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RESEARCH ARTICLE

Somatic symptoms, functionality, and bipolar disorder type 1: The role of childhood trauma

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ABSTRACT

Objective: Somatic symptoms, with the heterogeneous character that are not fully explained by a medical condition, are common in bipolar disorder type-1 (BD-1) which might interfere with the choice of treatment, health-care utilization, medical costs as well as functionality. The purpose of this study was to evaluate association of somatic symptoms with sociodemographic-clinical features, functionality, and childhood trauma in remitted BD-1.

Method: After excluding patients with medical comorbidities, 61 patients diagnosed with BD-1 according to the diagnostic and statistical manual of mental disorders participated in the study. We required at least 8 weeks of remission and confirmed it with hamilton depression rating scale and young mania rating scale. Somatization Scale, functioning assessment short test (FAST), and childhood trauma questionnaire (CTQ) were administered to the participants.

Results: Somatization scores were significantly correlated with CTQ-total (r=0.323, p=0.011) and FAST-total (r=0.278, p=0.03), while inversely correlated with years in education (r=-0.395, p=0.002). When a partial correlation was run to determine the relationship between somatization and functioning, while controlling for childhood trauma, there was no statistically significant correlation between somatization and functioning (p=0.076).

Conclusion: Our study suggests that childhood trauma may have an influence on the relationship between somatization and functionality in patients with BD-1. When addressing somatic symptoms in patients with BD, an integrated approach including childhood trauma should be considered.

Keywords: Bipolar disorder type-1, childhood trauma, functionality, medically unexplained somatic symptoms, somatization

INTRODUCTION

Somatization is commonly defined as the experience and expression of psychological distress through somatic symptoms (1–3). Somatic symptoms, which may not be related to a medical condition, could be referred to as "medically unexplained" or "functional" and may be as varied as chronic pain, headache, gynecological symptoms, gastrointestinal, and musculoskeletal symptoms. These worrisome and unpleasant bodily symptoms may be conceptualized as a spectrum, from a single sensation to Somatic Symptom Disorder, defined as maladaptive and excessive thoughts, feelings, and behaviors, persisting for >6 months in the

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fifth edition of the diagnostic and statistical manual of mental disorders (DSM-5). Somatization which leads to high healthcare costs, disability, and a decrease in quality of life (4) is prevalent in patients with psychiatric conditions, especially in depressive disorder (5,6) and anxiety (7). Moreover, somatic symptoms are associated with worse outcomes in psychiatric disorders (8).

Patients with bipolar disorder (BD) experience somatic symptoms at a rate similar to unipolar depression, nearly twice that of the general population (9). Somatic symptoms are found to be associated with earlier age of first psychiatric admission and first psychiatric hospitalization, rapid cycling course and risk of attempting suicide in BD (10). There is also a higher risk of chronic pain in BD (11). In one study, it was shown that approximately 50% of patients with bipolar depression experience moderate-to-severe pain, which was associated with sleep disorders and a delayed diagnosis of BD (12). Furthermore, a higher likelihood of diagnosis of fibromyalgia in BD was demonstrated (OR: 7.55) (13). However, somatic symptoms have not yet been extensively studied in BD Type-1 (BD-1).

The association between adulthood somatization and childhood trauma has been well reported (14–16). Emotional abuse and neglect, physical, and sexual abuse in childhood were found to be significant predictors of a wide range of somatic symptoms (17,18). In BD, significantly higher rates of childhood trauma were reported compared to healthy controls (19) and childhood trauma is considered to be an influence on clinical features, age at onset, and inter-episode affective functioning of BD (20). This bilateral relationship of trauma with both BD and somatization may have effects on the somatic symptoms and functionality in BD.

Somatization is shown to be related to poorer functionality (21). In some situations, perceived general health could be impaired more severely in somatizing patients than patients with chronic medical illnesses (21). Even though medical comorbidity is a significant confounder of somatic symptoms, Altamura et al. (22) found no difference in psychosomatic factors between patients with and without medical comorbidity in a sample of unipolar depression plus BD. The relationship between somatization and general medical conditions that almost as a rule coexist in bipolar disorder and the effect of somatization on functionality is not yet clear.

Somatic symptoms with a heterogeneous character that are not fully explained by a medical condition might interfere with the choice of treatment, health-care utilization, medical costs as well as functionality in BD-1. This paper aims to analyze the association of somatization with sociodemographic and clinical features, functionality, and childhood trauma in remitted Type 1 BD. Our main hypothesis was there would be a positive significant association between somatization and childhood trauma in patients with BD. However, we hypothesized that this relation would not be significant when controlling for childhood trauma.

METHODS

This cross-sectional study was carried out in outpatient clinics and community-based mental health centers of a tertiary mental hospital. The study was conducted in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the world medical association Declaration of Helsinki. The Ethical Committee of Erenkoy Training and Research Hospital for Psychiatry and Neurological Diseases granted approval for this study (IRB: November 16, 2020–39). Patients aged between 18 and 65, diagnosed with BD Type 1 according to the DSM-5 participated in the study. Psychiatric interviews were conducted with the participants to confirm the diagnosis of BD Type 1 and to determine any existence of exclusion criteria. To exclude somatic symptoms associated with medical conditions, we excluded patients with chronic medical comorbidities requiring continued treatment. Comorbid medical diseases were determined by patients' national personal health record system with their consent. We required a score of less than eight on the Hamilton depression rating scale (HDRS) and <5 on the young mania rating scale (YMRS), and at least 8 weeks remission as an inclusion criterion for the study. A total of 32 patients were excluded from the study (24 patients due to medical comorbidities, 2 patients due to neurological conditions, 2 patients due to intellectual disabilities, and 4 patients for not filling out the forms correctly.). Written informed consent was obtained from volunteered patients after explaining the method and the purpose of this study.

Main Outcome Measures

Sociodemographic and clinical variables such as age, gender, marital and occupational status, years in education, duration of BD, number of mood episodes, and psychiatric history of 1st° family members were collected from the patient's medical records and themselves.

Young Mania Rating Scale (YMRS)

The YMRS scale is a Likert-type scale developed to assess the severity of a manic episode (23). The scores of the clinician-rated scale can vary between 0 and 60 and the higher scores indicate greater psychopathology. The validity and reliability study of the Turkish version was performed by Karadag et al. (24).

Hamilton Depression Rating Scale (HDRS)

HDRS is a 17-item, interview rating scale which is used to evaluate the severity of depressive symptoms (25). The total score of the scale may yield between 0 and 52. The scores between 0 and 7 indicate no depression whereas 8–16 mild depression, 17–23 moderate depression, and ≥24 severe depression. Turkish version of HDRS was demonstrated to be valid and reliable (26).

Functioning Assessment Short Test (FAST)

FAST which is a 24-item Likert type scale was administered for evaluation of functionality by a psychiatrist. FAST is a widely used method to assess functionality in BD. It comprises six areas of functionality: Autonomy, occupational functioning, cognitive functioning, financial issues, interpersonal relationships, and leisure time (27). Higher scores indicate poor functioning. The validity and reliability study of the Turkish version was conducted by Aydemir and Uykur (28).

Somatization Scale

To evaluate somatic symptoms, a 33-item self-report Somatization Scale was used. This self-rated scale constituted items from the minnesota multiphasic personality inventory related to somatization disorder and its validity and reliability study was performed by Dulgerler and Ozgur (29). The internal consistency reliability coefficient of the somatization scale was calculated to be 0.83 while the test-retest reliability coefficient was 0.996 (29). Somatization Scale scores vary from 0 to 33 and the higher the score the higher the somatization rate.

Childhood Trauma Questionnaire (CTQ)

The CTQ is a self-report tool for evaluating childhood and adolescence experiences of abuse and neglect retrospectively and quantitatively. It has 28 items and allows one to assess using five sub-dimensions: Physical abuse, physical neglect, emotional abuse, emotional neglect, and sexual abuse. The Turkish version of CTQ has been shown to be valid and reliable and the Cronbach's alpha value of the scale was 0.93 (30).

Table 1: Sociodemographic and clinical characteristics

Sex, n (%)	
Female	31 (50.8%)
Male	30 (49.2%)
Age, mean±SD	38.5±9.3
Marital status, n (%)	
Single	26 (42.6%)
Married	26 (42.6%)
Divorced/widowed	9 (14.8%)
Education (years), mean±SD	10.1±3.6
Occupational status, n (%)	
Employed	18 (29.5%)
Unemployed	38 (62.3%)
Retired	3 (4.9%)
Student	2 (3.3%)
Age at onset*	23 (13–55)
Duration of BD (years)*	14.3±8.8
No. hospitalizations*	1 (0–9)
No. past depressive episodes*	1 (0–10)
No. past manic episodes*	2 (1–15)
No. past mood episodes with mixed features*†	0 (0–4)
First degree family history, n (%)	
None	43 (70.5%)
BD	7 (11.5%)
Schizophrenia	3 (4.9%)
Unipolar depression	7 (11.5%)
OCD	1 (1.6%)

No.: Number of; *: Median (min–max); †: Includes both depressive and manic episodes with manic features; SD: Standard deviation; BD: Bipolar disorder; OCD: Obsessive-compulsive disorder.

Statistics

Statistical Package for the Social Sciences version 20 was performed for analysis of data. An a priori power analysis was conducted using G*Power -3.1.9.7 software program (31), using an effect size of 0.45 (32), an alpha value of 0.05 to achieve a power of 95. Results showed that a total of 58 participants were required. Characteristics of the data were reported as mean±standard deviation if normally distributed, median (minimum–maximum) in case of non-normality for continuous variables and as a number (percentages) for categoric variables. Kolmogorov–Smirnov test was used to test the normality of data. Student's t-test was used to compare normally distributed data between gender groups. One-way Analysis of variance was used to analyze using the marital status groups (single/married/divorced or widowed) and occupational status groups (employed/

Table 2: Results of the psychometric scales

	Mean±SD
FAST	
Autonomy	2.4±2.5
Occupational functioning	6.1±3.2
Cognitive functioning	4.1±3.3
Financial issues	1.7±2.0
Interpersonal relationships	5.7±3.7
Leisure time	2.2±1.5
Total	23.2±10.7
Somatization scale	9.2±4.2
CTQ	
Emotional abuse	7.4±3.1
Physical abuse	6.1±2.3
Sexual abuse	5.6±1.7
Physical neglect	7.1±2.4
Emotional neglect	10.8±4.5
Minimization	0.7±.8
Total	37.4±10.5
HDRS	1.2±1
YMRS	0.9±1

SD: Standard deviation; FAST: Functioning Assessment Short Test; CTQ: Childhood Trauma Questionnaire; HDRS: Hamilton Depression Rating Scale; YMRS: Young Mania Rating Scale.

unemployed/retired/student). Levene test was used to test the homogeneity of the variances. For the non-normally distributed data, Mann–Whitney U test (for pairs) and Kruskal–Wallis test (more than two groups) were performed. Spearman's correlation analysis was performed between psychometric scale scores and sociodemographic clinical data. A partial correlation analysis was run to analyze the relationship between functionality, somatization, and education whilst controlling for childhood trauma. The p-value was set at <0.05 for statistical significance.

RESULTS

In this study, 61 patients diagnosed with BD-1 and without any other medical condition participated. The data on sociodemographic and clinical characteristics of patients are summarized in Table 1. Results of the given scales are demonstrated in Table 2.

The mean of CTQ- total and somatization scale scores were 37.4±10.5 and 9.2±4.2, respectively. Somatization scores did not differ statistically according to gender, marital, and occupational status (p=0.807, p=0.641, and p=0.14, respectively). The mean functionality scores according to FAST were 23.2±10.7. No significant differences in FAST-total (p=0.091, p=0.824, and p=0.606, respectively) and CTQ-total scores (p=0.583, p=0.813, and p=0.378, respectively) were noted in groups according to gender, marital status, or occupational status. Results of subscales of the FAST and CTQ were given in Table 2. Furthermore, HDRS and YMRS scores which were given to confirm the remission state are shown in Table 2.

Correlation analysis of sociodemographic-clinical data and psychometric scales is shown in Table 3. Somatization scores were found to be inversely correlated with education (r=-0.395, p=0.002). Furthermore, there was a statistically significant moderate positive correlation between the Somatization Scale and the number of depressive episodes (r=0.269, p=0.036), FAST-total (r=0.278, p=0.030), CTQ-total (r=0.323, p=0.011), CTQ- Emotional Abuse (r=0.349, p=0.006), CTQ-Physical Abuse (r=0.333, p=0.009), and CTQ-Physical Neglect subscales (r=0.394, p=0.002).

A partial correlation was run to determine the relationship between somatization, functionality, and education whilst controlling for childhood trauma. The results of this analysis are given in Table 4. There was still a moderate and negative partial correlation between somatization and education (r=-0.364, p=0.004) while controlling for childhood trauma, which was statistically significant. Zero-order correlations showed a statistically significant correlation between FAST-total and Somatization Scale (r=0.287, p=0.025). However, in partial correlation analysis when controlling for childhood trauma, this relationship was not statistically significant, indicating childhood trauma has a major influence on the relationship between somatization and functionality (p=0.121).

DISCUSSION

The present study analyzed the association of somatization with sociodemographic and clinical features, functionality, and childhood trauma in remitted type 1 BD. We also investigated the relationship between somatization and functionality when controlling for childhood trauma.

The present study found an association between somatization and a history of emotional abuse, physical abuse, and physical neglect, during childhood in patients with BD-1. Several studies revealed the relationship between adverse childhood experiences and somatization in the general population and individuals with depression (3,16,33,34). It has also

Table 3: Correlation analysis of sociodemographic- clinical data and psychometric scales

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Somatization scale	–													
2. Education	**-0.395****	–												
3. Age	0.75	-0.236	–											
4. Duration of BD	0.123	-0.218	**0.653****	–										
5. No. depressive episodes	**0.269***	-0.077	0.98	**0.295***	–									
6. No. manic episodes	0.120	**-0.307***	**0.401****	**0.418****	0.209	–								
7. No. hospitalizations	0.082	-0.153	0.205	**0.435****	0.228	**0.364****	–							
8. FAST total	**0.278***	-0.042	0.028	0.136	0.192	0.163	0.078	–						
9. CTQ-Total	**0.323***	-0.149	0.111	0.173	0.292	0.080	-0.106	**0.287***	–					
10. CTQ-Emotional abuse	**0.349****	0.300	-0.087	**0.295***	**0.308***	**-0.028**	-0.227	0.126	**0.732****	–				
11. CTQ-Sexual abuse	0.234	-110	0.011	-0.035	0.225	0.298*	-0.028	**0.312***	**0.609****	**0.498****	–			
12. CTQ-Physical abuse	**0.333****	-0.086	0.113	0.057	0.192	0.182	-0.025	0.165	**0.486****	**0.449****	**0.329****	–		
13. CTQ-Physical neglect	**0.394****	**-0.458****	0.197	0.080	0.207	0.204	0.122	**0.386****	**0.666****	**0.333****	**0.542****	0.244	–	
14. CTQ-Emotional neglect	0.139	-0.038	0.063	**0.269***	0.166	-0.051	-0.189	0.223	**0.830****	**0.476****	**0.350****	**0.327***	**0.384****	–

BD: Bipolar disorder; CTQ: Childhood Trauma Questionnaire; FAST: Functioning Assessment Short Test; *: Significant at the 0.05 level; **: Significant at the 0.01 level.

Table 4: Partial correlation analysis of somatization, functionality, and education, controlling for childhood trauma

Control variable: CTQ-total	Variables	1	2	3
	1. Somatization	–		
	2. FAST-total	0.202	–	
	3. Education	-0.364*	0.001	–

*: Significant at 0.01 level; CTQ: Childhood Trauma Questionnaire; FAST: Functioning Assessment Short Test.

been demonstrated that as the number of childhood trauma types exposed to increases, the number of somatic symptoms also intensifies (3). The mechanisms linking childhood trauma to adulthood somatization were hypothesized in various explanations. One of the theories is that childhood trauma cause changes in the central nervous system which ends up in sensitivity to pain and an increased risk of somatization (35). Furthermore, childhood trauma causes disruption in early care and attachment, leading to a vulnerable position to somatization in adulthood (36).

Both somatization and childhood trauma are significant elements that affect functionality. In this present study to clarify the effect of trauma on the relationship between somatization and functionality, we also conducted partial correlations. When controlling for childhood trauma, this relation was not statistically significant indicating childhood trauma has a major influence on the relationship between somatization and functionality in patients with BD-1. There is a high rate of childhood traumatic experiences in patients with BD-1, varying from 45% to 68% in different studies (37). Therefore, trauma history should be a routine part of the evaluation of patients with bipolar disorder. Besides that, patients with somatic symptoms should also be a red flag to screen attentively for childhood traumatic experiences.

Besides childhood trauma, anxiety or depression, and general medical illness; fewer than 12 years of education were demonstrated to be a risk factor for somatic symptoms in the general population (38). In our sample of patients with remitted BD-1, somatization was negatively correlated with years of education, as well. Considering the robust effect of trauma experience on somatization and the high frequency of traumatic experiences in BD, a partial correlation was run to determine the relationship between education and somatization while controlling for education. Although the correlation degree was moderate, the inverse association between education and somatization was found to persist indicating a relationship between years in education and somatization.

The association between somatization and depression has been well documented. Although there are recurrent mood swings between mania and depression in BD, patients spend most time in depression rather than mania and this situation is related to a greater risk of impairment in work, social and family life (39). There was a positive correlation between somatization and the number of depressive episodes of patients in our study. One of the most common somatic symptoms, pain, was demonstrated to be common in bipolar depressed patients. There was a positive correlation between somatization and the number of depressive episodes in our participant group. This finding may suggest that patients with more somatic symptoms might need to be monitored more closely in terms of depression risk. In fact, up to two-thirds of patients with medically unexplained somatic symptoms were shown to develop the depressive disorder in the medium term (40). In another study, some of the specific somatic symptoms showed a high positive predictive value for depression (41). Whether all these findings also apply to patients with BD is a future research question.

Somatization is related to functional impairment, an increase in the global burden of disease, high rates of disability, and medical utilization (42,43). Likewise, an inverse association was found between somatization and functionality in patients with BD in our study. Somatic symptoms, especially medically unexplained painful symptoms, may affect patients' admission to medical health-care services and/or treatment compliance. On the other hand, they may influence the treatment choices of physicians and the treatment responses of patients. Therefore, careful assessment of somatic symptoms in patients with BD-1 is essential.

Several limitations should be considered when interpreting the results of this study. Due to the cross-sectional design, any causal inferences must be made with caution. Longitudinal assessments are needed to make more definitive conclusions. The data on somatization and childhood trauma were collected self-reportedly and thus may potentially be biased. Due to the high prevalence of medical comorbidities in BD-1 (44) and the difficulties in accessing medical care for individuals with severe mental illness (45), it must be considered that somatic symptoms in patients with BD may be associated with failure to diagnose a general medical condition. In addition, patients were not evaluated in terms of anxiety disorders, which are often associated with somatic symptoms. Patients in euthymic state and in remission of BD-1 were included in the study, as the type, intensity, and severity of somatic symptoms may vary according to the type of mood episode (9). We did not include healthy controls as a comparison group. The future studies comparing patients with BD and healthy controls in terms of somatization would be beneficial. Although patients with medical comorbidities were excluded from the study, psychopharmacological treatments may have an impact on the somatic symptoms of patients.

In conclusion, somatic symptoms may have an influence on functionality in patients with BD-1. Therefore, a careful evaluation of somatic symptoms is essential. Furthermore, our study suggests childhood trauma may have a major influence on the relationship between somatization and functionality in patients with Type-1 BD. When addressing somatic symptoms, an integrated approach including childhood trauma should be considered. As strongly recommended by various treatment guidelines, adjunctive psychotherapy, especially in the context of somatic symptoms accompanying childhood trauma should be implemented in the treatment plan of patients with BD.

Contribution Categories		Author Initials
Category 1	Concept/Design	N.G.U.S., A.B., B.A., F.I.
	Literature review	N.G.U.S., A.B., B.A.
	Data analysis/Interpretation	N.G.U.S., B.A.
Category 2	Drafting manuscript	N.G.U.S., A.B., B.A., F.I.
	Critical revision of manuscript	N.G.U.S.
Category 3	Final approval and accountability	N.G.U.S., A.B., B.A., F.I.
Other	Tecnical or material support	N.G.U.S., A.B., B.A.
	Supervision	F.I.

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