Psychosocial Functioning in Euthymic Patients with Bipolar Disorder Type – II And Associated Clinical and Cognitive Factors

Rifat Serav İLHAN[1], Hilal DEMİREL[2], Vesile ŞENTÜRK-CANKORUR[3]

SUMMARY

Objective: The aim of this study was to investigate the psychosocial functioning of euthymic Bipolar Disorder Type – II (BD-II) patients and its association with cognitive functions and subclinical symptoms. The hypothesis was BD-II patients would have a low level of psychosocial functioning compared to healthy subjects, and the psychosocial functioning would be associated independently with cognitive dysfunction and subclinical symptoms.

Method: Thirty-three subjects that met the criteria for BD-II according to Structured Clinical Interview for DMS-IV and thirty-five healthy subjects were included. Clinical symptoms were assessed by the Hamilton Depression Rating Scale (HDRS); Young Mania Rating Scale (YMRS); Hamilton Anxiety Rating Scale (HARS); and psychosocial functioning was assessed by Functioning Assessment Short Test (FAST). Neurocognitive assessment battery consisted of WAIS-R general information subtest, Wisconsin Card Sorting Test (WCST) perseverative errors, non-perseverative errors, and category completed subtests; Trail Making Test-B (TMT-B); Stroop TBAG form; Trail Making Test-A (TMT-A); Auditory Consonant Trigrams (ACT) ACT; and Wechsler Memory Scale-Revised (WMS-R).

Results: Clinical symptoms assessed by the different scoring subtests were significantly different between the two groups. In addition, FAST scores were associated with ACT scores in BD-II group.

Conclusion: BD-II patients had cognitive dysfunctions and low level of psychosocial functioning even in their euthymic states. Working memory dysfunction was independently associated with the psychosocial functioning of euthymic BD-II patients.

Keywords: Bipolar disorder type II, psychosocial functioning, cognitive function

INTRODUCTION

Several reports have shown that bipolar disorder (BD) patients experience psychosocial functioning impairment during remission periods (MacQueen et al., 2001, Tohen et al., 2005, Bonnin et al., 2010, O'Donnell et al., 2017, Soni et al.). However, this data is predominantly based on studies conducted with bipolar disorder type I (BD-I) patients. There has been a limited number of studies evaluating psychosocial functioning levels in bipolar disorder type II (BD-II), the subtype of bipolar disorder, in the euthymic period (Sanchez-Moreno et al., 2009, Rosa et al., 2010). Two surveys comparing the psychosocial functioning levels of BD-I and BD-II patients (Coryell et al., 1989, Judd et al., 2005) were performed by Sanchez-Moreno et al (2009). The BD-I and BD-II patients were reported in both studies to have similar levels of disability during both the euthymic and depressive episodes. In the cross-sectional study performed by Wingo et al. (2010), a similar level of deficits in the psychosocial functions of patients with BD-I (n = 42) and BD-II (n = 23) was found. Cooke et al. (1996) reported that social functioning

Received: 06.08.2016 - **Accepted:** 12.08.2017

[1]M.D., Dr. Nafiz Korez Sincan State Hospital, Department of Psychiatry, Ankara, [2]Psychologist, Private Practice, Department of Clinical Psychology, Ankara, [3]Prof., Ankara University Faculty of Medicine, Department of Psychiatry, Ankara, Turkey.

e-mail: *rfilhan@hotmail.com*

doi: 10.5080/u18384

levels were lower in BD-II (n = 13) patients than in BD-I (n = 17) patients in their study using the Medical Outcome Study Short Form-20 subscales. According to findings of a recent review, euthymic BD-II patients have a lower level of psychosocial functioning compared to healthy controls (Ilhan and Senturk-Cankorur 2015).

Clinical manifestations and cognitive dysfunctions in bipolar disorder have been reported to be associated with psychosocial functioning levels (Martino et al., 2009, Bora et al 2011, Andreu and Bozikas 2013, Soni et al 2017). Andreu and Bozikas (2013) reviewed 12 types of research composed of mostly BD-I patients and shown that cognitive dysfunction was associated with psychosocial functioning levels in the euthymic BD-I Patients. Similarly, Manove and Levy (2010) reviewed 11 follow-up studies conducted with mainly BD-I patients in the euthymic period and reported that neurocognitive dysfunction particularly impairments in executive functions negatively affected the psychosocial functioning level. Wingo et al. (2009) assessed an 8 review similar study and showed that there was a direct correlation between cognitive dysfunction and loss of psychosocial functioning in 6 of these studies. In particular, it was reported that verbal memory, executive functions, attention, and processing speed were associated with deterioration in psychosocial functioning (Wingo et al., 2009).

The relationship between the level of psychosocial functioning, and the cognitive and clinical characteristics of BD-I patients in the euthymic period has been presented in a number of studies. However, there are limited studies investigating psychosocial functioning levels, related clinical manifestations, and cognitive functions of BD-II patients in the euthymic period.

The low level of psychosocial functioning has been associated with sub-threshold depressive symptoms (Rosa et al., 2010, Wingo and Harvey 2010, Torrent et al., 2006), according to the findings of a limited number of studies investigating the relationship between psychosocial functioning level and clinical symptoms in BD-II. A limited number of studies investigating the relationship between psychosocial functioning level and cognitive functions have reported that impairment in executive functions is associated with a lower level of psychosocial functioning (Torrent et al., 2006, Martino et al., 2011, Sole et al., 2012). In a cross-sectional study conducted by Torrent et al. (2006), there was a significant relationship between psychosocial functioning deficits and Trail Making Test-B (TMT-B) measures that assessed executive functions of BD-II patients in the euthymic period. In another cross-sectional study, Sole et al. (2012) compared 42 healthy controls with 43 euthymic BD-II patients. They reported that executive functions of the BD-II group (TMT-B measures) and psychosocial functioning deficits were associated. In this same study, the relationship between cognitive functions and psychosocial functioning in euthymic BD-II patients, deterioration in executive functioning, and sub-threshold depressive symptoms were found to be associated with lower levels of psychosocial functioning.

Few studies have focused on the relationship between psychosocial functioning, cognitive functions, or psychosocial functioning. However, none have focused on the relationship between these factors in the same sample.

The aim of this study was to determine the level of psychosocial functioning of the BD-II patients in the euthymic period, and to investigate the relationship between the sub-threshold clinical symptoms and cognitive dysfunction and psychosocial functioning levels. We hypothesized that psychosocial functioning levels of euthymic BD-II patients were lower than healthy controls, and that psychosocial functioning levels were associated with sub-threshold clinical symptoms and cognitive dysfunction, which was independent of other variables were tested.

METHOD

Sample

The sample of the study included 33 patients that applied to Ankara University Medical School (AUMS) Psychiatric Department Adult Policlinic and diagnosed with BD-II disorder according to the Diagnostic and Statistical Manual of Mental Disorders IV-TR (DSM IV-TR). In addition, 35 healthy controls without a history of psychiatric disorders and neurological disease were also enrolled in the study. Inclusion criteria of the study was as follows: between the ages of 18-65, diagnosed with BD-II with a structured clinical interview (SCID-I) for DSM-IV Axis I Disorders, at least primary school graduate, in remission for at least 6 months, and having no additional psychiatric illness other than anxiety disorders, respectively. Electroconvulsive Therapy (ECT) and benzodiazepines are known to negatively affect cognitive function and their use was defined as exclusion criteria. Other exclusion criteria were the presence of any central nervous system disorder, mental retardation, alcohol-substance use disorder, head trauma, and not volunteering for the study. The majority of patients (86.8%) were followed up with multidrug therapy. These included the use of atypical antipsychotics 60.5% (n = 20), 36.8% (n = 12) lithium, 36.8% (n = 12) lamotrigine, and valproic acid, 10.5% (n = 3). The mean drug doses for lithium, valproic acid, and lamotrigine were 814.3 mg, 1125.0 mg and 105.4 mg/day, respectively, with mean blood lithium levels of 0.5 ± 0.0 meq/l and valproic acid levels of 69.0 ± 9.8 meq/lt.

Ethics committee approval was taken from AUMS on 09.06.2011 with 777 number stated in B.30.2.ANK.0.20.70.01 in the Non-Interventional Clinical Investigation Evaluation Commission.

ASSESSMENT TOOLS

Sociodemographic and Clinical Evaluation

The diagnosis of BD-II was made using SCID-I, and the sociodemographic and clinical characteristics of the patients were assessed through an information form created by the researchers. All modules of SCID-I have been implemented. Mood characteristics were determined by Young Mania Rating Scale (YMRS), Hamilton Anxiety Scale (HAM-A), and Hamilton Depression Scale (HAM-D). Patients with a score of 7 or less from HAM-D (Akdemir et al., 1996) and 6 or less from the YMRS (Karadağ et al., 2001) were accepted as euthymic. The total score of the HAM-A scale ranges from 0-56. However, no cut-off score has been calculated in Turkish validity reliability studies (Yazıcı et al 1998). In our study, no diagnosis of anxiety disorders, but the presence of anxiety symptoms in HAM-A was accepted as a sub-threshold of anxiety symptoms.

Psychosocial Functioning

In this study, the level of psychosocial functioning was assessed by FAST (Aydemir and Uykur 2012). FAST was developed by Rosa et al. (2007) in order to evaluate the different domains of psychosocial functioning such as autonomy, finance, cognitive functions, interpersonal relations, and leisure activities. The scale development study was conducted with patients with BD-I and BD-II, and FAST was used to assess functioning in studies that compared BD-I and BD-II patients (Rosa et al., 2010). The Turkish validity and reliability study of this scale was made by Aydemir and Uykur (2012). FAST questioned the last 15 days of patients' functionality. The scores in the FAST ranged from 0 to 72, and total scores above 11 indicated a loss of psychosocial functioning (Rosa et al., 2007).

Neurocognitive Functions

In this study, the domains of cognitive functions including premorbid IQ, executive functions, attention, working memory, verbal memory, and learning were evaluated.

Premorbid IQ was measured by the Wechsler Adult Intelligence Test-Revised Form (WAIS-R) General Knowledge subtest (Atkinson et al., 1989).

The executive functions were measured by the Wisconsin Card Sorting Test (WCST) (Karakas et al., 1998), the number of perseverative errors, the number of non-perseverative errors, category completion subtests, and Trail Making Test-B (TMT-B, Cangöz et al., 2007).

Attention was measured by the Stroop test Basic Science Research Group (BSRG) form (Karakaş et al., 1999) and the Trail Making Test A (TMT-A, Cangöz ve ark. 2007).

The Auditory Consonant Trigrams Test (ACT, Anil et al., 2003) and the Wechsler Memory Scale Enhanced form (WMS-I, Karakas et al., 1996) were used for memory and learning.

The WAIS-R General Information subscale was used in the evaluation of the premorbid IQ (Weschler 1981, Atkinson et al 1989). The vocabulary subtest was accepted as one of the best measures of premorbid IQ and premorbid cognitive level (Torrent et al., 2007). The reason for selecting WAIS-R general information subtest in our study was due to the better reflection of premorbid cognitive functions in patients thought to have cognitive dysfunction (Russel et al., 2000).

Wisconsin Card Sorting Test (WCST)

The test was applied with two decks containing four stimulating cards and 64 reaction cards. Each card had a different color and number of shapes. The requested item was matched to the stimulant card that each of the decks was deemed to be correct. The correct mapping category was sorted by color, shape, and number. When the subject correctly matched 10 times in succession, the next categorization was passed. After each reaction to the knee was recorded as true or false, but no information was given about the correct mapping category. Validity and reliability studies were carried out by Karakaş et al. (1998). In our study, the number of categories completed (abstract thinking), perseverative error (mental flexibility, problem-solving), and non-perseverative error numbers (mental flexibility, problem-solving) were used for the evaluation of executive function performance such as cognitive flexibility, abstract thinking, and problem-solving.

Stroop test Basic Science Research Group Form (BSRG)

The Stroop test has been used to define the ability to alter the direction of changing demands and under a disturbing effect (Spreen and Strauss, 1991). The test has different forms. It is a BSRG form adapted to Turkish by Karakaş et al. (1999) used in this study. The Stroop test measured processing speed, executive functions, and selective attention performances. In our study, the Stroop test was used for selective attention measurement. In this sense, the Stroop BSRG form task V completion time was used to compare the selective attention performance of the patient and the control group.

Trail Making Test (Form A -Form B)

The Trial Making Tests consists of an A and B form and combines figures 1 to 25 on the page in random order starting from 1 and drawing them in order. In section B, it is desirable to combine numbers and letters in such a way that they will be in the correct sequence, combining numbers from 1 to A,

from 2 to 2, from B to 2, followed by a number and a letter. During the application, the duration of the person's test is recorded. Part A measures image searching and scanning, while B measures the metrics of part A as well as executive functions (Lezak 1995). Standardization study of the Turkish form of this test was done by Cengöz et al. (2007) in the adult and elderly sample over 50 years of age. A separate Turkish version created by Türkeş et al. (2015) was used to determine the norm in the sample between 20-49 years old.

Auditory Consonant Trigrams (ACT)

The aim of this test is to measure short-term memory, divided attention, and information processing capacity in adults (Brown 1958, Peterson and Peterson 1959). It is a test that assesses working memory. The sum of correctly recalled letter numbers is used for evaluation. Turkish validity and reliability study was conducted by Anıl et al. (2003). The act was used in our study to evaluate the working memory performance.

Wechsler Memory Scale-Revised (WMS-R)

This scale, previously developed by Wechsler himself, was rearranged in 1987. It has been shown to be the most comprehensive and psychometrically most advanced measuring instrument for examination of memory (D'Elia et al., 1989). Twenty one points are obtained from 13 sub-tests in the individually administered WMS-R. In this study, the logical instant memory test subtest of WMS-R was used for assessing verbal memory and learning.

Procedure

The evaluation was initiated by filling out the sociodemographic and clinical data forms. Afterwards, SCID-I was applied according to DSM-IV-TR criteria and any psychiatric diagnosis was investigated in the healthy control group. Neuropsychological tests were given in the morning to exclude mental fatigue, and participants were questioned for alcohol, tea, coffee, and tobacco use and quantities before the test. Patients that had been diagnosed with cognitive dysfunction and general medical condition had not been tested. Interviews were conducted in two sessions (an average of 3 hours in total). Clinical scales were applied by author RIS and by neuropsychological tests author HD.

Statistical Analysis

For group comparison, a Mann-Whitney U test for continuous variables without normal distribution and chi-square test for categorical variables were used for continuous variables with normal distribution. Psychosocial functioning, clinical and cognitive functions were assessed by Kolmogorov Smirnov normality test and it was determined that excluding the data except WCST 4, 6, and YMRS scores showed normal distribution. In order to evaluate the relationship between antipsychotic use and cognitive functions, the patient group was divided into two groups as an antipsychotic and non-antipsychotic group. The two groups' cognitive functions were compared with the independent sample t-test. A Pearson correlation analysis was used to evaluate the relationship between the clinical and cognitive variables that differ statistically between the two groups and the psychosocial functioning levels of the patient group. Clinical and cognitive characteristics that were found to be correlated with the level of psychosocial functioning were included in the linear regression analysis in which the FAST scores were taken as dependent variables. HAM-D, HAM-A, WCST-7, and ACT scores correlated with the FAST scores were included in the linear regression analysis. Then, in binary and triple combinations, and finally in four data were included in the model as independent variables. In this process, stepwise selection and enter methods were used. A p-value of less than 0.05 was considered statistically significant. SPSS 20 statistical program was used.

RESULTS

Sociodemographic characteristics of BD-II and control group

The mean age of the BD-II and control groups were 36.9±10.7 and 37.8±9.3 years, respectively. There was no significant difference between the two groups (f = 0.13, p = 0.72). In addition, 61.1% (n = 20) of the BD-II group and 40.0% (n = 14) of the control group were similar and the gender distribution of both groups was similar (x2 = 3.07, p = 0.08). The duration of education for the BD-II and control group were 11.8±3.1 and 12.9±2.8, years respectively, and there was no significant difference between the two groups (f = 2.21, p = 0.14) (Table 1).

Table 1. Sociodemographic and clinical features of BD-II and control group

	BD-II	Control	f/ / x^2		p
Age (m±sd)	36.9 ±10.7	37.8±9.3	0.13		0.72
Sex (f) (%(n))	61.1(20)	40 (14)	3.07		0.08
Education (m±sd)	11.8±3.1	12.9±2.8	2.21		0.14
			t	d.f	p
HAM-D (m±sd)	4.3±2.0	1.7±1.6	5.70	66	**<0.01**
HAM-A (m±sd)	6.6±3.3	1.6±1.6	7.87	66	**<0.01**
YMRS (m±sd)	0.6±1.5	0.0±0.0	2.4	66	0.06
FAST (m±ss)	7.0±3.4	3.7±2.4	3.89	66	**<0.01**

BD-II=bipolar type II disorder m=mean sd=standard deviation, X^2 = ki square p<0.05
HAM-D: Hamilton Depression Scale HAM-A: Hamilton Anxiety Scale; YMRS: Young Mani Rating Scale; and FAST: Functioning Assessment Short Test

Psychosocial functional levels of the BD-II and control group

The mean FAST score was 7.0 ± 3.4 in the BD-II group and 3.7 ± 2.4 in the control group. These scores were below cut-off score of functioning in both groups. The difference between the mean FAST scores of both groups was statistically significant (t = 3.89, d.f. = 66, p < 0.01) (Table 1).

Clinical features of the BD-II and control group

Mean scores of HAM-D (t = 5.70, d.f. = 66, p < 0.01) and HAM-A (t = 7.87, d.f. = 66, p < 0.01) in terms of mood symptoms were evaluated and showed significant differences between the two groups. Depression and anxiety scores were significantly higher in the BD-II group than in the control group. There was no significant difference (Mann-Whitney U test; p = 0.06) between mania scores (Table 1).

The mean duration of illness in the BD-II group was 11.2 ± 7.9 years and the onset age of the illness was 25.3 ± 7.2 years. The mean number of depressive and hypomanic episodes was 3.3 ± 2.0 and 2.2 ± 1.7, respectively, and the mean number of illness period was 5.7 ± 3.6. While 92.1% of the sample was reported to have the first episode of a depressive episode, 65.8% of the sample had seasonal features and 55.3% had atypical depression.

Cognitive function levels of BD-II and control group Premorbid IQ

No significant difference was found between the BD-II patient group and the control group in the WAIS-R general information subtest (t = 1.74, d.f. = 66, p = 0.09).

Executive functions

The WCST number of perseverative error (WCST-6) and the number of category completed (WCST-4) did not differ significantly between the two groups (p = 0.38; p = 0.33, respectively), The BD-II group showed a significantly worse performance in the number of non-perseverative error subtest (WCST-7) compared to the control group (t = 5.0, d.f. = 66, p < 0.01). Similarly, the BD-II group had a worse performance (t = 6.13 d.f. = 66, p < 0.01) by completing the TMT-B test longer than the control group.

Attention

The BD-II group had a significantly lower TMT-A score than the control group (t = 5.96, d.f. = 66, p<0.01). The Stroop test of the BD-II group was found to be 29.9 ± 7.3 seconds in the task V and 24.3 ± 6.2 in the control group. The BD-II group completed Stroop test task V faster than the control group and showed a lower performance in the area of selective attention (t = 3.63, d.f. = 66, p < 0.01) (Table 2).

Working Memory

The mean ACT scores were found to be significantly different between the two groups (t = 2.97, d.f. =66, p < 0.01). BD-II patients recalled fewer words compared to the control group and exhibited lower performance in the area of working memory (Table 2).

Verbal memory and learning

In the WMS-R logical memory subtest, where verbal memory and learning performance were evaluated, the BD-II group recalled fewer words than the control group (t = 2.18, d.f. = 66, p = 0.03) (Table 2).

Table 2. Comparison of cognitive functions between BB-II and the control groups

	BB-II	Control	t	d.f	p
Premorbid IQ					
General information	13.0±3.9	11.5±2.3	1.74	66	0.09
Executive Functions					
TMT-B	80.3±21.9	56.1±8.7	6.13	66	**<0.01**
WCST Category completed	5.4±1.1	5.9±0.1			0.33
Numbers of perseverative errors	11.1±11.5	7.3±2.8			0.38
Numbers of non-perseverative errors	14.8±9.7	6.4±3.2	5.0	66	**<0.01**
Attention					
Stroop	29.9±7.3	24.3±6.2	3.63	66	**<0.01**
TMT-A	34.5±4.9	28.4±3.5	5.96	66	**<0.01**
Working Memory					
ACT	45.6±6.9	48.4±6.4	2.97	66	**<0.01**
Verbal learning and Memory					
WMS-R	14.8±4.0	17.2±4.9	2.4	66	**<0.01**

TMT-B: Trail Making Test – B; WCST: Wisconsin Card Sorting Test; TMT-A: Trail Making Test- A; ACT: Auditory Consonant Trigrams; and WMS –R: Wechsler Memory Scale - Revisited

Table 3. Cognitive functions and clinical factors associated with the level of psychosocial functioning in the BD-II Group

	FAST (Analysis of Correlation)		FAST (Linear Regression)		
	r	p	ß	t	p
HAM-D	0.420	**0.02**	0.296	1.820	0.08
ACT	-0.368	**0.04**	-0.350	-2.363	**0.03**
HAM-A	0.474	**<0.01**	0.316	1.910	0.07
WCST-7	0.354	**0.04**	0.196	1.300	0.20

FAST: Functioning Assessment Short Test; HAM-D: Hamilton Depression Scale; HAM-A: Hamilton Anxiety Scale; WCST-7: Wisconsin Card Sorting Test -7; ACT: Auditory Consonant Trigrams

Association between psychosocial functioning levels and clinical symptoms in the BD-II and control groups

The levels of psychosocial functioning that differed between BD-II and control groups were found to be related to HAM-D and HAM-A scores. When these clinical symptoms were controlled, the difference in psychosocial functioning between the two groups disappeared (F = 1.26, d.f. = 18, p = 0.27).

Factors associated with the level of psychosocial functioning in the BD-II group

In the BD-II group, the FAST scores were significantly correlated with HAM-D (r = 0.420, p = 0.02) and HAM-A (r = 0.474, p < 0.01). In the BD-II group, the association of FAST scores with cognitive functions was assessed and showed a statistically significant correlation with WCST-7 (r = 0.354, p = 0.04) and ACT (r = -0.368, p = 0.04) (Table 3).

We investigated the relationship, using linear regression analysis, between HAM-D and HAM-A scores, WCST-7, and ACT scores. These were determined to be associated with the FAST scores and were taken as independent variables, while the FAST scores were taken as dependent variable. The FAST scores were found to be associated with the ACT (t = -2.363); HAM-A scores (t = 1.910 β = 0.316); and the HAM-D scores (t = 1.820, β = 0.296, p = 0.07) remained borderline level of significance (Table 3).

Cognitive function performances of patients with and without antipsychotic use were compared. A significant difference was not found between both groups with regard to general information (t = 1.18 d.f. = 15.4 p = 0.30), WCST-4 (t = -0.84 d.f. = 22.9, p = 0.40), WCST-6 (t = 1.63, d.f. = 15.9, p = 0.11), WCST-7 (t = 0.76, d.f. = 28.5, p = 0.44), TMT-A (t = 0.31, d.f. = 30.6, p = 0.73), TMT-B (t = -1.19, d.f. = 30.9, p = 0.22), Stroop (t = -0.88 d.f. = 29.1, p = 0.38), ACT (t = -0.51, d.f. = 29.0, p = 0.60) ve WMR-R (t = -0.25, df = 30.7, p = 0.80).

DISCUSSION

Although psychosocial functioning levels in BD-II patients were below the cutoff score (<11) for FAST when comparing the mean FAST scores for both two groups, it was observed that the BD-II group FAST scores were significantly higher than the that of the control group. This finding points out that there are psychosocial functioning impairments in BD-II patients compared to those of the healthy people. Similar findings have been reported from the studies conducted with BD-II patients in the literature (Cooke et al., 1996, Judd et al., 2005, Torrent et al., 2006, Rosa et al., 2010, Wingo et al., 2010, Sole et al., 2012). In the study by Rosa et al. (2010), where the BD-II, BD-I, and healthy control groups were compared with regard to their psychosocial functioning levels, it was reported that BD-II patients experienced similar level of functioning loss with the BD-I group and both groups shared a similar level of low performance in the functioning compared to that of the healthy control group. It was also found that BD-IIs showed significantly low performance compared to BD-Is in the cognitive subarea of FAST. However, when the factors such as age, number of depressive episodes, and sub-threshold depressive symptoms were controlled, there was statistical difference. It was reported that the results obtained from the studies were not coherent and difficult to repeat since the tools used in determining the psychosocial functioning levels in bipolar disorder were comprised of self-scales that did not contain comments from the clinician and subjective evaluations (Dean et al, 2004). For instance, Judd et al. (2005) used Global Assessment of Functioning (GAF) and found that there was no significant difference between BD-I and BD-II groups with regard to psychosocial functioning impairment. Another study that adopted a similar study design found that depressive patients with BD-I and BD-II had similar GAF scores (Ruggero et al, 2007). The study conducted by Cooke et al. (1996) using the 20-Item Short Form Health Survey (SF-20) subscales showed that BD-II patients (n=13) had low scores in the social functioning levels compared to BD-I patients. These measurement tools are not able to evaluate the specific and distinct areas of functioning but rather they are able to evaluate only overall and limited areas of functioning. The scales are composed of the measurement tools that are too long and difficult to use in clinical settings (Zarate ve ark 2000). Since some scaling tools developed for measuring the specific areas of psychosocial functioning do not involve some areas like cognitive and

finance, they seem to be far away from providing the current need. The use of scales (such as FAST) that assess functioning in bipolar disorder, examine sub-areas of functioning, and are easy to use in the clinical settings, will provide details of the information and comparability of findings.

The relationship between psychosocial functioning deficits and cognitive and clinical features of BD-I patients in euthymic period has been revealed in many studies. However, there has not been enough studies in the literature regarding the similar relation existing in patients with BD-II in the euthymic period. For this reason, it seems that there is a need for studies to reveal the relationship between the clinical features and cognitive functions of BD-II patients in the euthymic period and their psychosocial functioning.

Wingo and Harvey (2010) reported that psychosocial functioning levels of BD-II and BD-I patients in the euthymic period were associated with sub-threshold depressive symptoms. In the study of Rosa et al. (2010), the difference in psychosocial functioning levels between patients with BD-I and BD-II was lost after the controlling for the sub-threshold depressive symptoms in patient groups. In our study, the association between psychosocial functioning levels and subclinical depressive and anxiety symptoms remained at a borderline level in the BD-II group. The remaining borderline level of significance may result from the fact that the similarity of anxiety and depression symptoms added to statistical analysis may weaken the association between psychosocial functioning and depression as well as the association between psychosocial functioning and anxiety. The assessment of depression and anxiety symptoms in studies with a single score, especially in small samples, may provide more accurate information about the association between psychosocial functioning and these two entities, which shows similarity and co-occurrence.

By reviewing the literature, there has been no study examining the relationship between anxiety symptoms and psychosocial functioning levels in euthymic BD-II patients. In addition, anxiety symptoms have not been controlled in studies investigating the psychosocial functioning levels of BD-II patients. Whereas, there have been studies that reported anxiety disorder comorbidities, which are commonly found in BD-II patients, are related with poor diagnosis, increased suicide attempts, and impaired psychosocial functioning (Benazzi 2007). Similarly, the difference found in the levels of psychosocial functioning between the BD-II and the control group was lost after the effects of depression and anxiety symptoms were controlled in our study. These findings reveal the association between psychosocial functioning and sub-threshold clinical symptoms.

According to our findings, BD-II patients in the euthymic period showed impairment compared to the control group in cognitive areas such as executive functions, attention, working memory, and verbal memory areas. The fact that the cognitive functions did not associate with sub-threshold clinical symptoms in the BD-II group, suggests that cognitive impairment is a distinct feature of the disease. These findings are in line with the findings of some other studies with BD-II patients in the euthymic period (Torrent et al., 2006, Martino et al., 2011, Sole et al., 2012). On the other hand, there are studies that have reported verbal memory is not impaired (Simonsen et al., 2008 Dittman et al., 2008, Hsiao et al., 2009). In the meta-analysis study of Bora et al. (2011); it was reported that BD-II patients exhibited impairments in the area of executive functions, working memory, and attention, which is similar to BD-I patients. However, impairments in the areas of verbal memory and learning are more specific to BD-I patients. These findings indicate that impairments in the area of executive functions, working memory, and attention persist in patients with BD-II during the remission period, and more research is needed for investigating impairment in the area of verbal memory.

In the literature, there are three studies investigating the association between psychosocial functioning levels and cognitive functions of euthymic BD-II patients (Torrent et al., 2006, Martino et al., 2011, Sole et al., 2012). In all three studies, the psychosocial functioning impairments in the euthymic BD-II patients were found to be associated with TMT-B scores. TMT-B is often used for the assessment of the executive functions and, at the same time, as an indicator of the working memory performance. Although the association was found between TMT-B scores and psychosocial functioning levels in our study, the ACT scores used to assess working memory performance were associated with psychosocial functioning levels in euthymic BD-II patients. Therefore, the working memory impairment is the most likely cognitive predictor that can be associated with the psychosocial functioning impairment in euthymic BD-II patients according to the data obtained from these studies.

The small sample size was among the major limitations of our study. Another limitation of our study was that the sample consisted of patients with multidrug users. Therefore, the effect of the medication on psychosocial functioning and cognitive functions could not be excluded. In our study, there was no significant difference between cognitive function performances of patients that were taking antipsychotics and those that did not. However, this result did not exclude the effect of medication on cognitive functions. Understanding the effect of medication on the results as a confounding factor would be possible by creating a separate sample and study pattern. In the literature, there has been no systematic study of the effect of the medication on psychosocial functioning and cognitive functions in patients with BD-II. In the studies

investigating cognitive functions in patients with BD-II, the use of psychotropic medication has been considered as confounding factor. However, the effects of medication on cognitive functions have not been statistically shown due to the inconsistency of study designs and selected samples composed of the mixture of BD-II or BD-I patients. In addition, data on medication have not been included in the statistical analyses but it has been documented as a limitation of the studies. In our study and different from the current literature, the difference between cognitive functions in patients that were on antipsychotic medication or not was not studied statistically. However, the inability to find any significant difference may be relevant with the type two error.

On the other hand, the studies focusing on the association between cognitive functions and medication usage in BD-I is suggestive. Martinez-Aran and colleagues (2007) stated that the number of medications used increased the impairments in psychosocial functioning. In the study by Donaldson et al. the usage of antipsychotic had an adverse effect on cognitive functions and psychosocial functioning.

It has been stated that effects of medication on cognitive functions were not excluded in the studies investigating cognitive functions in euthymic patients with BD-II (Martino et al. 2011). Moreover, studies conducted with BD-I patients were suggestive. For instance, in the study by Senturk and colleagues (2007), cognitive functions of patients that were administered medication for lithium and valproic acid did not differ significantly. In the study by Frangou and colleagues (2007), the anti-psychotic usage was observed to have an adverse effect on executive functions and memory. However, it is important to keep in mind that the need for antipsychotic medication in bipolar patients increases secondary to a more serious clinical picture that coincides with a deterioration in the cognitive functioning of patients. In this sense, some researchers have suggested that the use of antipsychotics increases the cognitive dysfunctions that already exist (Wittman et al. 2008).

The effects of carbamazepine, lamotrigine, valproic acid, topiramate, and oxcarbazepine on cognitive functions were compared and the mood stabilizers, valproic acid and carbamazepine, which cause the greatest cognitive impairment in euthymic bipolar patients, were reported to have minimal effect on cognitive functions (Goswami et al. 2009).

In this study, the establishment of structured treatment and rehabilitation programs specifically for the treatment of cognitive dysfunction in patients with BD-II may contribute to strengthening the psychosocial functioning levels observed in the euthymic period. However, in routine clinical practice, assessment of the level of psychosocial functioning of BD-II patients as well as assessment of the sub-threshold depression and anxiety symptoms and cognitive dysfunctions, is needed.

REFERENCES

Akdemir A, Örsel S, Dağ I et al (1996) Hamilton Depresyon Derecelendirme Ölçeği (HDDÖ)'nin geçerliği, güvenirliği ve klinikte kullanımı. Psikiyatri Psikoloji Psikofarmakoloji Dergisi 4: 251-9.

Andreou C and Bozikas VP (2013) The predictive significance of neurocognitive factors for functional outcome in bipolar disorder. Current Opinion in Psychiatry 26:54-9.

Anil EA, Kivircik BB, Batur S et al (2003) The Turkish version of the Auditory Consonant Trigram Test as a measure of working memory: a normative study. Clin Neuropsychol 17:159-69.

Atkinson L, Cyr JJ, Doxey NC et al (1989) Generalizability of WAIS-R factor structure within and between populations. J Clin Psychol 45:124-9.

Aydemir Ö and Uykur B (2012) Kısa Işlevsellik Değerlendirme Ölçceği'nin Türkçe Sürümünün Bipolar Bozuklukta Güvenilirliği ve Geçerliği. Turk Psikiyatri Derg 23:193-200.

Benazzi F (2007) Bipolar disorder – focus on bipolar II disorder and mixed depression. The Lancet, 369:935-45

Bonnin CM, Martínez-Arán A, Torrent C et al (2010) Clinical and neurocognitive predictors of functional outcome in bipolar euthymic patients: a long-term, follow-up study. Journal of Affective Disorders 121:156-60.

Bora E, Yücel M, Pantelis C et al (2011) Meta-analytic review of neurocognition in bipolar II disorder. Acta Psychiatrica Scandinavica 123:165-74.

Brown J (1958) Some tests of the decay theory of immediate memory. Quarterly Journal of Experimental Psychology 10:12-21.

Cangöz B, Karakoç E, Selekler K (2007) Iz Sürme Testi'nin 50 yaş ve üzeri Türk yetişkin ve yaşlı örneklemi üzerindeki norm belirleme ve geçerlik-güvenirlik çalışmaları. Turkish Journal of Geriatrics 10:73-82.

Cooke RG, Robb JC, Young LT et al (1996) Well-being and functioning in patients with bipolar disorder assessed using the MOS 20-ITEM short form (SF-20). J. Affect. Disord 39:93–7.

Coryell W, Keller M, Endicott J et al (1989) Bipolar II illness: course and outcome over a five-year period. Psychological Medicine 19:129-41.

Dean BB, Gerner D, Gerner RH (2004) A systematic review evaluating health-related quality of life, work impairment, and healthcare costs and utilization in bipolar disorder. Current medical research and opinion, 20:139-54.

D'elia L, Satz P, Schretlen D (1989) Wechsler Memory Scale: A critical appraisal of the normative studies. Journal of Clinical and Experimental Neuropsychology 11:551-68.

Dittmann S, Henning-Fast K, Gerber S et al (2008) Cognitive functioning in euthymic bipolar I and bipolar II patients. Bipolar Disorders 10:877-87.

Donaldson S, Goldstein LH, Landau S et al (2003) The Maudsley Bipolar Disorder Project: the effect of medication, family history, and duration of illness on IQ and memory in bipolar I disorder. Journal of Clinical Psychiatry 64:86-93.

Frangou S, Donaldson S, Hadjulis M et al (2005) The Maudsley Bipolar Disorder Project: executive dysfunction in bipolar disorder I and its clinical correlates. Biological Psychiatry 58:859-64.

Goswami U, Sharma A, Varma A et al (2009) The neurocognitive performance of drug-free and medicated euthymic bipolar patients do not differ. Acta Psychiatrica Scandinavica 120:456-63.

Hsiao YL, Wu YS, Wu JYM et al (2009) Neuropsychological functions in patients with bipolar I and bipolar II disorder. Bipolar disorders, 11:547-54.

Ilhan RS and Cankorur VŞ (2015) Clinical and Cognitive Predictors of Psychosocial Functioning During the Euthymic Period in Bipolar Disorder Type II. Turkish Journal of Psychiatry. 26:13.

Judd LL, Akiskal HS, Schettler PJ et al (2005) Psychosocial disability in the course of bipolar I and II disorders: a prospective, comparative, longitudinal study. Arch. Gen. Psychiatry 62:1322–30.

Karadağ F, Oral ET, Aran Yalçın F et al (2001) Young Mani Derecelendirme Ölçeğinin Türkiye'de Geçerlik ve Güvenilirliği. Turk Psikiyatri Derg 13: 107-14.

Karakaş S, Kafadar H, Eski R (1996) Wechsler bellek ölçeği geliştirilmiş formunun test tekrar test güvenirliği. Türk Psikoloji Dergisi, 11:46-52.

Karakaş S, Irak M, Ersezgin ÖU (1998) Wisconsin Kart Eşleme Testi (WCST) ve Stroop Testi TBAG formu puanlarının test içi ve testler-arası ilişkileri. X. Ulusal Psikoloji Kongresi özet kitabı, p: 44.

Karakaş S, Erdoğan E, Sak L et al (1999) Stroop Testi TBAG Formu: Türk kültürüne standardizasyon çalışmaları, güvenirlik ve geçerlik. Klinik Psikiyatri, 2:75-88.

Lezak MD, Howieson DB, Loring DW (1995) Executive functions and motor performance. Neuropsychological assessment, 3:650-85.

MacQueen GM, Young LT, Joffe RT (2001) A review of psychosocial outcome in patients with bipolar disorder. Acta Psychiatrica Scandinavica, 103:163-70.

Manove E and Levy B (2010) Cognitive impairment in bipolar disorder: an overview. Postgraduate medicine, 122:7-16.

Martinez-Aran A, Vieta E, Reinares M et al (2004) Cognitive function across manic or hypomanic, depressed, and euthymic states in bipolar disorder. Am J Psychiatry 2:262–70.

Martinez-Aran A, Vieta E, Torrent C et al (2007) Functional outcome in bipolar disorder: the role of clinical and cognitive factors. Bipolar disorders, 9:103-13.

Martino DJ, Marengo E, Igoa A et al (2009) Neurocognitive and symptomatic predictors of functional outcome in bipolar disorders: a prospective 1-year follow-up study. Journal of affective disorders, 116:37-42.

Martino DJ, Igoa A, Marengo E et al (2011) Neurocognitive impairments and their relationship with psychosocial functioning in euthymic bipolar II disorder. The Journal of Nervous and Mental Disease 199:459-64.

O'Donnell LA, Deldin PJ, Grogan-Kaylor A et al (2017) Depression and executive functioning deficits predict poor occupational functioning in a large longitudinal sample with bipolar disorder. J Affect Disord 215:135-42.

Peterson L and Peterson MJ (1959). Short-term retention of individual verbal items. Journal of experimental psychology, 58:193.

Rosa AR, Sanchez-Moreno J, Martinez-Aran A et al (2007) Validity and reliability of the Functioning Assessment Short Test (FAST) in bipolar disorder. Clin. Pract. Epidemol. Ment. Health 3: 5.

Rosa AR, Bonnin CM, Vazquez GH et al (2010) Functional impairment in bipolar II disorder: Is it as disabling as bipolar I? Journal of Affective Disorders, 127:71–6.

Russel AJ, Munro J, Jones PB et al (2000) The National Adult Reading Test as a measure of premorbid IQ in schizophrenia. Br J Clin Psychol 39:297-305.

Ruggero CJ, Chelminski I, Young D et al (2007) Psychosocial impairment associated with bipolar II disorder. Journal of affective disorders, 104:53-60.

Sanchez-Moreno J, Martinez-Aran A, Tabares-Seisdedos R et al (2009) Functioning and disability in bipolar disorder: an extensive review. Psychotherapy and psychosomatics, 78:285-97.

Senturk V, Goker C, Bilgic A et al (2007) Impaired verbal memory and otherwise spared cognition in remitted bipolar patients on monotherapy with lithium or valproate. Bipolar disorders, 9:136-44.

Simonsen C, Sundet K, Vaskin A et al (2008) Neurocognitive profiles in bipolar I and bipolar II disorder: differences in pattern and magnitude of dysfunction. Bipolar Disorders, 10:245-55

Sole B, Bonnin C, Torrent C et al (2012) Neurocognitive impairment and psychosocial functioning in bipolar II disorder. Acta Psychiatrica Scandinavica, 125:309-17.

Soni A, Singh P, Shah R et al (2017) Impact of Cognition and Clinical Factors on Functional Outcome in Patients with Bipolar Disorder. East Asian Arch Psychiatry 27:26-34.

Spreen O and Strauss E (1991) Controlled oral word association (word fluency). Spreen O, Strauss E. A compendium of neuropsychological tests. Oxford: Oxford Univ Pr, 219-27.

Tohen M, Greil W, Calabrese JR et al (2005) Olanzapine versus lithium in the maintenance treatment of bipolar disorder: a 12-month, randomized, double-blind, controlled clinical trial. Am. J. Psychiatry 162:1281–90.

Torrent C, Martinez-Aran A, Daban C et al (2006) Cognitive impairment in bipolar II disorder. Br. J. Psychiatry 189:254–9.