A Comparison between the Temperament and Character of Patients Suffering from Major Depression with and without Substance Use Disorder (SUD) and Normal People

Abstract

Objective: The purpose of this study was to compare the temperament and character of patients suffering from major depression with and without Substance Use Disorder (SUD) and normal people. **Method:** This research was a causal-comparative study. The statistical population of the study consisted of patients with major depressive disorder who referred to Tabriz medical centers in the second and third quarters of 2017. Thirty patients suffering from major depressive disorder with substance use disorder and 30 patients without substance use disorder were selected by purposive sampling method and 30 normal subjects were selected by convenience sampling method. The temperament and character inventory (TCI) and Beck depression Inventory-II (BDI-II) were employed in the process of data collection. **Results:** The findings of this study revealed that depressed patients showed significantly higher novelty seeking and harm avoidance, and lower perseverance, self-direction, and cooperation than normal people. Moreover, depressed patients with substance use disorder reported a high degree of novelty seeking and a lower level of perseverance, self-direction, and cooperation in comparison to depressed patients without comorbidity. **Conclusion:** The results of this study indicated that the dimensions of temperament and character have a significant role in the development of mental disorders. Identifying these dimensions in high risk groups can be effective in developing preventive and therapeutic interventions for depression and substance use disorders.

Keywords: temperament and character, major depressive disorder, substance use disorder

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Introduction

Psychiatric disorders are so prevalent that in the society that 26.2% of people have criteria for the diagnosis of more than one disorder. Out of this rate, 3.8% and 6.7% were diagnosed with the criteria for drug abuse and depression, respectively. Major depressive disorder is one of the most common psychiatric disorders (Serrano et al., 2010) and has the highest prevalence and rate of durability (about 17%) (Kaplan, & Sadock, 2007). Major depressive disorder is a branch of depression that is characterized by five or more of the following symptoms for two weeks: 1) depressed mood, 2) tangible reduction of interest or pleasure, 3) weight gain or loss, 4) insomnia or sleepiness, 5) mental or motorcycle slowdown, 6) fatigue or loss of energy, 7) feeling of extreme unworthiness or excessive guilt, 8) decreased ability to think or concentrate, and 9) frequent thoughts of death. The diagnosis of this disorder requires at least one of the two important symptoms of depressed mood and lack of interest or pleasure (American Psychiatric Association, 2013). Depression affects different aspects of life and its symptoms affect individuals' performance in different areas (Gilbert, 2007).

In most cases, patients with major depression are simultaneously afflicted by drug abuse disorders or other psychiatric disorders. Research findings in this domain show that one-fourth of depressed patients suffer from alcohol consumption disorders (Davis et al., 2006). The fifth edition of the Diagnostic and Statistical Manual of Psychiatric Disorders states that the main feature of drug use disorders is a collection of cognitive, behavioral, and physiological symptoms that the person continues to use drugs despite his/her awareness of the significant problems with substance use. An important feature of substance abuse disorder is a fundamental change in brain circuits that may persist even after detoxification and lead to frequent returns and severe appetite for drug use when individuals are exposed to drug-related stimuli. At present, the diagnosis of drug abuse is based on a morbid pattern of the behaviors associated with drug use (American Psychiatric Association, 2013).

There is a huge controversy over the etiology of this disorder (Nadimi, 2015). Although societal factors are highly emphasized when it comes to drug use, substance abuse can also be related to biological, psychological and personality processes. Temperament and character are among the variables that contribute to the formation and intensification of drug abuse and depression (Abolghasemi, Bahari, Narimani, & Zahed, 2011; Ferrari et al., 2013).

According to Cloninger's psychological biology model (1993), human temperament is predominantly determined and formed early genetically in childhood. Temperament consists of four different dimensions, namely novelty seeking (activation of behavior in response to new rewards and stimuli), harm avoidance (behavioral inhibition in response to punitive symptoms), reward dependence (continuity of behavior in response to signs of social rewards), and

persistence (continuity of behavior despite failures). These dimensions may be related to neurotransmitter circuits in the central nervous system (Cloninger, 1986). Moreover, this model includes character dimensions that are most influenced by environmental factors, grow in adulthood, and influence individual and social performance at three levels of intrapersonal (self-directedness), interpersonal (cooperativeness), and trans-personal (self-transcendence) (Cloninger et al., 1993; Cloninger, 2000). Studies in this domain have shown that the dimensions of the temperament and character in depressed patients are significantly different from those in the general population. In the study of Zaninotto et al. (2015), it was found that depressed patients achieved high scores in the harm avoidance dimension and low scores in self-directedness dimension. Asano et al. (2014) reported that patients with major depression who had low levels of self-directedness experienced a shorter return period after recovery. In contrast, harm avoidance predicted a return of the next period of depression. In a study conducted by Kampmana et al. (2012), it was raveled that patients with depression gained high scores in harm avoidance and self-transcendence but obtained low scores in self-directedness, cooperativeness, and persistence compared with the control group. In addition, Lee et al. (2012) reported low levels of cooperativeness in depressed people. Dabashi, & Najafi (2016) reported a significant correlation between depression and dimensions of temperament and character. Two dimensions of harm avoidance and self-directedness were strong predictors of depression disorder. Abolghasemi, Karami, Bakhti, & Bagian Koulehmarz (2015) showed that depressed people had a significantly lower scores in novelty seeking, harm avoidance, and self-transcendence but lowers scores in self-directedness and persistence than the normal group.

The studies that have examined the dimensions of temperament and character in drug-dependent individuals have reported high levels of novelty seeking and harm avoidance but low self-directedness in this group (Marquez- Arrico et al., 2000; Yoon et al., 2007). Evren, Yancar, & Erkiran (2007) also showed that drug-dependent patients achieve higher scores in novelty seeking and lower scores in reward dependence, self-directedness, and persistence than alcohol dependent patients. Abolghasemi, Kiamarsi, & Momeni (2013) showed that the average score of harm avoidance and novelty seeking in drug addicts is significantly higher than those in non-addicted people. Also, the mean scores of reward dependence, cooperativeness, and self-directedness in this group were significantly lower than those in non-addicted ones.

However, there are a limited number of studies that have examine the differences in the temperament and character between depressed people with and without drug abuse (Rae et al., 2002, as cited in Paavonen et al., 2016). In a study conducted by Paavonen et al. (2016), patients with major depression and alcohol abuse were reported to have levels self-directedness and persistence and higher scores novelty seeking than depressed patients without this comorbidity. In

another study, Marquez-Arrico et al. (2016) reported low self-directedness in substance-dependent depressed people. Considering the role of temperament and character in depression and substance use, and with regard to the paucity of research backgrounds, it was sensed that a few number of studies have been conducted in Iran in this field and, therefore, the opportunity ahead was grabbed to compare the dimensions of temperament and character in patients suffering from major depression with and without substance abuse and normal people.

Method

Population, Sample, and Sampling Method

This research was a causal-comparative study wherein the dimensions of temperament and character were compared between three groups of people suffering from major depression with and without substance abuse and normal people. The statistical population of the study consisted of patients with major depressive disorder who referred to Tabriz medical centers in the second and third quarters of 2017. Thirty patients suffering from major depressive disorder with substance use disorder and 30 patients without substance use disorder based on DSM-5 diagnostic criteria were selected by purposive sampling method. The entry criteria for the inclusion of these individuals in the research were no history of psychiatric disorders other than depression and drug use, no history of chronic disease, education above primary school, and age range of 20 to 50 years. Then, 30 normal subjects were selected by convenience sampling method.

Instruments

1. Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I): This is a flexible interview that was constructed by First, Spitzer, Gibbon, & Williams (1996; as cited in Segal, 1997). Tran & Smith (2004) reported the kappa coefficient of 60% as the interrater reliability among evaluators. The interview was conducted on a sample of 299 individuals after translation into Persian. The diagnostic agreement for most general and specific diagnoses were moderate or good (Kappa higher than 60%). The overall agreement (Kappa's total current diagnoses obtained 52% and 55% for the total lifetime diagnoses) is also appropriate (Sharifi et al., 2004).

2. Beck Depression Inventory-II (BDI-II): This questionnaire was developed by Beck et al. in 1961 to measure depression symptoms. Its revised version was presented by Beck, Steer, & Brown (1996) to be consistent with the diagnostic criteria for depression disorders in the fourth edition of Diagnostic and Statistical Mental Disorders. It includes 21 items that are scored from 0 to 3. A total score of 0 to 13 indicates minimal depression, the score from 14 to 19 indicates mild depression, the score from 20 to 28 indicates moderate depression, and the score from 29 to 63 indicates severe depression. Beck et al. reported the concurrent validity of 0.79 and the re-test reliability coefficient of 0.67 for this scale (Beck, Stear & Garbin, 1998). In the Iranian population, Ghasemzadeh et al. (2005) obtained the Cronbach's alpha coefficient of 0.78 and the retest coefficient of 0.74 for this scale.

3. Temperament and character inventory (TCI): This questionnaire was constructed by Cloninger, Przybeck, Svrakic, & Wetzel (1994) and contains 125 true/false items. The temperament section consists of four dimensions, namely novelty seeking, harm avoidance, reward dependence, and persistence; and the character part includes three dimensions, namely self-directedness, cooperativeness, and self-transcendence. Alonso et al. (2008) reported the Cronbach's alpha coefficient of 0.86 for this scale. This questionnaire was standardized in Iran by Kaviani, & Poornaseh (2005) where they reported the internal consistency coefficients of this questionnaire to range from 0.55 to 0.80 and their re-test reliability coefficients to range from 0.73 to 0.90.

Results

The descriptive statistics of demographic variables are presented in Table 1.

Table 1: Descriptive Statistics of Demographic Variables of the Sample

Variables		Major depression with substance use		Major depression without substance use		Normal people	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Education	Lower than high school diploma	13	43.44	12	40.00	12	40.00
	High school diploma to bachelor's	11	36.66	9	30.00	10	33.33
	Bachelor's degree and higher	6	20.00	9	30.00	8	26.66
Marital status	Unmarried	10	33.33	8	26.66	6	20.00
	Married	20	66.66	22	73.33	24	80.00
Job status	Employed	13	43.33	16	53.33	19	63.33
	Unemployed	17	56.66	14	46.66	11	36.66

The descriptive statistics of temperament and character dimensions are presented in Table 2.

Table 2: Descriptive Statistics of Temperament and Character for each Group

Variables		Major depression with substance use		Major depression without substance use		Normal people	
		Mean	SD	Mean	SD	Mean	SD
Temperament	Novelty seeking	9.77	2.46	8.66	2.10	7.33	1.89
	Harm avoidance	9.87	2.63	9.72	2.77	7.68	2.44
	Reward dependence	10.66	3.11	9.92	3.54	10.02	2.98
	Persistence	1.92	1.77	2.67	1.58	3.82	2.15
Character	Self-directedness	8.12	2.23	10.96	3.46	12.44	2.78
	Cooperativeness	11.89	2.48	13.88	2.78	17.70	3.13
	Self-transcendence	10.98	3.17	11.36	3.41	11.54	2.90

To examine the difference between the three groups, multivariate analysis of variance (MANOVA) should be used. Before running this test, its assumptions should be checked. One of the assumptions of running this test is the canonical correlation between dependent variables. Bartlett's Test of Sphericity shows that the variables hold a canonical correlation with each other and can produce a hybrid variable, since the calculated chi square (X^2=4.48) is not significant. Therefore, the canonical correlation between variables has been met. Another assumption is the equality of variance/covariance matrix. Based on the Box test, the homogeneity assumption of the variance/covariance matrix has been observed (P>0.05, F = 1.46, M = 4.26). Another assumption for running this test is the homogeneity of the error variances. The results of Levene's test showed that this assumption has been observed in novelty seeking (P >0.05, F = 0.76), harm avoidance (P >0.05, F = 0.58), persistence (P >0.05, F = 1.36), self-directedness (P >0.05, F = 0.96), and cooperativeness (P >0.05, F = 1.48). However, this assumption has been met in two dimensions of reward dependence (P <0.05, F = 1.87) and self-transcendence (P <0.05, P = 2.26). Therefore, the Pillai's trace is reported as a multi-variable index. To evaluate the effect of the group's variables on dependent variables (temperament and character), MANOVA was run and the results showed that there was a significant difference in the linear combination of variables between the three groups (P <0.001, F = 1.44, and P = 0.860). To analyze the variation pattern, Univariate analysis of variance was used and the results have been presented in Table 3.

Table 3: Univariate Analysis of Variance Examining Patterns of Difference in Groups

Variables		Sum of squares	Df	Mean Squares	F	Sig.	Eta squared
Temperament	Novelty seeking	144.02	2	72.01	9.40	0.001	0.129
	Harm avoidance	435.40	2	217.70	12.35	0.02	0.161
	Reward dependence	637.48	2	318.74	16.42	0.08	-
	Persistence	14.34	2	7.17	3.91	0.001	0.195
Character	Self-directedness	939.50	2	469.75	24.92	0.001	0.391
	Cooperativeness	1396.01	2	698.01	18.40	0.001	0.286
	Self-transcendence	1077.90	2	538.95	14.57	0.12	-

As Table 3 shows, there is a significant difference between the three groups in all subscales of temperament, except for reward dependence, and all subscales of character except for self-transcendence. In order to determine which pair of groups are statistically different from each other, Scheffe's post-hoc test was used. The results of this test showed that depressed patients had significantly higher levels of novelty seeking and harm avoidance but held significantly lower levels of persistence, self-directedness, and cooperativeness than normal people. In addition, depressed patients with substance abuse disorder were found to have

a higher degree of novelty seeking and lower levels of persistence, self-directedness, and cooperativeness than depressed patients without substance use.

Discussion and Conclusion

The purpose of this study was to compare the dimensions of temperament and character between depressed patients with and without substance use, and normal people. The findings of this study showed that depressed patients showed significantly higher degrees of novelty seeking and harm avoidance, but lower levels of persistence, self-directedness, and cooperativeness than normal people. In addition, depressed patients with substance use disorder were reported with higher degrees of novelty seeking and perseverance but received lower scores on self-directedness than depressed patients without this comorbidity.

Another finding of this study was that the mean score of novelty seeking in depressed people were higher than that in the normal group. This finding is consistent with the studies carried out by Kusunoki et al. (2000) and Grucza, Przybeck, Spitznagel, & Cloninger (2003), but is inconsistent with the results of studies undertaken by Bajraktarov, Novotni, Arsova, Gudeva, & Vujovik (2017). In addition, depressed people with substance use disorder were found more likely to experience novelty seeking than depressed people without this comorbidity. This finding is also in line with the research conducted by Ryb, Dischinger, Kufera, & Read (2006); Abolghasemi, Kiamarsi, & Momeni (2013); Schneider, Ottoni, De Carvalho, Elisabetsky, & Lara (2015), Hurtado et al. (2016); Paavonen et al. (2016); and Marquez- Arrico, Lopez- Vera, Prat, & Adan (2016). Novelty seeking is an inherited personality trait that indicates individual differences in the brain activator system and is regulated by the neurotransmitter of dopamine. Low levels of dopamine in an individual create a drive mode to look for drugs and experiences that increase dopamine levels. Novelty seeking is characterized by a tendency to exploratory activities and a strong emotional experience in response to new stimuli, extremes in confronting reward signs, avoidance of punishment, and impulsive decisions (Cloninger, 1993; Cloninger, 1994). These attributes make them more at risk and turn to substance use in order to try new experiences and emotions. On the other hand, depression disorder can lead to unpleasant emotions, distress, and loss of performance in a variety of fields. In consequence, problematic conditions may arise that may lead a person with a high degree of novelty seeking to drug use.

The findings of this study showed that the mean score of harm avoidance in depressed people was higher than that in the normal group. This finding is consistent with the findings of research conducted by Bajraktarov et al. (2017), Zaninotto et al. (2015), Spittlehouse et al. (2010), Abolghasemi, Karami, Bakhti, & Bagian Koulehmarz (2015), and Basharpour, Atarod, & Eini (2017) . However, there was no significant difference between the mean scores of depressed patients with and without substance use disorder in the harm avoidance dimension. This finding is in line with the results of studies carried

out by Marquez- Arrico et al. (2016), and Paavonen et al. (2016), but is inconsistent with the research findings reported by Hurtado et al. (2016) and Schneider et al. (2015). Harm avoidance is another dimension of character, which is related to the metabolism of serotonin and is characterized by the tendency to avoid punishment or lack of rewards (Cloninger, 1994). A person with a high level of harm avoidance tends to experience negative emotions such as fear, reticence, and pessimism (Bajraktarov et al., 2017) and undergoes difficulty adapting to the environment and conducting new and active behaviors (Smith et al, 2011). Such characteristics make a person with a high level of harm avoidance susceptible to depression and negative emotional experiences.

Persistence is another dimension of character, which is characterized by hardworking and tirelessness characteristics. The results of this study showed that the mean score of persistence scores in depressed patients was lower than that in the normal group. This finding is in line with the research findings conducted by Eric et al. (2017), Haji Raza'ea et al. (2017), Abolghasemi, Kiamarsi, & Momeni (2015), and Hossein Doust, & Heshmati (2015). In addition, depressed people with substance use disorder had less persistence than depressed people without this comorbidity. This finding is in line with the research findings reported by Paavonen et al. (2016) and Schneider et al. (2015). An n individual with a low degree of persistence easily feels touchy as a result of criticism and feels unable to adapt to the difficult conditions of life (Cloninger, 1989). Such an individual struggles with the problems and failures of life and does not try to change the situation. Instead, s/he resorts to inefficient problem-solving techniques, such as substance use, and will be prone to discouragement, disappointment, and experience of negative mood in the face of difficulties.

In addition, the results of the current study showed that the mean scores of self-directedness and cooperativeness in depressed people were lower than those in the normal group; in the same way, the depressed subjects with substance use disorder showed lower degrees of self-directedness and cooperativeness than the depressed participants without this comorbidity. These findings are in line with the research findings obtained by Bajraktarov et al. (2017), Eric et al. (2017), Paavonen et al. (2016), Hurtado et al. (2016),Marquez- Arrico et al. (2016), Lei et al. 2014), Abolghasemi, Kiamarsi, & Momeni (2015), and Bashpour, Atarod, & Eini (2017). Self-directedness and cooperativeness are the dimensions of the personality temperament. Self-directedness refers to one's ability to behaviorally adjust and adapt to situational demands in order to achieve personal goals and values (Cloninger, & Svrakic, 1993). A person with low self-directedness does not enjoy clear goal-oriented status in work and life, has low self-esteem, and does not act influentially in the process of affairs (Kaviani, 2007).

Cooperativeness shows how an adaptive individual confronts others with flexibility and fairness, combines intuition with ethics, and defines him/herself as an integrated part of groups and society. Low scores on self-directedness and cooperativeness have been reported in personality disorders, mood disorders,

and psychiatric disorders. These scales are considered as a general measure of mental health and adaptive skills and, thereby, low scores in these scales are a general indicator of mental health problems (Cloninger et al., 1994; Svrakic, Whitehead, Przybeck, & Cloninger, 1993).

The limited statistical population of the research (the inclusion of only the city of Tabriz and men), the self-reporting state of the research tools, and the lack of control of the type and extent of drug use are among the limitations of the present study. Therefore, the current research findings should be generalized with caution.

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