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Relationship between Childhood Adversities, Emotion Dysregulation and Cognitive Processes in Bipolar Disorder and Recurrent Depressive Disorder

Dicle OYMAK YENİLMEZ[1], Murat İlhan ATAGÜN[2], İlkay KELEŞ ALTUN[3], Serhat TUNÇ[4], Mine UZGEL[5], Kürşat ALTINBAŞ[6], Gizem CESUR[7], Esat Timuçin ORAL[8]

SUMMARY

Objective: Cognitive development is susceptible to environmental distress, leading to cognitive distortions. Cognitive distortions may affect clinical course of psychiatric disorders. We aimed to assess whether childhood maltreatment and emotion dysregulation impair automatic thoughts (ATs) and meta-cognitions (MCs) in Bipolar Disorder (BD) and Major Depressive Disorder - Recurrent (MDB-RE) in this study.

Method: 85 patients with BD, 81 MDD-RE in remission and 86 healthy participants were enrolled. Automatic Thoughts Scale (ATS), Metacognition Questionnaire (MCQ-30), Childhood Trauma Questionnaire (CTQ-28), Difficulties in Emotion Regulation Strategies Scale (DERS) were the measures used.

Results: ATs were determined by CTQ physical abuse (β=0.34, p<0.01), DERS goals (β=-0.37, p<0.01), impulse (β=0.53, p<0.01) and non-accept (β=0.23, p<0.05) subscales in BD (F=21.08, p<0.01) and CTQ emotional neglect (β=0.22, p<0.05), DERS strategies (β=0.39, p<0.05) in MDD-RE (F=9.97, p<0.05). MCs were predicted by sexual abuse (β=0.46, p<0.01) in BD (F=4.88, p<0.01), and emotional abuse (B=-0.30, p<0.05) in MDD-RE (F=7.02, p<0.01).

Conclusion: These results suggest that emotion dysregulation and childhood adversities are associated with cognitive processes such as MCs and ATs in MDD-RE and BD. Cognitive processes can cause various clinical manifestations and emotion dysregulation and childhood traumas should be considered as psychopathological components that can affect the course of mood disorders via various components. Further follow-up studies and larger samples are needed to better understand the effects of these components.

Keywords: Bipolar disorder, major depressive disorder- recurrent episodes, automatic thoughts, metacognitions, childhood trauma, emotion dysregulation

INTRODUCTION

Negative life events in the early stages of development may lead to cognitive distortions and psychiatric disorders related to assessment about the self and the external world (Beck 1967, Kennedy et al. 1998, Harkness and Lumley 2008). In the later stages of life, these distortions can cause vulnerability to psychiatric disorders by experiencing negative life events again (Beck 1967, Abramson et al. 1997, Kennedy al. 1998). In addition, automatic thoughts (ATs) and metacognitions (MCs) may cause stereotyped cognitive distortions, which may lead to negative assessment for the self and the external world, negative self-esteem, pessimism and eventually to psychiatric disorders (Beck 1967). These cognitive processes become activated when negative events are encountered, and active cognitive processes may lead to uncontrollable negative consequences, destructive social problems and

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[1]MD., Sultan 1st Murat State Hospital, Department of Psychiatry, Edirne, [2]Assoc. Prof., Ankara Yıldırım Beyazıt University, Faculty of Medicine, Department of Psychiatry, Ankara, [3]MD., Trabzon Kanuni Training and Research Hospital, Department of Psychiatry, Trabzon, [4]Assist. Prof., [5]Assist., Kafkas University, Faculty of Medicine, Department of Psychiatry, Kars, [6]Assoc. Prof., Selçuk University Faculty of Medicine, Department of Psychiatry, Konya, [7]Assist. Prof., [8]Prof., İstanbul Ticaret University, Department of Psychology, İstanbul, Turkey.

e-mail: miatagun@ybu.edu.tr

lower self-confidence to one's own cognitive activity (Wells 2009). Consequently, triggered negative beliefs can cause depressive symptoms (Papageorgiou and Wells 2003, Weber and Exner 2013). In addition to early life experiences, innate characteristics may also affect cognitive development. For example, various temperament characteristics can be observed in bipolar disorder (BD) and depression (Cloninger 1987) and these characteristics may also affect the development of cognitive phenomena such as MCs, ATs, and schemas (Johnson and Fingerhut 2004). Therefore, there may be differences in cognitive processes due to different reasons in mood disorders.

In the literature, studies on cognitive processes of BD are limited and conflicting. Lex and colleagues (2008) examined automatic thoughts in bipolar I disorder in remission and they could not find any significant difference in comparison to healthy controls and the authors have suggested that this finding is due to absence of depressive symptoms. In addition, other studies performed in BD showed similar results (Hollon et al. 1986, Alloy et al. 1999). However, another study in patients with bipolar I disorder in remission, did not support these results by showing a significant difference between controls and patients on negative ATs (Gruber et al. 2008). In a study investigating metacognitions in a mixed sample with BD subtypes (type I, II and BD not otherwise specified), it was found that all of the BD groups had higher MCQ scores in comparison to healthy controls (Østefjells 2017). Similarly, in depressed patients with MDD-RE and BD, MCQ scores were correlated with depression severity (Sarısoy et al. 2014, Batmaz et al. 2014).

Studies by Eaves and Rush (1984), Hollon et al. (1986) and Gül et al. (2015) have demonstrated a relationship between ATs and severity of depression in MDD-RE which corresponds to Unipolar Depressive Disorder in ICD-10 (World Health Organization 1992). In longitudinal followup studies, it has been shown that the severity of negative ATs and dysfunctional attitudes are alleviated in correlation with the decreased severity of depression in the treatment process (Oei et al. 2006). In studies about metacognitions suggest that patients with current depression are more likely to have a higher level of MCs than the previously depressed patients and the controls and this is thought to precipitate depression (Halvorsen et al. 2015, Huntley and Fisher 2016).

Emotion regulation develops from birth and it is also related with psychiatric disorders (Beeghly and Cicchetti 1994, Maughan and Cicchetti 2002). Similarly, childhood experiences of adversities create predisposition and sensitivity to psychiatric disorders. Although cognitive distortions can lead to psychiatric disorders, the mediating role of cognitive processes in psychiatric disorders by emotion dysregulation and childhood traumas are unknown. MCs and ATs may be affected by developmental periods and life events. MCs develop at an earlier stage of development than ATs (Piaget 1977). The aim of this study was to determine MCs and ATs of patients with BD and MDD-RE in remission, and to investigate the mediating role of emotion dysregulation and childhood adversities in cognitive processes in BD and MDDRE. It was hypothesized that MCs and ATs of the patients with BD and MDD-Rein remission were higher than those of HCs and emotion dysregulation and childhood trauma may mediate abnormalities in ATs and MCs.

METHOD

Subjects

This study was conducted with patients who consulte the psychiatric outpatient clinics of Kafkas University Faculty of Medicine, Bakirkoy Training and Research Hospital for Psychiatry, Trabzon Kanuni Training and Research Hospital, Diyarbakir Gazi Yaşargil Training and Research Hospital, Ankara Atatürk Training and Research Hospital and Selçuk University Facultyof Medicine. The study included patients with type I BD (n=85), MDD-RE (n=81) in remission and healthy individuals as the control group (n=86) matched with the patient groups on age, gender and education level. Diagnoses were checked with the Structured Clinical Interview According to DSM-IV- TR- Axis I Disorders (First et al. 1997, Özkürkçügil et al. 1999). Patients and controlssigned a written informed consent documents prior to the study enrollment. Fourteen patients (10 BD, 4 MDD-RE) did not agree to participate in the study. The inclusion criteria were being of 18-65 years of age, being in remission for at least 6 months, having a history of 2 depressive episodes for MDD-RE, being literate, not having any comorbid psychiatric diagnoses. The exclusion criteria consisted of having any central nervous system disease, mental retardation, alcohol or any other substance use disorder, history of major traumas and head injuries, having been hospitalized in the last 6 months, having any comorbid psychiatric diagnosis, diagnosis of psychiatric illness in the first degree relatives of the controls and not consenting to participate in the study.

The study was approved by the Ethical Committee for Clinical Research of Kafkas University, School of Medicine in 09.06.2016, with the serial number is80576354-050-99/89.

Instruments

Patients and controls were asked to complete a sociodemographic and clinical data form which was prepared based on clinical experience, literature and the aims of the study. The Beck Depression Inventory (BDI), the Young Mania Rating Scale (YMRS), the State-trait anxiety inventory (STAI) were used for clinical assessments. Also, the Hypomania Checklist-32 (HKL-32) was used to check

potential hypomanic episodes in MDE-RE. The Participants were further tested on the psychometric scales listed below.

Structured Clinical Interview for DSM-IV Axis I (SCID-I): The SCID-I is a structured diagnostic tool that is designed to assess DSM–IV Axis I disorders. SCID-I is a clinician administered scale. It's developed by First et al. (1997) and adaptation to the Turkish language and reliability study was conducted by Özkürkçügil et al. (1999).

The Metacognitions Questionnaire – 30 (MCQ-30): The MCQ-30 was developed by Cartwright-Hatton and Wells (1997). Wells and Cartwright-Hatton later formed a 30- item short form (MCQ-30). Tosun and Irak (2008) adapted it to the Turkish population and determined its validity and reliability. Each item in the MCQ-30 is uses a 4-point scale ranging from 1 (Do not agree) to 4 (Agree very much). It is rated on a 4 – point Likert scale. Scores in the 30 to 120 range or above on the questionnaire indicate the scale of the unhelpful beliefs. According to the psychometric study conducted by Wells and Cartwright-Hatton (2004), items in the MCQ-30 are distributed to five factors and this distribution as in the long form. These five factors are: (1) positive beliefs about worry (items 1, 7, 10, 20, 23 and 28), (2) cognitive confidence (items 8, 14, 18, 24, 26 and 29, (3) uncontrollability and danger (items (6, 13, 15, 21, 25 and 27), (4) cognitive self-consciousness (items 3, 5, 12, 17, 19 and 30), and (5) the need to control thoughts (items 2, 4, 9, 11, 16 and 22).

Automatic Thoughts Questionnaire (ATQ): The ATQ was developed by Hollon and Kendall (1980), the validity and reliability of the Turkish language version was performed by Şahin et al. (1992). It is a likert-type scale consisting of 30 items each rated from 1 to 5 and indicating the frequency of automatic negative thoughts related to depression. The scores change range between 30 and 150. There is not a cutoff point and higher scores show tendency to negative automatic thoughts.

Difficulties in Emotion Regulation Scale (DERS): The DERS was developed by Gratz and Roemer (2004), as a 36-item measure of the disorder and consists of 6 subscales including. awareness, clarity, nonacceptance, strategies, impulse and goals. The validity and reliability of the Turkish language version was performed by Rugancı and Gençöz (2010). The effect sizes of the subscales other than the awareness subscale were adequate. The sub-dimension of the awareness subscale was not able to achieve even the medium effect size (Bardeen et al. 2012, Fowler et al. 2014). Because of conflicting results for the awareness subscale in previous studies, the study was conducted by excluding the awareness scale.

The Childhood Trauma Questionnaire (CTQ): The CTQ is a 28-item self-report instrument developed by Bernstein and colleagues (2003). This scale evaluates childhood emotional, physical or sexual abuse and childhood physical or emotional neglect. The total score is a combination of five subscale scores. Validity and reliability of the Turkish language version was performed by Sar et al. (2012).

Young Mania Rating Scale (YMRS): The YMRS was developed by Young et al. (1978) to measure the severity of mania and reliability and validation studies for the Turkish version were conducted by Karadag et al. (2003). It is an 11-item scale. Items related to irritability, destructive and aggressive behavior, thought content, speed and amount of speech are counted with double points. Higher scores indicate severity of mania.

Beck Depression Inventory (BDI): The BDI was developed by Beck and colleagues (1961) to measure physical, emotional, cognitive and motivational symptoms of depression and validity and reliability study of the Turkish language version was performed by Hisli (1988). This self-report questionnaire consists of 21 items and items are rated on a 4-point scale ranging from 0 to 3. The total score may vary between 0-63, with 21 and higher scores indicating moderate to severe depression (Hisli 1989).

Hypomania Checklist – 32 (HCL-32): The HCL-32 was developed by Angst et al. (2005) to screen hypomania. It is a self-report questionnaire and the scale was used to identify the hypomanic component in patients with depressive episodes in order to help the clinician to diagnose bipolar-II and bipolar disorders. Sensitivity and specificity have been shown. Validity and reliability of the Turkish language version was performed by Aydemir et al. (2011).

State-Trait Anxiety Inventory (STAI): The STAI was developed by Spielberger et al. (1970), it includes 20 items on state anxiety (STAI-S) and 20 items on trait anxiety (STAI-T). All items are scored on a 4-point Likert scale, high scores indicating the severity of anxiety. Validity and reliability of the Turkish language version was performed by Öner and Le Compte (2011). The total score of both scales varies between 20 and 80.

Statistical Analysis

Statistical analyses were performed on the SPSS 20 (IBM, Armonk, NY, USA). Descriptive analyses (frequencies or means and standard deviations) were obtained initially. The Kolmogorov-Smirnov Test was used to test the normality in the distribution of the variables. One-way analysis of variance (ANOVA) was used to determine whether groups displayed differences in terms of the CTQ, DERS, MCQ scores between MDD-RE, BD and controls. Since Levene's homogeneity of variances test showed homogeneity of the variance, tukey test was used in the post-hoc comparisons. The Pearson correlation analysis was used to determine the significance of the relationships between MCQ, CTQ and

DERS score levels in the patient groups. Linear Regression Analysis was conducted in order to demonstrate any relation between the MCQ score of the BD group with the scores on the CTQ and DERS. The level of significance was accepted as 0.05. Results were reported in terms of the mean and the standard deviation.

RESULTS

The sample of the study consisted of 252 participants consisting of 81 (31.9%) MDD-RE, 85 (33.9%) BD (64 type I and 21 type II) patients and 86 (34.3%) healthy control individuals. Sociodemographic data of the participants are shown in Table 1. There was not any statistically significant difference between the groups regarding age, gender or level of education (p>0.05).

The results of ANOVA evaluating the presence of any differences between the groups in terms of the CTQ, DERS, MCQ and ATQ scores are presented in Table 2. Accordingly, the mean scores on the CTQ physical abuse ($F_{2.248}$=3.41, p<0.05), physical neglect ($F_{2.248}$=6.39, p<0.01), emotional abuse ($F_{2.248}$=6.58, p<0.01) and emotional neglect ($F_{2.248}$=5.34, p<0.01) subscales were found significantly different between the groups. It was found in post-hoc comparisons that there was a higher mean score on the CTQ physical neglect subscale in the MDD-RE group as compared to the BD and control groups. There were higher scores on the CTQ physical abuse, emotional abuse and emotional neglect subscales in the MDD-RE in comparison to the control group. The CTQ emotional abuse subscale score was higher in the BD as compared to the control group.

In terms of the difficulty in emotion regulation, the mean scores on the DERS non-acceptance ($F_{2.248}$=19.31, p<0.01), goals ($F_{2.248}$=22.97, p<0.01), impulse ($F_{2.248}$=26.89, p<0.01), strategy ($F_{2.248}$=33.86, p<0.01), clarity ($F_{2.248}$=13.01, p<0.01) subscales were significantly different between the BD, MDDRE and control groups. According to this, it was observed that the BD group had higher mean scores compared to MDD-RE and control group in terms of goals, impulse and strategy subscale scores and the BD group had higher mean scores on non-acceptance and clarity subscales of the DERS as compared to the control group only , whereas the MDDRE group had higher scores than the control group in terms of non-acceptance, impulse, strategies and clarity subscales.

In terms of MCs, there were significant differences between the BD, MDD-RE and control groups on the mean scores of MCQ positive beliefs ($F_{2.248}$=6.14, p<0.01), uncontrollability and danger ($F_{2.248}$=6.53, p<0.01), cognitive confidence ($F_{2.248}$=5.01, p<0.05), the need to control thoughts ($F_{2.247}$=9.77, p<0.01) and cognitive self-consciousness ($F_{2.247}$=7.02, p<0.01) subscales. Accordingly, it was observed that the BD group had higher scores than the MDD-RE group on all subscales of the MCQ. The MDD-RE had lower mean scores on the MCQ positive beliefs and cognitive self-consciousness subscales in comparison to the control group. In terms of automatic thoughts, there were significant differences between the BD, MDD-RE and control groups ($F_{2.248}$=16.92, p<0.01). Accordingly, the BD and MDD-RE groups had higher scores than controls in the ATQ.

Finally, in terms of symptom levels, the MDD-RE and BD groups had higher scores than the controls in BDI ($F_{2.248}$=23.49, p<0.01); and the BD group had higher score

Table 1. Demographic Characteristics of Sample Groups

	BD (N=85)	MDD-RE (N=81)	C (N=86)	t / X^2 / F	p
Age	36.56±11.64	36.30±9.44	32.28±9.80	0.83	0.44
Gender (woman %)	46 (54.1%)	53 (66.3%)	51 (60.0%)	2.54	0.28
Education (years)	11.89±3.13	11.40±2.79	11.27±4.66	0.71	0.49
Marital Status (maried %)	39 (45.9%)	53 (66.3%)	49 (57.65)	11.02	0.004*
Income Status	44 (51.8%)	23 (28.7%)	30 (36.5)	9.15	0.06
Family History (yes %)	43 (50.6%)	30 (37.5%)		32.53	<0.001**
Age of Onset	25.40±8.44	27.72±7.36	-		
Number of Depressive Episodes	2.53±1.10	3.01±3.36	-		
Number of Manic Episodes	3.61±3.62	-	-		
Suicide Attempts (never %)	58 (68.2%)	57 (71.3%)	-		
YMRS	2.87±4.26	0.48±1.60	0.57±1.42		
BDI	15.93±14.16	18.51±13.06	6.83±6.09		
HCL-32	22.45±7.09	10.31±8.56	12.74±6.82		

One-Way ANOVA, Chi-Square or t test. BDI: Beck Depression Inventory, YMRS: Young Mania Rating Scale, HCL-32: Hypomania Checklist – 32. BD: Bipolar Disorder, MDD-RE: Major Depressive disorder -recurrent episode, C: Control

Table 2. ANOVA Results

	BD $\bar{x}$ (s)	MDD-RE $\bar{x}$ (s)	C $\bar{x}$ (s)	$F_{2.248}$	Post-hoc
CTQ					
Sexual Abuse	7.21 (2.92)	7.93 (3.65)	7.48 (3.37)	0.97	-
Physical Abuse	8.58 (3.78)	9.66 (3.66)	8.10 (4.29)	3.41*	2>3
Physical Neglect	11.47 (4.57)	13.50 (4.37)	10.97 (5.38)	6.39**	2>1,3
Emotional Abuse	10.18 (3.28)	10.26 (3.07)	8.62 (3.58)	6.58**	1,2>3
Emotional Neglect	16.45 (6.17)	18.16 (6.10)	14.85 (7.22)	5.34*	2>3
Total	56.94 (15.41)	62.43 (16.07)	51.35 (22.35)	7.61**	2>3
DERS					
Nonacceptance	16.92 (5.96)	15.15 (4.22)	12.07 (5.11)	19.31**	1,2>3
Goals	17.20 (4.44)	14.39 (2.75)	13.22 (4.33)	22.97**	1>2,3
Impulse	18.13 (5.79)	16.24 (4.49)	12.76 (4.12)	26.89**	1>2<3
Strategy	24.69 (7.70)	21.66 (5.16)	16.66 (6.15)	33.86**	1,2>3
Clarity	13.12 (3.99)	13.34 (3.12)	10.81 (3.51)	13.01**	1,2>3
Total	102.78 (25.31)	95.21 (18.40)	77.86 (20.24)	29.96**	1,2>3
MCQ					
Positive Beliefs	12.75 (4.37)	10.93 (3.16)	12.76 (3.90)	6.14**	1,3>2
Uncontrollability and Danger	15.36 (4.57)	13.08 (3.78)	14.15 (3.81)	6.53**	1>2
Cognitive Confidence	14.54 (5.15)	12.20 (4.68)	13.14 (4.53)	5.01*	1>2
Need to Control Thoughts	15.55 (4.51)	12.61 (4.56)	13.43 (4.22)	9.77**	1>2,3
Cognitive Self-Consciousness	16.05 (4.51)	13.73 (4.25)	15.80 (4.35)	7.02**	1,3>2
Total	71.81 (20.76)	58.08 (18.44)	68.80 (14.68)	13.00**	1,3>2
ATQ	79.25 (32.99)	76.01 (26.27)	56.29 (23.45)	16.92**	1,2>3
BDI	15.93 (14.16)	18.51 (13.06)	6.83 (6.09)	23.49**	1,2>3
YMRS	2.87 (4.26)	0.48 (1.60)	0.57 (1.42)	20.24**	1>2,3
HCL-32	22.45 (7.09)	10.31 (8.56)	12.74 (6.82)	61.16**	1>2,3
STAI-S	47.80 (8.58)	47.71 (6.62)	46.36 (5.70)	0.96	-

*p <0.05, **p <0.01. STAI-S: State-trait anxiety inventory- state anxiety; CTQ: Childhood Trauma Questionnaire, DERS: Difficulties in Emotion Regulation Scale, MCQ: Metacognitions Questionnaire ATQ: Automatic Thoughts Questionnaire, BDI: Beck Depression Inventory, YMRS: Young Mania Rating Scale, HCL-32: Hypomania Checklist – 32.

than the MDD-RE group and the controls in the YMRS ($F_{2.248}$=20.24, p<0.01). In addition to this, hypomania scores were higher in the BD group than in the MDD-RE group and the control group ($F_{2.248}$=61.16, p<0.01). There were not any significant differences between groups mean scores of trait anxiety. There were not any significant differences on gender basis between ATs and MCs (p>0.05).

Correlation analyses were carried out between variables including the scores of the psychometric scales ATQ, MCQ, CTQ, DERS, YMRS, BDI, STAI-S, and the factors of age, education, age at onset of disease, number of episodes and the number of hospitalizations. In the control group, the ATQ total score correlated with the total scores on the MCQ (r=0.24, p<0.05), DERS (r=0.48, p<0.01) and the BDI (r=0.63, p<0.01). There were significant correlations between total scores on the CTQ (r=0.29, p<0.01) and BDI (r=0.32, p<0.01); and the HCL-32 correlated with MCQ total scores (r=0.27, p<0.05). There were correlations between the DERS total score and the scores on the BDI (r=0.29, p<0.05) and the STAI-S (r=-0.35, p<0.01). There were correlations between the CTQ total score and the YMRS (r=0.38, p<0.01) and the STAI-T (r=0.32, p<0.01). In the MDD-RE group, there were correlations between the ATQ score and the scores on the DERS (r=0.70, p<0.001), BDI (r=0.33, p<0.01) and the HCL-32 (r=-0.52, p=0.001). The MCQ total score correlated with the total scores on the CTQ (r=0.46, p<0.001), YMRS (r=0.26, p<0.05), STAI-S (r=0.36, p=0.001) and the HCL-32 (r=0.29, p<0.01). There were correlations between the DERS total score and the BDI (r=0.38, p=0.001) and HCL-32 (r=-0.38, p=0.001) scores. There was a correlation between YMRS and the CTQ total score (r=0.34, p<0.01). In the BD group the ATQ score correlated with the MCQ total score (r=0.34, p<0.01), CTQ (r=0.25, p<0.05) and DERS total (r=0.62, p<0.001), YMRS (r=0.31, p<0.01), BDI (r=0.44, p<0.0001) and STAI-S (r=0.35, p=0.001). There were correlations between the DERS total score and the YMRS (r=0.26, p<0.05), the BDI (r=0.42, p<0.0001) and

Table 3. Determinants of Automatic Thought in Groups

		Unstandardized Coefficients		Standardized Coefficients	t	p
		B	SE	B		
C[1]	DERS Total	0.39	0.1	0.37	3.81	<0.001
	BDI	1.55	0.39	0.41	4.01	<0.001
MDD-RE[2]	DERS Total	0.74	0.12	0.52	6.01	<0.001
	HCL-32	-1.10	0.26	-0.36	-4.31	<0.001
BD[3]	DERS Total	0.68	0.13	0.52	5.18	<0.001

Linear regression analysis. C: Control, MDD-RE: Major Depressive disorder -reccurrent episode, BD: Bipolar Disorder, Dependent variable: ATQ, Independent variable: DERS-total, CTQ, BDI, YMRS, STAI-S, STAI-T, HCL-32.

Table 4. Determinants of Metacognitions in the Groups

		Unstandardized Coefficients		Standardized Coefficients	t	p
		B	SE	B		
C[1]	DERS	0.28	0.07	0.38	3.82	<0.001
	CTQ	0.16	0.07	0.24	2.33	0.023
MDD-RE[2]	CTQ	0.48	0.11	0.42	4.34	<0.001
	STAI-T	0.86	0.27	0.31	3.2	0.002
BD[3]	CTQ	0.32	0.13	0.24	2.39	0.019
	STAI-T	0.91	0.24	0.38	3.82	<0.001

Linear regression analysis. The explanations of the short forms are provided in the footnotes of the Tables 2 and 3. Dependent variable: MCQ-Total; Independent variables: DERS-total, CTQ, BDI, YMRS, STAI-S, STAI-T, HCL-32. [1]F=9.37, p<0.001, Adjusted R^2=0.24; [2]F=16.67, p<0.001, Adjusted R^2=0.28; [3]F=12.23, p>0.001, Adjusted R^2=0.21.

the STAI-T (r=0.47, p<0.001) scores. There were correlations between the CTQ total score and the YMRS (r=0.36, p=0.001) and the BDI (r=0.35, p=0.001) scores.

Regression Analysis

First, a linear regression analysis was conducted to examine the predictive power of symptom levels on the ATs of BD. Analyses included variables which had a significant correlation with ATs. According to this, it was observed that DERS total score (β=0.68, p<0.001) was a positive predictor of ATs in the BD group (R^2=0.41, F=9.11, p<0.001). A second linear regression analysis was conducted to examine the predictive power of symptom levels on the ATs in the MDD-RE group. Analyses included variables which a significant correlation with the ATs. Hence, it was observed that the DERS total score (β=0.68, p<0.001) was a positive predictor of ATs, and the HCL-32 (β=-1.10, p<0.001) score was a negative predictor of ATs in the MDD-RE group (R^2=0.41, F=9.11, p<0.001). Another linear regression analysis was conducted to examine the predictive power of symptom levels on the ATs of controls. It was observed that the DERS total score (β=0.39, p<0.001) and the BDI score (β=1.55, p<0.001) were positive predictors of ATs (R^2=0.43, F=9.53, p<0.001) in the control group. Details of the analysis are presented in Table 3. In the regression analysis, determinants of ATs were the DERS and HCL-32 scores in the MDD-RE and the DERS score in the BD group.

Finally, a linear regression analysis was conducted to examine the predictive power of symptom levels on the MCs in the BD, MDD-RE, control groups. Analyses included variables which had significant correlations with MCs. According to this, it was observed that CTQ total score (β=0.32, p<0.05) and STAI-T (β=0.91, p<0.001) were positive predictors of MCs in the BD group (R^2 =0.21, F=12.23, p<0.001). It was observed in another linear regression analysis that the CTQ total score (β=0.48, p<0.001) and STAI-T (β=0.86, p<0.05) were positive predictors of MCs in the MDD-RE group (R^2=0.28, F=16.67, p<0.001). Analyses are shown in Table 4. Determinants of MCs were the CTQ total and STAI-T scores in the MDD-RE and BD groups (Table 4).

DISCUSSION

The aim of this study was to investigate the ATs and MCs in BD, MDD-RE and to evaluate whether there is a relationship between these dimensions and childhood adversities and emotion dysregulation. There were significant differences between the groups in terms of MCs, ATs, childhood traumas and emotion dysregulations. In comparison to the healthy controls, the MDD-RE and BD groups had significantly higher scores in the CTQ, DERS and depression. In the regression analysis, ATs were determined by the DERS and CTQ scores in the BD and MDD-RE groups. However, MCs were determined with the CTQ and the trait anxiety scores.

It was detected that the DERS scores positively correlated with only ATs in the BD group. To our knowledge, there has not been a study on this subject in the literature. ATs may play a trigger role and cause negative emotions. The problems with emotion dysregulation in the BD may trigger depressive or manic episodes by disrupting regulation of negative emotion and disrupting the system which reduces the effect of emerging emotion (Salovey 1995). The disorder itself may disrupt emotion regulation, the balance between positive and negative emotions may lead to further deterioration (Gross 2011) and may induce chronicity in patients.

In the BD group the CTQ score was positively correlated with MCs in this study. We could not find any studies that had investigated the relationship between cognitive processes and childhood traumas in BD. However, it was reported that metacognitive beliefs on loss of control and danger were higher in patients with psychotic disorders, in comparison to psychotic patients without a history of childhood trauma (Scherer-Dickson 2010). It is thought that MCs play an important role in the course of the disease and MCs may cause psychotic symptoms, tendency / sensitization and increase the risk of recurrent illness in psychotic patients with a history of childhood traumas (Scherer-Dickson 2010). Negative life events that occur in later life may cause signs of depression by activating these distortions (Beck 1967, Cloninger 1987, Johnson and Fingerhut 2004). Our study supports this connection. MCs develop in the later stages of life, such as the period of formal operational stage (Piaget 1977), so it may be the cause of the positive directional relationship between the childhood traumas and the MCs in particular.

In the MDD-RE group, the scoring on the DERS was positively correlated with only ATs. In a study which investigated the relationship between dysfunctional attitudes and cognitive emotion regulation during stressful events, it was observed that the relationship between depression and dysfunctional attitudes decreased as a result of adaptive cognitive emotion regulation (Vanderhasselt et al. 2014). Also, in another study, it was stated that adaptive emotion regulation helps to prevent, reduce or shorten the intensity or duration of dysphoric states that reactivate depressive thought patterns contributing to the (re-)occurrence of major depressive episodes (Segal at al. 2006, Jarrett et al. 2012). In our study, a positive linear correlation was found between the DERS scores and ATs in the MDD-RE group in agreement with these studies. The use of adaptive emotion regulation strategies may prevent dysfunctional cognitions to be controlled and thus prevent the emergence of depressive symptoms. Adaptive emotion regulation may facilitate control over depressive symptoms and can protect against individual differences and depressive symptoms triggered by stressors (Garnefski et al. 2007). A positive correlation was found between the scores on the MCQ and the CTQ, especially on sexual and emotional abuse, in the MDD-RE group. Raes et al. (2008) found a significant relationship between emotional abuse and depressive disorder and they suggested that ruminations may be the mediators in similarity to our study. Likewise, the belief that 'rumination will work' may consolidate ruminative thoughts and ruminative thoughts may cause clinical symptoms (Yılmaz 2016).

In both the BD and MDD-RE groups, ATs were positively correlated with only childhood traumas. Regarding the relationship between childhood traumas and dysfunctional attitudes, it was observed in women with depressive disorder that the relationship between emotional abuse and depression was mediated by dysfunctional attitudes (Akbaba Turkoglu et al. 2015). Rezaei et al. (2016) reported that the relationship between childhood traumas and depressive disorder was mediated by disconnection and rejection schema domain. These results are also consistent with the early maladaptive schema model triggered by adversities (Young et al. 2003). To our knowledge, there have not been any studies on this subject in BD reported in the literature. It was reported that more negative life events were observed in BD compared to controls (Bernstein et al. 1994, Etain et al. 2010, Janiri et al. 2015). This suggests that negative life events may cause episodes by triggering cognitive distortions besides ATs as well as MCs in BD. All of these studies are consistent with our study, suggesting that negative cognitions in patient groups are associated with childhood adversities.

The most important limitations of our study include not having evaluated in detail the treatment histories, the previous evaluations on the past episodes such as psychotic period, mixed episode, rapid cycling history and in having a crosssectional design. Also, only BD type I patients were examined in this study. However, depressive episodes in BD type II are longer and more severe. Therefore, it will be appropriate to evaluate BD type II patients in future studies. Retrospective evaluation of the scales is also an important limitation. One of the other limitations of our study is that the psychometric scales used were self-report scales and the sample size was small. However, the comparison of MDD-RE with BD groups and the low number of studies evaluating cognitive processes in BD are the strengths of this study.

To conclude, this is the first study to investigate the effect of emotion dysregulation and childhood traumas on MCs and ATs in BD and MDD-RE. Our results suggest that emotion dysregulation and childhood adversities are dimensions that influence cognitive processes such as MCs and ATs, which are quite important in MDD-RE and BD. This study can be a guide for professionals working in the mental health field to provide a holistic view of the patients in clinical intervention processes.

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