. Study design

This study is a cross- sectional comparative study.

2.3. Reported measures

In a single visit for each eligible participant, the interviewers completed a brief history form; the MINI scale (the clinician-rated format) (Sheehan et al., 1998); the Structured Clinical Interview for DSM-IV-TR Axis II Disorders (SCID-II) (First, 1997); Global Assessment of Functioning scale (GAF): (from DSM-IV-TR p. 34) (American Psychiatric Association, 2000); and Montgomery- Asberg Depression Rating Scale (MADRS) (Montgomery & Asberg, 1979). Participants would then fill in the Deliberate Self Harm Inventory- short version (DSHI-s) (Lundh, Karim, & Quilisch, 2007), and the Barrat's Impulsiveness Scale version 11 (BIS-11) (Patton, Stanford, & Barratt, 1995) themselves. Illiterate participants would respond to the questions from the scales dictated by the interviewer. A validated Arabic version of the MINI (Ghanem et al., 1999) was used. Arabic versions of SCID-II (Hatata, Khalil, Asaad, Abou-Zaid, & Okasha, 2003), DSHI-s (Hilmy, 2011), and BIS-11 (Hassan, 2012) were used as well. These translated versions had been used and validated in other settings as cited. No Arabic versions were needed for the GAF and MADRS as those are clinician-rated scales.

In addition to confirming the diagnosis before including participants in the study, the MINI scale was used to assess for the presence of other comorbid psychiatric disorders and/or substance abuse or dependence, and for the assessment of suicide risk. The suicide section (section C) of the MINI has predictive validity for future suicidal behavior in patients

(Roaldset, Linaker, & Bjørkly, 2012).

SCID-II is a semi-structured interview, which provides an assessment of DSM-IV-TR axis II personality disorders. In this study, only the section for borderline personality disorder was applied to diagnose BPD in the participants. GAF scale was used to assess the overall level of global functioning, while MADRS was used to assess the severity of current depression. Deliberate self-harm (DSH) in this study refers to self-injury of non-suicidal intent and was measured by DSHI-s.

BIS-11 is a measure of trait impulsiveness. In an attempt to ensure that impulsivity assessed in this study was trait and not state impulsivity, we insisted that participants respond according to their lifelong behavior and not just their current behavior during the depressive episode.

2.4. Statistical analysis

All statistical tests were performed using SPSS (Statistical Package for the Social Sciences) version 23. Data was summarized using mean, standard deviation, median, minimum and maximum for quantitative data and using frequency (count) and relative frequency (percentage) for categorical data. Comparisons between quantitative variables were done using the non-parametric Kruskal-Wallis and Mann-Whitney tests. For comparing categorical data, Chi square (x^2) test was performed. Exact test was used instead when the expected frequency is less than 5. Correlations between quantitative variables were done using Spearman correlation coefficient. Stepwise linear regression, including suicide risk as the dependent variable and global functioning; DSH; and total impulsivity as independent variables, was done to detect independent predictors of suicide. A p-value of less than 0.05 was considered statistically significant for all results.

3. Results

3.1. Summary of main results

Among patients with DD, BPD was significantly associated with higher suicide risk. Among patients with bipolar depression, BPD was significantly associated with lower global functioning and higher suicide risk. Among patients with BPD and depression (in the total number of participants with BPD), suicide risk was significantly correlated with higher DSH and lower global functioning. Only global functioning was found to significantly predict suicide risk in this model (p-value = 0.023).

3.2. Demographics of the studied population

Table 1 shows the demographic characteristics of the studied population. The average age of the participants was 34 years. 74% of the participants were women, 72.3% were married, and 54.67% received less than a high school certificate. Of the participants included in the DD group, 113 (75.3%) had MDD and 37 (24.7%) had dysthymia; while in the BD group, 95 (63.3%) had bipolar I disorder (BDI), 14 (9.3%) had bipolar II disorder (BDII), and 41 (27.3%) fulfilled the criteria for bipolar disorder only when bipolar specifier criteria were considered (BD-BS). Participants in DD group were compared to those in BD group with regards to the demographic data. Participants in both groups did not differ significantly by gender, marital status, or highest level of education achieved.

Table 1
Demographic Characteristics.

		N = 300
Age (years, mean +_ SD)		34 +_8.53
Gender	**Men**	26%
	Women	74%
Education	**< high school**	54.67%
	High school grade	23.67%
	College	21.67%
Marital Status	**Married**	72.33%
	Single	21.33%
	Divorced	4%
	Widows	2.33%
Employment	**Employed**	45%
	Unemployed	6.33%
	Housewives	48.67%

Table 2
Mean Scores of MADRS, GAF, and DSHI-s* in the Participants with Depressive Disorders versus Bipolar Disorder.

	Depressive Disorders (n = 150) Mean (S.D.)	Bipolar Disorder (n = 150) Mean (S.D.)	p-Value
MADRS score	24.53 (9.22)	23.31 (8.15)	0.279
GAF Score	53.93 (9.91)	52.97 (9.15)	0.347
DSHI-s Score	1.24 (3.55)	1.42 (3.43)	0.546

MADRS: Montgomery- Asberg Depression Rating Scale- **GAF**: Global Assessment of Functioning scale- **DSHI-s**: Deliberate Self Harm Inventory- short version.

3.3. Clinical and psychometric data in both groups

Participants in DD group were compared to those in BD group as regards clinical and psychometric data. Participants in both groups did not differ by depression severity, global functioning, or frequency of DSH (Table 2).

Analysis of the psychiatric history of the participants in both groups revealed that those in the DD group had a distinctly older age at onset of the disorder compared with those in the BD group. Mean suicide risk in the BD group was 10.19 (high risk), compared to 7.03 in the DD group (moderate risk). The mean number of previous suicide attempts was also higher in the BD group. Scale scores on the BIS-11 showed higher rates of total, attention, and motor impulsivity in BD participants as compared to DD participants (Table 3).

3.4. Prevalence of borderline personality disorder (BPD) in both groups

In our study population, 23.3% (n = 35) of participants in the DD group had borderline personality disorder (BPD) as compared to 21.3% (n = 32) of participants in the BD group. As for the subgroups, 25.7% (n = 29) of the participants in the MDD group had BPD as compared to 16.2% (n = 6) of the participants in the dysthymia group; while 18.9% (n = 18) of the participants in the BDI group, 14.3% (n = 2) in the BDII group, and 29.3% (n = 12) in the BD-BS group had borderline personality disorder. None of those differences showed statistical significance.

3.5. Participants with BPD in each group

We compared participants with and without borderline personality disorder in each group. We found that within the ‘depressive disorders’ group, BPD was significantly associated with higher suicide risk scores in addition to lower age (Table 4). Moreover, BPD was associated with higher other axis I comorbidity (as diagnosed by the MINI): 71.4% of the participants with BPD compared to 50.4% of those without BPD had other axis I comorbidity (p-value = 0.029). BPD was not significantly associated with decline in global functioning. BPD was also not significantly associated with gender: the percentage of women in participants with and without BPD in the DD group was 80% and 74.8% respectively (p-value = 0.527).

On the other hand, within the ‘bipolar disorder’ group, BPD was significantly associated with lower global functioning and higher

Table 3
Comparison of Different Clinical and Psychometric Data between the Participants with Depressive Disorders (DD) and Bipolar Disorder (BD).

		Depressive Disorders (n = 150) % (count)	Bipolar Disorder (n = 150) % (count)	p-Value
Other Total Comorbidity*		55.3 (83)	44 (66)	0.050
Comorbid Drugs or alcohol abuse/ addiction		6.0 (9)	6.7 (10)	0.813
		Mean (S.D.)	**Mean (S.D.)**	
Age at onset of DD/ BD (years)		27.50 (8.85)	23.04 (8.52)	**< 0.001**
Suicide Risk Score		7.03 (9.43)	10.19 (9.73)	**0.016**
No. of suicide attempts		0.93 (2.86)	1.48 (2.45)	**0.001**
Barratt Impulsiveness Scale	**Total impulsivity**	70.37 (11.05)	72.98 (12.29)	**0.022**
	Attention impulsivity	17.95 (3.76)	19.25 (4.23)	**0.012**
	Motor Impulsivity	22.87 (5.44)	24.35 (5.64)	**0.017**
	Non-planning Impulsivity	29.55 (5.34)	29.87 (5.48)	0.626

Bold p-values are significant.
Other total comorbidity* was assessed using Mini International Neuropsychiatric Interview (MINI) Scale and included generalized anxiety disorder, panic disorder, agoraphobia, social phobia, special phobia, obsessive compulsive disorder, post-traumatic stress disorder, alcohol abuse/ dependence, substance abuse/ dependence, bulimia nervosa, somatization disorder, and/ or adult attention deficit hyperactivity disorder (ADHD).

suicide risk scores. Yet, BPD was not significantly associated with age, gender, or other axis-I comorbidity: the percentage of women in participants with and without BPD group was 75.0% and 71.2% respectively (p-value = 0.670).

3.6. Factors correlated with suicide in participants with BPD

To determine if clinical or psychometric factors were correlated with suicide risk in participants with BPD and depression (in the total number of participants with BPD), we conducted correlation analysis (Table 5). We found that suicide risk was significantly correlated with higher DSH and lower global functioning. This was followed by stepwise linear regression, including suicide risk as the dependent variable and global functioning; DSH; and total impulsivity as independent variables, to detect any potential predictors of suicide. Only global functioning was found to significantly predict suicide risk in this model. Any increase in global functioning score was associated with a lower suicide risk score (beta= -0.280, p = 0.023, adjusted R^2 = 64%, F = 5.433) (Table 6).

4. Discussion

We hypothesized that BPD in patients with DD or BD is associated with worse global functioning and higher suicide risk. This study confirmed that among participants with DD and among participants with bipolar depression, BPD was significantly associated with a higher suicide risk. This is consistent with previous research (Joyce et al., 2003; Parker et al., 2016; Sharp et al., 2012). It also confirmed that

Table 5
Correlation between the Suicide Risk Score and Different Data in the Participants with BPD (among the Total Number of Participants) (n = 67).

		Suicide Risk r	p-value
Age at Onset of Depressive/ Bipolar Disorder		−0.032	0.794
Duration of Current Depressive Episode		0.054	0.667
MADRS Score		0.172	0.165
GAF Score		−0.368	**0.002**
DSHI-s Score		0.331	**0.006**
BIS Score	**Total Impulsivity**	−0.166	0.180
	Attention Impulsivity	−0.103	0.405
	Motor Impulsivity	−0.117	0.346
	Non- planning Impulsivity	−0.101	0.418

Bold p-values are significant.

Table 6
Association between the Suicide Risk Score and Global Functioning (Among the Total Participants with Borderline Personality Disorder and Depression (n = 67)): Stepwise Linear Regression Model.

	Beta	95% CI	p value
Global Functioning	−0.280	−0.046 to −0.540	0.023

Table 4
Means of Different Variables in the Participants with/ without Borderline Personality Disorder (BPD) within Each Group.

	Depressive Disorders (DD)			Bipolar Disorder (BD)		
	DD with BPD (n = 35) % (count)	DD without BPD (n = 115) % (count)	p- value	BD with BPD (n = 32) % (count)	BD without BPD (n = 118) % (count)	p-value
Other total comorbidity*	71.4 (25)	50.4 (58)	**0.029**	46.9 (15)	43.2 (51)	0.841
Comorbid Drugs or alcohol abuse/ addiction	17.1 (6)	2.6 (3)	**0.005**	3.1 (1)	7.6 (9)	0.690
	Mean (S.D)	**Mean (S.D)**		**Mean (S.D)**	**Mean (S.D)**	
Age (years)	31.17(8.13)	34.65(8.44)	**0.029**	33.19(7.52)	34.44(8.90)	0.497
GAF Score**	52.71(8.35)	54.30(10.34)	0.431	49.00(10.01)	54.04(8.64)	**0.025**
Suicide Risk Score	13.71(9.77)	5.00(8.36)	**< 0.001**	13.56(10.36)	9.28(9.39)	**0.020**

Other total comorbidity* was assessed using Mini International Neuropsychiatric Interview (MINI) Scale and included generalized anxiety disorder, panic disorder, agoraphobia, social phobia, special phobia, obsessive compulsive disorder, post-traumatic stress disorder, alcohol abuse/ dependence, substance abuse/ dependence, bulimia nervosa, somatization disorder, and/ or adult attention deficit hyperactivity disorder (ADHD).
Bold p-values are significant.
** GAF: Global Assessment of Functioning scale.

among participants with bipolar depression, BPD was significantly associated with lower global functioning. This is also consistent with Parker et al. (2016), who found that patients with bipolar disorder comorbid with BPD were less likely to be employed than those with bipolar disorder only.

However, contrary to our hypothesis, our study did not find a significant association between BPD and global functioning in patients with DD. This is similar to the findings of Stern, Herron, Primavera, and Kakuma, (1997); who did not find a significant difference of global functioning between BPD patients with depressive symptoms and MDD patients. Research investigating the association between BPD and global functioning in patients with DD is scarce. Gunderson et al. (2014) suggested that MDD and BPD overlap in their psychopathology, while bipolar disorder and BPD are independent disorders. This might explain why global functioning might be significantly associated with BPD in patients with bipolar depression but not in patients with MDD or DD. BPD in bipolar depression represents a comorbid disorder which might affect the outcome of the latter in the form of affecting the global functioning. On the other hand, BPD and MDD might represent different presentations of the same psychopathology, in which case the global functioning might be more affected by the severity of the original psychopathology and the symptoms than it would be by the presence or absence of BPD.

Among the total number of patients with BPD and depression, we found that suicide risk was significantly correlated with higher DSH and lower global functioning, but only global functioning was found to significantly predict suicide risk. This supports previous research stating that BPD patients who attempt suicide are more likely to have previous history of DSH (Baus et al., 2014; Pérez, Marco, & García-alandete, 2014; Sher et al., 2016). Grandclerc, De Labrouhe, Spodenkiewicz, Lachal, and Moro, (2016) and Joiner et al. (2005) tried to explain this by pointing out that serious suicidal attempts require both the ability and the desire to perform them. Deliberate self-harm, especially when repeated, habituates the person to physical pain which can increase the risk of later suicide. Another explanation that has been proposed in the literature for the relationship between DSH and suicide is a common underlying biological substrate. The serotonin system and its underlying genes e.g., SLC6A4 are a promising candidate for this explanation (Bozorgmehr et al., 2018; Hankin, Barrocas, Young, Haberstick, & Smolen, 2015; Lin & Tsai, 2004; Sher & Stanley, 2009). The opioid system is another suspected shared substrate between DSH and suicidal behavior, which still needs further investigation in research (Sher & Stanley, 2008).

Our results, also, go with those of Benazzi (2005) who reported that suicidal ideation was associated with lower global functioning in patients with BDII depression. On the other hand, although Soloff and Chiappetta (2017) found no association between poor psychosocial functioning and suicidal risk in patients with BPD followed up for 8 years, they found that frequent changing of jobs (which implies poor occupational functioning) predicted suicide attempts in the same patients. Their findings, along with our finding showing that global functioning might predict suicide with an adjusted R^2 of 64%, raise the point that global functioning is a comprehensive entity that should be divided into more specific entities to find out the exact predictors of suicide among global functioning.

Not finding significant correlation between impulsivity and suicide risk in patients with BPD and depression distinguishes our study from previous research. Chesin, Jeglic, and Stanley, (2010), for example, found an association of impulsivity with the lethality and number of suicide attempts in patients with BPD. Other studies showed that impulsivity predicted suicide risk in patients with MDD and bipolar disorder (Rihmer & Benazzi, 2010; Zeng et al., 2015). This discrepancy might be due to studying different populations since, unlike the aforementioned articles, we studied BPD patients with comorbid depression in which characteristics of suicide are probably different from those in BPD-only or depression-only patients. It seems that lower global functioning, rather than impulsivity, predicts suicide in patients with BPD and comorbid depression.

5. Conclusions

This study suggests that BPD is associated with higher risk of suicide in patients with different types of depression. BPD may also be associated with lower global functioning in patients with bipolar depression. Lower global functioning might predict suicide in patients with BPD and depression. This particular finding points to the importance of the assessment and support of global functioning in patients with BPD and depression.

6. Limitations of this study

One limitation of our study is the convenience sampling method, however, we tried to overcome this by including a larger sample size of 300 participants. In addition, the retrospective assessment of manic/hypomanic symptoms in many participants could have led to an imprecise allocation of participants with bipolar disorder to the 'depressive disorders' group or vice versa. We suggest future studies with additional diagnostic information from family members.

Moreover, almost all participants were on medications. The timing of data collection in relation to the start of medications was not standardized, which might have confounded the results. This study did not assess for, or exclude, patients with other personality disorders, and this too may be a confounding factor in some results. In addition, we assessed trait impulsivity using BIS-11 in those patients, as one of our secondary outcomes and despite requesting that participants respond to the BIS-11 scale according to their lifetime traits, this might have produced non-accurate results. Ideally, trait impulsivity should be measured in controlled (euthymic) patients, but this was not available for our study design.

Declarations of interest

None.

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Ethical Statement

All participants provided written informed consent.

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