Suicide attempts in Bipolar Disorder: The roles of interpersonal sensitivity and perceived cognitive failures

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SUMMARY

Objective: Suicidal behavior remains a major clinical concern in bipolar disorder even during euthymic periods. This study aimed to compare interpersonal sensitivity, perceived cognitive failures, and affective symptoms in euthymic patients with bipolar disorder with and without a history of suicide attempts, and to examine whether perceived cognitive failures mediate the association between interpersonal sensitivity and suicidal behavior.

Method: This cross-sectional study included 68 euthymic patients with bipolar disorder. Participants were divided according to the presence of a history of suicide attempts. All participants were evaluated with the Hamilton Anxiety Rating Scale (HAM-A), Hamilton Depression Rating Scale (HAM-D), Interpersonal Sensitivity Measure (IPSM), and Cognitive Failures Questionnaire (CFQ). Group comparisons, correlation analyses, and bootstrap mediation analyses were performed.

Results: Patients with a history of suicide attempts had higher HAM-D ($p=.008$), CFQ ($p=.005$), and IPSM total scores ($p=.033$). The number of lifetime suicide attempts was positively correlated with perceived cognitive failures ($r=.38$, $p<.01$) and interpersonal sensitivity ($r=.26$, $p<.05$). In the bias-corrected bootstrap mediation model controlling for medical comorbidity, perceived cognitive failures statistically mediated the association between interpersonal sensitivity and the number of suicide attempts ($\beta=.138$, $p=.019$), whereas anxiety and depressive symptoms did not.

Discussion: Euthymic patients with bipolar disorder and a history of suicide attempts showed greater interpersonal sensitivity and subjective cognitive difficulties. Perceived cognitive failures may represent an important factor involved in the association between interpersonal sensitivity and suicidal behavior. Assessing interpersonal and cognitive factors in addition to mood symptoms may improve the clinical evaluation of suicide risk.

Key Words: Bipolar disorder, interpersonal sensitivity, perceived cognitive failures, suicide.

INTRODUCTION

Bipolar disorder (BD), which is characterized by recurrent episodes of mania and depression, is a persistent and chronic psychiatric disorder (1). Notwithstanding sociodemographic characteristics, the prevalence of this psychiatric disorder exceeds 1% of the global population. BD is among the foremost causes of disability in adults, resulting in cognitive and functional impairment, as well as an escalation in suicide rates (2,3). BD has been identified as a psychiatric disorder with one of the highest suicide rates (4). Throughout the course of the disease, the elevated risk of suicide, which has been observed to manifest particularly during depressive episodes but also during the euthymic phase, constitutes a pivotal challenge in its clinical management. Research has demonstrated that individuals diagnosed with BD have lifetime suicide attempt rates ranging from 25 to 50 %. This risk is estimated to be approximately 20–30 times higher than that in the general population (5–7). Therefore, elucidating the clinical and psychosocial factors contributing to suicidal behavior in BD is of great importance for both risk assessment and the development of preventive interventions for patients with BD.

Interpersonal sensitivity is a personality trait characterized by an individual's heightened sensitivity to others' thoughts, feelings, and behaviors. This sensitivity is further characterized by expectations

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of negative evaluation or rejection and intense emotional responses to these situations (8). This trait encompasses components such as social anxiety, low self-esteem, and interpersonal dependency and is closely associated with various psychiatric disorders, particularly mood disorders (9). According to the extant literature, increased interpersonal sensitivity has been observed during both depressive and euthymic periods in patients with BD. This heightened sensitivity has been demonstrated to exert a detrimental effect on patients' social functioning and potentially contribute to an elevated suicide risk (8,10,11). Furthermore, research has indicated a correlation between interpersonal sensitivity, childhood trauma, and non-suicidal self-harm behaviors (12,13). These findings suggest that interpersonal sensitivity in BD may not merely be a concomitant trait but also a potentially critical factor for understanding and predicting suicidal behavior.

Cognitive failures are daily manifestations that include distraction, forgetfulness, lack of planning, and incorrect task performance. These failures reflect an individual's subjective perception of their cognitive functioning (14). These errors have been observed not only in elderly individuals or those with neurological diseases but also in various psychiatric conditions, including mood disorders (15). Cognitive impairments can be observed at all stages of BD (14). Contrary to the findings of certain studies (16,17), some studies have reported an association between cognitive impairments and heightened suicidal ideation or attempts in patients with BD (18,19). Another study revealed that favorable cognitive function is linked to a protective role against suicidal behavior in patients with BD (7). These findings suggest that cognitive impairments in BD may be an important component that affects not only functionality but also the risk of suicide. A meta-analysis of 41 studies underscored the necessity for additional research on the predictive role of cognitive functions in suicidal behavior in BD (20).

The extant literature suggests that both interpersonal sensitivity and cognitive difficulties may be associated with suicide risk in patients with BD. However, recent evidence also indicates that these associations are not uniform across studies. A recent systematic review and meta-analysis reported mixed findings regarding the relationship between cognitive functioning and suicidal ideation or suicide attempts in BD, with associations varying according to the cognitive domain assessed and the type of suicidal outcome examined (20). This inconsistency may partly reflect methodological differences, including the use of objective neuropsychological tests versus self-reported or perceived cognitive difficulties. Similarly, recent work has highlighted the clinical relevance of interpersonal sensitivity in mood disorders, but most studies have examined interpersonal sensitivity as an isolated psychosocial risk-related factor rather than in combination with cognitive complaints (8,13). Moreover, a recent scoping review of psychosocial factors associated with suicidality in BD emphasized that this literature often lacks explicit theory-driven models linking psychosocial factors to suicidal outcomes (21). In this context, the present study aimed to examine the potential statistical mediating role of perceived cognitive failures in the association between interpersonal sensitivity and suicide attempts in euthymic patients with BD. By evaluating interpersonal sensitivity, perceived cognitive failures, and suicidal behavior within a single model, this study seeks to provide an exploratory contribution to understanding psychosocial and perceived cognitive correlates of suicide risk in BD.

METHOD

Participants and Procedure

The study sample comprised 68 patients diagnosed with BD at the Necmettin Erbakan University Faculty of Medicine Psychiatry Clinic. The inclusion criteria for patients were as follows: having a diagnosis of BD according to the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5), being in the euthymic phase according to clinical evaluation and scales, and being aged between 18 and 60. The exclusion criteria for the study were as follows: Young Mania Rating Scale (YMRS) score >7, Hamilton Depression Rating Scale (HAM-D) score >7, presence of mental retardation, schizophrenia, or schizoaffective disorder, presence of serious uncontrolled physical illness or medication use that could affect cognitive function, history of head trauma and organic brain syn-

drome, and presence of alcohol and substance use disorders. All participants were assessed with the Young Mania Rating Scale and Hamilton Depression Rating Scale to confirm euthymia, and with the Hamilton Anxiety Rating Scale, Interpersonal Sensitivity Measure, and Cognitive Failures Questionnaire for clinical evaluation. Patients were divided into two groups based on the presence of suicide attempts: those with suicide attempts (SA) (n=23, 33.8%) and those without suicide attempts (NSA) (n=45, 66.2%). The presence and number of lifetime suicide attempts were determined through face-to-face clinical interviews with the patients and by reviewing detailed past medical records. For the group comparisons, suicide attempt was used as a dichotomous variable indicating the presence or absence of a lifetime suicide attempt. For the correlation and mediation analyses, the number of lifetime suicide attempts was used as a continuous outcome variable. Sociodemographic and psychometric variables were compared between the two groups. The sample size was calculated using G*Power 3.1.9.2 software (α=0.05, power=0.80, effect size=0.65). The analysis indicated that at least 64 participants should be included in this study.

Data Collection Tools

Sociodemographic data form: This form was designed to gather demographic information, including age, gender, education level, marital status, income level, and living status.

Young Mania Rating Scale (YMRS): This scale was developed by Young et al. to measure the severity of mania (22). The scale comprises 11 items, each with five stages. The interviewer utilizes a structured assessment tool to evaluate the severity of manic symptoms, focusing on the experiences of the previous week. The Turkish validity and reliability study yielded an internal consistency coefficient of 0.79 (23). The YMRS was used to ascertain that the BD patients included in the present study were in the remission phase.

Hamilton Depression Rating Scale (HAM-D): This scale is a widely used clinical tool for assessing the severity of depressive symptoms (24). This 17-item scale assesses depressive symptoms, including mood, sleep, appetite, guilt, libido, and loss of interest. Items are scored on a 0-4 or 0-2 scale. The scale's score range extends from 0 to 52, with higher scores denoting an elevated risk of depression. The evaluation can be conducted by an interviewer with psychopathology expertise. The adaptation of the scale to the Turkish population has demonstrated its high reliability and validity (25).

Hamilton Anxiety Rating Scale (HAM-A): This scale, which is a psychometric instrument that assesses the intensity of anxiety symptoms experienced by individuals, is a five-point Likert-type scale (26). The scale serves as an indicator of the severity of anxiety experienced by participants. Each item is assigned a score ranging from 0 to 4, with a maximum total score of 56, and no specific cutoff score has been established. The administration of this scale is best suited for interviewers with expertise in psychopathology, and it can be used for comparative studies. The Turkish adaptation of the scale has been found to have high validity and reliability (27).

Interpersonal Sensitivity Measure (IPSM): This scale was developed by Boyce and Parker (1989) to assess individuals' levels of sensitivity in interpersonal relationships (28). The scale was adapted into Turkish by Doğan and Sapmaz (2012) and subsequently reduced to 30 items. The Turkish version employs a five-point Likert scale (1 = "not at all appropriate," 5 = "definitely appropriate") and consists of three subscales: "Interpersonal Worry and Dependency" (IPSM-IWD), "Lack of Social Self-Confidence" (IPSM-LSSC), and "Non-Assertive Behaviors" (IPSM-NAB). Individuals who exhibit elevated scores on this scale demonstrate high interpersonal sensitivity. The internal consistency coefficient of the Turkish version of the scale was reported to be .88. The Cronbach's alpha values for the subscales were .90, .76, and .72, respectively (29).

Cognitive Failure Questionnaire (CFQ): The CFQ was developed by Broadbent et al. in 1982 (30). It is a 25-item self-report scale that assesses cognitive impairments in attention, memory, and motor function in daily life. The 4-point Likert-type

Turkish version developed by Yapıcı Eser et al. (2020) underwent a comprehensive examination of its validity and reliability. The instrument demonstrated high internal consistency reliability, as evidenced by a Cronbach's alpha coefficient of 0.91. In the adapted form for our country, the maximum score is 75, with higher scores indicating greater perceived cognitive impairment (31).

Statistical Analysis

All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) software (IBM, Statistics for Windows, Version 22) and Jamovi (v2.6.44) software for mediation analyses. The distribution characteristics of the data were evaluated using the Kolmogorov–Smirnov and Shapiro–Wilk tests. For continuous variables that exhibited a normal distribution, the independent samples t-test was employed, while the Mann–Whitney U test was utilized for non-normally distributed variables. The chi-square (χ^2) test was used to analyze categorical data. A significance level of $p<.05$ was established as the threshold for determining statistical differences between the groups. Spearman's correlation analysis was used to assess the relationships between variables These correlation analyses were considered exploratory, and no formal correction for multiple testing was applied. Therefore, the correlation findings were interpreted cautiously as hypothesis-generating associations. Furthermore, mediation analysis using a general linear model was conducted to assess the potential statistical mediating role of perceived cognitive failures in the association between interpersonal sensitivity and the number of suicide attempts. Anxiety and depressive symptoms were also included in the model, and medical comorbidity was entered as a covariate because it differed significantly between the suicide-attempt and non-attempt groups. To improve the robustness of the indirect-effect estimation in this modest clinical sample, the mediation analysis was repeated using 5000 bias-corrected bootstrap samples. Standardized β coefficients, standard errors (SE), 95% confidence intervals (CI), z-values, and p-values were reported. The indirect, direct, and total associations were evaluated separately, with the significance threshold set at $p<.05$.

RESULTS

Sociodemographic and Clinical Characteristics

The analysis revealed no statistically significant differences between participants with a history of suicide attempts (SA) and those without (NSA) in terms of demographic and clinical variables. These variables included age, gender, marital status, education level, income, place of residence, type of bipolar disorder, and tobacco use ($p>.05$). However, a notable finding was the significantly higher rate of medical comorbidity observed in the SA group (39.1% vs. 15.6%; $p=.03$). A detailed comparison of the sociodemographic characteristics of the groups is presented in Table 1.

Group Differences Among Psychometric Tests

A comparison of the scales used to assess the severity of psychiatric symptoms revealed that the SA group had significantly higher levels of depression ($p=.008$). Additionally, individuals in the SA group had significantly higher perceived cognitive failure scores ($p=.005$). The SA group had significantly higher interpersonal sensitivity total scores ($p=.033$), IPSM-IWD subscale scores ($p=.024$), and IPSM-LSSC subscale scores ($p=.033$) than the NSA group did. However, no significant difference was found between the groups in the IPSM-NAB subscale ($p=.515$). Table 2 presents a comparison of the psychometric test results.

Correlations Between Interpersonal Sensitivity, Perceived Cognitive Failures and Suicide Attempts

A positive relationship was found between the number of suicide attempts and CFQ scores ($r=.38$, $p<.01$) in the correlation analysis. Similarly, the IPSM total score was significantly correlated with the number of suicide attempts ($r=.26$, $p<.05$). A significant positive correlation was also found between the IPSM-LSSC and the number of suicide attempts ($r=.27$, $p<.05$). Furthermore, CFQ scores were positively correlated with the IPSM total scores ($r=.41$, $p<.01$), HAM-D scores ($r=.27$, $p<.05$), HAM-A scores ($r=.35$, $p<.01$), IPSM-IWD scores ($r=.34$, $p<.01$),

Table 1. Comparison of Sociodemographic and Clinical Characteristics Between Patients with and without Suicide Attempt (Mean ± SD).

		Group			
		NSA (n=45)	SA (n=23)	t / Z / x^2	p
Age [a]		40.71 ± 12.35	43.91 ± 13.2	-0.988	.327
Years of Education (years) (median)		10.71 ± 4.48 (12)	10.13 ± 4.9 (12)	-0.353	.724
Gender	Female	24 (53.3%)	13 (56.5%)	0.062	.803
	Male	21 (46.7%)	10 (43.5%)		
Marital Status	Married	27 (60%)	14 (60.9%)	0.005	.945
	Single	18 (40%)	9 (39.1%)		
Income (TL) (median)		13791±18592 (0)	14934±24391 (0)	-0.485	.628
Occupational Status	Employed	19 (42.2%)	9 (39.1%)	4.034	.133
	Unemployed due to disorder	0 (0%)	2 (8.7%)		
	Unemployed due to other reason	26 (57.8%)	12 (52.2%)		
Living with	Alone	1 (2.2%)	0 (0%)	0.519	.471
	Family	44 (97.8%)	23 (100%)		
Place of Residency	Urban	44 (97.8%)	21 (91.3%)	1.512	.219
	Rural	1 (2.2%)	2 (8.7%)		
BMI [a]		29.11 ± 6.03	28.24 ± 4.24	0.615	.541
Bipolar Type	Type I	40 (88.9%)	20 (87%)	0.055	.815
	Type II	5 (11.1%)	3 (13%)		
Tobacco Use	Yes	16 (35.6%)	10 (43.5%)	0.405	.525
Seasonality	Yes	21 (46.7%)	10 (43.5%)	0.062	.803
Presence of Psychotic Symptoms in Episodes	Yes	19 (42.2%)	13 (59.1%)	1.685	.194
	Depression	14 (31.1%)	10 (43.5%)	1.125	.570
Predominant Polarity	Mania	23 (51.1%)	9 (39.1%)		
	Equal	8 (17.8)	4 (17.4%)		
Rapid Cycling	Yes	7 (15.6%)	1 (4.3%)	1.842	.175
History of ECT	Yes	4 (8.9%)	0 (0%)	2.172	.141
Medical Comorbidity	Yes	7 (15.6%)	9 (39.1%)	4.701	.030
Family History of Psychiatric Disorder	Yes	19 (42.2%)	65.2 (15%)	3.219	.073
Duration of Disorder (years) (median)		14.49 ± 9.8 (14)	13.89 ± 11.17 (10)	-0.377	.706
Age at onset of Disorder (median)		25.64 ± 10.61(22)	30.65 ± 11.98 (30)	-1.850	.064
Number of Suicide Attempts (median)			1.74 ± 0.75 (2)		

P≤0.05, Chi-square and Mann-Whitney U tests were carried out. [a]Independent Sample t-test was applied due to normally distributed data. SA: Suicide Attempt, NSA: Non-Suicide Attempt, BMI: Body Mass Index, ECT: Electro-Convulsive Therapy, TL: Turkish Liras, SD: standard deviation.

and IPSM-LSSC scores (r=.35, p<.01). The data related to the correlation analyses are presented in Table 3.

The Mediating Role of Perceived Cognitive Failures in the Relationship Between Interpersonal Sensitivity and Number of Suicide Attempts

In the mediation analysis, the number of suicide attempts was used as the outcome variable, and medical comorbidity was included as a covariate. The model was estimated using 5000 bias-corrected bootstrap samples. The indirect association between IPSM and the number of suicide attempts through CFQ was statistically significant (Estimate=0.00812, SE=0.00345, 95% BC bootstrap CI=0.00195–0.01837, β=0.1378, p=.019). IPSM was significantly associated with CFQ scores (Estimate=0.33050, SE=0.10196, β=0.3596, p=.001), and CFQ was significantly associated with the number of suicide attempts (Estimate=0.02456, SE=0.00717, β=0.3832, p<.001). In contrast, the indirect associations through HAM-A and HAM-D were not significant. The total association between IPSM and the number of suicide attempts was significant (Estimate=0.01595, SE=0.00687, β=0.2708, p=.020), whereas the direct association did not reach statistical significance (Estimate=0.00865,

Table 2. Comparison of Psychometric Tests of the Groups (Mean – SD).

	Group			
	NSA (n=45)	**SA (n=23)**	**t / Z**	**p**
HAM-A (median)	4.53 ± 5.22 (2)	4.22 ± 4.57 (3)	-0.334	.739
HAM-D (median)	1.27 ± 1.7 (0)	2.17 ± 1.37 (2)	-2.663	**.008**
YMRS (median)	0.18 ± 0.61 (0)	0.35 ± 0.78 (0)	-1.398	.162
CFQ (median)	15.73 ± 10.34 (15)	27.52 ± 18.36 (21)	-2.796	**.005**
IPSM Total [a]	68.29 ± 12.73	78.22 ± 19.34	-2.228	**.033**
IPSM-IWD [a]	34.31 ± 8.84	41.04 ± 15.25	-2.307	**.024**
IPSM-NAB [a]	21.71 ± 7.27	22.91 ± 6.95	-0.654	.515
IPSM-LSSC (median)	12.64 ± 4.3 (12)	14.7 ± 3.75 (14)	-2.137	**.033**

p ≤ 0.05, Chi-square and Mann-Whitney U tests were carried out. [a]Independent Sample t-test was applied due to normally distributed data. SA: Suicide Attempt, NSA: Non-Suicide Attempt, HAM-A: Hamilton Anxiety Scale, HAM-D: Hamilton Depression Scale, YMRS: Young Mania Rating Scale, CFQ: Cognitive Failure Questionnaire, IPSM: Interpersonal Sensitivity Measure, IPSM-IWD: Interpersonal Sensitivity Measure-Interpersonal Worry and Dependency, IPSM-LSSC: Interpersonal Sensitivity Measure-Lack of Social Self-Confidence, IPSM-NAB: Interpersonal Sensitivity Measure-Non-Assertive Behaviors, SD: standard deviation.

Table 3. Correlation Between Psychometric Tests and Sociodemographic Features.

(n=68)	Age	Years of Education	Duration of Disorder	Number of Suicide Attempts	CFQ	IPSM	HAM-A	HAM-D	IPSM-IWD	IPSM-LSSC	IPSM-NAB
Age	1										
Years of Education	-.37**	1									
Duration of Disorder	.52**	-.21	1								
Number of Suicide Attempts	.06	-.05	-.08	1							
CFQ	-.16	-.02	-.06	.38**	1						
IPSM	-.04	-.14	-.05	.26*	.41**	1					
HAM-A	-.16	-.08	-.12	.04	.35**	.18	1				
HAM-D	-.15	.05	-.07	.33**	.27*	.06	.47**	1			
IPSM-IWD	-.05	-.09	-.13	.23	.34**	.92**	.15	.08	1		
IPSM-LSSC	.05	.02	.01	.27*	.35**	.12	.18	.16	-.02	1	
IPSM-NAB	-.02	-.10	-.02	.12	.14	.67**	.10	-.10	.52**	-.22	1

*p<0.05, ** p<0.01, Spearman's correlation test was carried out. HAM-A: Hamilton Anxiety Scale, HAM-D: Hamilton Depression Scale, CFQ: Cognitive Failure Questionnaire, IPSM: Interpersonal Sensitivity Measure, IPSM-IWD: Interpersonal Sensitivity Measure-Interpersonal Worry and Dependency, IPSM-LSSC: Interpersonal Sensitivity Measure -Lack of Social Self-Confidence, IPSM-NAB: Interpersonal Sensitivity Measure-Non-Assertive Behaviors.

SE=0.00645, β=0.1469, p=.180). Medical comorbidity did not show a significant direct or total association with the number of suicide attempts. These findings are consistent with a statistical mediating pathway in which higher interpersonal sensitivity is associated with more frequent perceived cognitive failures, which in turn are associated with a higher number of suicide attempts. The revised pathway diagram and the updated mediation results are presented in Figure 1 and Table 4.

DISCUSSION

Patients with euthymic BD and a history of suicide attempts had higher interpersonal sensitivity, perceived cognitive failure scores, and HAM-D scores than those without such a history. Although all participants met the predefined clinical and scale-based criteria for euthymia, the higher HAM-D scores in the SA group should not be interpreted as indicating an acute depressive episode; rather, they may reflect residual or subthreshold depressive vulnerability. Such residual depressive symptoms may still be clinically relevant for suicide risk in BD, even during euthymic periods. The number of suicide attempts was positively correlated with interpersonal sensitivity and perceived cognitive failures. The mediation analysis showed that perceived cognitive failures, but not anxiety or depressive symptoms, statistically mediated the association between interpersonal sensitivity and the number of suicide attempts after accounting for medical comorbidity. Consistent with the clinical relevance of residual depressive symptoms, HAM-D was significantly associated with the number of suicide attempts in the revised model; however, the indirect pathway from interpersonal sensitivity to the number of suicide attempts through HAM-D was not significant. Therefore, the main statistical indirect association in the present model appeared to be more closely related to perceived cognitive failures than to depressive symptoms. However, because of the cross-sectional design, this finding

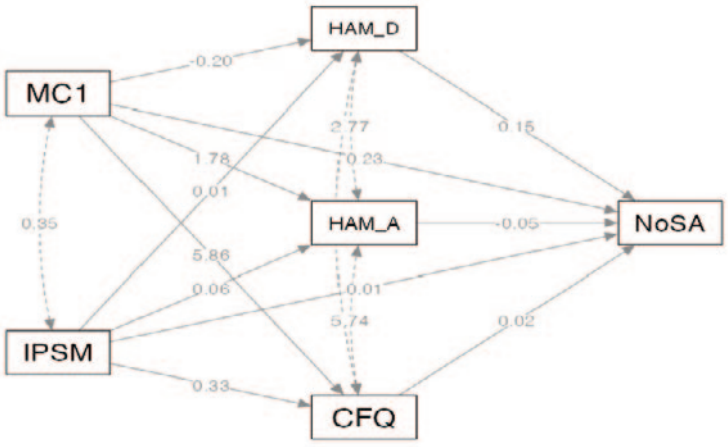

Figure 1. Path Diagram of the Mediation Model.

Standardized path coefficients are presented. The model tested the statistical mediating role of perceived cognitive failures in the association between interpersonal sensitivity and the number of suicide attempts, with medical comorbidity included as a covariate. IPSM: Interpersonal Sensitivity Measure; CFQ: Cognitive Failures Questionnaire; HAM_A: Hamilton Anxiety Rating Scale; HAM_D: Hamilton Depression Rating Scale; NoSA: Number of Suicide Attempts; MC1: presence of medical comorbidity.

Table 4. Indirect and Total Effects of Perceived Cognitive Failures, Anxiety, Depression, and Medical Comorbidity on the Relationship Between Interpersonal Sensitivity and Number of Suicide Attempts

Type	Effect	Estimate	SE	95% C.I.		□	z	p
				Lower	Upper			
Indirect	IPSM => CFQ => NoSA	0.00812	0.00345	0.00195	0.01837	0.1378	2.354	**.019**
	IPSM => HAM-A => NoSA	-0.00272	0.00213	-0.00817	-1.13e-4	-0.0463	-1.279	.201
	IPSM => HAM-D => NoSA	0.00191	0.00201	-8.77e-4	0.00814	0.0324	0.949	.343
	MC1 => CFQ => NoSA	0.14381	0.10199	-0.05180	0.62288	0.0658	1.410	.159
	MC1 => HAM-A => NoSA	-0.08516	0.07535	-0.32133	0.04432	-0.0390	-1.130	.258
	MC1 => HAM-D => NoSA	-0.02999	0.06956	-0.20736	0.09664	-0.0137	-0.431	.666
Component	IPSM => CFQ	0.33050	0.10196	0.00420	0.59340	0.3596	3.242	**.001**
	CFQ => NoSA	0.02456	0.00717	0.00540	0.04126	0.3832	3.425	**<.001**
	IPSM => HAM-A	0.05706	0.03696	6.86e-4	0.12424	0.1818	1.544	.123
	HAM-A => NoSA	-0.04774	0.02088	-0.09406	-0.00479	-0.2544	-2.287	**.022**
	IPSM => HAM-D	0.01290	0.01246	-0.01070	0.03450	0.1247	1.036	.300
	HAM-D => NoSA	0.14788	0.06257	0.02584	0.30905	0.2599	2.364	**.018**
	MC1 => CFQ	5.85643	3.78493	-3.80013	17.64228	0.1717	1.547	.122
	MC1 => HAM-A	1.78396	1.37204	-1.24245	5.65737	0.1531	1.300	.194
	MC1 => HAM-D	-0.20282	0.46245	-1.07157	0.70256	-0.0528	-0.439	.661
Direct	IPSM => NoSA	0.00865	0.00645	-0.00339	0.02186	0.1469	1.342	.180
	MC1 => NoSA	0.23379	0.22870	-0.19747	0.67988	0.1069	1.022	.307
Total	IPSM => NoSA	0.01595	0.00687	0.00139	0.03035	0.2708	2.322	**.020**
	MC1 => NoSA	0.26245	0.25495	-0.24571	0.82888	0.1201	1.029	.303

Note. Confidence intervals were computed using the bias-corrected bootstrap method with 5000 bootstrap samples. Betas are completely standardized effect sizes. HAM-A: Hamilton Anxiety Rating Scale; HAM-D: Hamilton Depression Rating Scale; CFQ: Cognitive Failures Questionnaire; IPSM: Interpersonal Sensitivity Measure; MC1: Medical comorbidity contrast indicator (1 = presence, 0 = absence); NoSA: Number of Suicide Attempts; C.I.: Confidence Interval; SE: Standard Error.

should be interpreted as an indirect statistical association rather than evidence of temporal or causal mediation. These findings suggest that suicide risk assessment in BD should address interpersonal and cognitive factors in addition to mood symptoms.

Interpersonal sensitivity has been associated with suicidal ideation and self-mutilative behaviors in non-clinical populations (32–34). Community-based studies have demonstrated a positive correlation between increased interpersonal sensitivity and the prevalence of self-harming behavior (12). Increased interpersonal sensitivity has also been reported in psychiatric disorders. Hidese et al. (2022) demonstrated positive correlations between general psychopathology and interpersonal sensitivity levels in schizophrenia, BD, and major depressive disorder (35). In a related study, Polskaya and colleagues (2023) reported an increase in interpersonal sensitivity among adolescent girls with suicidal tendencies and eating disorders (36). A more recent study underscored the significance of interpersonal sensitivity in patients with mood disorders (8). Research in this area has revealed heightened interpersonal sensitivity in patients with suicidal tendencies and treatment-resistant depression (37,38). Regardless of the type of mood disorder, interpersonal sensitivity has been found to be associated with atypical depression, childhood traumatic experiences, and increased impulsivity (9,39,40). However, some authors have suggested that BD is associated with higher interpersonal sensitivity among mood disorders (11,13). Furthermore, Kwon et al. (2024) proposed that heightened interpersonal sensitivity in patients with BD is associated with low self-esteem (13). The extant literature provides substantial evidence that interpersonal sensitivity is associated with suicidal thoughts, behaviors, and BD. However, there is a paucity of literature on interpersonal relationships in relation to suicidal behavior in patients with BD. In the present study, we sought to examine the relationship between interpersonal sensitivity and suicide attempts in patients with BD. The findings of the present study indicate that individuals with BD who have attempted suicide exhibit heightened levels of interpersonal sensitivity. Furthermore, these sensitivity levels were positively correlated with the number of suicide attempts. Most studies that have reported an increase in interpersonal sensitivity in patients diagnosed with bipolar disorder have been conducted on individuals experiencing depressive episodes. The present study found that interpersonal sensitivity persists even during euthymic periods. Components of interpersonal sensitivity, such as interpersonal worry/dependency and lack of social self-confidence, were also higher in patients with a history of suicide attempt. Recent network-based evidence indicates that interpersonal sensitivity is not a unitary construct but includes interrelated components such as interpersonal worry, dependency, and social self-confidence (8). This is consistent with our finding that IPSM total, IPSM-IWD, and IPSM-LSSC scores were higher in patients with a history of suicide attempt, whereas the non-assertive behavior subscale did not differ significantly between groups. Thus, the present findings suggest that the suicide-related relevance of interpersonal sensitivity in BD may be more

closely related to interpersonal worry/dependency and lack of social self-confidence than to non-assertive behaviors per se.

It has been established that cognitive impairments are more prevalent in all stages of BD than in healthy controls (14). However, contradictory results have been reported regarding the relationship between suicidal ideation or attempts and cognitive function in BD (20). While some researchers have reported that cognitive functions are not impaired in BD patients with suicidal thoughts or attempts compared to those without (16,17), others have suggested that cognitive functions are negatively affected in those with suicidal attempts (15,18,19). It has been posited that the variability in outcomes may be attributable to the assessment of disparate cognitive domains across different studies (20). Li et al. (2025) asserted that good cognitive function in patients with BD serves as a protective factor against suicidal thoughts (7). In another study with a relatively large sample size, non-suicidal self-harm behaviors in BD patients are also associated with cognitive dysfunction (41). A study evaluating subjective cognitive functions reached a similar conclusion. This study claimed that subjective cognitive functions were more impaired in patients with BD than in healthy individuals and that these impairments could even predict suicidal thoughts (14). In the present study, perceived cognitive failure scores were found to be elevated in patients who had attempted suicide, and these scores exhibited a robust positive correlation with the number of suicide attempts. Our findings align with studies emphasizing the clinical relevance of cognitive difficulties in self-harm-related outcomes in BD. However, recent evidence also suggests that the relationship between cognition and suicidality in BD is complex rather than linear. Le et al. (2024) reported mixed findings across cognitive domains in BD, indicating that cognitive functioning may relate differently to suicidal ideation and suicide attempts depending on the domain assessed (20). In addition, recent studies have shown that cognitive difficulties may be relevant to self-harm-related outcomes in BD, but these findings are not fully consistent across samples and assessment methods (41). Importantly, the CFQ used in the present study measures perceived cognitive failures in daily life rather than objective neuropsychological performance. Therefore, our findings should be interpreted as supporting the clinical relevance of perceived cognitive difficulties in relation to suicidal behavior, rather than as evidence that objective cognitive impairment directly contributes to suicide attempts. Furthermore, the positive association between perceived cognitive failures and interpersonal sensitivity suggests that these two domains may jointly characterize a subgroup of patients with greater suicide-related vulnerability.

A salient finding of this study is that perceived cognitive failures statistically mediated the association between interpersonal sensitivity and the number of suicide attempts in the mediation model, which included anxiety and depressive symptoms and controlled for medical comorbidity. This result suggests that when assessing suicide risk in BD, it may be useful to consider interpersonal sensitivity and perceived cognitive difficulties together rather than as entirely separate domains. Existing research has not sufficiently addressed how interpersonal sensitivity and perceived cognitive difficulties may be statistically linked to suicidal behavior within the same model. Prior research has largely treated these variables as independent risk-related factors (14,21). The main contribution of the present study is that it integrates two previously separate lines of research: the psychosocial literature on interpersonal sensitivity and the cognitive literature on perceived cognitive difficulties in BD. Rather than treating these variables as independent risk markers, the present model suggests that perceived cognitive failures may help characterize the statistical link between interpersonal sensitivity and the number of suicide attempts. Nevertheless, given the cross-sectional design and modest sample size, this interpretation should be regarded as exploratory and hypothesis-generating.

Individuals with high interpersonal sensitivity have been shown to experience heightened arousal, negative evaluation expectations, and perceptions of rejection in social interactions (8). This phenomenon may lead to an escalated state of vigilance, characterized by incessant monitoring of potential threats and an accentuated focus on emotionally laden information during cognitive processes such as attention and memory. Emotional overload, characterized by the excessive accumulation of distressing emotions, can lead to a marked depletion of cognitive resources. This, in turn, has

the potential to diminish an individual's sense of self-efficacy or the belief in one's ability to execute a task or achieve a goal. A decline in self-efficacy and impaired problem-solving capacity can reinforce feelings of helplessness and hopelessness in stressful life events, triggering suicidal tendencies. In this context, cognitive failures may be considered a perceived cognitive correlate that helps explain the association between interpersonal sensitivity and suicidal behavior. However, the present cross-sectional data cannot exactly determine whether interpersonal sensitivity precedes cognitive failures or whether these factors jointly reflect broader vulnerability processes related to suicide risk. These findings indicate that suicide risk assessment in patients with BD should not be limited to mood symptoms. The persistence of elevated interpersonal sensitivity and cognitive error frequency during the euthymic period underscores the necessity of incorporating these factors into the standard clinical assessment protocol. In individuals with high interpersonal sensitivity, perceptions of rejection, social withdrawal, and feelings of helplessness may be more pronounced, triggering mechanisms that increase the risk of suicide. Similarly, in patients who experience frequent cognitive failures, weaknesses in daily living skills, and problem-solving abilities may reduce their capacity to cope with stress, thereby increasing their susceptibility to suicidal behavior. Consequently, interpersonal and perceived cognitive domains may represent clinically relevant targets for future preventive intervention studies in individuals with BD, although their efficacy in reducing suicide risk should be tested in prospective interventional research. From a clinical perspective, patients with high interpersonal sensitivity and frequent perceived cognitive failures may benefit from more detailed assessment and psychosocial support focusing on interpersonal interpretation, coping with perceived rejection, problem-solving skills, cognitive organization strategies, and relapse/risk monitoring. These implications should be considered as hypothesis-generating clinical suggestions rather than evidence of established psychotherapeutic effects.

This study has some limitations. First, the modest sample size obtained from a single center limits the generalizability of the findings. In particular, the relatively small number of patients with a history of suicide attempt may reduce the statistical stability of the mediation model and increase the risk of overfitting. Although the mediation analysis was repeated using 5000 bias-corrected bootstrap samples and medical comorbidity was included as a covariate, the findings should still be regarded as exploratory and require replication in larger multicenter samples. The second limitation of this study is its cross-sectional design, which precludes conclusions about temporal ordering or causality. Therefore, the mediation findings should be interpreted as statistical indirect associations rather than evidence that interpersonal sensitivity causes cognitive failures or suicidal behavior. Another limitation is the retrospective assessment of lifetime suicide-attempt history. Although suicide attempts were evaluated using both face-to-face clinical interviews and detailed medical record review, recall bias and incomplete documentation cannot be entirely excluded. In addition, several clinically relevant variables, including medication type, psychotropic treatment characteristics, number of previous mood episodes, hospitalization history, illness severity indices, and comorbid anxiety disorders, were not included in the statistical analyses. These factors may influence both perceived cognitive difficulties and suicidal behavior in patients with BD. Furthermore, the correlation analyses were exploratory and were not corrected for multiple comparisons; therefore, these bivariate findings should be interpreted cautiously. Finally, cognitive failures were assessed using the CFQ, which is a self-report measure of perceived cognitive difficulties in daily life rather than an objective neuropsychological assessment. This may introduce response bias and limits the extent to which the findings can be generalized to objective cognitive impairment. Future studies with larger samples, longitudinal designs, more comprehensive clinical characterization, and both subjective and objective cognitive assessments should examine whether the observed associations remain significant after controlling for illness- and treatment-related variables. A notable strength of this study is its examination of the relationships between interpersonal sensitivity, perceived cognitive failures, and suicidal behavior in euthymic patients with BD within a unified model. The application of mediation analysis to statistically demonstrate the mediating role of perceived cognitive errors in the relationship between interpersonal sensitivity and suicidal behavior provides a unique contribution to the literature. Furthermore, the observation of

these relationships even during the euthymic period, when mood symptoms are minimal, suggests that risk factors are not limited to the acute period.

Perceived cognitive failures significantly mediated the association between interpersonal sensitivity and suicidal behavior in euthymic patients with BD. These findings suggest that suicide risk in BD may be influenced not only by mood symptoms but also by interpersonal sensitivity and subjective cognitive difficulties. Assessing these domains may improve risk evaluation and help inform targeted preventive interventions. Further longitudinal studies with larger multicenter samples are needed.

Ethics Approval and Consent to Participate: The present study was conducted in accordance with the Declaration of Helsinki for investigations involving humans and was approved by the local ethics committee on human research (IRB Date/Number: 6.9.2024 / 2024.5137). Written informed consent was obtained from all patients prior to participation.

Consent for Publication: Not applicable

Data Availability Statement: Data supporting the findings are available from the corresponding author upon reasonable request.

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