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Functional Impairment, Attachment, and Affective Temperaments in Euthymic Patients with Bipolar Disorder

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ABSTRACT

Background: Functional impairment in euthymic patients with bipolar disorder is a compelling issue, and revealing unknown related factors with functional impairment is a substantial topic. We aimed to assess the effects of clinical factors, affective temperaments, and attachment on overall functioning in euthymic patients with bipolar disorder.

Methods: Sixty-three patients with bipolar disorder and 61 healthy controls participated in this study. The assessment involved Hamilton Depression Rating Scale; Young Mania Rating Scale; Relationship Scales Questionnaire; Temperament Evaluation of Memphis, Pisa, Paris, and San Diego; and Functioning Assessment Short Test.

Results: Secure attachment scores were significantly higher in the control group than in the bipolar disorder group. Depressive, anxious, and cyclothymic temperament scores were significantly higher in the bipolar disorder group. In the bipolar disordergroup higher occupational, cognitive, autonomy, interpersonal relationships, and leisure subdomain and overall functional impairment scores were found than in the healthy control group. Secure attachment scores were significantly and negatively correlated with anxious and depressive temperaments. Secure attachment scores were positively and significantly correlated with hyperthymic temperament scores. Years of education; subclinical depressive symptoms; secure attachment; and cyclothymic, irritable, depressive, hyperthymic, and anxious temperaments were all significantly correlated with the overall functional impairment in the patient group. The cyclothymic and anxious temperament positively predicted the overall functional impairment in the bipolar group, while the secure attachment negatively predicted the overall functional impairment in the regression analysis.

Conclusion: The results suggest that, when following up the patients with bipolar disorder in relation to functional impairment, secure attachment, cyclothymic, and anxious temperaments should be taken into consideration.

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INTRODUCTION

Given that it is a life-long illness characterized by recurrent episodes, it is unsurprising that bipolar disorder (BD) is associated with functional decline.[1] In fact, in a meta-analysis, the overall functional impairment of patients with BD was found to be 58.6%.[2] In this meta-analysis, only the studies which used the Functioning Assessment Short Test to measure functional impairment were evaluated. Additionally, in this meta-analysis, functional impairment was determined according to the cut-off point of the Functioning Assessment Short Test. Moreover, in a follow-up study conducted after the first episode, only 1 in 3 BD patients regained their premorbid functional level.[3] In the European Mania in Bipolar Longitudinal Evaluation of Medication study, the work domain of functioning was assessed before the year of the manic episode. Through the evaluation of 3681 patients, high work impairment was found at 68% in the year before the manic episode.[4] In a study with euthymic patients with BD, impaired functioning was associated with reduced quality of life.[5] Additionally, patients have demands about functional recovery. They wish to regain the levels of life quality, social and family life satisfaction, and working ability prior to the onset of the disease.[6] In light of such findings, there is growing research interest in investigating the factors that cause the functional impairment seen in patients with BD.[7] Besides this, the functional impairment issue is a topic of investigation in other major psychiatric disorders. In a study with 2280 patients with major depressive disorder, 7% of the patients were determined as normal functioning before the onset of treatment. At the end of the 12-month follow-up, nearly 60% of the patients were not functioning in the normal range.[8] Schizophrenia is one

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of the most debilitating diseases worldwide, and 4 main functional domains are being considered in its functional impairment: social interactions, work functioning, performance in daily activities, and independent living abilities.[9]

Attachment is a key factor related to the early childhood period. Indeed, formed by the early family environment, an individual's attachment system and processes have a lifelong impact. More specifically, people's attachment styles are based on their early relationships with caregivers. Attachment theory focuses on the way in which normative processes support an individual's mental health or promote pathology.[10] Yet, evidence concerning the influence of different attachment styles on BD remains unclear.[11] In some studies, no association has been identified between attachment styles and BD.[12,13] By contrast, other studies have determined that insecure attachment is significantly associated with BD patients when compared with healthy controls.[14,15]

Affective temperaments are thought to characterize the behavioral endophenotypes related to mood disorders with heritable origins.[16,17] They resemble a mental state that differs between healthy behaviors and subclinical presentations of mood disorders.[18] It has been suggested that there are 5 different affective temperaments: depressive, anxious, irritable, cyclothymic, and hyperthymic temperaments.[19,20] In a meta-analysis of patients with mood disorders, the irritable, cyclothymic, and anxious temperament scores were higher in the patient group than in the control group.[21]

The factors known to be most commonly associated with functional impairment in patients with BD are sociodemographic factors, subclinical symptoms, number of episodes, number of hospitalizations, comorbid conditions, substance abuse, personality features, and neurocognitive impairment.[22-24] Aside from these factors, it is possible that there are less well-investigated factors associated with functional impairment in patients with BD. Some of these factors are attachment, affective temperaments, neurological soft signs, dysfunctional attitudes, and features of pervasive developmental disorders.

MAIN POINTS

- Differences between patients with bipolar disorder (BD) and healthy controls were found regarding attachment and affective temperaments.
- Despite the remission criterion, the BD group showed more global functional impairment than the healthy controls.
- Secure attachment and hyperthymic affective temperament were positively correlated.
- Secure attachment, anxious, and cyclothymic affective temperaments may be predictors of global functional impairment in the BD group.
- The functional impairment assessment of euthymic patients with BD may focus on secure attachment, anxious and hyperthymic temperaments.

The present study had 2 key objectives. First, the study sought to assess the differences between euthymic patients with BD and healthy controls in terms of their sociodemographic and clinical features, attachment styles, affective temperaments, and functional impairment. Second, it aimed to assess the effects of sociodemographic and clinical factors, attachment styles, and affective temperaments on the functional impairment of euthymic patients with BD. To the best of our knowledge, this study is the first to assess the effects of the different attachment styles on the overall functional impairment of euthymic patients with BD, and this is the first study to assess the overall functional impairment of patients with BD using a combination of attachment styles and affective temperaments. Our main hypothesis was that secure attachment and hyperthymic temperament would negatively predict functional impairment, while fearful, dismissing, and preoccupied attachment styles and depressive, irritable, cyclothymic, and anxious temperaments would positively predict overall functional impairment in those with BD.

MATERIAL AND METHODS

Participants and Procedure

This study involved 63 euthymic patients with BD and 61 healthy controls. The study was carried out between October 2018 and February 2020. The patients with BD were recruited from our outpatient clinic. The healthy controls were recruited from our hospital staff, and we aimed to match the healthy controls with patients in terms of age, gender, and years of education. The participants were all adults aged 18-65 years. All of the participants underwent a comprehensive clinical interview conducted by the first author of this paper, a senior psychiatry resident. All procedures were performed according to the ethical standards of the 1964 Helsinki Declaration and its later amendments. Ethical approval to conduct this study was obtained from the Clinical Research Ethical Committee of Atatürk University Faculty of Medicine (Date: 04.10.2018, Decision no: 11). Moreover, all of the participants provided written informed consent to participate in the study.

All of the participants were interviewed in accordance with the Turkish version of the Structured Clinical Interview for DSM-IV (SCID-I).[25,26] To assess the severity of the participants' mood symptoms, the Turkish version of the 17-item Hamilton Depression Rating Scale (HAM-D-17) [27,28]and the Young Mania Rating Scale (YMRS) were utilized.[29,30] Only patients with a score of ≤7 on the HAM-D-17 and a score of ≤5 on the YMRS were included in this study. Moreover, the included patients were required to have been euthymic for at least 8 weeks. The exclusion criteria for the patients with BD were mental retardation, current pregnancy and/or lactation in women, current/history of a diagnosis of alcohol and/or substance abuse

within the previous 12 months, any comorbid psychiatric diagnosis according to the DSM-IV within the previous 12 months, and any medical illness affecting their general medical status. Only participants without any current psychiatric and/or medical disorders were enrolled as healthy controls in this study.

Measures

Following enrollment, all of the participants completed a sociodemographic and clinical data form that had been specifically developed by the researchers for the purposes of this study. The participants were also assessed using the Relationship Scales Questionnaire (RSQ); the Temperament Evaluation of Memphis, Pisa, Paris, and San Diego (TEMPS-A); and the Functioning Assessment Short Test (FAST).

Relationship Scales Questionnaire

The RSQ is a Likert-type self-report questionnaire that assesses attachment through 30 items.[31] It includes 4 types of attachment styles: secure, preoccupied, fearful, and dismissive. Secure and dismissive attachment styles are measured with 5 items, while preoccupied and fearful attachment styles are measured with 4 items. The scores that form the 4 attachment styles are obtained by adding the items that aim to measure these styles and dividing this total by the number of items in each subscale. Thus, the scores that can be obtained from the subscales range from 1 to 7. Griffin and Bartholomew found internal consistency coefficient of RSQ subscales ranging from 0.41 to 0.71.[31] Turkish validity and reliability studies of RSQ were performed by Sümer et al.[32] They calculated the internal consistency coefficient of RSQ subscales ranging from 0.27 to 0.61. We found good internal consistency of subscales of RSQ in our study (0.52-0.82).[33]

Temperament Evaluation of Memphis, Pisa, Paris, and San Diego

The participants' affective temperaments were assessed using the Turkish version of the TEMPS-A,[19,34] which evaluates 5 affective temperaments: irritable, anxious, cyclothymic, depressive, and hyperthymic. Turkish form of TEMPS-A includes 100 questions. The questions of this scale require "yes" (score 1) or "no" (score 0) answers. High scores of the TEMPS-A for each type of affective temperament are indicative of high features of affective temperaments. Anxious temperament scores range between 0 and 24, cyclothymic temperament scores range between 0 and 19, hyperthymic temperament scores range between 0 and 20, irritable temperament scores range between 0 and 18, and depressive temperament scores range between 0 and 18. Akiskal et al[19] found internal consistency coefficient of TEMPS-A subscales ranged from 0.67 to 0.91. Turkish validity and reliability study of TEMPS-A were performed by Vahip et al.[34] They calculated the internal consistency coefficient of TEMPS-A subscales ranging from 0.77 to 0.85. We found good internal consistency of subscales of RSQ in our study (0.79-0.88).[33]

Functioning Assessment Short Test

The participants' functioning was assessed using the FAST.[35] More specifically, the Turkish version of the FAST was applied to all of the participants to assess their level of functioning.[36] The FAST consists of 24 items. Each item is rated as 0: no difficulty, 1: mild difficulty, 2: moderate difficulty, 3: severe difficulty. It is designed to assess overall functioning as well as 6 specific domains of functioning: interpersonal relationships, financial issues, cognitive functioning, autonomy, leisure time, and occupational functioning. The total scores resemble overall functional impairment and range from 0 to 72. The overall functional impairment score is based on adding of all items. High scores for the FAST are indicative of poor functioning. Rosa et al[35] found internal consistency coefficient of FAST as 0.909. Turkish validity and reliability study of FAST were performed by Aydemir et al.[36] They calculated the internal consistency coefficient of FAST as 0.96. We found an excellent internal consistency of FAST in our study (0.90).[33]

Statistical Analysis

Statistical Package for the Social Sciences version 23.0 (IBM SPSS Corp.; Armonk, NY, USA) was used to perform all of the statistical analyses in this study. Descriptive statistics of the data are presented with n (%), non-normalized variables are shown as "median and interquartile range," and normalized variables are shown as "mean ± standard deviation." When comparing 2 categorical variables, the chi-squared test was used, depending on the group specifics. Fisher Freeman Halton Exact test was used to compare the marital status of the patient and the healthy individuals. The normal and non-normal distributions of the continuous variables were assessed using the Shapiro–Wilk test. In terms of the numerical variables, for those with a normal distribution, the independent sample *t*-test was used, whereas for those with a non-normal distribution, the Mann–Whitney *U*-test was used. Spearman's correlation coefficient was calculated to evaluate the associations between the clinic and sociodemographic variables and the RSQ, TEMPS-A, and total FAST scores. In the BD group, multiple linear regression analysis by backward elimination was performed to estimate the predictive effects of independent variables on overall functional status. The model evaluated the overall functioning of BP patients using total FAST scores as the dependent variable. Only independent variables that were significant in correlation analyses and univariate linear regression analyses were included in the multiple regression model. Tests for multicollinearity for the significantly correlated variables with the overall functional impairment were performed. Accordingly, it was seen that the data met the assumption

that the Variance Inflation Factor values should be below 10; therefore, it was decided that there is no collinearity within the data. Internal reliability of the scales was evaluated by calculating Cronbach's α coefficients. Statistical significance was set at $P < .05$.

RESULTS

Demographic and Clinical Features

The sociodemographic and clinical characteristics of the participants are presented in Table 1. In terms of their BD diagnosis, 87.30% (n = 55) of the patients had BD type 1 and 12.70% (n = 8) had BD type 2. The mean age of the patients was 35.01 ± 12.33 years, while their mean number of years of education was 11.65 ± 3.88 years. Some 44.44% (n = 28) of the patients were female. The mean age of the healthy controls was 35.67 ± 12.35 years, while their mean number of years of education was 12.21 ± 4.06 years. Moreover, 42.62% (n = 26) of the healthy controls were female. With regard to the age, years of education, and gender variables, no significant differences were observed between the 2 groups (see Table 1).

Table 1. Sociodemoghraphic and Clinical Characteristics of the Groups

	Bipolar Disorder Group (n = 63)	Control Group (n = 61)	*P*
	n (%) or Mean ± SD or Median and IQR Value	n (%) or Mean ± SD or Median and IQR Value	
Age	35.01 ± 12.33	35.67 ± 12.35	.768
Years of education (years)	11.6 ± 3.88	12.21 ± 4.06	.432
Female	28 (44.44)	26 (42.62)	.838
Male	35 (55.56)	35 (57.38)	
Single	31 (49.20)	24 (39.35)	.293
Married	29 (46.03)	36 (59.02)	
Divorced	3 (4.77)	1 (1.63)	
BD type 1	55 (87.30)	-	
BD type 2	8 (12.70)	-	
Unemployed	26 (41.27)	11 (18.03)	**.032**
Employed	25 (39.68)	35 (57.38)	
Retired	6 (9.52)	5 (8.20)	
Student	6 (9.52)	10 (16.39)	
Age of illness onset	23.96 ± 6.44	-	
Duration of illness (years)	8.00 (12.50)	-	
Age at diagnosis of illness	24.00 (21.00)		
Duration of remission (years)	54.00 (195.00)		
Number of manic episodes	1.00 (2.00)		
Number of depressive episodes	0.00 (2.00)		
Total number of episodes	3.00 (3.00)		
Hospitalization number	1.00 (2.00)		
Positive history of episode with psychotic features	37(58.63)		
HAM-D-17	2.00 (3.00)	1.00 (1.50)	**<.001**
YMRS	0.00 (0.00)	0.00 (0.00)	**<.001**

Independent sample *t*-test, Fisher Freeman Halton Exact test, and Chi-squared test. Significant outcomes are reported in bold.
HAM-D-17, 17-item Hamilton Depression Rating Scale; YMRS, Young Mania Rating Scale.

In respect of the current clinical assessment, the BD group had higher HAM-D-17 and YMRS scores than the control group ($P < .001$ and $P < .001$, respectively) (see Table 1). In addition, the 2 groups differed in terms of their secure attachment scores, which were significantly higher in the control group than in the BD group ($P = .013$) (see Table 2). As for the affective temperaments, the depressive, cyclothymic, and anxious temperament scores were significantly higher in the BD group ($P = 0.014$, $P = 0.002$, and $P = 0.022$, respectively) (see Table 2). Regarding the functional impairment, occupational, cognitive, autonomy, interpersonal relationships, and leisure subtest scores, as well as the total scores for the FAST, the BD group exhibited significantly more functional impairment than the control group ($P < .001$, $P < .00$, $P < .001$, $P < .001$, $P < .001$, and $P < .001$, respectively) (see Table 2).

Correlations Between the Variables

The evaluations of the relationships between attachment type and affective temperament scores in the BD group

Table 2. Comparision of Scores of FAST, TEMPS-A, and RSQ Between the Groups

	Bipolar Disorder Group (n = 63)	Control Group (n = 61)	*P*
	Median (IQR)	Median (IQR)	
RSQ—secure	4.4 (1.6)	4.6 (1.2)	**.013**
RSQ—fearful	3.3 (1.8)	3.3 (1.2)	.778
RSQ—dismissing	4.6 (2.0)	3.8 (0.2)	.118
RSQ—preoccupied	3.3 (1.9)	3.5 (1.0)	.767
TEMPS-A—depressive	6.0 (5.0)	5.0 (1.0)	**.014**
TEMPS-A—cyclothymic	6.0 (8.0)	4.0 (1.0)	**.002**
TEMPS-A—hyperthymic	10.0 (8.0)	8.0 (2.0)	.131
TEMPS-A—irritable	2.0 (5.0)	2.0 (1.0)	.185
TEMPS-A—anxious	4.0 (9.0)	3.0 (2.0)	**.022**
FAST—autonomy	2.0 (4.0)	0.0 (1.0)	**<.001**
FAST—occupational	3.0 (7.0)	0.0 (3.0)	**<.001**
FAST—cognitive	4.0 (5.0)	1.0 (2.0)	**.007**
FAST—financial	0.0 (2.0)	0.0 (0.0)	.117
FAST—interpersonal	2.5 (5.0)	0.0 (1.5)	**<.001**
FAST—leisure	3.0 (3.0)	1.0 (0.0)	**<.001**
FAST—total	14.0 (13.0)	4.0 (6.0)	**<.001**

Mann-Whitney's *U*-test. Significant outcomes of *P*-values are reported in bold.
FAST, Functioning Assessment Short Test; IQR, interquartile ange; RSQ, Relationship Scales Questionnaire; TEMPS-A, Temperament Evaluation of Memphis, Pisa, Paris, and San Diego.

Table 3. Correlations Between Scores of RSQ and TEMPS-A

		RSQ—Secure	RSQ—Fearful	RSQ—Dismissing	RSQ—Preoccupied
TEMPS-A—depressive	*r*	−0.268	0.425	0.273	0.385
	P	**.034**	**.001**	**.030**	**.002**
TEMPS-A—cyclothymic	*r*	−0.129	0.441	0.461	0.469
	P	.313	**<.001**	**<.001**	**<.001**
TEMPS-A—hyperthymic	*r*	0.326	−0.002	0.245	0.125
	P	**.009**	.990	.053	.331
TEMPS-A—irritable	*r*	−0.163	0.366	0,228	0.157
	P	.201	**.003**	.072	.219
TEMPS-A—anxious	*r*	−0.308	0.486	0.250	0.254
	P	**.014**	**.000**	**.048**	**.045**

Significant outcomes of *P*-values are reported in bold. Spearman's correlation coefficient.
RSQ, Relationship Scales Questionnaire; TEMPS-A, Temperament Evaluation of Memphis, Pisa, Paris, and San Diego.

are shown in Table 3. The results revealed that the secure type-attachment scores were significantly and negatively correlated with the depressive and anxious affective temperament scores ($r = -0.268$, $P = .034$ and $r = -0.308$, $P = 0.014$, respectively) (see Table 3), while they were positively and significantly correlated with the hyperthymic temperament scores ($r = 0.326$, $P = .009$) (see Table 3). The fearful-type attachment scores were significantly and positively correlated with the depressive, cyclothymic, irritable, and anxious affective temperament scores ($r = 0.425$, $P = .001$; $r = 0.441$, $P < .001$; $r = 0.366$, $P = 0.003$; and $r = 0.486$, $P < .001$, respectively) (see Table 3). The dismissing-type attachment scores were significantly and positively correlated with the depressive, cyclothymic, and anxious affective temperament scores ($r = 0.273$, $P = .030$; $r = 0.461$, $P < .001$; and $r = 0.250$, $P = .048$, respectively) (see Table 3). Moreover, the preoccupied-type attachment scores were significantly and positively correlated with the depressive, cyclothymic, and anxious affective temperament scores ($r = 0.385$, $P = .002$; $r = 0.469$, $P < .001$; and $r = 0.254$, $P = .045$, respectively) (see Table 3).

The evaluations of the relationships between total FAST scores and sociodemographic and clinical variables and attachment type and affective temperament scores also revealed that the total FAST scores of the BD group were significantly correlated with the patients' years of education ($r = -0.257$, $P = .042$), HAM-D-17 scores ($r = 0.367$, $P = .003$), RSQ secure-type attachment scores ($r = -0.297$, $P = .018$), TEMPS-A depressive temperament scores ($r = 0.475$, $P < .001$), TEMPS-A cyclothymic temperament scores ($r = 0.393$, $P = .001$), TEMPS-A hyperthymic temperament scores ($r = -0.325$, $P = .009$), TEMPS-A irritable temperament scores ($r = 0.293$, $P = .020$), and TEMPS-A anxious temperament scores ($r = 0.533$, $P < .001$) (see Tables 4 and 5).

Regression Analysis

The results of the regression analysis that evaluated the effects of independent variables on the overall functional impairment of the BD group are presented in Table 6. In the multiple regression model, RSQ—secure, TEMPS-A—anxious temperament, TEMPS-A—depressive temperament, TEMPS-A—irritable temperament, and

Table 4. Correlations Between FAST Total Scores and Sociodemographic and Clinical Variables

		Age	Years of Education	Age of Illness Onset	Duration of Illness (Years)	Duration of Remission (Years	Total Number of Episodes	Number of Hospitalization	HAM-D-17	YMRS
Fast total	I	−0.136	−0.257	−0.235	−0.038	−0.075	−0.013	−0.008	0.367	0.120
	P	.286	**.042**	.064	.766	.557	.919	.951	**.003**	.349—

Significant outcomes of *P*-values are reported in bold. Spearman's correlation coefficient.
FAST, Functioning Assessment Short Test; HAM-D-17, 17-item Hamilton Depression Rating Scale; YMRS, Young Mania Rating Scale.

Table 5. Correlations Between FAST Total Scores and Scores of RSQ and TEMPS-A

		RSQ—Secure	RSQ—Fearful	RSQ—Dismissing	RSQ—Preoccupied	TEMPS-A—Depressive	TEMPS-A—Cyclothymic	TEMPS-A—Hyperthymic	TEMPS-A—Irritable	TEMPS-A—Anxious
FAST total	*r*	−0.297	0.240	0.046	0.134	0.475	0.393	−0.325	0.293	0.533
	P	**.018**	.058	.722	.295	**<.001**	**.001**	**.009**	**.020**	**<.001**

Significant outcomes of *P*-values are reported in bold. Spearman's correlation coefficient.
FAST, Functioning Assessment Short Test; RSQ, Relationship Scales Questionnaire; TEMPS-A, Temperament Evaluation of Memphis, Pisa, Paris, and San Diego.

Table 6. Results of Regression Analysis for Determinants of Overall Functioning Scores in Euthymic Patients with BD

Model	Variables	Unstandardized Coefficients				95% CI for B	
		B	SE	*t*	Significance	Lower Bound	Upper Bound
	(Constant)	14.840	4.358	3.405	**.001**	6.212	23.468
	RSQ—secure	−2.143	0.861	−-2.489	**.014**	−3.848	-0.438
	TEMPS-A—anxious	0.564	0.210	2.688	**.008**	0.149	0.979
	TEMPS-A—cyclothymic	0.611	0.233	2.626	**0.010**	0.150	1.072

Adjusted $R^2 = 0.312$, $P < .001$. Dependent variable: FAST total. Significant outcomes of *P*-values are reported in bold.
FAST, Functioning Assessment Short Test; RSQ, Relationship Scales Questionnaire; SE, standard error; TEMPS-A, Temperament Evaluation of Memphis, Pisa, Paris, and San Diego.

TEMPS-A—cyclothymic temperament scores were assessed. These were the only variables that were both significantly correlated with FAST total scores and significantly predicted FAST total scores in the univariate linear regression. The regression analysis was performed with the backward elimination method, and this analysis produced 3 different models. In the final model (Model 3), the RSQ—secure type-attachment scores ($B = -2.143$, $P = .014$), TEMPS-A—anxious temperament scores ($B = 0.564$, $P = .008$), and TEMPS-A—cyclothymic temperament scores ($B = 0.611$, $P = .010$) significantly predicted total scores of FAST (see Table 6). This model explained 31.2% variance of total scores of FAST.

DISCUSSION

This study revealed there to be significant differences between the BD and control groups in terms of the participants' clinical symptoms, functioning, attachment styles, and affective temperaments. Moreover, the overall functional impairment of the participants in the BD group was found to be correlated with their years of education, subclinical depressive symptoms, the secure attachment type, and all 5 affective temperaments. However, the overall functional impairment of the BD group was only predicted by the participants' secure attachment and the anxious and cyclothymic affective temperaments in the regression analysis.

Our data demonstrated that the participants with BD exhibited higher levels of subclinical depressive and manic symptoms than the healthy controls. Interestingly, despite the criteria for remission being very limiting in the present study, a significant difference was detected between the 2 groups. Similar to the findings of this study, prior investigations have reported that subclinical symptoms may be detected in patients with BD in remission.[37,38] Polymorphism of s-allelle of the serotonin transporter gene (5HTTLPR) was associated with subclinical depressive symptoms and irritable, depressive, cyclothymic, and anxious affective temperaments.[39,40] Given the association between 5HTTLPR polymorphism and all of the affective temperaments except hyperthymic temperament and subclinical depressive symptoms, the present study's significant difference between patient and healthy control groups in terms of subclinical depressive symptoms may deserve further attention. Additionally, in the present study, depressive, anxious, and cyclothymic temperament scores were higher than the control group. Previously, depressive symptoms were associated with all the affective temperaments except hyperthymic temperament.[41,42] Among our participants, the secure attachment scores were found to be significantly higher in the control group than in the BD group, which accords with the findings of some earlier reports.[14,43] It has previously been reported that the irritable, cyclothymic, and anxious temperament scores are higher in mood disorder patients than in healthy controls.[21] In the present study, we found that the depressive, cyclothymic, and anxious temperament scores were significantly higher in the BD group than in the control group, although we did not identify a difference between the 2 groups with regard to the irritable temperament scores. According to the overall functioning scores and the scores for all of the functioning domains (except financial issues), the participants with BD exhibited significantly more functional impairment than the healthy controls. This finding is similar to the findings of previous studies, and it should be kept in mind that a recent meta-analysis revealed the least impaired functioning domain in patients with BD to be financial issues.[2]

In a 2-year prospective study involving 1656 patients with BD, having a university-level education was found to be related to increased functional improvement.[44] Moreover, a high education level has been identified as an independent predictor of high psychosocial functioning in patients with BD.[45] In prior studies, subclinical depressive symptoms have been identified as one of the main factors associated with functional impairment in patients with BD.[46,47] In the present study, a high education level and low depressive level were found to be correlated with better functioning on the part of the participants with BD, although the regression analysis did not reveal the education level and depression level to be predictors of overall functional impairment.

In the present study, all of the affective temperaments were found to be correlated with the overall functional impairment of the participants with BD. However, in the regression analysis, only the anxious and cyclothymic temperaments were shown to positively predict functional

impairment. Similar and different results have previously been reported with regard to the relationships between the different affective temperaments and functional impairment in patients with BD. For example, the cyclothymic temperament scores have been found to be associated with overall functional impairment in patients with BD.[48] In 2 longitudinal studies involving BD patients, the hyperthymic temperament was shown to be related to better psychosocial functioning.[49,50] The anxious temperament's main features are an increased tendency toward concern, an aversion to risky events and an apprehension of awful situations,[20,51] and these features may cause the unfavorable effects of the anxious temperament in relation to psychosocial functioning. In addition, in a national epidemiological survey, the anxious temperament was found to be a predictor of anxiety and depressive disorders.[52] The results of this study may elucidate the causes of the present study's results concerning the association between overall functional impairment and anxious temperament. The cyclothymic temperament is characterized by shifts in mood and energy status.[20,51] Shifts between depressive and hyperthymic features are usually apparent in cyclothymic temperament.[53] Such shifts may contribute to the functional impairment seen in those with BD. The present study's outcomes suggest the value of assessing the affective temperaments, especially the anxious and cyclothymic temperaments of patients with BD in order to achieve better overall functioning during follow-up. On the other hand, in the course of BD, recurrent episodes may yield increases in anxiety levels and problems of emotion dysregulation. These consequences of having BD may result in changes in the features of affective temperaments. The BD's probable influences on levels of affective temperament features in patients with BD may deserve investigation in future studies.

In 2 previous studies involving participants with a combination of different psychiatric disorders, the association between attachment styles and functioning in BD patients was investigated, although no significant association was found.[54,55] Furthermore, a systematic review suggested the secure attachment style to be related to less functional impairment and the insecure attachment style to be related to more functional impairment in patients with severe mental disorders, including psychotic disorders, BD, and personality disorders.[56] In a study involving a sample of patients with BD, attachment styles were not found to be associated with social functioning.[57] Formative figures with regard to attachment that provide a sense of security may influence the formation of positive self-worth and other useful characteristics. Thus, patients with secure attachments may apply more useful coping methods to overcome daily problems.[56,58,59] These useful coping methods may give rise to better psychosocial functioning on the part of BD patients who display more secure attachment features. In the present study, secure attachment was found to predict overall functioning in the regression analysis. Yet, in the correlation analysis of the relationship between the attachment styles and the affective temperaments, the secure attachment style was shown to be positively associated with the hyperthymic affective temperament and negatively associated with the anxious and depressive affective temperaments. Cyclothymic temperament was determined to be positively associated with fearful, dismissing, and preoccupied attachment styles. Additionally, the anxious affective temperament was determined to be positively associated with the dismissing, preoccupied, and fearful attachment styles. In light of the predictive effect of the anxious and cyclothymic affective temperaments in relation to the overall functional impairment in the BD group, the different attachment styles may deserve further research attention. In particular, the secure attachment style (which was correlated with both the hyperthymic, depressive, and anxious affective temperaments in this study) may deserve special attention. With regard to the present study's results concerning the effects of attachment styles on overall functioning and affective temperaments, the potential associations between the different attachment styles and functional impairment in patients with BD should be investigated further.

It must be acknowledged that this study had a number of limitations. First, the scales that were administered in the present study to assess the participants' attachment styles, and affective temperaments were mostly self-rated. These self-assessments should be complemented by more objective investigations in the future, although it should be noted that we used the FAST, a clinician-rated instrument, to assess the participants' functioning. Second, the cross-sectional design of this study did not allow us to infer causal associations. Consequently, follow-up studies should be conducted to facilitate causal interpretations. Third, personality disorders represent a common comorbidity in patients with BD,[60] and they may lead to a deterioration in the functioning of such patients. In the present study, the exclusion of comorbid personality disorders was not performed, so future studies should ensure that their exclusion criteria reflect this issue. Fourth, the effects of pharmacological treatment and medication adherence on the participants' functioning were not assessed in this study, although future studies could address this research gap.

Despite the abovementioned limitations, the strengths of the present study should be emphasized. First, this study is the first to assess the effects of the different attachment styles on the overall functional impairment of patients with BD. Second, the present study assessed the functional impairment, attachment styles, and affective temperaments of both the BD patient group and the control group. Third, the BD patients' remission status was determined by applying strict criteria in this

study. In addition, their remission was evaluated both symptomatically and with at least 8 weeks of remission.

The findings of this exploratory study revealed that the anxious and cyclothymic temperaments predict the overall functional impairment of patients with BD, whereas the secure attachment predicts good functional outcomes. The participants' years of education, subclinical depressive symptoms, the irritable, depressive, and hyperthymic temperaments were all correlated with functional impairment, although they did not predict the overall functional impairment in the BD group. It must be acknowledged that these associations do not offer a complete picture of the determinants of the functional impairment seen in patients with BD. Prospective longitudinal studies should be conducted to investigate the determinants of functional impairment in more sophisticated ways among larger samples. Overall, the findings of the present study indicated that the different attachment styles and the affective temperaments are all important in relation to the psychosocial outcomes of BD patients. In the follow-up processes of euthymic patients with BD, the different attachment styles and affective temperaments should be considered in terms of targeting functional improvement.

Ethics Committee Approval: This study was approved by the Ethics Committee of Atatürk University Faculty of Medicine (Approval No: 11, Date: October 4, 2018).

Informed Consent: Informed consent was obtained from the all participants who participated in the study.

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