

The effect of perceived parental attitude score on symptoms of bipolar disorder and schizophrenia

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ABSTRACT

Objectives: We aimed to investigate the effect of perceived parental attitudes on the symptoms of these diseases in patients with schizophrenia and bipolar disorder (BD) and to compare the perceived parental attitudes between these two disorders.

Methods: This cross-sectional study was conducted between August 2020 and August 2021 at a university hospital in Turkey. Fifty-two patients with BD and 50 patients with schizophrenia in remission, aged 16-50 years, who met the respective diagnostic criteria defined by the Diagnostic and Statistical Manual of Mental Disorder-5 were included in the study.

Results: The mean age of patients with BD was 38.90 ± 10.95 years, while it was 39.08 ± 11.51 years for those with schizophrenia. Females comprised 65.38% (n = 34) of the BD group and 78.00% (n = 39) of the schizophrenia group. Our results showed that the severity of various negative schizophrenia symptoms increased with higher levels of perceived parental libertarian attitude. In addition, the severity of delusion, which is one of the positive symptoms of schizophrenia, was found to increase with lower perceived parental interest. We did not find a significant relationship between the severity of mania and depression symptoms and perceived parental attitudes.

Conclusions: In addition to supporting previously reported relationships of various factors and schizophrenia and BD, our results suggest that the increase in the level of liberality of parents has a negative impact on the negative symptoms of schizophrenia. In addition, the decrease in the level of interest of parents towards their children exacerbates delusion symptoms.

Keywords: Bipolar disorder, schizophrenia, parental attitudes, environment

The role of environmental factors in the etiology, course and symptoms of many psychiatric disorders has been and continues to be the subject of research. The most well-known of these diseases are bipolar disorder (BD) and schizophrenia [1, 2]. Schizophrenia and BD are serious psychiatric disorders that are believed to result from the complex interaction of genetic and environmental factors. While there is sub-

stantial evidence that these are disorders demonstrate genetic inheritance, the influence of environmental factors is less certain [3].

Family functions may play an important role in the course of symptoms of BD and schizophrenia [4, 5]. It has been shown that children who are maltreated, have oppressive parents, those with separated parents or who have lost a parent or parents, and adults with

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poor socioeconomic status, lower education, and live alone, are more likely to suffer from serious psychiatric disorders such as BD and schizophrenia [2, 6-8]. For instance, in one study, it was reported that family conflicts negatively affect the course of the disease. The same study also found that schizophrenia patients with severe positive symptoms perceived their family environment as being rigid and overly prescriptive [9]. Decreased familial problem-solving ability has been shown to predict the increased persistence of adolescent depressive symptoms independently of pharmacological intervention [4]. Some studies have shown that families of adults with BD and families including children at risk for BD are less organized, less cohesive, and experience more conflict than families of healthy individuals [10, 11]. It was also reported that higher maternal warmth, by both children with BD and their mothers, to be associated with lower rates of post-healing relapse in the 8-year follow-up of adolescents with BD [12]. Existing studies investigating the interaction of these two diseases and the environment have mostly focused on the effect of the environment on the onset of these diseases [3, 13]. In particular, there are very few studies examining the effects of parental attitudes and other environmental factors on the course and symptoms of these diseases.

This study has two aims. The first is to investigate the effect of perceived parental attitudes on the symptoms of these diseases in patients with schizophrenia and bipolar disorder (BD) and the second is to compare the perceived parental attitudes between these two disorders.

METHODS

Design

This comparative cross-sectional study was conducted between August 2020 and August 2021 at Department of Psychiatry Clinic, Hitit University Medical School, Corum Community Mental Health Center, Corum, Turkey. The study received ethical approval from the the Clinical Ethics Committee of Hitit University Faculty of Medicine (Date: 14.07.2020, No: 315).

Study Group

Fifty-two BD patients and 50 schizophrenia patients in remission, aged 16-50 years, who met the di-

agnostic criteria for schizophrenia (for schizophrenia patients) and for BD I or II or another specified bipolar and related disorder (for BD patients), as defined by the Diagnostic and Statistical Manual of Mental Disorder-5. All individuals were given detailed information about the purpose of the study and independently volunteered to participate in the study by signing written informed consent forms. Patients with chronic disease, autoimmune or endocrine disease requiring the use of anti-inflammatory drugs, subjects with other psychiatric or mental diseases, pregnant patients, and non-cooperative patients (for whom the scales could not be applied) were excluded from the study.

Information Form for Data Collection

The information form included questions about the socio-demographic variables of patients, such as age, sex, marital status, cohabiting status (with whom they live), education status, working status, economic status, smoking status, and information about their disease (family history of BD or schizophrenia, age at disease onset, age at first treatment, number of hospitalizations, suicide attempts). The form was prepared by the researchers and the questions were asked to the patients during face-to-face interviews.

Participants in the BD group were assessed using the Young Mania Rating Scale (YMRS) for mania symptoms and the Hamilton Depression Scale (HAMD) for depression symptoms. The severity of symptoms of patients in the schizophrenia group was evaluated by Scale for the Assessment of Positive Symptoms (SAPS) and Scale for the Assessment of Negative Symptoms (SANS) [1]. In addition, the Parental Attitude Scale (PAS) was applied to the patients in both groups to determine their perception of parental behavior towards them [3].

Parental Attitude Scale (PAS)

The PAS was developed by Lamborn *et al.* [14] to evaluate individuals' perceptions of parental attitudes. Three primary factors emerge as a result of the factor analysis applied to the scale scores. These factors are: (1) The acceptance/care factor measures children's perceptions regarding their parents' care-giving, love, and participatory attitudes, and is measured with 9 items; (2) The strictness/supervision factor measures children's perceptions regarding their parents' controlling attitude, and is measured with 8 items; and (3) The psychological autonomy factor measures chil-

dren's perceptions of their parents democratic attitude and encouragement of individuality, and is measured with 9 items.

All items in each factor receive responses based on use of Likert-type scales. Factors 1 and 2 are evaluated together, often referred to as "acceptance/involvement". Higher scores in both factor 1 and 2 indicate "democratic" attitude, while parents with lower scores in both are defined to have "permissive-neglectful" attitude. Parents with low factor 1 score but high factor 2 score are determined to have "authoritarian" attitude. Parents with high factor 1 score but low factor 2 score are determined to have "permissive-tolerant" attitude. The Turkish validity and reliability of the scale were performed by Yılmaz *et al.* [15].

Scale for the Assessment of Positive Symptoms (SAPS)

The SAPS was developed by Andreasen [16] and is filled on the basis of the information obtained during the interview with the patient and their relatives. Observations during the interview are used to measure the level, distribution and severity of positive symptoms of patients with schizophrenia. The scale measures findings in 4 sub-scales: 7 items under "hallucination", 13 items under "delusion", 5 items under "bizarre behavior", and 7 items under "positive formal thought disorder". The severity of symptoms is evaluated on 6-point Likert-type scales. Total scores are also calculated. As the score obtained from the scale and subscales increases, the severity of the patient's positive symptoms also increases. The Turkish validity and reliability study of the SAPS was carried out by Erkoç *et al.* [17].

Scale for the Assessment of Negative Symptoms (SANS)

The SANS was developed by Andreasen [16] and is filled on the basis of the information obtained during the interview with the patient and their relatives. The observations during the interview are used to measure the level, distribution and severity of negative symptoms in patients with schizophrenia. The SANS used in this study had 5 subscales: 8 items under "affective blunting", 5 items under "alogia", 4 items under "avolition/apathy", 5 items under "anhedonia/asociality", and 3 items under "attention". The severity of symptoms are evaluated on 6-point Likert-type scales, and total scores were also calculated. Higher scores indi-

cate greater severity of negative symptoms. The Turkish validity and reliability study of the scale was carried out by Erkoç *et al.* [18].

Young Mania Rating Scale (YMRS)

The YMRS is a rating scale used to evaluate manic symptoms at baseline and over time in patients with mania. The scale is usually administered by a clinician and takes around half an hour to complete. The scale consists of 11 items and is based on the patient's subjective reports concerning the previous 48 hours. Additional information is based on clinical observations made during the clinical interview. Four items are rated between 0 and 8 (two-point intervals) (irritability, speech, thought content, and disruptive/aggressive behavior), the remaining seven items are graded between 0 and 4. The strengths of YMRS include its brevity, widely accepted use, and ease of implementation [19, 20].

Hamilton Depression Rating Scale (HAM-D)

This scale was developed by Max Hamilton [21] in 1960 to determine the depression risk among individuals. The scale evaluates the symptoms of depression for the last 7 days. The HAM-D is designed to rate the severity of depression in patients. Although it contains 21 areas, patient scores are calculated based on the first 17 answers according to different Likert-type scales. Higher scores indicate greater risk for depression. The Turkish validity and reliability study of the scale was performed by Aydemir *et al.* [22].

Statistical Analysis

The data obtained during the study were assessed via the SPSS v21 software (SPSS Inc., Chicago, IL, USA) with a pre-determined significance threshold of $p < 0.05$. Quantitative variable distributions were checked with the Kolmogorov-Smirnov test. Quantitative data descriptions were given with mean \pm standard deviation or median (minimum-maximum) values according to Kolmogorov-Smirnov test results. Categorical descriptive data were given with frequency (number and percentage). Quantitative variables with normal distribution underwent comparisons with the Student's t-test, while those with non-Gaussian distribution underwent Mann-Whitney U test comparisons. Between-group categorical distribution analyses were conducted Pearson chi-square or

Table 1. Patient characteristics and scale scores with regard to diagnosis

	Bipolar AD (n = 52)	Schizophrenia (n = 50)	p value
Age (years)	38.90 ± 10.95	39.08 ± 11.51	0.937
Sex			0.233
Female	18 (34.62%)	11 (22.00%)	
Male	34 (65.38%)	39 (78.00%)	
Marital status			0.018
Married	27 (51.92%)	12 (24.49%)	
Single	17 (32.69%)	30 (61.22%)	
Widow	4 (7.69%)	2 (4.08%)	
Divorced	4 (7.69%)	5 (10.20%)	
Live with			0.014
Alone	3 (5.77%)	10 (20.00%)	
Parents/siblings	22 (42.31%)	28 (56.00%)	
Partner/children	26 (50.00%)	12 (24.00%)	
Parents/partner/children	1 (1.92%)	0 (0.00%)	
Education status			0.006
Literate	0 (0.00%)	0 (0.00%)	
Primary school	12 (23.08%)	6 (12.00%)	
Secondary school	12 (23.08%)	11 (22.00%)	
High school	13 (25.00%)	28 (56.00%)	
University	15 (28.85%)	5 (10.00%)	
Working status			0.520
Regularly	18 (34.62%)	13 (26.00%)	
Irregularly	7 (13.46%)	3 (6.00%)	
Doesn't work	22 (42.31%)	28 (56.00%)	
Retired due to disability	3 (5.77%)	4 (8.00%)	
Retired	2 (3.85%)	2 (4.00%)	
Economic condition			0.065
Self-sufficient	46 (88.46%)	36 (72.00%)	
Non-self-sufficient	6 (11.54%)	14 (28.00%)	
Bipolar AD in family	18 (34.62%)	5 (10.00%)	0.006
Schizophrenia in family	7 (13.46%)	14 (28.00%)	0.116
Age at onset	23 (14 - 51)	21.5 (14 - 44)	0.720
Age at first treatment	23 (14 - 51)	23 (14 - 52)	0.830
Number of hospitalizations	2 (0 - 14)	2 (0 - 21)	0.232
Suicide attempt	9 (17.31%)	9 (18.00%)	1.000
Smoking			0.167
No	21 (40.38%)	20 (40.00%)	
0-10 cigarettes daily	3 (5.77%)	0 (0.00%)	
1 package daily	20 (38.46%)	16 (32.00%)	
1-2 package daily	8 (15.38%)	14 (28.00%)	
Parental Attitude Scale			
Acceptance/involvement	25 (14 - 32)	24 (11 - 31)	0.286
Psychological autonomy	18.44 ± 4.96	18.26 ± 4.57	0.847

Data are given as mean ± standard deviation or median (minimum - maximum) for continuous variables according to normality of distribution and as frequency (percentage) for categorical variables

Fisher's exact tests. Spearman correlation coefficients were calculated to evaluate relationships between scale scores. Multiple linear regression analysis were performed to determine related factors with the disease severity.

RESULTS

The mean age of patients with BD (n = 52 was 38.90

± 10.95 years, while it was 39.08 ± 11.51 years in patients with schizophrenia (n = 50). There was no significant difference between the two groups in terms of age (p = 0.937). Overall, 65.38% (n = 34) of the BD group and 78% (n = 39) of the schizophrenia group were female, and groups were similar in terms of sex (p = 0.233). The percentage of married individuals was significantly higher among BD patients compared to patients with schizophrenia (p = 0.018). Living alone was significantly more common in patients with schiz-

Table 2. Correlations between Parenteral Attitude Scale and other scale scores

		Acceptance/ Involvement	Psychological autonomy
Young Mania Rating Scale (n = 52)	r	0.188	-0.086
	<i>p value</i>	0.182	0.542
Hamilton Depression Rating Scale (n = 52)	r	-0.178	0.055
	<i>p value</i>	0.206	0.701
SAPS Hallucinations (n=50)	r	-0.159	0.151
	<i>p value</i>	0.270	0.296
SAPS Delusions (n=50)	r	-0.340	0.011
	<i>p value</i>	0.016	0.938
SAPS Bizarre behavior (n = 50)	r	-0.030	-0.113
	<i>p value</i>	0.834	0.436
SAPS Positive formal thought disorder (n = 50)	r	-0.050	-0.171
	<i>p value</i>	0.731	0.234
SAPS Inappropriate (n = 50)	r	0.008	0.108
	<i>p value</i>	0.954	0.454
SAPS Total (n = 50)	r	-0.271	-0.023
	<i>p value</i>	0.057	0.875
SANS Affective blunting (n = 50)	r	0.178	0.208
	<i>p value</i>	0.216	0.147
SANS Alogia (n = 50)	r	0.254	0.164
	<i>p value</i>	0.076	0.254
SANS Avolition/Apathy (n = 50)	r	0.055	0.349
	<i>p value</i>	0.704	0.013
SANS Anhedonia/Asociality (n = 50)	r	0.130	0.302
	<i>p value</i>	0.369	0.033
SANS Attention (n = 50)	r	-0.029	0.486
	<i>p value</i>	0.842	< 0.001
SANS Total (n = 50)	r	0.149	0.289
	<i>p value</i>	0.301	0.042

r = Spearman correlation coefficient

izophrenia, while BD patients more commonly lived with their partners and children ($p = 0.014$). The majority of schizophrenia patients were high school graduates, while BD patients had a significantly higher rate of university graduation ($p = 0.006$). In the BD group, family history for BD was present in 34.62% ($n = 18$); whereas only 10% ($n = 5$) of patients with schizophrenia reported a family history of the same disease. No difference was observed between the two groups in terms of other parameters, including working status ($p = 0.520$), economic status ($p = 0.065$), age at onset ($p = 0.720$), age at first treatment ($p = 0.830$), number of hospitalizations ($p = 0.232$), suicide attempt ($p = 1.000$), and smoking status ($p = 0.167$). There was no significant difference between the two groups in terms of the acceptance/involvement and psychological autonomy dimensions of PAS ($p = 0.286$ and $p = 0.847$, respectively) (Table 1).

Analysis of correlations revealed that there was a significant negative correlation between delusion severity and acceptance/involvement score ($r = -0.340$, $p = 0.016$) (Table 2, Fig. 1). Psychological autonomy subscale score was positively correlated with the avolition/apathy ($r = 0.349$, $p = 0.013$) (Fig. 2), anhedonia/asociality ($r = 0.302$, $p = 0.033$) (Fig. 3), attention ($r = 0.486$, $p < 0.001$) (Fig. 4) subscales of SANS, and also, total SANS score ($r = 0.289$, $p = 0.042$) (Fig. 5). There were no other significant correlations between other parameters and scores (Table 2).

Our multiple linear regression analysis results were as follows; We found higher PAS acceptance/involvement score was related with lower SAPS delusions score ($p = 0.043$) (Table 3). We found

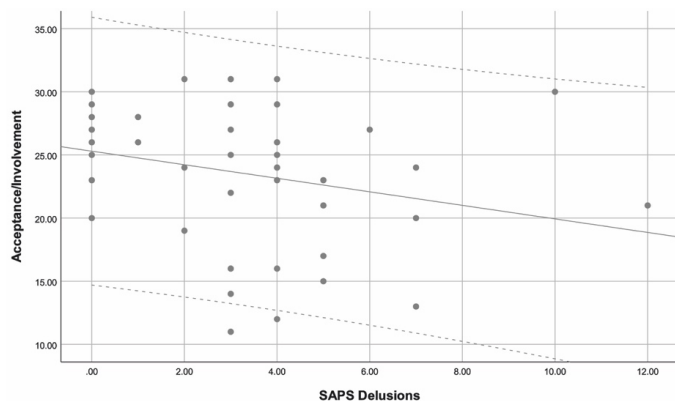


Fig. 2. Scatter plot of the PAS psychological autonomy and SANS avolition/apathy scores.

economically non-self-sufficient patients had higher SAPS inappropriate scores ($p = 0.003$) (Table 4), SANS affective blunting scores ($p < 0.001$) (Table 5), SANS alogia score ($p = 0.037$) (Table 6), SANS avolition/apathy score ($p = 0.016$) (Table 7), SANS attention score ($p < 0.001$) (Table 9), SANS total score ($p < 0.001$) (Table 10). We found male patients had higher SAPS inappropriate scores ($p = 0.022$) (Table 4) and lower SANS alogia score ($p = 0.018$) (Table 6). We found higher age was related with lower SANS alogia score ($p = 0.002$) (Table 6), SANS avolition/apathy score ($p < 0.001$) (Table 7), SANS total score ($p = 0.001$) (Table 10). We found higher PAS psychological autonomy score ($p = 0.007$) was related with higher SANS avolition/apathy score (Table 7). We found patients with schizophrenia history in family ($p = 0.003$) had higher SANS anhedonia/asociality score (Table 8) and SANS total scores ($p = 0.006$) (Table

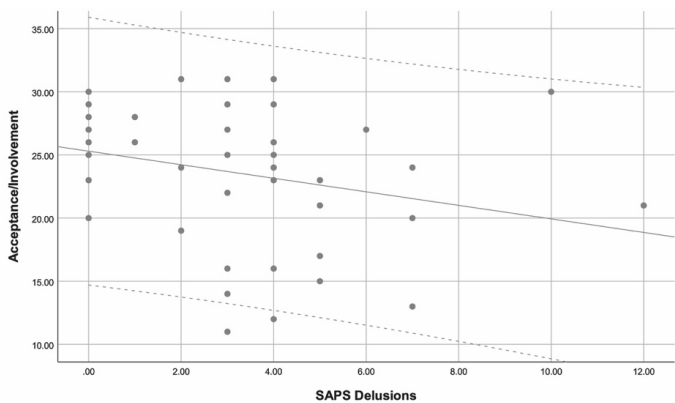


Fig. 1. Scatter plot of the PAS acceptance/involvement and SAPS delusions scores

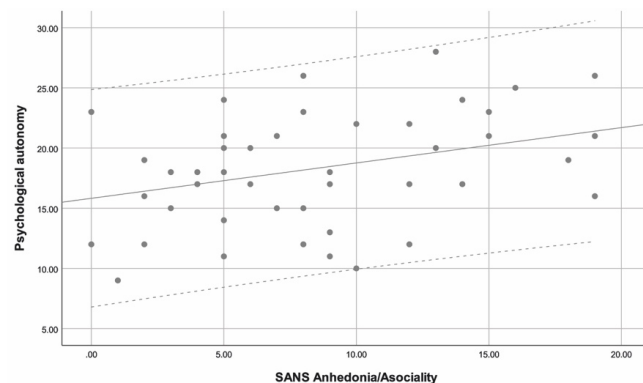


Fig. 3. Scatter plot of the PAS psychological autonomy and SANS anhedonia/asociality scores.

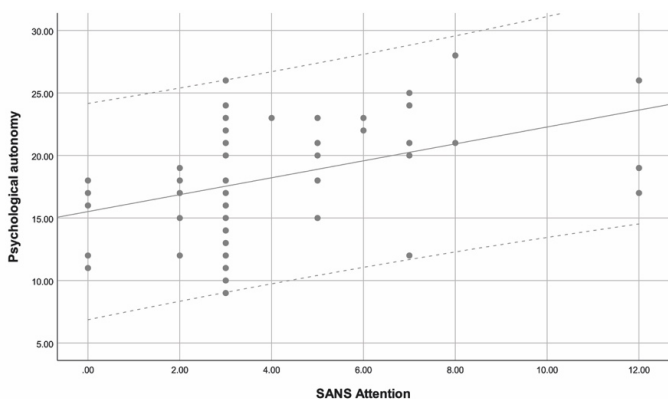


Fig. 4. Scatter plot of the PAS psychological autonomy and SANS attention scores.

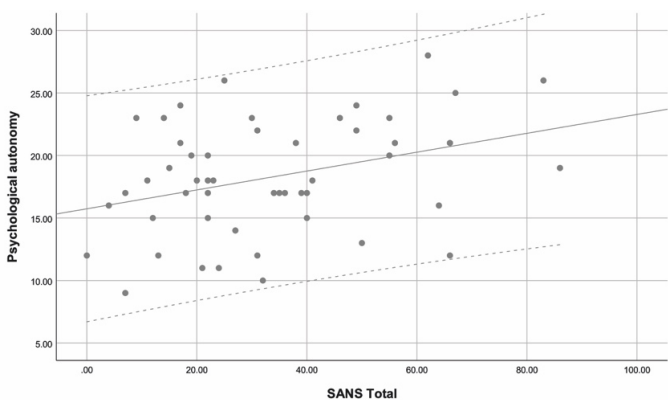


Fig. 5. Scatter plot of the PAS psychological autonomy and SANS total scores.

10). Also, lower age at onset ($p = 0.007$) was related with higher SANS anhedonia/asociality score (Table 8). Higher PAS psychological autonomy score ($p = 0.008$) was related with higher SANS attention score (Table 9). Smoking patients had lower SANS total scores than non-smokers ($p = 0.039$) (Table 10). In the regression analysis, no other significant relationship was detected.

DISCUSSION

Schizophrenia and BD are among the most severe mental disorders that affect patients, their families, and society [23]. While these diseases affect the environment, many environmental factors, especially familial factors, can affect the clinic of these diseases [4]. In this study we aimed to investigate the effects of family attitudes perceived by patients on the symptomatology of BD and schizophrenia and to show the differences in perceived family attitudes between these two diseases. Our results showed that the severity of many of the negative symptoms of schizophrenia including avolition/apathy, anhedonia/asociality, attention and SANS total score increased as the perceived parental libertarian attitude increased. Negative correlation between PAS acceptance/involvement score and SAPS

Table 3. Significant related factors of the SAPS Delusions score, multiple linear regression analysis

	Unstandardized β	Standard Error	Standardized β	p value	95.0% CI for β
(Constant)	6.780	1.754		< 0.001	3.251 10.309
PAS Acceptance/ Involvement score	-0.152	0.073	-0.290	0.043	-0.299 -0.005

Dependent variable: SAPS Delusions score; Adjusted $R^2=0.065$; $F=4.310$; $p = 0.043$. CI = Confidence interval

Table 4. Significant related factors of the SAPS Inappropriate score, multiple linear regression analysis

	Unstandardized β	Standard Error	Standardized β	p value	95.0% CI for β
(Constant)	-1.283	0.460		0.008	-2.209 -0.358
Gender, Male	0.442	0.187	0.324	0.022	0.065 0.818
Economic condition, Non-self-sufficient	0.545	0.173	0.432	0.003	0.197 0.892

Dependent variable: SAPS Inappropriate score; Adjusted $R^2 = 0.170$; $F = 6.012$; $p = 0.005$. CI = Confidence interval

Table 5. Significant related factors of the SANS Affective blunting score, multiple linear regression analysis

	Unstandardized β	Standard Error	Standardized β	<i>p</i> value	95.0%	CI for β
(Constant)	-1.016	2.712		0.710	-6.469	4.437
Economic condition, Non-self-sufficient	8.044	1.999	0.502	< 0.001	4.024	12.063

Dependent variable: SANS Affective blunting score; Adjusted $R^2 = 0.237$; $F = 16.187$; $p < 0.001$. CI = Confidence interval

Table 6. Significant related factors of the SANS Alogia score, multiple linear regression analysis

	Unstandardized β	Standard Error	Standardized β	<i>p</i> value	95.0%	CI for β
(Constant)	11.285	3.329		0.001	4.584	17.986
Age	-0.129	0.040	-0.411	0.002	-0.209	-0.048
Gender, Male	-2.792	1.142	-0.324	0.018	-5.090	-0.494
Economic condition, Non-self-sufficient	2.212	1.031	0.279	0.037	0.136	4.288

Dependent variable: SANS Alogia score; Adjusted $R^2 = 0.260$; $F = 6.734$; $p = 0.001$. CI = Confidence interval

Table 7. Significant related factors of the SANS Avolition/Apathy score, multiple linear regression analysis

	Unstandardized β	Standard Error	Standardized β	<i>p</i> value	95.0%	CI for β
(Constant)	4.543	2.910		0.125	-1.314	10.401
Age	-0.181	0.048	-0.446	< 0.001	-0.276	-0.085
Economic condition, Non-self-sufficient	3.078	1.234	0.299	0.016	0.593	5.562
PAS Psychological autonomy score	0.343	0.121	0.336	0.007	0.099	0.587

Dependent variable: SANS Avolition/Apathy score; Adjusted $R^2 = 0.341$; $F = 9.463$; $p < 0.001$. CI = Confidence interval

Table 8. Significant related factors of the SANS Anhedonia/Asociality score, multiple linear regression analysis

	Unstandardized β	Standard Error	Standardized β	<i>p</i> value	95.0%	CI for β
(Constant)	13.428	2.367		< 0.001	8.667	18.190
Schizophrenia in family	4.671	1.476	0.400	0.003	1.702	7.641
Age at onset	-0.272	0.096	-0.357	0.007	-0.466	-0.078

Dependent variable: SANS Anhedonia/Asociality score; Adjusted $R^2 = 0.227$; $F = 8.174$; $p = 0.001$. CI = Confidence interval

Table 9. Significant related factors of the SANS Attention score, multiple linear regression analysis

	Unstandardized β	Standard Error	Standardized β	p value	95.0% CI for β
(Constant)	-3.803	1.429		0.011	-6.678 -0.927
Economic condition, Non-self-sufficient	3.352	0.707	0.528	< 0.001	1.930 4.773
PAS Psychological autonomy score	0.196	0.070	0.310	0.008	0.055 0.337

Dependent variable: SANS Attention score; Adjusted R²=0.423; F=18.977; p < 0.001. CI = Confidence interval

delusions score, and positive correlation between SANS attention score, SANS avolition/apathy score and PAS psychological autonomy score were also confirmed by regression analysis. However the significant positive correlation between the SANS total score and the psychological autonomy score of PAS could not be confirmed by multivariate analysis. In addition, we saw that the severity of delusion, which is one of the positive symptoms of schizophrenia, increases as the perceived parental interest decreases. We did not find a significant relationship between the severity of positive schizophrenia symptoms other than delusion, all of mania and depression symptoms and perceived parental attitudes.

Positive and negative effects of parents' attitudes and character traits on people's mental health have been shown in many studies [4, 5, 12]. Children exposed to overprotective parent attitudes early in life may become accustomed to see their environment as a dangerous place –a place in which they need help to survive. This perception may negatively affect the child's ability to acquire self-regulation skills, learn to

express their negative emotions appropriately, thus reducing the quality of relationships with their family and peers [24]. In a national survey, negative parenting attitudes that included corporal and non-physical punishment were associated with both parent and child mental health problems [25]. Most studies are limited to investigating the role of childhood trauma in the clinical presentation of patients with BD and schizophrenia. However, childhood trauma may also contribute to the development and symptoms of such diseases. Negative attitudes of the parents towards the child and the resulting traumatic effect may affect emotional functioning during disease and, in turn, the general prognosis [26]. In Özütek's study [27] on the subject, a relationship was found between the deterioration in the problem-solving dimension of family functionality of patients with schizophrenia and the positive and negative symptom levels and general psychopathology levels of the patients. In the study of Tüzer *et al.* [9], it was found that patients with schizophrenia with severe positive symptoms perceived their family environment as “strict and overly pre-

Table 10. Significant related factors of the SANS Total score, multiple linear regression analysis

	Unstandardized β	Standard Error	Standardized β	p value	95.0% CI for β
(Constant)	36.925	10.830		0.001	15.113 58.738
Age	-0.760	0.204	-0.422	0.001	-1.171 -0.350
Economic condition, Non-self-sufficient	22.024	5.057	0.482	< 0.001	11.839 32.208
Schizophrenia in family	14.412	5.002	0.315	0.006	4.337 24.486
Smoker	-10.003	4.697	-0.239	0.039	-19.463 -0.543

Dependent variable: SANS Total score; Adjusted R²=0.420; F=9.859; p < 0.001. CI = Confidence interval

scriptive", and greater positive and negative symptoms was associated with increased expression of emotion in the family environment. In a research examining the family functions of patients with schizophrenia showed apparent family dysfunction, and concluded that families should be informed about the crucial nature of family and social support [28]. In another study, it was thought that symptomatic relapse of schizophrenia could be a result of environmental interaction, and that the reactivity of relatives were associated with psychotic symptoms [29]. In our study, we evaluated the symptom severity of schizophrenia patients with SANS and SAPS. In the light of our findings regarding correlations, we concluded that the symptoms of avolition/apathy, anhedonia/asociality, and attention were more severe and the total SANS score was significantly higher in schizophrenia patients whose patients had higher psychological autonomy scores (favoring democratic / libertarian attitude). When we assessed positive symptoms, we observed that the delusion symptom was more severe in schizophrenic patients who defined their parents as having lower acceptance/involvement score. Negative correlation between acceptance/involvement score and delusion severity and positive correlation between the psychological autonomy score and the avolition/apathy and attention severity were also confirmed by regression analysis. However, the r values of the significant correlations found between the perceived PAS score and the positive and negative symptoms of schizophrenia remained below the desired level (0.5). In addition, since the questionnaires measuring both perceived family attitudes and symptoms severity yield subjective results, it would not be correct to say that the results are unbiased. So these results of the study should be supported by other studies with a larger patient population.

Family characteristics such as conflict and adjustment have been associated with the course of mood symptoms in bipolar disorder. Adaptation includes family roles, leadership, discipline, and resilience, while adjustment includes family intimacy (time together, boundaries, and emotional bonds) [30]. Patients with bipolar disorder show levels of family mismatch, like negative family attitudes or interactional behaviors, during and after their illness, although not as high as those seen in patients with schizophrenia. These are suggested to predict poor

short-term outcomes related to the disorder [31]. A recent study by Wittenborn *et al.* [32] noted that the poor relationships of people with BD with their parents and spouses were associated with non-remission, relapse, and recurrence of depressive and bipolar symptoms. In the present study, we used YMRS (for mania severity) and HDRS (for depression severity) to assess the possible relationships of the severity of symptoms in BD patients. We could not detect a significant relationship between the severity of neither mania nor depression symptoms in BD patients and their perceived parental attitudes.

It is well known that BD and schizophrenia are highly inherited disorders (some form of family history reported in 59% and 64% of patients, respectively) and significant progress has been made in identifying genetic risk factors. However, 15-40% of the risk from environmental sources is largely unknown [3, 33, 34]. Etain *et al.* [26] assumed that environmental factors were the main causes of the disorder even in diseases such as BD and schizophrenia, where hereditary transmission is known to be the highest, and stated that genes affect the level of sensitivity to these factors. Furthermore, they emphasized that genetic and non-genetic factors are probably interacting in the formation of these diseases and they have a multifactorial origin. In our study, the incidence of BD was found to be significantly higher in patients with a family history of BD compared to schizophrenia. In those with a family history of schizophrenia, the incidence of schizophrenia was higher than the incidence of BD, but it was not statistically significant. Multiple regression analysis results showed that patients with schizophrenia history in family had higher SANS anhedonia/asociality score and SANS total scores. These results support that both the presence and symptoms of BD and schizophrenia may be influenced by familial and perhaps genetic characteristics.

Schizophrenia is associated with lower intelligence and educational performance compared to the general population [35]. It is unclear whether BD patients have lower intellectual and educational performance similar to that observed in schizophrenia. Vreeker *et al.* [35] found that BP patients were more likely to complete higher education despite having lower intelligence quotients (IQs) compared to controls. In contrast, they showed that patients with schizophrenia had both lower IQs and lower levels of education com-

pared to controls, similar to the study by Sletved and colleagues [36]. Vasudeva *et al.* [37] and Pacheco *et al.* [38], on the other hand, did not find any difference between the two diseases in terms of education level. In this study, there was no significant difference between the BD and schizophrenia groups in terms of lower education levels; however, a significant trend for higher education was observed in the BD group compared to the schizophrenia group.

Since schizophrenia and BD affect inter-personal relationships to a great degree depending on symptom severity, they can also cause some problems and restrictions in terms of marriage. Pacheco *et al.* [38] and Sletved *et al.* [36] found that the frequency of being married in schizophrenia patients was lower compared to BD patients. Vasudeva *et al.* [37] did not find any difference between the two diseases in terms of marital status. In our study, while the percentage of married BD patients was higher compared to the schizophrenia group, there was no significant difference between the two groups in terms of being divorced or widowed. In addition, the percentage of participants living alone was higher in the schizophrenia group, similar to the study by Mausbach *et al.* [39], while, consequently the percentage of those living with a partner and child (or children) was higher in the BD group.

Limitations

Our study has several limitations. First, the low number of patients and discrepancies in distribution into categorical subgroups may have negatively affected statistical results. Secondly, the insufficient number of similar studies limited our ability to compare the results of our research. Thirdly, because of its cross-sectional design and reliance on self-report data for some parameters, caution should be exercised when interpreting the findings of this study, particularly when generalizing results. Fourthly, interpretation of results could be improved by considering cross-cultural implications. Finally, as with almost every survey study, the results of this study might be affected from sided and biased thoughts.

CONCLUSION

In conclusion, our results support the idea that some environmental factors, such as marital status, educa-

tion level, living alone or living with relatives, age, gender and economical and working features may have a role in the development and course of schizophrenia and BD disease. The increase in the level of liberality of parents appears to have a negative impact on the negative symptoms of schizophrenia. In addition, the decrease in the level of interest of parents towards their children appears to exacerbate delusion symptoms. Education of the families of patients with BD and schizophrenia and correction of environmental factors that can be improved can contribute to disease control and remission-free follow-up. Since the present study was a survey study and since the study population consisted of individuals with two major psychiatric illnesses that could affect the thoughts of both patients and their families, the results of the study may have been affected by biased thinking. Therefore, more comprehensive studies with a larger number of patients are needed to support the results of this study.

Authors' Contribution

Study Conception: EY, UA, EO; Study Design: EY, UA, EO; Supervision: EY, UA, EO; Funding: EY, UA; Materials: UA; Data Collection and/or Processing: EY, UA; Statistical Analysis and/or Data Interpretation: E; Literature Review: EY, EC; Manuscript Preparation: EY and Critical Review: EO.

Conflict of interest

The authors disclosed no conflict of interest during the preparation or publication of this manuscript.

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