

## Factors Associated with Depression in Obsessive-Compulsive Disorder: A Cross-Sectional Study

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### ABSTRACT

**Introduction:** Major depressive disorder (MDD) is the most frequent comorbid psychiatric condition associated with obsessive-compulsive disorder (OCD). This study aimed to evaluate the prevalence of current depression in OCD, differences in socio-demographic and clinical characteristics, and obsessive-compulsive symptoms between OCD patients with and without depression. Additionally, factors associated with comorbid depression were investigated in our study.

**Methods:** In total, 140 OCD patients, of which 63 were OCD patients with MDD (OCD+MDD, n=63) and 77 were OCD patients without depression (OCD-MDD, n=77) were included in the study. All patients were diagnosed with OCD using the Structured Clinical Interview for DSM-IV. The Yale-Brown Obsessive-Compulsive Scale, Beck Anxiety Scale, and Beck Depression Scale were administered to all patients. After the socio-demographic and clinical variables and scales were accomplished, the OCD patients divided into two groups as OCD with or without depression and we compared their mean scores of the variables and scales. Univariate analyses were followed by logistic regression.

**Results:** There were no significant differences in age, gender, marital status, period without treatment, profession, medical and family history, and social support between the two groups. Anxiety, depression, and obsession and compulsion scores were significantly higher in the OCD+MDD group. The avoidance, insight, instability, and retardation scores of the OCD+MDD group were also significantly higher than those of the OCD-MDD group.

**Conclusion:** Our study suggests that many factors are strongly associated with depression in OCD. Positive correlations between poor insight, severity of obsession and compulsion, and stressful life events during the last six months increased the risk of depression in OCD. Our study suggests that high level of avoidance, instability and retardation, history of suicidal attempt, and delayed treatment are other notable factors associated with the development of depression in OCD.

**Keywords:** Obsessive-compulsive disorder, depression, symptom, factor

### INTRODUCTION

Obsessive-compulsive disorder (OCD) is a common psychiatric disorder that was first described by Esquirol in 1838. It is a multidimensional and etiologically heterogeneous and is the fourth most common mental disorder after depressive disorder, phobia, and substance abuse (1,2). OCD is defined as a condition characterized by the presence of persistent intrusive, and recurrent thoughts, impulses, or images (obsessions), and/or repetitive behaviors, and rituals or mental acts (compulsions) (3) that cause a significant distress or interference with daily functioning and impairment in quality of life and social and familial relationships (4,5,6,7).

Axis I and Axis II comorbid disorders in OCD may concurrently occur or may occur at any time during the long course of the illness. The results of clinical study show that depressive disorder is the most common comorbid psychiatric disorder in OCD. The lifetime prevalence of depression among OCD patients ranges from 12% to 67.5% in a clinical and general population (Table 1) (8,9). Epidemiological data suggest that other psychiatric disorders may coexist with OCD. The prevalence rates of comorbid disorders in OCD were reported as panic disorder (2–24.9%), generalized anxiety disorder (.95–34.6%), social phobia (15–43.5%), special phobias (.95–33%), bipolar disorder (.95–15%), eating disorder (2.4–5%), and body dysmorphic disorder (12.1–15.3%) (Table 1) (10,11,12,13,14,15,16,17,18).

Obsessive-compulsive disorder patients with depression are reported to have more anxiety, retardation, suicidal thoughts/attempts, hospitalization, impairment in social and work adjustment, lower level of quality of life, longer illness duration, severe obsessive-compulsive symptoms, poor response to treatment and bad prognosis, chronicity, aggressiveness, sexual and/or religious obsessions and checking compulsions, and comorbid generalized anxiety disorder (15,18,19,20,21,22,23,24,25,26). Depressive symptoms are also more associated with obsessions than compulsions (27).



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Although many studies in literature have suggested a relation between depression and OCD, only a few studies have evaluated factors associated with depression in OCD. Therefore, this study aimed to evaluate the prevalence of current depression in OCD and differences in socio-demographic and clinical characteristics. Symptom dimensions between OCD patients with and without depression and factors associated with comorbid depression were also evaluated in our study.

## METHODS

### Subjects

This is a cross-sectional study with 140 OCD patients from the Department of the Psychiatry of the Baskent University School of Medicine who met the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) (3) criteria for OCD between September 2012 and January 2014. Written informed consent was obtained from the patients and the parents of patients who were younger than 18 years.

This study adhered to the tenets of the Declaration of Helsinki and was approved by the Baskent University Institutional Review Board and Ethics Committee (Project no: KA 12/255) and supported by Baskent University Research Fund.

Patients with schizophrenia, schizophreniform disorder, bipolar affective disorder, mental retardation, severe neurological disorder, age  $\leq$  15 years, and a history of any serious and progressive organic physical disease, and pregnant or breast-feeding women were excluded. Patients with any history of a depressive episode and bipolar disorder depressive episode occurring before OCD onset were also excluded.

Detailed socio-demographic data and data on clinical features (e.g., age, marital status, education level, profession, onset age, period without treatment, family history, stressful life events, social support, etc.) were obtained through a semi-structured interview.

Stressful life events such as business, education, finance, health, grief, migration, and legal, familial, social and marital problems in the past six months were evaluated in detail by the semi-structured interview.

Obsessive-compulsive disorder and major depressive disorder (MDD) diagnosis were established by the clinician using DSM-IV (28). The Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), Yale-Brown Obsessive-Compulsive Scale (Y-BOCS), and Y-BOCS checklist were applied during the second interview. Two symptom categories were defined as obsession group and compulsion group. The obsession group included contamination, religious, sexual, somatic, doubts, hoarding, aggression, and symmetry and the compulsion group included cleaning, checking, repetition, hoarding, ordering, and listing. After the socio-demographic and clinical variables and scales were accomplished, the OCD patients were divided into two groups as OCD with or without depression, and we compared their mean scores of the variables and scales.

### Assessment Instruments

The Structured Clinical Interview for DSM-IV Axis I Disorders is a clinical interview scale applied by the interviewer to explore the diagnosis of Axis I psychiatric disorders. It consists of six modules investigating the diagnostic criteria of a total of 38 axis I disorders. Two modules are used for mood episodes and mood disorders, two are used for psychotic symptoms and psychotic disorders, and each of the remaining two modules is used for anxiety disorders, substance abuse, and other disorders. It was developed in 1997 by First et al. (28). The validity and reliability study of the Turkish version was done by Ozkurkçugil (29) under the name of Structural Clinical Interview for DSM-IV Axis-I disorder.

The presence and severity of OCD symptoms were measured by the Y-BOCS. Y-BOCS is intended the use of a structured interview. The scale includes 19 items, but only 10 items are used for the total score: five for obsessions and five for compulsions. Each item rates from (no symptoms) to 4 (extreme symptoms), and the total range is 0–40; subtotals indicate the severity of obsessions and compulsions. Scores should reflect the average (mean) occurrence of each item for the entire week. A person who scores over 16 meets the DSM-IV criteria for OCD (30,31). The Turkish validity and reliability were established by Tek et al. and matched the original (32).

The Y-BOCS symptom checklist includes more than 60 symptoms organized according to 15 separate categories of obsessions and compulsions. This scale comprehensively identifies all possible types of obsessions and compulsions (30,31).

**Table 1.** The prevalence of an Axis I disorder comorbidity in obsessive-compulsive disorder

	Prabhu et al. (19) n=253	Torresan et al. (20) n=858	Viswanath et al. (18) n=545	Torresan et al. (22) n=330	Kalra et al. (43) n=54	Mohammadi et al. (21) n=444	Denys et al. (10) n=420	Tukel et al. (26) n=420
MDD	22.4	68.4	30.3	59.4	38.88	14.0	20.7	36.1
Dysthymia	11.8	12.5	16.3	-	1.85	-	6.2	20.4
GAD	6.2	34.6	6.2	24.8	1.85	5.2	.95	12.2
PD and/or A	6.2	20.2	2.5	24.9	7.40	6.5	4.0	13.6
Hypochondriasis	.6	3.6	.7	2.7	-	-	2.8	4.1
Substance abuse	3.7	8.2	3.2	15.4	-	-	1.5	-
Social phobia	11.2	36.1	13.0	37.0	3.70	8.1	3.6	15.6
Special phobia	1.2	33.0		25.8	3.70	10.8	.95	17.7
Nationality	India	Brazil	India	Brazil	India	Iran	The Netherlands	Turkey

MDD: major depressive disorder; GAD: generalized anxiety disorder; PD and/or A: panic disorder and/or agoraphobia

The Turkish version of BDI was used to assess the prevalence and severity of depressive symptoms. BDI is a self-report inventory created by Aeron Beck (33). BDI items consist of four statements, scored 0 to 3, and the total scores range from 0 to 63. A score of 0 to 4 is considered as none/minimal, 10 to 16 as mild depression, 17 to 29 as moderate depression, and 30 to 63 as severe depression. BDI scores, 14 or higher, were categorized as depressive. The Turkish reliability and validity were established by Hisli, who considered a score of 17 or above as indicative of major depression in the Turkish population; similarly, the same value was accepted as the indicator of major depression in this study (34).

Beck Anxiety Inventory is a 21-item scale developed by Beck et al. (35) is widely used to measure the severity of anxiety. Acceptable validity and reli-

ability has been reported in various populations. Each item was scored from 0 to 3, in increasing order of severity. The scores for each of these 21 items were totaled at the end of the psychological evaluation. Ulusoy evaluated the validity and reliability of this inventory for the Turkish society (36).

### Statistical Analysis

Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS Inc. Chicago, IL, USA) version 17.0. Univariate analyses were conducted to compare the OCD patients with or without MDD with regard to the socio-demographic and clinical variables. For each continuous variable (age, gender, educational level, onset age, marital status, stressful life events, BAI, BDI, Y-BOCS); normality was checked by Kolmogorov–Smirnov and Shapiro–Wilk tests and by histograms. All numerical data was expressed as median values (minimum–maximum) or as proportions. Comparisons between the groups were made using Mann–Whitney U test, which was used for abnormally distributed data. The categorical variables of the groups were analyzed using the chi-square test.

Univariate analyses were initially done, and then clinical variables (listed in Tables 2 and 3) that were identified as significantly associated with depression were included in multivariate logistic regressions.

Correlations were tested by Spearman's correlation test. Spearman's correlation coefficients were interpreted as excellent relationship  $r \geq .91$ , good  $.90 \leq r < .71$ , fair  $.70 \leq r < .51$ , weak  $.50 \leq r < .31$ , and little or none  $r \leq .3$ . A p-value of .05 was taken as the level of significance (Table 4).

## RESULTS

### Socio-Demographic Factors and Prevalence

Sixty-three of these patients met the DSM-IV criteria for both OCD and MDD (OCD+MDD group) and 77 patients met the criteria for OCD without MDD (OCD–MDD group). Of the 140 OCD patients, 65% (n=91) were females and 35% (n=49) were males. The mean age of the patients was  $32.8 \pm 10.6$  (range: 15–65) years. Thirteen (9.3%) patients were unemployed and 42 (30%) suffered a medical disorder. Seven patients had thyroid disease, and three patients were hepatitis B virus porter. The disease developed after bone marrow transplantation in one patient.

No statistically significant differences were found between age, gender, marital status, and employment distribution in the complicated and uncomplicated groups. The socio-demographic features of the OCD patients with or without depression (univariate analyses) are shown in Table 2.

The prevalence of current major depression among all OCD patients was 45% (n=63). MDD was the most common comorbid psychiatric disorder followed by social phobia, special phobia, and generalized anxiety disorder. Axis I psychiatric disorders were 42.9% in the OCD+MDD and 53.2% in the OCD–MDD groups ( $p=.238$ ).

### Differences in OCD Symptoms between the OCD+MDD and OCD–MDD Groups

The most common obsessions were contamination (62.9%), doubt (51.4%), and religious (33.8%) in the total sample. On the other hand, cleaning (67.9%), checking (53.6%), and repeating (43.6%) were the most common compulsions among all the groups. In the OCD+MDD group, the most common obsessions were hoarding (64.3%), symmetry (59.1%), religious (53.2%), and contamination (50%), whereas the most

**Table 2.** Socio-demographic and clinical characteristic distribution of OCD–MDD and OCD+MDD groups

	OCD–MDD (n=77)	OCD+MDD (n=63)	
	Median (Min–Max) / n (%)	Median (Min–Max) / n (%)	p
<b>Gender (Female)</b>	47 (61.0)	44 (69.8)	.292
<b>Educational level (years)</b>	13 (5–17)	13 (0–16)	.347
<b>Age of onset (years)</b>	21 (9–61)	21 (10–51)	.977
<b>Age of examination (years)</b>	28 (15–65)	27 (15–62)	.646
<b>Age (years)</b>	30 (15–65)	34 (16–62)	.355
<b>Period of without treatment (months)</b>	24 (0–264)	24 (0–300)	.418
<b>Marital status</b>			
Married	38 (49.4)	31 (49.2)	.833
Single	35 (45.5)	30 (47.6)	
Divorced	4 (5.2)	2 (3.2)	
<b>Profession</b>			
Worker	10 (13.0)	5 (7.9)	.229
Civil servant	20 (26.0)	10 (15.9)	
Unemployed	7 (9.1)	6 (9.5)	
Retired	2 (2.6)	3 (4.8)	
Housewife	15 (19.5)	23 (36.5)	
Student	23 (29.9)	16 (25.4)	.229
<b>Medical disorder</b>	23 (29.9)	19 (30.2)	.999
<b>History of disorder/trauma/operation</b>	30 (39.0)	21 (33.3)	.597
<b>Substance abuse</b>	20 (26.0)	21 (33.3)	.357
<b>Family history</b>	32 (41.6)	30 (47.6)	.498
<b>Stressful life events before onset</b>	29 (37.7)	22 (34.9)	.860
<b>History of psychotic attack</b>	5 (6.5)	6 (9.5)	.543
<b>History of hospitalization</b>	9 (11.7)	4 (6.3)	.383
<b>History of suicidal attempt</b>	8 (10.4)	18 (28.6)	.008
<b>Stressful life events in the last six months</b>	29 (37.7)	35 (55.6)	.041
<b>Social support</b>	60 (77.9)	45 (71.4)	.435

Min–max: minimum–maximum; OCD: obsessive-compulsive disorder; MDD: major depressive disorder

common compulsions were listing (75%), hoarding (70.6%), cleaning/washing (50.5%), and checking (49.3%). Only the somatic obsession and compulsive hoarding and listing were significantly higher in prevalence in the OCD+MDD group. Symptom categories according to the Y-BOCS checklist in the OCD+MDD group are shown in Table 3.

### Clinical Characteristics

The differences of the clinical characteristics between the two groups are summarized in Tables 1, 2, and 3. The mean age of obsessive-compulsive symptoms onset in the OCD+MDD group was 21 years (range: 9–61). The age of onset and duration of symptoms did not differ between the two groups. Social support was significantly high in both groups, and the difference was not statistically significant. The percentage of patients in the OCD+MDD group with suicide attempt history was significantly high-

er than that of uncomplicated groups (28.6%,  $p=0.008$ ). Thirty patients in the OCD+MDD group reported a family history of OCD.

Thirty-five (55.6%) OCD+MDD patients experienced stressful life events in the last six months ( $p=.041$ ). Stressful life events were experienced by 34.9% of the patients in OCD+MDD group before the onset of OCD.

The OCD+MDD group had significantly higher BDI scores 28 (range: 5–53), ( $p<.0001$ ). The mean BAI score was  $22.9\pm 13.1$  among the entire study population. The BAI scores were significantly higher in the OCD+MDD group, and the mean score was 27 (range: 5–53) ( $p=.0001$ ).

In the OCD+MDD group, the total YBOC-S and obsession and compulsion scores were significantly higher than in the OCD–MDD group. Differences between the OCD+MDD and OCD–MDD groups regarding scale scores are shown in Table 3.

YBOC-S item-12, which was avoidance, item-13, which was instability, and item-15, which was retardation were significantly increased in the OCD+MDD group ( $p=.005$ ,  $p=.033$ ,  $p=.029$ ). There were no differences in the scores for item-14, which was pathologic responsibility, and item-16, which was pathologic doubt, between the two groups (Table 5). YBOC-S item-11, which was insight, was significantly higher in the OCD+MDD group ( $p=.0001$ ), which indicates that poor insight was significantly higher in the complicated group. The mean obsession scores among poor insight patients were 14 (range: 5–20). Obsession and compulsion scores were significantly higher among the poor insight patients (OCD+MDD) ( $p=.0001$ ).

The intercorrelations of subscales were evaluated. There were strong correlations between the YBOC-S and BDI scores ( $r=.60$ ). As a result, the depression scores positively correlated with the severity scores of the YBOC-S scores. Correlations with other subscales are summarized in Table 3.

### Factors Associated with Comorbid Depression in OCD

At the end of the univariate analysis, logistic regression analysis was applied to evaluate statistically significant parameters and depression. Depression

**Table 3.** Comparisons between the levels of BAI, BDI, YBOC-S (item 11-12-13-14-15-16) severity and depression in the OCD+MDD and OCD–MDD groups

	OCD–MDD (n=77) Median (Min–Max)	OCD+MDD (n=63) Median (Min–Max)	p
Total YBOC-S	22 (6–38)	28 (11–39)	.0001
YBOC-S obsession	11 (2–19)	15 (6–20)	.0001
YBOC-S compulsion	10 (2–19)	13 (5–20)	.0001
YBOC-S insight	1 (0–3)	2 (1–3)	.0001
YBOC-S avoidance	2 (0–4)	2 (0–4)	.005
YBOC-S instability	2 (0–4)	2 (0–4)	.033
YBOC-S pat. responsibility	1 (0–4)	1 (0–3)	.369
YBOC-S retardation	1 (0–4)	2 (0–4)	.029
YBOC-S pathologic doubt	1 (0–4)	1 (0–4)	.055
BAI	16 (4–48)	27 (5–53)	.0001
BDI	16 (3–49)	28 (5–53)	.0001

Min–max: minimum–maximum; OCD: obsessive-compulsive disorder; MDD: major depressive disorder; YBOC-S: Yale–Brown Obsessive-Compulsive Scale; BAI: Beck Anxiety Inventory; BDI: Beck Depression Inventory

**Table 4.** Spearman's correlations

		Group no	Age	YBOC-S	Obsession scores	Compulsions scores	BAI
Age	r	.08					
	p	.357					
YBOC-S	r	.38*	.09				
	p	.0001	.302				
YBOC-S Obsession	r	.39*	.02	.91*			
	p	.0001	.805	.0001			
YBOC-S compulsion	r	.32*	.13	.95*	.75		
	p	.0001	.136	.0001	.0001		
BAI	r	.31*	–.048	.40*	.36*	.37*	
	p	.0001	.570	.0001	.0001	.0001	
BDI	r	.45*	.09	.60*	.60*	.54*	.71*
	p	.0001	.915	.0001	.0001	.0001	.0001

YBOC-S: Yale–Brown Obsessive-Compulsive Scale; BAI: Beck Anxiety Inventory; BDI: Beck Depression Inventory

**Table 5.** Symptom categories according to the Yale–Brown Obsessive-Compulsive Checklist in the OCD+MDD group

Obsession categories	n	%	p	Compulsion categories	n	%	p
Contamination	44	50.0	.16	Cleaning/washing	48	50.5	.069
Religious	25	53.2	.208	Checking	37	49.3	.309
Somatic	5	38.5	.772	Repeating	30	49.2	.397
Pathologic Doubt	33	45.8	.866	Hoarding	12	70.6	.036
Sexual	6	37.5	.600	Ordering	31	53.4	.121
Hoarding	9	64.3	.16	Listing	9	75.0	.036
Aggression	16	41.0	.576	Other	25	51.1	.069
Symmetry	26	59.1	.029				

**Table 6.** Logistic regression analyses a. Variable(s) entered on step 1: age, compulsive hoarding, stressful life events in the last six months, BAI, YBOC-S, insight\_A2

	B	S.E.	Wald	Df	p	Odds Ratio	95% C.I. for EXP(B)	
							Lower	Upper
Age	.024	.019	1.592	1	.207	1.024	.987	1.063
Compulsive hoarding	1.512	.675	5.020	1	.025	4.538	1.208	17.040
Stressful life events in the last six month(1)	.952	.408	5.449	1	.020	2.590	1.165	5.759
BAI	.034	.017	3.959	1	.047	1.034	1.001	1.069
YBOC-S	.113	.034	10.805	1	.001	1.120	1.047	1.198
YBOC-S -insight (1)	.316	.507	.388	1	.533	1.371	.508	3.705
Constant	-5.294	1.350	15.378	1	.000	.005		

YBOC-S: Yale–Brown Obsessive-Compulsive Scale; BAI: Beck Anxiety Inventory

was considered as a dependent variable. Instead of all the significant parameters, only clinically significant parameters were preferred among the highly correlated variables.

In the logistic regression analysis, age, hoarding (compulsion), stressful life event, BAI score, YBOC-S score, and insight were added. Hoarding (compulsion), stressful life event, BAI scores, and YBOC-S scores were positively correlated with the severity of depression in OCD (Table 6).

Based on the results of the logistic analysis, the correlation between compulsive hoarding severity and depression was also significant [confidence interval (CI): 95%, 1.2–1.7]. The patients with compulsive hoarding had 4.5-times more depressive symptoms than the patients with non-compulsive hoarding. The rates of stressful life events in the last six months, increasing BAI, and increasing YBOC-S odds were 2.6 (CI: 95%, 1.2–5.7), 1.1 (CI: 95% 1–1.1), and 1.1 (CI: 95%, 1.05–1.2) respectively.

## DISCUSSION

Depression is the most common comorbid mental disorder in OCD (10,13,37,38,39,40). The prevalence rates of MDD in OCD vary considerably among studies. While depression accompanied one-third of OCD patients in the first examination, two-thirds have a lifetime history of depression (38,41). The results of the current study indicate that approximately half of the patients met the criteria of depression, which is similar to results reported in the world and local literature (23,38).

In this study, no significant differences were found for gender, age, marital status, years of education, age of onset, stressful life events at the begin-

ning of disorder; and age of onset between the complicated and uncomplicated groups. OCD symptoms were evaluated in accordance with world literature. Symptom dimensions of obsession and compulsion were also in accordance with those in related studies.

In our study, symmetry obsession and compulsive hoarding and listing were experienced more frequently in the MDD+OCD group. Hoarding is defined as “collecting of insignificant or little value items in excessive amounts” (42). Although compulsive hoarding is most commonly associated with OCD, it may be accompanied by various psychiatric illnesses such as dementia, schizophrenia, mental retardation, and anorexia nervosa (43,44,45,46). Rates of compulsive hoarding among OCD patients range from 18% to 42% (8,47). According to logistic regression analysis, compulsive hoarding seems to be associated with depression by more than 4.5 times. Although there were high rates of religious and aggressive obsessions, these were not determined as factors related to depression in OCD.

Quarantini et al. (44) found no significant associations between MDD and OCD symptom dimension. Contrary to this finding, Besiroglu et al. (27) found a relationship between aggressive obsessions in MDD+OCD patients; Hasler et al. (28) reported positive associations between aggressive, religious, sexual, and somatic obsessions and compulsive checking and depression in OCD. Contrary to the findings of Tukul et al. (42) and Eisen et al. (4), Kalra et al. (43) did not determine a significant relation between symptom dimension and depression.

Anxiety disorders are the second most common disorders in OCD. In our study, 48.6% of the patients met at least one Axis I comorbidity criterion

and 45% of the patients presented with depression, 16.3% with anxiety disorder, 17.1% with special phobia, and 15.7% with social phobia. Our study revealed that the second factor associated with depression in OCD is a high BAI score. Similarly, Kalra et al. (39) and Yap et al. (48) found a positive relation between BAI scores and depression comorbidity.

According to the logistic regressions analyses, OCD patients with depression indicated more severe obsessive and compulsive symptoms than OCD patients without depression. Although these findings were not surprising, contrary to earlier studies, we found that both obsessive and compulsive scores were related to depression severity. Moreover, many studies showed that obsessive symptoms are more strongly correlated with depressive symptoms than with compulsive symptoms (27,48,49). Lee and Kwon (50) defined a new model that classified obsession into two subtypes, and they suggested that autogenous obsessions are particularly related to depression in OCD. They indicated that compulsions reduce anxiety severity, so quality of life is less impaired. On the other hand, the severity of obsessions and compulsions may be correlated with the impairment of social function and quality of life and poor insight; thus, they may facilitate the development of depression and other Axis I disorders in OCD (4,22,50).

According to the results of our study, another factor associated with depression in OCD was stressful life events during the last six months. Most studies show a positive correlation between stressful life events and chronic diseases such as depression (51). Therefore, it can be said that stressful life events may be a risk factor for the development of depression in OCD regardless of the severity of obsessions and compulsions. Rosso et al. (52) suggested that more than 60% of OCD patients experience at least one stressful life event during the year before the onset of the disorder. Stressful life events are also associated with later onset of the disorder, a history of complicated birth, less family history of OCD, aggressive/checking, symmetry/ordering, hoarding dimension, and female gender (53,54,55,56).

In our study, poor insight was found to be another factor related to depression in OCD. Clinical insight in psychiatric research refers to awareness and recognition of a mental illness, of its symptoms, need for treatment, and its consequences (57). The association between poor insight and OCD+MDD is in compliance with results of previous studies (58,59,60). Poor insight in OCD has been described as a condition where patients refuse or resist or are noncompliant to treatment, and are unaware of the excessiveness of obsessions and anxiety. Poor insight has been reported in 15% to 36% of OCD patients (58,61,62,63) and is associated with early onset and long duration of illness, low response to treatment, more severe symptoms, a higher frequency of obsessive and compulsive hoarding, high level comorbidity of mental disorders such as depression, and generalized anxiety disorder (60,64,65,66,67).

Our study has some limitations. By virtue of its cross-sectional design, this study does not permit inference about the causal relationship. Another limitation of the study is that our participants were selected from specialized services; therefore, the results may not reflect the situation of the general population. Data on family history and stressful life events were only indirectly investigated; no instruments were used to evaluate the family history and stressful life events. The sample size was small in comparison with other major studies.

In conclusion, this study suggests that many factors are strongly associated with depression in OCD; it was found that positive correlation between

poor insight, severity of obsessions and compulsions, severity of anxiety, compulsive hoarding, and stressful life events during the last six months increased the risk of the development of depression in OCD. Our findings also suggest that a high level of avoidance, instability and retardation, history of suicidal attempt, and delayed treatment are other notable risk factors associated with the development of depression in OCD.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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