Comparing the Recognition of Emotional Facial Expressions in Patients with Obsessive-Compulsive and Major Depression

Abdollah Ghasempour,*[1] Samad Fahimi,[2] Ahmad Amiri,[2] Ebrahim Akbari,[2] Abbas Abolghasemi,[3] Ali Fakhari[4]

1. Department of Psychology, Young Researchers Club, Ayatollah Amoli Branch, Islamic Azad University, Amol, Iran
2. Department of Psychology, Faculty of Psychology and Educational Sciences, University of Tabriz, Tabriz, Iran
3. Department of Psychology, Faculty of Humanities, University of Mohaghegh Ardabili, Ardabil, Iran
4. Department of Psychiatry, Tabriz University of Medical Sciences, Tabriz, Iran

Article information	*Abstract*
	Background: Recognition of emotional facial expressions is one of the psychological factors which involve in obsessive-compulsive disorder (OCD) and major depressive disorder (MDD). The aim of present study was to compare the ability of recognizing emotional facial expressions in patients with Obsessive-Compulsive Disorder and major depressive disorder. **Materials and Methods**: The present study is a cross-sectional and ex-post facto investigation (causal-comparative method). Forty participants (20 patients with OCD, 20 patients with MDD) were selected through available sampling method from the clients referred to Tabriz Bozorgmehr clinic. Data were collected through Structured Clinical Interview and Recognition of Emotional Facial States test. The data were analyzed utilizing MANOVA. **Results**: The obtained results showed that there is no significant difference between groups in the mean score of recognition emotional states of surprise, sadness, happiness and fear; but groups had a significant difference in the mean score of diagnosing disgust and anger states ($p<0.05$). **Conclusion**: Patients suffering from both OCD and MDD show equal ability to recognize surprise, sadness, happiness and fear. However, the former are less competent in recognizing disgust and anger than the latter.

Introduction

Obsessive compulsive disorder (OCD) is a chronic and debilitating disorder which has two aspects: cognitive (obsession) and behavioral (compulsion). The lifetime prevalence of OCD in the general population is estimated to be 2-3% [1]. Major depressive disorder is one of disorders that have high comorbidity with obsessive compulsive disorder [2]. Major depression is a common psychiatric disorder which afflicts about 17% of people in lifetime [1]. Recognizing emotional states is one of the important psychological components in OCD and major depressive disorder (MDD) [3]. Six basic emotions (happiness, sadness, anger, fear, surprise and disgust) are similar in facial recognition in different cultures [4]. Darwin noted that facial expression of emotions in full fledged human have evolved the same gestures that we are seeing in other animals [5]. Several studies investigated the failure to recognize facial emotional expressions in people with anxiety and depression. So that, Demenescu et al. in a research concluded that people with anxiety and major depressive disorders are significantly weaker in recognition of facial expression of emotion than normal people and they have overall deficit in facial emotion recognition [3]. In addition, people with major depressive disorder have more deficits than people with anxiety

disorders in emotion recognition, in recognition of facial emotion is expressed [3]. Jhung et al. stated that generally the deficit in recognition of facial expressions of emotion in patients with OCD is related to the severity of contamination and washing symptoms in them, and biased perception of social information in these patients result in poor performance in recognition of facial expression of emotion [6]. McClure et al. found that bipolar adolescents recognize emotional states weaker than anxious and normal adolescents [7]. Gilba et al. in a study concluded that people with anxiety and major depressive disorders are weaker in recognition of emotional states of anger, sadness and neutral than normal people, but there was no difference in recognition of happiness among anxious and normal people, while patients with MDD were weaker in recognition of joy than normal and anxious people [8]. According to what mentioned above, further knowledge about the ability of recognizing different emotions in people with OCD and MDD is an undeniable necessity; although some studies have been done in this area but they have shown conflicting results to date, also there is no study which addressed recognition of emotional states in both OCD and MDD patients simultaneously. So the present study was designed to compare the emotion recognition ability

in patients with OCD and MDD.

Materials and Methods

Due to the subject of this study and the nature of variables, the type of this study has been post event (causal comparative) in which researchers try to evaluate, compare, and explain the obtained results [9]. In this study, the recognition of emotional states as independent variable was compared in both groups (OCD and MDD patients). The population of the study was all patients with obsessive compulsive disorder and major depressive disorder in Tabriz city and the sample consisted of 40 patients; 20 patients (male and female) with obsessive-compulsive disorder and 20 patients (male and female) with major depressive disorder who in the February and March of 2010 referred to Bozorgmehr clinic and were selected using available sampling method. In comparative studies, the numbers of subjects have been suggested to be at least 15 people [10], so in present study, the number of subjects in each group was 20 to increase the external validity of the study.

Demographic checklist: This checklist was used for gathering demographic information in the study and contained questions about gender, age, educational level, and history of hospitalization. Structured clinical interview: structured clinical interview is a flexible interview that has been developed by Ekman and Friesen to diagnose Axis I disorders in DSM-IV [11]. Segal believes that this interview has a good validity to identify mental disorders [10].

Recognition of emotional facial states test: This test was developed by Ekman and Friesen in 1976 and contains 36 pictures which show six emotions (surprise, disgust, sadness, anger, happiness and fear) and participants should look at each picture and guess the emotion; the subjects' performance is evaluated by the number of correct answers. The test-retest reliability coefficient for the test interval of one week is reported 0.85 [11]. Internal consistency and test-retest reliability coefficient (after 6 months) for this scale in adolescents were reported 0.84 and 0.74 respectively [12]. The reliability of this test in this study was 0.68 using Cronbach's alpha. The test was performed using computer.

Clinical samples were selected according to the results of psychiatrist's diagnosis and researcher's interview (clinical structured interview was used to ensure about the diagnosis and no comorbidity between two disorders). After gathering information such as age, gender, education level, hospitalization history, and providing informed consent, the test of recognition of facial expression of emotion was administered individually by the researcher. Inclusion criteria for OCD and MDD patients included: providing informed consent, having criteria for OCD and MDD based on psychiatric diagnosis and structured clinical interview, reading and writing ability, no history of hospitalization, no prior treatment

and no comorbidity. For ethics and subjects' cooperation, some information about the purpose of the study was given to participants somewhat that not influence the results. Participants were informed that their information will not be analyzed individually and they have right to leave the study whenever they want. After completing the consent, the tests were performed by the researchers. For data analysis descriptive statistics (mean±SD) and analysis of variance (MANOVA) was used and $p<0.05$ was considered as significant level. Statistical analysis was performed using SPSS-16.

Results

Among patients with OCD, 55% (N=11) were female and 45% (9 patients) were male; and 65% of depressed patients (N=13) were female and 35% (7 patients) were male. Among patients with OCD and MDD, respectively 10% (2 patients) and 15% (3 patients) didn't have a high school diploma, 40% (8 patients) and 65% (N=13) were high school graduates, 35% (7 patients) and 20% (4 patients) had bachelor degree and, 15% (3 cases) of OCD group had a master's degree. The mean and standard deviation of age in people with OCD and MDD was respectively 28.88±8.21 and 34.15±2.54. Table 1 shows the mean, standard deviation, the Levene and BOX test for the two groups. Before using the test of analysis of variance, the assumption of homogeneity of variance was studied using Levene test. According to the results shown in table 1, the assumption of homogeneity of variances in recognizing emotional states were verified in the two groups. This test was not significant for any of the variables. Box test confirmed the assumption of homogeneity of covariance. So due to the results of these tests, using parametric tests was permitted. The difference between centroid of the two groups in dependent variables (emotion recognition) was significant ($p=0.03$) and the difference was 29%, i.e. 29% of the variances is related to the difference between the two groups (those with OCD and MDD). So groups have significant difference in recognition of facial expression of emotions. Eta squared (0.293; squared correlation coefficient between the dependent variables and group membership) shows that about 29% of the variance in the distribution of variables is related to group membership.

Statistical power was 100%. There were no significant differences between groups in dependent variables. As can be seen in table 2, the mean scores for emotional state recognition of disgust (F=4.06 and $p<0.05$) and anger (F=4.21 and $p<0.04$) in MDD patients is significantly higher that people with OCD, it means that people with MDD have better ability to recognize emotional states of anger and disgust in comparison with people with OCD. The results of the MANOVA test did not show any significant differences between the groups in terms of recognition of expressions of surprise, sadness, happiness, fear; this means that the ability of the two groups in recognition of these emotional states is equal.

Table 1. Mean, SD, and the results of Levene and BOX tests for recognition of emotional states in two groups

group	OCD (Mean±SD)	MDD (Mean±SD)	Levene results F	df1	df2	p-Value
BIS	3.55±1.31	3.80±1.23	0.29	1	38	0.59
BAS	2.72±1.46	3.55±1.09	1.49	1	38	0.23
Response to drives	2.88±0.94	3.2±1.32	2.78	1	38	0.10
Fun seeking	2.90±1.48	3.8±1.28	0.22	1	38	0.64
Reward responsiveness	4.95±0.94	5.5±0.94	0.09	1	38	0.75
D personality type	3.12±1.19	2.8±1.47	1.36	1	38	0.25

BOX results			
Value of BOX	F		p-Value
35.98	1.41		0.098

Table 2. MANOVA for recognition of emotional stat

Variables	SS	df	MS	F	p-Value
Surprise	0.625	1	0.625	0.38	0.54
Disgust	6.81	1	6.81	6.06	0.05*
Sadness	0.90	1	0.90	0.393	0.39
Anger	8.10	1	8.10	4.21	0.04*
Happiness	3.02	1	3.02	3.38	0.07
Fear	1.03	1	1.03	0.57	0.45

*: $p \leq 0.05$ is significant

Discussion

The results of this study showed that the ability of people with obsessive compulsive disorder and major depressive disorder in recognition of emotional states of surprise, sadness, happiness and fear is equivalent, while in recognizing emotional states of anger and disgust, people with OCD perform weaker than MDD patients. Emotion perception and recognition of others is considered a very important factor in social communication and because of the importance of facial expression of emotions in social relations, a defect in this ability naturally affects the quality of communications [5]. This is the same defect that claimed that people with anxiety disorders (including OCD) and MDD suffer from.

Our result about better performance of patients with major depressive disorder in recognizing disgust and anger contradict the results of Gilba et al. [8] and Demenescu et al. [3]; these researchers showed that people with major depression are weaker than anxious people in recognition of emotional states generally [4], and have no significant difference with OCD patients in recognition of anger [8]. MacLeod et al. observed that people with anxiety disorders due to a bias in selective attention to threatening stimuli have deficits in social interaction and communication [3].

This means that these people are not able to understand the feelings, goals, and intentions of others in social interactions. Such a defect could result in a dysfunctional communicative patterns in interpersonal relationships and such person is incapable of understanding others' feelings, does not understand their experienced emotions, perform weaker in recognition of emotional states such as anger and disgust than those with depression. Anxiety is a common problem in people with OCD and available evidence suggest that anxiety symptoms are reported more frequently in these patients than those with other non-anxiety disorders such as major depressive disorder

[1]. In cognitive perspective, anxious people have biased cognitive systems. Anxiety is related to bias processing which leads to encoding threatening information. Studies show that threatening stimuli can leads to bias in visual processing [1]. Hence the anxiety that people with OCD have in their social interactions can decrease their performance in recognition of facial emotions such as disgust and anger. On the other hand, some researchers stated that people suffering from major depression because of the bias in selective attention for negative emotional stimuli have more ability in recognition of negative emotional states such as anger and disgust in their social interactions [13].

One of the important finding of this study is that people with OCD didn't have significant difference in recognition of emotional states of sadness and fear, compared with people with major depression. In line with this finding, Gilba et al. showed that people with anxiety and major depressive disorders have the same performance in recognizing sadness. They showed that sadness is easily recognizable for normal people, so people with anxiety and depression have the same performance in recognizing sadness [8]. About no significant difference between groups in terms of recognition of emotional states of fear, Putnam and Kring, stated that the emotion of fear is hard to express because extinction in expression of fear has evolutionary base, it means that the signs of expression of fear are weakened and not expressed well; therefore clinical patients have trouble in recognizing fear and act same as each other in fear recognition [14]. Another possible reason they found for no significant differences between clinical groups in the recognition of facial expression of fear was that the factor of experimental setting prevents expression of fear naturally and makes hard to recognize it, so it leads to same performance of clinical groups in recognizing fear. Other findings of present study were that there was no significant difference between people with OCD and

MDD in recognizing emotional states of happiness and surprise.

These findings contradict the results of Gilba et al. [8] and Demenescu et al. [3]. These researchers showed that anxious people do better in recognizing happiness [8] and other emotions generally [3] than MDD patients. Keeley et al. believe that there is comorbidity between OCD and MDD in some areas such as bias in judgment, perception, imagination and memory [2]. So these factors in people with obsessive compulsive and major depressive disorders may explain no difference in the recognition of some emotions (such as happiness and surprise) in these two groups. About the difference between our results and the results of some foreign studies such as Demenescu's et al. study [3], these factors can be cited: cultural differences in test of recognition of facial expressions of emotion, the test performing condition, the lack of standardization of this test in clinical and non-clinical Iranian populations. Also, unlike some studies, in present study, patients diagnosed obsessive compulsive and major depressive disorders for the first time and were outpatient and in the early stages of the disease (the disorder was not chronic); therefore these factors may cause contrastive results. Overall, the results indicate similar performance of the two groups of patients with OCD and MDD in recognition of surprise, sadness, joy and fear, while people with OCD acted more poorly than MDD patients in recognizing disgust and anger. Disability of people with OCD in recognizing disgust and anger may cause more deficits in social and interpersonal functions, and social interactions in them compared to patients with major depression.

The limitations of this study were patient selection, small sample size and available sampling method, which these factors, in turn, could affect the study results. Given that this research used static images to assess the ability of recognizing emotions in people with OCD and MDD, we suggest that future studies attempt to assess this ability in natural and social situations and use dynamic emotional images instead of using static images to be more similar to environmental stimuli. Also, it is suggested that further research on recognition of facial expression of emotion also be studied in patients with major depression and obsessive compulsive disorders and other mood disorders (such as double depression, bipolar disorder) and anxiety disorders (e.g., panic, social anxiety).

This study was conducted in Tabriz, so for further generalization of the results it should be done in different geographical areas. Finally, the above results suggest that Specific treatment strategies (treatment based on the recognition of facial expressions of emotion, emotional intelligence and emotional regulation) may improve the ability to recognize emotional facial expressions and nonverbal interactions in patients with OCD and MDD.

Authors' Contributions
All authors had equal role in design, work, statistical analysis and manuscript writing.

Conflict of Interest
The authors declare no conflict of interest.

References
1. Sadock BJ, Sadock VA. Kaplan and Sadock's synopsis of psychiatry: Behavioral sciences/ clinical psychiatry. 10th ed. Philadelphia: Lippincott Williams and Wilkins; 2007.
2. Keeley ML, Storch EA, Merlo LJ and Geffken GR. Clinical predictors of response to cognitive-behavioral therapy for obsessive-compulsive disorder. Clin Psychol Rev 2008; 28(1): 118-30.
3. Demenescu LR, Kortekaas R, den Boer JA and Aleman A. Impaired attribution of emotion to facial expressions in anxiety and major depression. PLoS One 2010; 5(12): e15058.
4. Kohler CG, Turner T, Stolar NM, et al. Differences in facial expressions of four universal emotions. Psychiatry Res 2004; 128(3): 235-44.
5. Kohler CG, Martin EA, Stolar N, et al. Static posed and evoked facial expressions of emotions in schizophrenia. Schizophr Res 2008; 105(1-3): 49-60.
6. Jhung K, Namkoong K, Kang JI, et al. Perception bias of disgust in ambiguous facial expressions in obsessive-compulsive disorder. Psychiatry Res 2010; 178(1): 126-31.
7. Mcclure E, Pope K, Hoberman A, et al. Facial expression recognition in adolescents with mood and anxiety disorders. Am J Psychiatry 2003; 160(6): 1172-1174.
8. Gilba E, Weiss D, Jeczemien P. Interpersonal deficits meet cognitive biases: memory for facial expressions in depressed and anxious men and women. Psychiatry Res 2002; 113(3): 279-293.
9. Delavar A. Research method in psychology and educational science. Tehran: Roshd Press; 2006.
10. Segal D. Structured interviewing and DSM classification. In: Turnev SM, Hevson M. Adult psychophatology and diagnosis. 6th ed. New York: Wiley Press; 1997: 24-87.
11. Ekman P, Friesen W. Photographs of facial affect recognition test. Palo Alto: Consulting Psychologists Press; 1976: 221-231.
12. Gardner K, Qualter P, Stylianou M and Robinson A. Facial affect recognition in non-clinical adults with borderline personality features: The role of effortful control and rejection sensitivity. Pers Individ Dif 2010; 49(7): 799-804.
13. Gotlib H, Krasnoperova E, Neubauer Yue D and Joormann J. Attentional biases for negative inter-personal stimuli in clinical depression. J Abnorm Psychol 2004; 113(1): 121-135.
14. Putnam KM, Kring AM. Accuracy and intensity of posed emotional expressions in unmedicated schizophrenia patients: Vocal and facial channels. Psychiatry Res 2007; 151(1-2): 67-76.