



## Predictors of concurrent depressive symptoms in patients with obsessive-compulsive disorder



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### ABSTRACT

Many patients with obsessive-compulsive disorder (OCD) exhibit concurrent depressive symptoms, which are associated with negative psychological outcomes. Yet little research has focused on identifying factors that predict depressive symptoms in OCD. The current study examined three transdiagnostic constructs—anxiety sensitivity (AS), intolerance of uncertainty (IU), and worry—as predictors of depressive symptom severity in a sample of treatment-seeking adults with a primary diagnosis of OCD ( $N = 93$ ). Strong, positive associations between depressive symptoms and measures of AS, IU, and worry were detected, and AS and worry (but not IU) remained significant unique predictors of depression after controlling for the severity of OCD symptoms. The conceptual and clinical implications of these findings, as well as study limitations and future directions, are discussed.

### 1. Introduction

Obsessive-compulsive disorder (OCD) is among the most common psychological conditions, with a lifetime prevalence rate of 1%–3% in the general population (Adam et al., 2012; Ruscio et al., 2010). Epidemiological research suggests that about 63% of individuals with OCD meet criteria for a co-occurring mood disorder (Ruscio et al., 2010), and a cross-national study demonstrated that relative to the general population, individuals with OCD are at increased risk for major depression (Weisman et al., 1994). Moreover, co-occurring depression is associated with increased severity and chronicity of OCD symptoms (e.g., Perugi et al., 1997; Stavrakaki and Vargo, 1986; Hong et al., 2004), as well as poorer quality of life (Masellis et al., 2003). Individuals meeting criteria for both disorders also evidence more severe anxiety symptoms, higher rates of unemployment, and greater functional disability than do non-depressed individuals with OCD (Hong et al., 2004; Tükel et al., 2006; Tükel et al., 2002). Furthermore, depressive symptoms encumber OCD treatment response, specifically with exposure and response prevention (ERP), regardless of whether or not patients are using concurrent medication (Abramowitz and Foa, 2000; Abramowitz et al., 2000; Overbeek et al., 2002). Given the increased severity and functional impairment associated with depression, as well as attenuated OCD treatment outcome, it is important to identify the factors associated

with depression in individuals with OCD.

Surprisingly, there is only a small body of literature on the relationship between OCD and depressive symptoms. Existing work suggests that of the various presentations of OCD (i.e., contamination, responsibility for harm, unacceptable thoughts, and symmetry), unacceptable obsessional thoughts about violence, sex, and morality are most consistently linked with depression (Hasler et al., 2005; Moritz et al., 2004). This is consistent with research indicating that these types of obsessions are associated with particularly high levels of distress (Abramowitz et al., 2003; McKay et al., 2004). Relatedly, researchers have found that the tendency to misinterpret innocuous intrusive thoughts as significant uniquely predicted depression among people with OCD (Abramowitz et al., 2007). Although these OCD-specific symptoms and cognitions explain significant variance in depressive symptoms among individuals with OCD, they do not fully account for this relationship. Accordingly, it is worthwhile investigating other conceptually-relevant factors that may also have explanatory power to elucidate the relationship between depression and OCD and identify possible targets for assessment and treatment.

One such factor is anxiety sensitivity (AS), defined as the tendency to fear anxiety-related physiological sensations. Individuals with elevated AS tend to be body vigilant and thus highly sensitive to internal sensations (Zvolensky and Forsyth, 2002). Although this construct is

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typically associated with panic disorder, AS is also elevated in OCD (Calamari et al., 2008; Wheaton et al., 2010), as patients may perceive anxious arousal as socially threatening (e.g., what if others notice that I am experiencing arousal?) and as indicating cognitive dyscontrol (e.g., when my thoughts race, I worry I am going crazy). AS and related catastrophic appraisals of arousal-related body sensations are also linked to depression, even among individuals without a co-occurring anxiety disorder (Otto et al., 1995; Taylor et al., 1996). Cox et al. (2001) suggested that this relationship is related to rumination and the dimension of AS associated with cognitive dyscontrol. Although these findings raise the possibility that AS helps explain depression among patients with OCD, this hypothesis has not been previously tested.

Intolerance of uncertainty (IU) may also help account for depressive symptoms among individuals with OCD. IU refers to cognitions about the importance of being certain, difficulty managing unpredictable change, and functional impairment in ambiguous situations (Obsessive Compulsive Cognitions Working Group, 1997), and is strongly associated with OCD. In a meta-analysis of the association of intolerance of uncertainty to OCD and depression, Gentes and Ruscio (2011) found that the construct was significantly related to both sets of symptoms, and did not demonstrate narrow specificity to any one disorder. Further, McEvoy and Mahoney (2012) found that IU mediated the relationship between neuroticism and depression in a treatment-seeking sample of individuals with anxiety and depression. Thus, it is worth investigating the extent to which IU explains depressive symptoms that co-occur with OCD symptoms.

Worry is another transdiagnostic phenomenon associated with both OCD and depression, although it is most often considered in the context of generalized anxiety disorder (Chelminski and Zimmerman, 2003). Worry is conceptually similar to rumination, a hallmark feature of depression, and research has identified characteristics common to both worry and rumination (e.g., repetitive thought, Segerstrom et al., 2000). Further, van Rijsoort et al. (2001) found that the relationship between worry and OCD symptoms is partially mediated by depressed mood. No studies, however, have examined the unique contribution of worry to depressive symptomatology among OCD patients above and beyond the effects of OCD symptom severity. Accordingly, along with AS and IU, worry may be an important predictor of depression in patients with OCD.

Conceptual formulations and research findings support the roles of AS, IU, and worry in OCD and depression independently, yet no studies have examined the relative contributions of these variables to depressive symptoms among individuals with OCD. Clarifying the nature of such associations would advance our understanding of depressed OCD patients so that better conceptual models, assessments, and interventions can be developed for this especially compromised subgroup of individuals with OCD. Accordingly, the current study aimed to examine the extent to which these factors predict depressive symptom severity in a large treatment-seeking sample of patients with OCD. On the basis of previous research, we expected to find that unacceptable thoughts would uniquely predict depressive symptom severity, even after accounting for OCD symptom severity. We hypothesized that AS, IU, and worry would predict depressive symptom severity over and above the variance explained by OCD symptom severity.

## 2. Method

### 2.1. Participants

Participants included 93 patients (49.5% female;  $n = 46$ ) with a primary diagnosis of OCD seeking treatment at residential, partial hospital and intensive outpatient programs within a multi-site network of OCD-specific treatment programs. The mean participant age was 31.2 years ( $SD = 13.681$ ; range = 18–68) and 94.6% ( $n = 88$ ) of patients identified as White, 1.1% ( $n = 1$ ) as Asian, and 1.1% ( $n = 1$ ) as

Native Hawaiian or Pacific Islander. Race/ethnicity data was missing for three participants.

### 2.2. Measures

#### 2.2.1. Quick inventory of depressive symptomatology-self report (QIDS-SR; Rush et al., 2003)

The QIDS-SR is a 16-item self-report measure of depression symptom severity. The QIDS-SR was developed to assess all domains of depression and to capture a wide range of symptom severity. The QIDS-SR has demonstrated highly acceptable psychometric properties (Rush et al., 2003) and good reliability in the current sample ( $\alpha = .88$ ).

#### 2.2.2. Dimensional obsessive-compulsive scale (DOCS; Abramowitz et al., 2010)

The 20-item self-report DOCS assesses the severity of four empirically supported OCD symptom dimensions: (a) contamination, (b) responsibility for harm, (c) unacceptable thoughts, and (d) symmetry/ordering. The DOCS has shown excellent reliability, sensitivity, and convergent validity with other measures of OCD symptoms in clinical samples (Abramowitz et al., 2010). The DOCS subscales demonstrated excellent reliability in the present sample ( $\alpha s = .92-.96$ ).

#### 2.2.3. Anxiety sensitivity index (ASI; Reiss et al., 1986)

The ASI is a unidimensional 16-item self-report measure of beliefs regarding the dangerousness of anxious arousal (e.g., “It scares me when my heart beats rapidly”). The ASI has demonstrated reliability and validity in previous research (Peterson and Heilbronner, 1987), and showed excellent internal consistency in the current sample ( $\alpha = .93$ ).

#### 2.2.4. Intolerance of uncertainty scale, short form (IUS-12; Carleton et al., 2007)

The IUS-12 is a 12-item short form of the original 27-item Intolerance of Uncertainty Scale (Freeston et al., 1994) that measures reactions to uncertainty, ambiguous situations, and the future. The IUS-12 has evidenced good psychometric properties (Buhr and Dugas, 2002; 2006), and demonstrated excellent reliability in the current sample ( $\alpha = .93$ ).

#### 2.2.5. Penn state worry questionnaire (Meyer et al., 1990)

The PSWQ is a 16-item self-report inventory designed to capture the generality, excessiveness, and uncontrollability of worry. The PSWQ has shown good reliability and validity in clinical samples (Rijsoort et al., 1999). The PSWQ demonstrated good reliability in the current sample ( $\alpha = .83$ ).

### 2.3. Procedure

Upon admission, each patient completed an in-person evaluation with a psychiatrist to confirm the diagnosis of OCD. Each participant also completed the QIDS-SR, DOCS, ASI, IUS-12, and PSWQ upon admission. As part of the admission process, patients provided consent for the study measures to be used for both clinical and research purposes. The consent procedures and study measures were approved by both the hospital network's Human Subjects Committee and Center for Research and Training.

## 3. Results

### 3.1. Preliminary analyses

Means and standard deviations are presented in Table 1. Distributions of scores on study measures were free of significant skew and kurtosis (all values  $< 2$ ). OCD symptom severity as measured by the DOCS in the current sample ( $M = 30.49$ ,  $SD = 15.27$ ) was comparable to that of other clinical samples ( $M = 30.06$ ,  $SD = 15.49$ ;

**Table 1**  
Means, standard deviations, and zero-order correlations.

	M	SD	1	2	3	4	5	6	7
1. QIDS-SF	11.36	7.18	–						
2. DOCS contamination	8.28	6.41	.16	–					
3. DOCS responsibility for harm	6.82	6.08	.42**	.29**	–				
4. DOCS unacceptable thoughts	9.08	6.42	.51**	.02	.52**	–			
5. DOCS symmetry	5.91	5.08	.37**	< .01	.25*	.18	–		
6. ASI	21.61	14.31	.64**	.15	.45**	.50**	.34**	–	
7. IUS-12	72.75	28.00	.59**	.14	.44**	.50**	.37**	.69**	–
8. PSWQ	59.03	14.68	.67**	.21	.42**	.48**	.37**	.63**	.71**

\*  $p < .05$ .  
\*\*  $p < .005$ .

Abramowitz et al., 2010). Although QIDS-SR scores varied across individual participants, the sample reported moderate overall depressive symptom severity (Rush et al., 2003). Regression diagnostics identified no violations of normality, homoscedasticity, or assumptions regarding multicollinearity (tolerance > .1; variance inflation factor < 5).

3.2. Bivariate analyses

Zero-order correlations among the study variables are presented in Table 1. At the bivariate level, QIDS-SR scores were significantly and positively related ( $ps < .001$ ) with all study variables except the DOCS contamination subscale. The magnitude of the relation between the QIDS-SR and the transdiagnostic predictors (i.e., ASI, IUS-12, and PSWQ scores) were large. Finally, correlations between QIDS-SR and the DOCS subscales ranged from moderate to large ( $rs$  ranged .37–.51).

3.3. Hierarchical linear regression analyses

To examine predictors of depressive symptoms, a hierarchical linear regression analysis was conducted with the QIDS-SR entered as the dependent variable. After entering the four DOCS subscales in Step 1 to control for OCD severity, we entered the ASI, IUS-12, and PSWQ simultaneously in Step 2. As shown in Table 2, the four DOCS subscales jointly accounted for a significant ( $p < .001$ ) 39% of the variance in QIDS-SR scores in Step 1, which was largely driven by significant ( $ps < .01$ ) unique effects of the DOCS unacceptable thoughts and symmetry subscales. Adding ASI, IUS-12, and PSWQ scores in Step 2 resulted in a significant increase (about 20%) in explained model variance,  $\Delta R^2 = .197, p < .001$ . The final model accounted for 58% of the variance in QIDS-SR scores,  $F(7, 71) = 14.27, p < .001$ . As can be seen, no single DOCS subscale accounted for significant unique variance in

**Table 2**  
Regression analysis predicting QIDS-SR scores.

	Predictors	R <sup>2</sup>	β	t	sr <sup>2</sup>
Step 1	DOCS contamination	.388*	.16	1.66	.02
	DOCS responsibility for harm		.12	0.94	.01
	DOCS unacceptable thoughts		.41	3.84*	.12
	DOCS symmetry		.28	2.98*	.07
Step 2	DOCS contamination	.584*	.06	.72	.00
	DOCS responsibility for harm		.02	.24	.00
	DOCS unacceptable thoughts		.16	1.61	.02
	DOCS symmetry		.11	1.23	.01
	ASI		.37	3.16*	.06
	IUS-12		-.05	-.42	.00
	PSWQ		.33	2.83*	.05

Note. QIDS-SR = Quick Inventory of Depressive Symptomatology-Self Report; DOCS = Dimensional Obsessive Compulsive Scale; ASI = Anxiety Sensitivity Index; IUS-12 = Intolerance of Uncertainty Scale-Short Form; PSWQ = Penn State Worry Questionnaire; sr<sup>2</sup> = squared semi-partial correlation.

\*  $p < .01$ .

QIDS-SR scores after including the transdiagnostic constructs as predictors of depression, yet the ASI and PSWQ emerged as significant unique predictors of QIDS-SR scores ( $ps < .01$ ). The IUS-12 did not uniquely explain additional variance in the QIDS-SR.

4. Discussion

Previous research has established OCD-specific factors that predict more severe depression among people with OCD, including the presence of obsessions with unacceptable content concerning violence, sex, and blasphemy. The presentation of OCD, however, explains only a portion of the relationship between depression and OCD symptoms. The current study therefore aimed to examine additional factors that might enhance our understanding of depression among individuals with OCD.

In support of our first prediction, and consistent with previous research, unacceptable obsessional thoughts were a significant independent predictor of depressive symptoms after accounting for variance explained by the other OCD symptom dimensions. As suggested by Ehrling and Watkins (2008), this may reflect conceptual parallels between obsessions and negative thinking patterns characteristic of depression. Indeed, obsessions about “taboo” topics (e.g., violence, sex, blasphemy) are often paired with negative self-appraisals (e.g., I am a bad person for having these thoughts). These thoughts may precipitate, maintain, and/or intensify depressive symptoms above and beyond other types of symptoms. Conversely, it is possible that depressive symptoms provide the context that shapes the content of obsessions and compulsions, such that individuals with negative cognitions may be more distressed by unacceptable thoughts relative to externally-focused stimuli (e.g., germs). The direction of the causal arrow is ambiguous and likely bidirectional.

Our finding that symmetry-related OCD symptoms also emerged as a significant individual predictor of depression symptoms after accounting for the other OCD symptom dimensions was unexpected given nonsignificant relationships between these variables in previous studies. Although for many individuals, symmetry, ordering, and arranging compulsions are driven by “not-just-right” experiences, such compulsions can also be associated with the urge to neutralize unacceptable obsessional thoughts that often relate to violent themes (e.g., “If I do not arrange items in a certain way my parent will die”) and are therefore similar to the types of obsessions assessed by the DOCS unacceptable thoughts subscale. Thus, it is possible that our pattern of results is explained by a predominance of this OCD presentation in the current sample.

Our regression analyses suggest that AS and worry uniquely account for variance in depressive severity above and beyond OCD severity. Although these transdiagnostic constructs have previously demonstrated relationships with OCD as well as depression, the current study is the first to examine them in the context of depression within an OCD sample. Elevated AS among individuals with OCD may compound the distress associated with obsessions in two ways. First, in addition to perceiving obsessional thoughts themselves as threatening, individuals

with greater AS perceive the physiological arousal associated with their obsessions as threatening, which might exacerbate overall distress or a sense of hopelessness (Blakey et al., 2017). Second, individuals with elevated AS might also be more likely to notice and catastrophically mis-appraise their anxious arousal as consistent with obsessional thoughts. For example, individuals with obsessions about inappropriate sexual behavior often interpret signs of physiological (i.e., anxious) arousal as indicators of sexual arousal (e.g., a racing heart around children is perceived as confirmation of pedophilia). These experiences, in combination with any functional impairment associated with AS (e.g., behavioral avoidance), may elevate depressive symptoms. Similarly, the additional negative mood state associated with worry, and the tendency to engage in negative thought processes, may compound the negative effects of OCD symptoms, leading to depressed mood. IU, however, was not a unique predictor of depressive symptom severity after accounting for OCD symptoms, AS, and worry. This may be a result of substantial overlap between IU and worry, or IU may be more relevant to anxiety symptoms and not as applicable to depression.

These findings have implications for the theory, assessment, and treatment of depressed OCD patients. First, they suggest that conceptual models of depression within the context of OCD should include factors other than solely OCD symptom presentation. Specifically, tendencies to worry and catastrophically misinterpret arousal-related body sensations predict depression among individuals with OCD. Second, our findings suggest that, along with exposure and response prevention, OCD patients with substantial depressive symptoms may benefit from interventions that target AS and worry. For example, Capron et al. (2012) demonstrated a relationship between AS and suicidal ideation, leading them to suggest AS amelioration interventions for individuals with significant suicidality. Given the relevance of AS to both OCD and depression, and the unique relationship we found between AS and depression in our sample, clinicians should assess AS and worry along with depression in patients with OCD. When AS is elevated, patients may benefit from psychoeducation about the anxiety response and associated physiological sensations, as well as interventions that aim to teach patients that physiological arousal is safe and tolerable (e.g., interoceptive exposure). With regard to worry, imaginal exposures that target obsessions may also build tolerance of ruminative worry characteristic of depression.

Several limitations should be considered when interpreting our findings. First, the cross-sectional nature of our analyses precludes causal inference; longitudinal research is necessary to examine causal hypotheses. Second, results from this study are based on self-report measures, which are subject to bias and can artificially inflate relationships between variables. Future research should include multiple methods of assessment. Third, this sample included patients receiving residential treatment for OCD, and thus likely had more severe symptoms than are seen in outpatient settings. This may have limited the generalizability of our findings. Fourth, the ASI used in the current study measures fear of physical sensations, whereas the ASI-3 (Taylor et al., 2007) has shown evidence of improved psychometric properties and measures physical, cognitive, and social concerns. Future research employing the ASI-3 should be considered. Finally, the current study did not examine other potentially relevant predictors of depressive symptom severity in individuals with OCD (e.g., experiential avoidance, thought-action fusion).

Despite these limitations, the current study extends previous research by examining predictors of depressive symptom severity in conjunction with dimensional OCD symptom severity. Our findings may inform both theoretical and practical approaches to improving the understanding and treatment of co-occurring OCD and depressive symptoms.

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