

Temperament and Character Personality Dimensions in Patients with Bipolar I Disorder



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SUMMARY

Objectives: To compare Cloninger's dimensions of temperament and character in patients with bipolar I disorder (BP-I) and healthy controls from the general population.

Materials and Methods: This cross sectional study included 96 BP-I patients (according to DSM-IV-TR criteria) that were admitted to a psychiatric hospital in Iran due to an acute episode of mania or depression, or a mixed episode during 2011. Following stabilization of the acute phase, the patients completed the 125-item Temperament and Character Inventory-Persian Version of (TCI-125-PV). The scale's 7 dimensions of temperament and character were compared between the bipolar group and 1212 healthy controls via independent samples t-test. Moreover, the correlation between temperament and character scores, and age, duration of disorder, and mood variables (depression and mania scores) were assessed using Pearson's correlation coefficient.

Results: The bipolar patients had significantly higher harm avoidance ($P = 0.001$), and lower reward dependency ($P = 0.001$), persistence ($P = 0.044$), cooperativeness ($P = 0.001$), self-directedness ($P = 0.001$), and self-transcendence ($P = 0.004$) scores than the controls. Female patients had lower reward dependency ($P = 0.001$), self-directedness ($P = 0.001$), and cooperativeness ($P = 0.001$) scores than male patients. In addition, TCI-125-PV scores were not strongly correlated with depression or mania scores, duration of disorder, or marital status.

Conclusion: The personality profiles of the BP-I patients differed from those of the controls. Lower self-directedness and cooperativeness scores in the bipolar group appeared to be associated with more immature personality traits.

Keywords: Bipolar mood disorder; character; personality; temperament

INTRODUCTION

Mood disorders are a group of disorders that may vary in their pathological emotions and associated clinical abnormalities. Despite appropriate pharmacotherapy, low rates of recovery and a relatively high probabilities of recurrence were observed in >50% of cases of mood disorders; therefore, it is essential to evaluate the non-pharmacological factors associated with poor treatment outcomes such as role of society and family (Rouget and Aubry 2007; Otto et al. 2003; Keck et al. 1997). Another important factor associated with treatment outcomes

could be personality types in bipolar patients (McKinnon et al. 2012). Cloninger attempted to construct a valid structural model of personality that included both normal and abnormal personality types, with an emphasis on biological parameters. From a structural point of view, personality is defined by the ongoing interaction between temperament, character, and psyche.

Temperament is considered an inherited tendency to experience particular emotions that form habits and automatic behavioral patterns. Temperament has 4 confirmed dimensions:

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novelty seeking; reward dependency; harm avoidance; persistence (Cloninger and Svrakic 2009). Character is the rational core of personality and involves such cognitive functions as abstract thinking, symbol interpretation, and reasoning. Character encompasses 3 distinct dimensions that mature during adulthood: self-directedness; cooperativeness; self-transcendence (Cloninger et al. 1994).

The study of mental disorders without consideration of the personality profiles of patients seems insufficient, as the prevalence of personality disorders is high. It was reported that 10%-20% of the general population has a personality disorder, and that >50% of psychiatric inpatients and outpatients have a personality disorder or abnormal personality traits (Thiriet al. 2013; Thomas et al. 2012; Compton et al. 2007, 2005; Grant et al. 2004). Research has shown that comorbid personality disorder and its characteristics, such as low-level self-directedness, are risk factors that are predictive of other psychiatric disorders (Cloninger 2000). In addition, a comorbid personality disorder can have serious negative effects on the treatment of psychiatric patients (Mandelliet al. 2012; Tyrer et al. 2012). On the other hand, growing of character dimensions of personality is associated with an increase in happiness and improved public health (Cloninger and Zohar 2011).

As previously mentioned, Cloninger's theory can also be used to evaluate abnormal personality traits. In fact, positive personality traits, such as self-directedness and cooperativeness, have a significant affect on psychiatric treatment outcomes (Kronström et al. 2011; Arnauer et al. 2008; Mörtberg et al. 2007; Martinotti et al. 2006). Use of Cloninger's model in the study of personality disorders in patients with DSM Axis I diagnoses has been increasing since 2000. Low character dimension scores based on TCI, particularly self-directedness and cooperativeness, are indicative of a personality disorder without specifying its subgroup. From a clinical point of view, inadequate development of character dimensions is associated with such traits as irresponsibility, inability to define long-term goals, and low self-esteem, which are typical of personality disorders. Cloninger's model has been used to study personality patterns in patients with mood disorders, schizophrenia, obsessive-compulsive disorder, and addiction (Gonzalez-Torres et al. 2009; Kim et al. 2009; Hori et al. 2008; Basiaux et al. 2001; Bagby and Ryder 2000).

Several studies compared personality patterns in patients with bipolar disorder and healthy controls, in terms of ethnicity and culture. A study performed in the US reported that harm avoidance and self-transcendence scores based on TCI were higher in bipolar patients than in controls, whereas self-directedness scores were lower (Loftus et al. 2008). In addition, a study conducted in Turkey reported that self-transcendence and cooperativeness scores based on TCI were much lower in bipolar patients (Sayin et al. 2007). A Swedish study reported that based on TCI, harm avoidance scores were higher

in bipolar patients than in controls, whereas self-directedness and cooperativeness scores were lower. In addition, the reward dependency score was lower in the patients than in controls (Engström et al. 2004). Hamic et al. reported that low cooperativeness and self-directedness scores based on TCI in bipolar patients were associated with cyclothymia and irritability (Hamic et al. 2013). Research conducted with an adolescent bipolar population in Brazil reported that reward dependency, cooperativeness, and self-directedness scores based on TCI were lower in the patients than in healthy controls, whereas harm avoidance scores were higher. That study also reported higher novelty seeking scores and lower persistence scores in the adolescent bipolar patients (Olvera et al. 2009). A comparison between self-directedness scores in bipolar patients and those with major depressive disorder showed that self-directedness in the bipolar patients was much lower (Jylhä et al. 2011). Although some personality dimensions are similar in patients with mood disorders across cultures, significant differences have also been observed that indicate the need for further research on personality traits in patients from various cultures. To the best of our knowledge there are no studies on personality dimensions in Iranian patients with mood disorders; therefore, the present study aimed to compare personality dimensions in Iranian bipolar I (BP-I) patients and healthy controls, based on Cloninger's psychobiological model of personality.

MATERIALS and METHODS

Participants and procedures

This cross-sectional study included 128 patients (64 male and 64 female) with BP-I that were selected from those admitted to Mashhad Ibn-e-sina Hospital due to an acute episode (manic, depressive, or mixed) in 2011 (Figure). All patients were residents of Khorasan-e-Razavi Province in North Eastern Iran. Each patient was diagnosed according to DSM-IV-TR criteria for bipolar I disorder; all diagnoses were confirmed by ≥ 2 psychiatrists, using the Schedule for Affective Disorders and Schizophrenia (Endicott and Spitzer 1978). Inclusion criteria were a confirmed diagnosis of bipolar I disorder, age 18-65 years, and the ability to provide informed consent. Patients with mental retardation, addiction, or comorbid psychiatric disorders were excluded from the study.

All patients underwent standardized pharmacotherapy for an acute episode using such mood stabilizers as sodium valproate (maximum dose: 20 mg kg⁻¹), lithium carbonate (to maintain a serum level of 0.8-1.5 mEq L⁻¹), or olanzapine (maximum dose: 20 mg d⁻¹), plus benzodiazepines if needed. Treatment was given until the acute episode was brought under control (range: 2-6 weeks). A Hamilton Rating Scale for Depression (Hamilton 1960) score ≤ 12 and a Young Mania Rating Scale

Inclusion criteria: 1. Diagnosis of BP-I based on DSM-IV-TR 2. Informed consent 3. No mental Retardation 4. No substance abuse or dependency 5. Age 18-65 years
128 patients (64 male and 64 female) with BP-I during acute-phase treatment that were eligible to participate
Departure from the study design due to exclusion criteria (n = 32): 1. Change in diagnosis during treatment 2. Need for other drugs or ECT during the study 3. Lack of desire to continue with the study 4. Failure to achieve control of the acute-phase process 5. Transfer to a different ward
Clinical remission based on interviews, and the Jung Mania Rating Scale and Hamilton Depression Scale (2-6 weeks)
Completion of the demographic information form and TCI-125 (n = 1212)
Comparison of TCI-125 findings between the patient and control groups (n = 1212)

Figure. Sampling procedures and assessment of the BP-I patients.

(Youngstrom et al. 2003) score ≤ 8 , were considered indicative of remission and a euthymic mood state.

The study details were described to each patient and they were assured that the results would be used only for scientific research purposes. It was also made clear that the patients' personal information would remain confidential. Information was obtained from each patient following receipt of his/her consent. After stable remission was confirmed, the patients were entered into the next phase of the research. In all, 96 patients completed the study, as 14 required additional medications and were excluded from the study, 8 voluntarily withdrew from the study, and 10 were transferred to other wards or were discharged before the study was completed. Then demographic and personality questionnaires were completed by each patient. The study protocol was approved by the Mashhad University of Medical Sciences Ethics Committee.

Measures

Various variables and factors were measured using the questionnaires and scales described below.

1. Demographic Questionnaire

A demographic questionnaire was used to collect data on age, gender, and duration of disease.

2. Temperament and Character Inventory 125-Item, Persian Version

In order to assess the patients' personality dimensions based on Cloninger's theory, the Temperament and Character Inventory 125-item, Persian Version (TCI-125-PV) was administered. TCI-125 is an assessment tool based on Cloninger's dimensional model; however, it can also be used to diagnose personality disorders based on the categorical model. TCI-125 is a set of tests that measure the level of expression of the 7 basic personality dimensions (4 temperament dimensions: novelty seeking, harm avoidance, reward dependency, and persistence; and 3 character dimensions: self-directedness, cooperativeness, and self-transcendence). The version of TCI used in this study included 125 true-false items. Each TCI subscale has its own set of items, each of which is given a score; the total score for each dimension is obtained from the scores of its subscales. Both true and false answers can increase the score, according to the content of the item (Svrakic et al. 2002). The Persian version of the scale, standardized by Dr. Kaviani for the Iranian population, was used. The retest reliability in 101 individuals was high, and its Cronbach's alpha coefficient was 0.73-0.90 for the 7 dimensions. Moreover, the internal consistency of TCI-125-PV in a population of 1212 individuals was adequate, and the Cronbach's alpha coefficient was 0.55-0.84 for the 7 dimensions (Kaviani 2009; Kaviani and Pournaseh 2005).

3. The Hamilton Rating Scale for Depression-17 (HRSD)

HRSD is the most commonly used rating scale for measuring depressive symptoms in clinical practice and research settings. It is used to assess the range of depressive symptoms, including depressed mood, low functioning, sleep changes, suicidal ideation, psychomotor agitation or retardation, change in appetite and sexual interest, anxiety, somatic symptoms, and cognitive symptoms (Osher et al. 1996). HRSD-17 items are rated on a scale of 0-4, with higher scores indicating greater symptom severity (Osher et al. 1996).

4. Young Mania Rating Scale (YMRS)

YMRS is an 11-item questionnaire in which each item response is scored as 0-4. The scale is used to rank the symptoms of mania according to 5 degrees of severity. Higher scores indicate more severe mania. YMRS items are similar to the symptoms of manic phase of bipolar disorder based on DSM-IV criteria and severity of symptoms. The YMRS

score ranges from 0 to 60 (Youngstrom et al. 2003). A cut-off score of 12 is considered clinical remission/euthymia by Tohen (Keller 2006).

Controls

The control group included healthy individuals that were evaluated in another study (Kaviani and Pournaseh 2005); the temperament and character of 1212 men and women living in Tehran, Iran, were evaluated using TCI-125-PV. The controls were selected via random non-systematic sampling of the urban general population. Inclusion criteria were no psychopathology and a level of education exceeding middle school; exclusion criteria were history of brain injury and mental retardation. In order to understand the effect of gender on the study variables the data obtained were analyzed separately for each gender (Kaviani and Pournaseh 2005).

Data analysis

Data were analyzed using the independent samples t-test, ANOVA, and Pearson's correlation coefficient tests. Each of the 7 dimensions of temperament and character were compared between the patient and control groups using the independent samples t-test. Furthermore, the correlation between temperament and character personality dimension scores, and age and duration of illness were assessed using Pearson's correlation coefficient. Data analysis was performed using SPSS v.16.0 for Windows.

RESULT

In total, data were collected from 96 BP-I patients (47 female and 49 male). In all, 52 of the patients were married, 25 were single, and 18 were divorced. Table 1 shows a comparison of some demographic data between the patients and controls. Mean $\pm$ SD TCI-125-PV scores in both groups are presented

in Table 2. Comparison between the data for the BP-I group and the control group indicates that there was a significant difference in all TCI-125-PV subscales scores, except novelty seeking, between the 2 groups ($P < 0.05$). The bipolar patients had significantly higher harm avoidance scores ($P = 0.001$), and lower reward dependency ($P = 0.001$), persistence ($P = 0.044$), self-directedness ($P = 0.001$), cooperativeness ($P = 0.001$), and self-transcendence scores ($P = 0.004$) than the controls, which was also true for the male patients, as compared to the control group. The female patients only had lower reward dependency ($P = 0.001$), self-directedness ($P = 0.001$), and cooperativeness ($P = 0.001$) scores than the control group; there weren't any significant differences in the 4 dimension scores between the female patients and controls (Table 2).

Data on the correlation between TCI dimension scores, and age, duration of disease, HDRS score and YMRS score in the patient group are shown in Table 3. Accordingly, there was a negative correlation between age and the cooperativeness score ($P < 0.05$); there weren't any other significant correlations between TCI-125-PV dimensions and age. In addition, TCI-125-PV dimension scores weren't significantly correlated with depression or mania scores; however, there was some level of correlation between the dimensions of temperament and character (a positive correlation between self-directedness and reward dependency, between self-directedness and cooperativeness, between harm avoidance and persistence, between cooperativeness and self-transcendence, between cooperativeness and reward dependency, and between self-transcendence and persistence, and a negative correlation between harm avoidance and self-transcendence, and between harm avoidance and cooperativeness) (Table 3). The correlation between the 7 TCI-125-PV dimensions, and duration of disease and marital status was analyzed, but there wasn't a significant correlation between any of the dimensions, and marital status or duration of disease ($P > 0.05$).

Table 1. Demographic data for the BP-I patients and healthy controls (37)

		BP-I (n = 96)		Healthy Population (n = 1212)		P
		Number	Percentage	Number	Percentage	
Age Group (years)	<20	8	8.33	227	18.70	>0.05
	20-29	33	34.38	247	20.40	
	30-39	24	25	290	23.90	
	40-49	15	15.63	234	19.30	
	50 and more	16	16.67	214	17.70	
Sex	Mal	49	51	620	51.20	>0.05
	Female	47	49	592	48.80	
Level of Education	Under Diploma	56	58.33	108	8.90	<0.05
	High school Diploma	23	23.96	476	39.30	
	Above Diploma	17	17.71	628	51.80	

Table 2. Comparison of mean $\pm$ SD TCI-125-PV scores between the BP-I patients and controls

Scale	Males					Females					Total				
	Patients		Controls		P	Patients		Controls		P	Patients		Controls		P
	M	SD	M	SD		M	SD	M	SD		M	SD	M	SD	
NS	9.02	3.876	8.35	3.67	0.232	8.49	3.316	8.55	3.70	0.901	8.76	3.60	8.45	3.67	0.401
HA	9.82	3.504	6.81	4.11	0.001	8.85	3.753	8.23	4.39	0.262	9.34	3.641	7.50	4.30	0.001
RD	7.10	1.874	8.37	2.35	0.001	7.09	2.185	8.64	2.40	0.001	7.09	2.021	8.50	2.38	0.001
P	2.81	1.161	3.18	1.42	0.033	2.96	.999	3.04	1.41	0.574	2.88	1.080	3.11	1.42	0.044
CO	13.24	3.065	18.23	4.01	0.001	14.34	3.503	18.73	3.97	0.001	13.78	3.316	18.47	3.99	0.001
SD	9.86	4.243	15.61	4.76	0.001	11.17	4.255	14.53	5.29	0.001	10.50	4.277	15.08	5.05	0.001
ST	8.61	3.729	9.83	3.17	0.027	9.17	3.396	10.09	3.02	0.070	8.89	3.563	9.96	3.10	0.004

TCI: Temperament and Character Inventory; NS: novelty seeking; HA: harm avoidance; RD: reward dependence; P: persistence; SD: self-directedness; CO: cooperativeness; ST: self-transcendence.

Table 3. Inter-correlations of TCI-125-PV dimensions and their relationship with age, disease duration, HAMD score, and YMRS score in patients with BP-I

	P	ST	RD	CO	HA	SD	NS	Age	HRSD	YMRS	Disease Duration
Disease Duration	0.049	0.006	0.033	−0.084	0.112	−0.023	−0.091	0.784(**)	0.097	0.101	1
YMRS	0.134	0.091	0.159	0.128	0.204	0.121	0.089	0.161	0.093	1	
HRSD	0.199	0.118	0.123	0.105	0.094	0.171	0.131	0.147	1		
Age	0.019	−0.083	−0.105	−0.286(**)	0.161	−0.089	−0.080	1			
NS	0.119	0.016	0.031	−0.084	0.159	−0.164	1				
SD	0.198	0.175	0.253(*)	0.293(**)	−0.172	1					
HA	0.226(*)	−0.527(**)	0.107	−0.277(**)	1						
CO	0.038	0.237(*)	0.322(**)	1							
RD	0.005	0.075	1								
ST	0.515(**)	1									
P	1										

TCI: Temperament and Character Inventory; NS: novelty seeking; HA: harm avoidance; RD: reward dependence; P: persistence; SD: self-directedness; CO: cooperativeness; ST: self-transcendence. **Correlation is significant at the 0.01 level; *Correlation is significant at the 0.05 level.

DISCUSSION

The primary aim of the present study was to compare TCI-125 personality dimension scores in BP-I patients following stabilization of an acute episode and healthy controls. There wasn't a significant difference in novelty seeking scores in either gender between the 2 groups; however, in the patient group harm avoidance scores were higher and reward dependency scores were lower—in other words, the patients (both male and female) tended to be significantly more pragmatic, tired, shy, anxious, and socially isolated, and less emotionally attached than the controls (Cloninger and Svrakic 2009). Moreover, persistence scores in the BP-I patients were much lower than in the controls, and were significantly lower only in the male patients. Based on these findings, when faced with new challenges the bipolar patients tended to be less perfectionistic than the controls, indicating that they might give up

easily. These 4 dimensions of temperament were independent in the bipolar patients, without apparent correlation.

Self-directedness and cooperativeness scores in both the male and female patients, and self-directedness scores in the male patients were much lower than those in the control group. Low self-directedness and cooperativeness scores can be indicative of personality disorder, without specifying a subgroup. Inadequate development of these dimensions could clinically manifest as some abnormal traits, including irresponsibility, inability to define long-term goals, low self-esteem, and other feature like these, which are common in those with a personality disorder (Cloninger 1998). Moreover, the present findings are consistent with those of previous studies, especially those relevant to harm avoidance (Lövdahlet al. 2010; Olvera et al. 2009; Evans et al. 2005; Engström et al. 2004). Patients with depressive disorder and bipolar spectrum disorders have high harm avoidance scores (Farmer et al. 2003; Hansenne et al. 1999), which indicates that a high harm avoidance score is

not specific to bipolar disorder, considering the role of mood states (depression or elation) of the patient in harm avoidance score (Sasayama et al. 2011).

Patients in the present study were evaluated following remission of an acute episode. It is possible that residual mood symptoms can affect temperament scores, and a high harm avoidance score could be a state marker. Some studies have shown that the harm avoidance score is positively correlated with depressive symptoms (Loftus et al. 2008); however, this is unlikely to have occurred in the present study population, as there weren't any significant correlations between YMRS and HRSD scores, and TCI-125 temperament scores, as reported earlier (Harley et al. 2011; Sayin et al. 2007). Moreover, Ekin et al. (2011) reported that there wasn't a correlation between the TCI-125 impulsivity subscale of the novelty seeking dimension and mood state scores in bipolar patients; therefore, it is likely that high harm avoidance and other temperament dimension scores are stable components of bipolar disorder. Pelissolo et al. posited that a high level of harm avoidance is a personality vulnerability that results in a propensity for mood disorders, and that the impact of a mood disorder is a type of "psychological scar" that can lead to an increase in level of harm avoidance, even following remission of an acute episode (Pelissolo and Corruble 2002). Evidence of the association between temperament and the severity of bipolar disorder is that the incidence of acute episodes and suicidal ideation increased as harm avoidance scores increased (Sayin et al. 2007). Most research has focused on the role of harm avoidance as a predisposing factor leading to the experience of negative emotions. As a probable result, the incidence of mood episodes and suicide attempts are correlated with high harm avoidance scores. In other words, this illustrates the possible role of premorbid temperament characteristics in disease prognosis (Sayin et al. 2007); however, in order to clarify the exact nature of the association, longitudinal studies must be undertaken.

Another common finding is lower self-directedness scores in bipolar patients than in healthy controls (Loftus et al. 2008; Sayin et al. 2007; Nowakowska et al. 2005; Engström et al. 2004). Low self-directedness scores in depressed patients are also commonly reported (Lövdahl et al. 2010). In particular, it has been shown that multiple episodes of depression and rapid cycling are associated with lower self-directedness scores (Lövdahl et al. 2010; Sayin et al. 2007). Two earlier studies reported similar findings regarding cooperativeness in patients with bipolar I disorder (Sayin et al. 2007; Engström et al. 2004); however, Nowakowska et al. (2005) reported that there wasn't a difference in cooperativeness scores between patients with bipolar I and II disorder, and controls. Findings in the literature regarding the other dimensions of temperament are not as consistent.

In the present study novelty seeking scores did not differ significantly between the patient and control groups. Bipolar

patients are expected to be wasteful, chaotic, impulsive, and irritable, all typical characteristics of novelty seekers (Lövdahl et al. 2010); however, published findings are inconsistent. Some researchers reported that novelty seeking scores are higher in bipolar patients than in controls (Olvera et al. 2009; Nery et al. 2008; Nowakowska et al. 2005), whereas others reported no difference between patients and controls (Lövdahl et al. 2010; Sayin et al. 2007; Engström et al. 2004). Novelty seeking scores considered normal have also been observed in bipolar spectrum disorders, such as bipolar II disorder (Savitz et al. 2008). These inconsistencies could be due to different subsyndromal mood-states in patients or the impact of personality disorders (Lövdahl et al. 2010), especially cluster B personality disorders, which are strongly associated with novelty seeking (Cloninger and Svrakic 2009).

The patients in the present study had lower reward dependency scores than the controls, which was consistent with earlier reports (Olvera et al. 2009; Engström et al. 2004). Olvera et al.'s study included 38 bipolar patients (adults and children) that were compared to 31 healthy individuals using TCI-125, and novelty seeking, harm avoidance, reward dependency, persistence, self-directedness, and cooperativeness scores were lower in the patient group, regardless of age. In this study novelty seeking aside, other dimensions are consistent with our finding (Olvera et al. 2009). They also reported children with bipolar disorder and comorbid oppositional defiant or conduct disorder had lower reward dependency scores than bipolar disorder alone (Olvera et al. 2009). In the present study male BP-I patients had lower persistence and self-transcendence scores than the controls. The observed differences between the male and female patients might have been due to the effect of gender on personality dimensions, (Snopek et al. 2012; Al-Halabi et al. 2011). Sasayama et al. reported the differences between patients with unipolar depression and bipolar II depression were greater among the females (Sasayama et al. 2011); however, in the present study the differences in temperament and character dimensions were greater between the male BP-I patients and controls.

Correlation analysis of temperament and character dimensions showed that as the persistence scores increased the self-transcendence score increased. Nonetheless, according to the persistence scores, which were lower in the patient group, the patients tended to be more sluggish and unstable, and were more inclined to give up after a failure, and it appears that these traits are somehow associated with a low self-transcendence score. Individuals with lower self-transcendence scores exhibit such behaviors as object-orientation and inability to tolerate discomfort and challenges, as do those with low persistence scores (Cloninger 1998). We think the low persistence scores in the present study's bipolar patients might explain some of their clinical and drug treatment failures, and lack of interest in follow-up.

Limitations

First, normalization of the TCI was performed using data from inhabitants of another city (Tehran), where could be different in culture and genetics from Mashhad, the city that study was conducted; use of normal samples from Mashhad might have yielded more useful findings. Moreover, patients were selected from just 1 psychiatric center, making it difficult to generalize the findings to all bipolar patients. The number of patients included in the study was limited and a larger sample size might have been more representative. Only a longitudinal study- can determine whether the above findings indicate susceptibility for the disease, or if it is due to remaining effects of manic phases or depression on these patients.

Conclusion

The present findings show that the patients with bipolar I disorder, even during a euthymic phase, had personality profiles that differed from healthy controls, based on patterns of temperament and character. The patients had higher harm avoidance scores and lower reward dependency, self-directedness, and cooperativeness scores. Persistence and self-transcendence scores in the male patients were lower than those in the controls. Duration of illness was positively correlated with higher harm avoidance and self-transcendence scores, and lower self-directedness, cooperativeness, and novelty seeking scores, which might be indicative of a negative impact of disease on the development of personality. Additional longitudinal research is required to more clearly delineate the relationship between personality characteristics and bipolar mood disorder-I.

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