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Obsessive-compulsive disorder and comorbid depression: the role of OCD-related and non-specific factors

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Abstract

Although comorbid depression is a predictor of poor treatment response in obsessive-compulsive disorder (OCD), there is limited understanding of factors that contribute to depression severity in OCD. The current study examines the influence of OCD-related factors (autogenous obsessions and obsessional beliefs) and non-specific factors (avoidance and anxiety) on depression severity in a sample of OCD patients. There were 56 participants with only OCD and 46 with OCD and comorbid depression. Self-report questionnaires measuring depression, OCD-related factors, and non-specific factors were completed. Although there were no significant differences between the two groups on these variables, depression severity was positively correlated with anxiety, avoidance, obsessional beliefs, and autogenous obsessions in the whole sample. When entered into a multiple regression model to predict depression severity, these factors accounted for 51% of the variance. While OCD-related factors remained significant predictors after controlling for non-specific factors, the non-specific factors made the most significant contributions to the model. Our findings suggest that in addition to dealing with autogenous obsessions, addressing anxiety and avoidance might lead to improvements in the treatment of OCD with comorbid depression.

Keywords: Obsessive-compulsive disorder; depression; anxiety; cognition; obsessional beliefs; avoidance

1. **Introduction**

Comorbid depression presents a challenging problem for the treatment of obsessive-compulsive disorder (OCD). The lifetime prevalence of major depressive disorder (MDD) and dysthymic disorder among OCD patients are as high as 50% and 17% respectively (Crino & Andrews, 1996), and comorbid depression consistently predicts poor treatment response to psychological treatments (Abramowitz, Franklin, Street, Kozak, & Foa, 2000; Gava et al., 2007; Keeley, Storch, Merlo, & Geffken, 2008). Furthermore, OCD patients with comorbid depression who do respond to therapy continue to have significantly higher OCD severity scores than non-depressed patients (Abramowitz & Foa, 2000; Overbeek, Schruers, Vermetten & Griez, 2002). Comorbid depression also predicts early drop-out from psychological and pharmacological treatment of OCD (Aderka et al., 2011). Such findings highlight the importance of gaining a better understanding of comorbid depression in OCD. In the current study, we examined the relationship between depression and a range of psychological variables, some of which were directly related to OCD symptomatology, while other variables were non-specific and transdiagnostic. In addition, we compared the relative contribution of OCD-related factors with the non-specific factors in the prediction of depression severity.

1.1 Understanding why depression occurs in OCD

Comorbidities frequently occur among psychiatric conditions and different models have been posited to explain these high levels of comorbidity. Although not explicitly stated in previous studies, researchers appear to assume a causal model to explain comorbid depression in OCD. According to this model, comorbidity occurs because one disorder (i.e., OCD) is a risk factor for the other (i.e., depression) (Klein &

Riso, 1993). While the causal model is consistent with research showing that in a majority of cases, the onset of depression follows OCD (Bellodi, Sciuto, Diageria, Ronchi, & Smeraldi, 1992; Demal, Lenz, Mayrhofer, Zapotoczky, & Zitterl, 1993), the assumption of causality has not been explicitly tested. Nevertheless, several researchers have suggested that depression occurs more frequently in OCD because features that are commonly seen in certain types of OCD are etiologically linked to depression and therefore predispose individuals to developing depressive episodes (e.g., Besiroglu, Uguz, Saglam, Agargun, & Cilli, 2007; Lee and Kwon, 2003).

In addition to these OCD-related factors, the influence of factors that are not specific to OCD have also been considered. From this perspective, depression occurs as a reaction to the high levels of distress and functional impairment, and is a consequence of suffering from a chronic and disabling disorder. While not mutually exclusive, the extent to which depression is affected by these two sets of factors can lead to different ways of dealing with comorbid depression. We therefore examine these two sets of factors separately.

1.1.1 OCD-related factors

OCD is a heterogeneous condition and individuals with some forms of OCD may be more prone to the development of comorbid depression. In particular, several studies on depression in OCD patients have shown that aggressive, sexual, and religious obsessions are related to higher levels of depression (Besiroglu, Uguz, Saglam, Agargun, & Cilli, 2007; Hasler et al., 2005). These types of obsessions are often very distressing due to their associated shame and guilt (Rachman, 1993; Salkovskis, 1999) and it is reasonable to expect that the cognitive appraisals of such OCD phenomena can have a strong influence on mood. Individuals with such obsessions usually present with

few or no compulsions (Haslam, Williams, Kyrios, McKay, & Taylor, 2005) and respond less consistently to behavior therapy (Ball, Baer, & Otto, 1996; Mataix-Cols, Marks, Greist, Kobak, & Baer, 2002).

Lee and Kwon (2003) labelled such obsessions as autogenous obsessions because these obsessions often occur without clear triggers. They contrasted autogenous obsessions with reactive obsessions such as cleaning and checking, which tend to occur as a reaction to specific overt triggers. Lee and colleagues suggested that patients with autogenous obsessions formed a distinct OCD subtype associated with significantly higher levels of guilt and greater use of avoidant coping strategies (Lee, Kwon, Kwon, & Telch, 2005; Lee & Kwon, 2003). There is some support for the contention that such autogenous obsessions have a particular relationship with depression (Arts, Hoogduin, Schaap, & de Haan, 1993; Kyrios, Hordern, & Bhar, 2003). For example, Arts and his colleagues (1993) found that their sample of 26 patients who had only obsessions were significantly more depressed than 48 patients who had both obsessions and compulsions. They suggested that anxiety-reducing compulsions might play a role in increasing an OCD sufferer's sense of control over their lives and thus ameliorate depressed mood.

However, some recent studies have provided contrary evidence. While the distinction between autogenous and reactive types of OCD has received further empirical support (García-Soriano, Belloch, Morillo, & Clark, 2011), the positive relationship between autogenous obsessions and depression is less consistent. For example, Lee and colleagues (2005) found higher levels of guilt in their sample of OCD patients with autogenous obsessions compared to those with reactive obsessions, but they failed to find higher levels of depression. Similarly, using a nonclinical sample,

Moulding, Kyrios, Doron, and Nedeljkovic (2007) found no differences between reactive and autogenous obsessions in their relationships with mood state. These differences might be due in part to the different ways of classifying autogenous and reactive groups. Lee and Kwon (2005) classified participants into these groups based on the patients' most distressing obsession but others have used the frequency measures (Moulding et al., 2007) or simply compared patients who had obsessions alone with patients who experienced both obsessions and compulsions (Art et al., 1993). These inconsistent findings might also be a result of sample variations in the cognitive appraisals of autogenous obsessions. As suggested by Lee and Kwon (2003), autogenous obsessions affect mood because they are interpreted negatively and it is possible that some individuals with autogenous obsessions might interpret these obsessions more personally and negatively, and therefore experience greater depressed mood as a consequence. The cognitive appraisals of intrusions might therefore be another important OCD-related factor that is associated with depression.

There is only one study to the authors' knowledge that has investigated differences in cognitive appraisals between OCD patients with and without MDD (Abramowitz et al., 2007) and the findings demonstrated that cognitive appraisals are indeed important in the understanding depression in OCD. Abramowitz and his colleagues assessed 80 OCD patients on a number of self-report and clinician-rated measures. Although they failed to find significant differences between depressed and non-depressed OCD participants on nomothetic measures of cognitive appraisal, differences were apparent when they used a semi-idiographic measure called the Interpretation of Intrusions Inventory (III; Obsessive-compulsive Cognitions Working Group [OCCWG], 2003). They suggested that the nomothetic measures of OCD did

not account for specific obsessions, compulsions, and beliefs. Therefore, due to the heterogeneity of OCD, these measures were not sensitive to differences in cognitive appraisals between depressed and non-depressed OCD patients. Using the III, they found that depressed OCD patients, compared to non-depressed OCD patients, were significantly more likely to interpret obsessive intrusions negatively and tended to overestimate the importance of thoughts, feel more responsible for having obsessions, and have a greater need to control these thoughts. Even after controlling for OCD symptom severity, the authors found that functional impairment and misinterpretations of obsessional thoughts predicted severity of depression. The authors proposed that negative interpretations of obsessions might result in self-blame and depressed mood, which in turn lead to an increase in obsessive thoughts. This vicious cycle thus perpetuates both depression and obsessive-compulsive symptoms.

In addition to the misinterpretation of intrusive thoughts, Abramowitz and colleagues also suggested that future studies investigate the OCD belief domains identified by the Obsessive Compulsive Cognitions Working Group (OCCWG, 2003, 2005). The OCCWG suggested that dysfunctional obsessional beliefs such as inflated personal responsibility, overestimation of threat, intolerance of uncertainty, perfectionism, and conviction in the importance and control of intrusions are critical in the understanding of the pathogenesis of OCD. They designed a self-report measure, the Obsessive Beliefs Questionnaire (OBQ) to assess these belief domains. As similar constructs have also been found to influence depression, e.g., inflated personal responsibility, self-blame (Garnefski & Kraaij, 2007; Rodman & Burger, 1985), and perfectionism (DiBartolo, Li, & Frost, 2008), one could hypothesize that these obsessional beliefs would also predispose OCD sufferers to depressive symptoms.

1.1.2 Non-specific factors

Researchers have repeatedly found that when compared to non-depressed OCD patients, depressed OCD patients have higher functional impairment and poorer quality of life (Eisen et al., 2006; Masellis, Rector, & Ricter, 2005; Stengler-Wenzke, Kroll, Riedel-Heller, Matschinger, & Angermeyer, 2007; Tükel, Meteris, Koyuncu, Tecer, & Yazici, 2006). Furthermore, the relationship between depression and functional impairment remains significant even after controlling for OCD symptom severity (Abramowitz et al., 2007). As such, it is likely that in addition to OCD-related factors, depression might also arise in OCD patients because of non-specific factors that are associated with disability in general.

One important non-specific factor that has a strong association with depression and disability is lowered activity levels (Williamson, 2000; Lewinsohn, 1975; Hopko & Mullane, 2008). In anxiety disorders, low activity levels are commonly a result of avoidance strategies, which are used to prevent the triggering of anxiety symptoms. Such avoidance is a well-recognised key feature of OCD (Abramowitz & Deacon, 2005). OCD sufferers primarily avoid going places or doing things for fear of triggering the highly distressing obsessions. In addition, while sufferers feel compelled to engage in compulsions, many find these compulsions stressful and burdensome, and thus go to great lengths to avoid performing them. This avoidance can result in seemingly paradoxical behaviors. For example, an OCD sufferer with a fear of germs might avoid washing the dishes because doing so would result in excessive ritualization, which would be very time consuming and highly distressing. Even though patients often view avoidance as a partial solution to distress, it paradoxically increases distress levels in the long run by consolidating obsessive fears (Greist, Marks, Berlin, Gournay, &

Noshirvani, 1980). Widespread avoidance might thus result in decreased positive reinforcement and lowered mood, which then increases the likelihood of depression.

However, such speculation about the relationship between avoidance and depression in OCD has not been examined extensively because avoidance in OCD has received very little attention in the research literature, with the exception of some studies on avoidance and risk taking (Rees, Anderson, & Egan, 2006; Steketee & Frost, 1994), and a couple of studies on experiential avoidance (Abramowitz, Lackey, & Wheaton, 2009; Manos, Cahill, Wetterneck, Conelea, Ross, & Riemann, 2010). This lack of attention to avoidance is also reflected in the most widely used measure of OCD symptom severity, the Yale-Brown Obsessive Compulsive Scale (Y-BOCS; Goodman et al., 1989). The avoidance item (Y-BOCS item 12) is omitted from the calculation of symptom severity even though the inclusion of this item into the calculation of the full scale improved the scale's psychometric properties (Woody, Steketee, & Chambless, 1995).

Another non-specific factor of interest is anxiety. As the strong relationship between anxiety and depression is well known (Mineka, Watson, & Clark, 1998), we are likely to find a relationship between anxiety and depression severity in OCD. Not unexpectedly, OCD patients with comorbid depression report more anxiety symptoms than their non-depressed counterparts (Overbeek et al, 2002; Fineberg et al.,2005). Similarly, Besiroglu et al. (2007) found that comorbid generalized anxiety disorder significantly predicted the occurrence of major depressive disorder in OCD. Examining the role of anxiety is also important because the effects of autogenous obsessions and obsessional beliefs on depression could be due to their associations with anxiety. Misinterpretations of intrusions and obsessional beliefs occur in other anxiety disorders,

albeit at a lower level than in OCD (OCCWG, 2005), and anxiety has been shown to mediate the relationship between OCD and thought-action fusion (Abramowitz, Whiteside, Lynam, & Kalsy, 2003). Consequently, there is a possibility that differences between depressed and non-depressed OCD patients are explained by higher anxiety levels among the depressed participants. For example, in Abramowitz et al.'s (2007) study, the relationship between cognitive appraisals and depression might have been an artefact of the relationship between cognitive appraisals and anxiety. Unfortunately, concurrent anxiety levels were not reported in their study.

1.3 Aim and Hypotheses

In summary, there is some evidence, albeit mixed, that the OCD-related factors of autogenous obsessions and obsessional beliefs are associated with depression. Research also suggests that non-specific factors of avoidance and anxiety might have significant relationships with depression in OCD. As OCD-related factors are correlated with non-specific factors (in particular anxiety), there is also the possibility that OCD-related factors would no longer be associated with depression after accounting for the influence of non-specific factors. If that is the case, psychological treatments for OCD with comorbid depression might require inclusion of treatment components shown to be effective in dealing with non-specific factors . The current study therefore aimed to (1) examine differences between depressed and non-depressed OCD cohorts on OCD-related and non-specific factors and (2) examine the relative contribution of these factors to depression severity among the whole sample of OCD patients.

We hypothesized that that (1) compared with non-depressed OCD patients, depressed OCD patients will have significantly higher scores on measures of

autogenous obsessions , obsessional beliefs, OCD symptom severity, anxiety severity, and avoidance, (2) that depression severity in the whole sample is predicted by these same variables and (3) that the relationship between depression and OCD-specific factors remain significant even after controlling for anxiety and avoidance.

2. Method

2.1 Participants

De-identified archival data were obtained from a study on OCD and hoarding (Mogan, 2007) and from a university-based psychology clinic. Data from a total of 112 participants with OCD were examined. Ten participants had more than 20% missing items from at least one scale. These participants were omitted from further analyses leaving 102 participants (39 male and 63 female). All participants had a DSM-IV diagnosis of either primary or secondary OCD. Exclusion criteria were psychosis, bipolar disorder, dementia, and other cognitive disorders. The age of participants ranged from 18 to 64 years (M = 38.0, SD = 11.5).

Based on responses to the Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV; Brown et al., 1994), participants were categorised into two groups. The first group comprised 45 participants with a current comorbid DSM-IV diagnosis of major depressive disorder or dysthymic disorder (OCD-DD). The second group comprised the remaining 56 participants who did not have a comorbid diagnosis of a depressive disorder (OCD-ND). It should be noted, however, that many participants from the OCD-ND group also experienced depressive symptoms, with 73% of the OCD-ND group scoring greater than the BDI-II cut-off score of 14 for mild depression and above. Nevertheless, their depressive symptoms were not sufficient or severe enough to warrant a DSM-IV diagnosis of major depression or dysthymic disorder.

There was a non-significant trend for OCD-DD participants to be older (M = 40.4, SD = 12.6) than the OCD-ND participants [M = 36.0, SD = 10.3; F (1, 99) = 3.64, p = .059]. There was no significant difference in the proportion of males and females in the depressed group (females = 57.8%) and non-depressed group (females = 66.1%; χ^2 = .73, p = .42). There was also no significant difference in the proportion of married and single participants between the OCD-DD group (Married = 53.7%) and the OCD-ND group (Married = 38.9%; χ^2 = 2.05, p = .21). Participants also reported comorbidities other than depression; 24 participants had another comorbid anxiety disorder, one had an eating disorder, and 21 had comorbid compulsive hoarding. There was a significantly higher proportion of participants with other comorbidities in the OCD-DD group (48.9%) compared to the OCD-ND group (8.9%; χ^2 = 20.3, p < .001)

2.2 Procedure

Ethics Approval for data collection was provided by the Human Research Ethics Committees at the University of Melbourne and Swinburne University of Technology. Use of archival data for this study was approved by RMIT University Human Research Ethics Committee. All participants undertook an initial interview and were administered the Anxiety Disorders Interview Schedule for DSM-IV Adult Version, (ADIS-IV; Brown, Di Nardo, & Barlow, 1994). These interviews were conducted face-to-face for metropolitan-based participants and by telephone for rural or interstate respondents, by clinical psychologists and provisional psychologists under supervision. Training for administration of the ADIS-IV was via one-to-one supervision with clinical psychologists experienced in the use of the ADIS-IV. Following the ADIS interview, participants were given or sent the questionnaire packs with replied paid envelopes. They were asked to complete and return the questionnaires in their own time. There was no identifying information on any of the research materials, and each person was

assigned a number to ensure confidentiality, anonymity, and accurate matching of data sets.

2.3 Materials

Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV; Brown et al., 1994). The ADIS-IV is a much-utilized semi-structured clinical interview covering DSM-IV criteria for anxiety and related disorders. The interview takes approximately 90 minutes to administer. Interviewers assess the presence of symptoms and rate severity, distress level, and interference. The ADIS-IV has been associated with excellent diagnostic reliability (k = .90; Di Nardo, Brown, Lawton, & Barlow, 1995) and confirmatory factor analysis supported the discriminant validity of the ADIS-IV for constructs including mood disorders, GAD, panic/agoraphobia, OCD, and social phobia (Brown, Chorpita, & Barlow, 1998).

Yale-Brown Obsessive Compulsive Scale (Y-BOCS; Baer, Brown-Beasley, Sorce, & Henriques, 1993; Goodman et al., 1989). The self-report version of the Y-BOCS (Baer et al., 1993) was used in this study; this version has been shown to be equivalent to the clinician-administered Y-BOCS (Steketee, Frost, & Bogart, 1996; Taylor, 1998). The Y-BOCS is divided into two sections; the first section is a checklist of obsessions and compulsions. The second section contains 12 questions about the severity of obsessive-compulsive symptoms. Responses are made on a Likert scale from 0 (no symptoms) to 4 (extreme symptoms). The first ten items assess the time spent, the degree of distress and interference, and the perceived resistance to and control over obsessions and compulsions. The sum total of this 10-item scale is used as the measure of OCD symptom severity with a range of scores from 0 to 40. The Y-BOCS has good reliability and validity (Goodman et al., 1989). Cronbach's alpha for the Y-

BOCS 10-item scale in the current study is .86. The Y-BOCS also contains two additional items that measure important features of OCD; item 11 measures the degree to which respondents recognised that their obsessions and compulsions are unreasonable or senseless, and item 12 measures the extent to which respondents avoid doing things, going places or being with people because of their obsessions or compulsions.

Padua Inventory – Washington State University Revised Version (PI-R; Burns, Keortge, Formea, & Sternberger, 1996; Sanavio, 1988). The Padua is a 39-item self-report inventory of OCD with very good reliability and validity (Burns et al., 1996; Hasler et al., 2005). The five subscales and their cronbach alphas for the current study are as follows: contamination obsessions and washing compulsions (α= .95), dressing and grooming compulsions (α = .80), checking compulsions (α = .92), obsessional thoughts of harm to self/others (OTAHSO; α = .75), and obsessional impulses to harm self/others (OITHSO; α = .62). Respondents are asked to assess, on a five point Likert scale from 1 (not at all) to 5 (very much), the degree of disturbance that the OCD related thoughts and behaviors create. Of particular interest were the OTAHSO obsessional thoughts and OITHSO obsessional impulses subscales as measures of autogenous obsessions (Moulding, Kyrios, Doron, & Nedeljkovic, 2007).

Beck Depression Inventory–II (BDI-II; Beck, Steer, & Brown, 1996; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The BDI-II is a 21-item self-report measure of depression. Respondents are asked to rate the severity of the cognitive, affective, and somatic symptoms of depression over the past week. It is a well-established measure with excellent reliability and validity for both clinical and non-clinical samples (Beck et al., 1996). Cronbach's alpha of the scale for the current sample is .93.

The Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988; Beck & Steer, 1991). The BAI is a 21-item self-report measure of anxiety. Respondents rate the degree they were bothered by cognitive and physiological symptoms of anxiety in the past week on a 4 point Likert scale from 0 (not at all) to 3 (severely, I could barely stand it). Adequate internal consistency and validity have been reported for both clinical and non-clinical participants (Beck & Steer, 1990). Cronbach's alpha of the scale for the current sample is .93.

The Obsessive Beliefs Questionnaire – 44-item version (OBQ-44; OCCWG, 2005). The OBQ-44 is a shortened version of the original 87-item schedule designed to measure beliefs hypothesized to underpin OCD (OCCWG, 2003, 2005; Taylor, Kyrios, Thordarson, Steketee, & Frost, 2002). These key beliefs are (1) Responsibility/Threat (RT), (2) Perfectionism/Tolerance for Uncertainty (PC), and (3) Importance of Thoughts/Control of Thoughts (ICT). Respondents rated their agreement on statements on a 7-point Likert scale ranging from 1 (disagree very much) to 7 (agree very much). The OBQ-44 and all three subscales have good reliability and validity in clinical and non-clinical groups (OCCWG, 2005). Cronbach's alpha for all subscales in the current study ranged from .89 to .94.

2.4 Design

To test for differences between the OCD-DD and OCD-ND groups, separate one-way analyses of variance (ANOVA) were conducted. Dependent variables were the BDI-II, BAI, OBQ-44 total and its subscale scores, the Padua total and its subscale scores, the Y-BOCS total, YBOCS item 11 insight and YBOCS item 12 avoidance. To test for predictors of depression, correlational analyses were first performed to ascertain the relationship between depression severity and the same variables, followed by a

hierarchical multiple regression to determine if the variables that were correlated with depression predicted the severity of depression, and if OCD-related factors significantly contributed to the prediction of depression severity after controlling for non-specific factors. All analyses were performed with PASW Statistics 9.0.

3. Results

3.1 Differences between OCD-DD and OCD-ND groups

As expected, the OCD-DD group had significantly higher BDI-II scores than the OCD-ND group. However, the mean BDI-II score for the OCD-ND group (M = 19.3, SD = 10.7) was very close to the recommended cut-off range of 20 to 28 for moderate depression (Beck et al., 1996). There were no significant differences in the BAI score. Nor were there any significant differences in the OCD symptom and cognition measures. Details are presented in Table 1.

Insert Table 1 here.

3.2 Predicting depression severity

Intercorrelations between variables were conducted on the whole sample and results of these analyses are presented in Table 2. As expected, there was a large positive correlation between BDI-II and BAI. There were also significant small to moderate positive correlations between BAI and almost all measures of obsessive-compulsive disorder and obsessional beliefs. There was no significant relationship between the BDI-II and Y-BOCS total, but there was a moderate positive correlation between the BDI-II and the Padua total score. As expected, there was a large positive correlation between BDI-II and OTAHSO obsessional thoughts subscale . There was a moderate positive correlation between BDI-II and the OITHSO obsessional impulses

subscale. There were no significant correlations between BDI-II and the other Padua subscales. In addition, there were significant small to moderate positive correlations between the BDI-II and OBQ-44 total score~~s~~ and all three OBQ-44 factors: Responsibility/Threat Estimation (RT), Perfectionism/Certainty (PC), Importance/Control of Thoughts (ICT). Finally, there was a large positive correlation between the BDI-II and avoidance as measured by Y-BOCS item 12 (see Table 1).

To examine the extent to which these variables predicted depression severity, a hierarchical multiple regression was conducted using the variables that were significantly correlated with depression severity. BDI-II was the dependent variable. The non-specific factors of BAI anxiety and Y-BOCS item 12 avoidance were entered in the first step of the regression. The OCD-related factors from the Padua (OTAHSO obsessional thoughts and OITHSO obsessional impulses) and the OBQ-44 (RT responsibility/ threat, PC perfectionism, and ICT importance of thoughts) were entered in the second step. Examination of residual scatterplots showed that primary assumptions for multiple regression were met. Mahalanobis distances were computed and no multivariate outliers were identified using the $p < .001$ criterion. No suppressor variables were found. Independent variables had weak to moderate inter-correlations (r ranged from .21 to .56) and tolerance statistics were acceptable (range .44 to .91).

After step 1, BAI anxiety and Y-BOCS item 12 avoidance accounted for 40% of the variance. In step 2, the addition of OTAHSO, OITHSO, RT, PC, and ICT resulted in a significant increment in R^2 and accounted for an additional 11% of the total variance. The complete model accounted for 51% of the variance. The only variables that made significant unique contributions to the severity of depression in the final model were BAI anxiety, Y-BOCS item 12 avoidance, and OITHSO obsessional

impulses. The contribution of ICT importance/control of thoughts subscale approached significance (see Table 3).

Insert Table 2 here.

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4. Discussion

The results of the study partially supported our hypotheses. Unlike previous research findings, the OCD-DD and OCD-ND groups did not differ significantly in their severity of OCD and anxiety symptoms. There was also no significant difference between the two groups on the obsessive thoughts to harm self or others, obsessional beliefs, and avoidance measures, and there was only a near significant difference between groups on obsessional impulses to harm self/others measure. However, consistent with the hypotheses, our results showed that depression severity in the whole sample was significantly predicted by anxiety, avoidance, obsessional thoughts , obsessional impulses, and obsessional beliefs. These factors accounted for 51% of the variance with obsessional impulses, avoidance and anxiety making significant contributions to the final model. Our results also showed that of the OCD-specific factors, only OITHSOS obsessional impulses remained a significant predictor of depression severity after controlling for anxiety and avoidance.

4.1.1 Lack of group differences

One explanation for the lack of group differences is the use of nomothetic self-report measures for all the variables in this study. Abramowitz et al. (2007) also did not find significant group differences between depressed and non-depressed OCD participants on nomothetic measures, but were able to differentiate the two groups when

they used semi-idiographic measures of OCD-related variables. This study might also be interpreted as indirect support for their suggestion that semi-idiographic measures provide a more accurate assessment of OCD-related variables due to the highly specific nature obsessions and compulsions in OCD sufferers.

The lack of significant differences between the two groups might also be due higher than expected depression scores in the OCD-ND group. Although participants in OCD-ND group did not fulfil DSM-IV criteria for a depressive disorder, they nevertheless suffered from many depressive symptoms and had BDI-II scores that were in the mild to moderate range of severity. That is, the OCD-ND group appeared to be qualitatively similar to the OCD-DD group. In the light of significant findings when examining predictors of depression severity in the sample as a whole, this latter explanation is probably the most likely cause for the lack of group differences.

4.1.2 OCD-related factors: autogenous obsessions and obsessional beliefs

In contrast to the lack of group differences, we found significant relationships between depression severity and both OCD-related and non-specific factors. Consistent with previous research (e.g., Besiroglu et al., 2007), autogenous obessions (as measured by the OTAHSO obsessional thoughts and OITHSO obsessional impulses subscales) were positively related to depression. These findings provide further support for Lee and Kwon's (2003) suggestion that OCD patients with autogenous obsessions were more likely to experience depressed mood. That severity of depression was also positively related to obsessional beliefs (i.e., overestimation of responsibility and threat, perfectionism, and over-importance of thoughts) is consistent with Abramowitz et al. (2007) who found a significant difference between depressed and non-depressed OCD participants on similar cognitive factors: over-importance of thoughts, over-

responsibility, and control of thoughts. The current findings suggest that dealing with obsessional thoughts and beliefs in therapy might help in alleviating depression, and therefore provides additional support for the use of cognitive therapy (CT) for OCD sufferers with comorbid depression (Abramowitz, 2004). CT directly addresses obsessional beliefs and has been shown to be effective in the treatment of "pure" obsessions (e.g., Freeston et al., 1997). Interestingly, Cottraux and colleagues found, in a randomized controlled trial of treatments for OCD, that CT had significantly more effect on comorbid depressive symptoms than behavior therapy (Cottraux et al., 2001). Similarly, Wilhelm and colleagues conducted an open trial of CT for OCD (Wilhelm, Steketee, Reilly-Harrington, Deckersbach, Buhlmann, & Baer, 2005), which specifically targeted the OCD belief domains as defined by the OCCWG and found that participants made significant improvements in both depressive and obsessive-compulsive symptoms.

Support for the hypothesis that OCD-related factors would remain significant predictors of depression after controlling for non-specific factors was mixed. While the addition of OCD-related factors in the second regression model significantly improved the prediction of depression severity, only OITHSO obsessional impulses remained a significant but relatively weak predictor of depression severity. Obsessional thoughts and all OBQ obsessional beliefs were not significant contributors to the final model. There is thus a possibility that non-specific factors of anxiety and avoidance mediate the relationship between depression and both obsessional beliefs and obsessional thoughts. Our findings therefore indicate that while dealing obsessional beliefs with cognitive therapy can have an impact on depression, targeting non-specific factors of anxiety and

avoidance should be considered, and could lead to better outcomes for patients with OCD and depression.

4.2 Non-specific factors: avoidance and anxiety

YBOCS item 12 avoidance and BAI anxiety were significant predictors of BDI-II depression severity. Although not surprising, this is the first study to the authors' best knowledge that examined and showed a relationship between avoidance and depression in OCD. Since avoidance is likely to lead to functional impairment, these results are again consistent with Abramowitz et al.'s (2007) finding that scores on the Sheehan Disability Scale (Sheehan, Harnett-Sheehan, & Raj, 1996) predicted depression in their sample of OCD patients. It is important to note again that no casual relationships should be assumed from the results. While the findings suggest that OCD patients who tend to use avoidance as a way of coping might be more prone to depressive symptoms. It is also possible that our findings were simply an indication that OCD patients who suffered from depression avoided things due to low mood and amotivation. Regardless of the direction, avoidance appears to be an important factor to address when treating comorbid depression in OCD.

Lewinsohn (1975) had suggested that depression is maintained by a decrease in positive reinforcement, which is a consequence of lowered engagement in pleasurable activities, and demonstrated that increasing activity levels result in improvements in mood. Consistent with this, Jacobson et al. (1996) found that the scheduling and increasing of activities is a critical component in cognitive behavior therapy and later developed a psychological treatment which focused mainly on behavioural activation (Martell, Addis, & Jacobson, 2001). Further studies have demonstrated the efficacy of behavioral activation in the treatment of depression (see Cuijpers, van Straten, &

Warmerdam, 2007). Consequently, Ledley, Pai, and Franklin (2007) suggested that behavioral activation techniques might be helpful for OCD patients with depression. In demonstrating the importance of avoidance in predicting depression, this study lends support to this proposal. It is not surprising that Kyrios, Hordern, Nedeljkovic, Bhar, Moulding, and Doron (2007) found no differences in treatment outcomes for depressed and non-depressed OCD cohorts using a cognitive-behavioral treatment that included a behavioral activation component in a manualized treatment program. Further examination of treatments with both behavioral activation and cognitive therapy components might result in better treatment outcomes for OCD with comorbid depression.

The role of anxiety as a predictor of depression severity is also not surprising considering the well documented association between anxiety and depression (Mineka, Watson, & Clark, 1998). Directly addressing anxiety might also be an avenue for improving treatment outcomes for OCD with comorbid depression. However, anxiety management interventions such as progressive muscle relaxation are often not included in treatment protocols for OCD due to the lack of evidence for their effectiveness (e.g., Steketee, 1999). Consequently, relying on habituation of anxiety during exposure and response prevention has been the primary way of handling anxiety in OCD.

Foa (1979), however, found that severely depressed OCD patients did not respond well to exposure and response prevention (E/RP). Unlike non-depressed OCD patients, their anxiety did not habituate within E/RP sessions. Furthermore, anxiety also failed to habituate between sessions. Similarly, Foa, Grayson, Steketee, Doppelt, Turner, and Latimer (1983) found that high pre-treatment depression scores were related to higher psychophysiological reactivity during E/RP and reduced habituation of anxiety

during and between E/RP sessions, which in turn, was related to a lack of improvement in OCD symptomatology. These studies indicated that E/RP alone might not be a very effective method for dealing with anxiety in depressed OCD patients.

One psychological treatment that might be useful in this context is acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 1999). ACT is a transdiagnostic approach which can be conducted without E/RP. It focuses on committed action towards ones values through increasing willingness to experience distressing thoughts and emotions. In ACT, the assumption that a decrease in symptom severity is required to improve patients' quality of life and functioning is questioned. Instead, the focus of ACT is on learning to accept difficult emotions as they arise without avoiding the experience, to disengage from previously held beliefs about these experiences, and to increase values-guided behaviour. The habituation of anxiety is not required in ACT and therefore, ACT might be an effective treatment for OCD with comorbid depression. There is some preliminary evidence that ACT is an effective treatment for OCD (Twohig, Hayes, & Masuda, 2006; Twohig et al., 2010) but further trials are required.

4.3 Limitations

Major limitations of the current study include the poor psychometric properties of two scales: the Y-BOCS item 12 avoidance scale and the OITHSO obsessional impulse scale. The YBOCS item-12 avoidance scale is single-item measure and is seldom used in OCD research. Its psychometric properties are therefore unknown. While single Y-BOCS scale items have revealed interesting results in previous studies (e.g., Catapano, Sperandeo, Perris, Lanzaro, & Maj, 2001), it would be important to measure avoidance in OCD using a more psychometrically sound measure.

Furthermore, Y-BOCS item 12 is a broad measure of avoidance, and it is unclear if the avoidance reported by OCD participants was due to their concerns about performing rituals, or attempts at reducing obsessional thoughts. There is also the possibility that item 12 reflected avoidance as a consequence of depression rather than OCD. There is currently no widely-used measure of avoidance in OCD, but there has been a suggestion that upcoming revisions of the Y-BOCS will have an avoidance scale (Antony, 2001). A better measure of avoidance in OCD might help clarify if specific types of avoidance have a greater impact on depression. For example, it is possible that the avoidance of pleasurable or social activities has a larger association with depression in OCD than the avoidance of rituals.

The internal consistency of the OITHSO obsessional impulses subscale was marginally acceptable. Furthermore, the relationship between OITHSO and depression might have been spurious because items 31 and 32 in the scale could indicate suicidal impulses rather obsessional impulses (item 31 is "When I look down from a bridge or a very high window, I feel an impulse to throw myself into space." and item 32 is "When I see a train approaching, I sometimes think I could throw myself under its wheels."). Consequently, the significant association between OITHSO obsessive impulses and depression severity should be interpreted with caution.

The study is also limited by the lack of information about the history, onset and course of depression in the sample. We did not ascertain if depression was primary or secondary to OCD. Neither was there any information about history of past depressive disorders in the sample. Therefore we could not test the possibility that OCD-related factors might have seen a stronger relationship with depression in OCD patients who suffered from secondary depression rather than primary depression. There was also no

information about Axis II disorders and therefore, we could not assess if the relationship between depression and non-specific factors was influenced by personality disorder features.

As already noted, causal inferences could not be made because the data in the current study is correlational and cross-sectional. For example, it is possible that depressed mood causes lowered activity levels and amotivation, which in turn leads to an increased use of avoidance as a coping strategy. Alternatively, it is also likely that the direction of the relationship is such that lowered activity levels increase depression in OCD. Nevertheless, longitudinal studies have showed that activity restriction does result in more severe depressive symptoms (e.g., Williamson & Schulz, 1995; Smith, Williamson, Miller, & Schulz, 2011), and treatment studies have demonstrated that increasing levels of engagement in physical and pleasurable activities can lead to improvements in depression (Daley, 2008; Lewinsohn, 1975; Lewinsohn & Graf, 1973). Consequently, it is reasonable to assume that avoidance is both causal and consequential of depressed mood in OCD sufferers, and could be a specific target in OCD treatment protocols. Further longitudinal and treatment outcome research in this area is recommended and would support the importance of dealing with avoidance to prevent or alleviate depression in OCD sufferers.

Conclusion

Dealing with comorbid depression in OCD is a priority for improving treatment outcomes for depression. The current study showed that both OCD-related factors (in particular, obsessional impulses) and non-specific factors (anxiety and avoidance) predicted depression severity in the sample of OCD patients. The results supported the current use of cognitive therapy components in the treatment of depression in OCD.

Based on our findings, we also suggest that interventions to target avoidance and anxiety in OCD such as behavioural activation or acceptance and commitment therapy might lead to further improvements in outcomes of OCD with comorbid depression. Further research to examine the impact of these therapies on OCD with comorbid depression is required.

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Research highlights

- Depression severity in OCD patients was positively correlated with anxiety, avoidance, obsessional beliefs, and autogenous obsessions
- These variables accounted for 51% of the variance in predicting depression severity
- Non-specific factors of anxiety and avoidance made the largest significant contributions to the prediction of depression severity

Table 1

Correlations with depression severity in the whole sample and means (standard deviations) on clinical variables across groups

	Correlations	Means and standard deviations					
	with BDI-II (n = 102)	Total sample (*n* = 102)	OCD-ND (*n* = 56)	OCD-DD (*n* = 46)	*F*	*p*	η_p^2
BDI-II	-	22.0 (12.5)	19.3 (10.7)	25.3 (13.7)	6.261*	.014	0.059
BAI	.52****	21.3 (13.5)	20.0 (12.8)	22.9 (14.3)	1.118	.295	0.011
Y-BOCS (Total)	.08	23.3 (7.02)	23.2 (7.70)	23.4 (6.17)	0.015	.904	0.000
Obsessions	.06	11.1 (4.68)	11.3 (5.07)	10.9 (4.19)	0.216	.644	0.002
Compulsions	.07	12.2 (3.55)	11.9 (3.78)	12.5 (3.25)	0.686	.409	0.007
Y-BOCS item 11	.11	1.18 (1.05)	1.16 (.91)	1.20 (1.20)	0.028	.868	0.000
Y-BOCS item 12	.51****	1.62 (1.30)	1.66 (1.16)	1.57 (1.46)	0.136	.714	0.001
Padua (total)	.33***	40.8 (26.8)	41.0 (24.1)	40.5 (30.0)	0.010	.922	0.000

COWC	.08	13.7 (12.7)	15.6 (12.7)	11.5 (12.6)	2.675	.105	0.026
DRGRC	.09	4.20 (3.91)	4.36 (3.85)	4.00 (4.01)	0.209	.648	0.002
CHKC	.17	16.3 (10.7)	15.3 (9.98)	17.5 (11.5)	1.120	.293	0.011
OTAHSO	.52****	7.57 (6.22)	7.16 (5.66)	8.07 (6.86)	0.532	.467	0.005
OITHSO	.45****	3.69 (4.53)	2.93 (4.20)	4.61 (4.79)	3.563	.062	0.034
OBQ-44 (Total)	.45****	187 (54.0)	189 (50.7)	186 (58.4)	0.098	.755	0.001
RT	.42****	69.4 (23.9)	70.0 (23.1)	68.9 (25.1)	0.037	.848	0.000
PC	.29**	75.1 (23.2)	75.2 (22.8)	74.8 (23.9)	0.008	.930	0.000
ICT	.42****	43.0 (17.7)	43.9 (15.1)	41.9 (20.6)	0.328	.568	0.003

Note: OCD-ND = OCD participants without depression, OCD-DD = OCD participants with comorbid depression, BDI-II = Beck Depression Inventory-II; BAI = Beck Anxiety Inventory; Y-BOCS = Yale-Brown Obsessive Compulsive Scale; COWC = Contamination Obsessions and Washing Compulsions; OTAHSO = Obsessional Thoughts about Harm to Self/Others; OITHSO = Obsessional Impulses to Harm Self/Others; CHKC = Checking Compulsions; DRGRC = Dressing/Grooming Compulsions; OBQ-44 = Obsessive Beliefs Questionnaire – 44-item version, RT = Responsibility/Threat Estimation, PC = Perfectionism/Certainty, ICT = Importance/Control of Thoughts. **** $p < .001$; *** $p < .005$; ** $p < .01$; * $p < .05$

Table 2

Summary of hierarchical regression analysis for variables predicting BDI-II scores (*n* = 102)

Variable	B	SE B	β	t	*p*	Zero-order *r*	Semi-partial *r*
Step 1							
BAI	0.360	0.077	.390	4.70	< .001	.520	.367
Y-BOCS item 12	3.642	0.798	.379	4.564	< .001	.512	.356
Step 2							
BAI	0.226	.081	.244	2.779	.007	.520	.202
Y-BOCS item 12	3.098	.787	.322	3.936	<.001	.512	.286
OTAHSO	0.245	.220	.122	1.115	.268	.516	.081
OITHSO	0.577	.240	.210	2.401	.018	.449	.174
RT	-0.016	.057	-.031	-0.284	.777	.420	-.021
PC	-0.009	.049	-.017	-0.189	.851	.293	-.014
ICT	0.123	.065	.175	1.884	.063	.425	.137

Note: OTAHSO = Obsessional Thoughts about Harm to Self/Others; OITHSO = Obsessional Impulses to Harm Self/Others; RT = Responsibility/Threat Estimation, PC = Perfectionism/Certainty, ICT = Importance/Control of Thoughts. R^2= .397 for step 1, F (2, 99) = 11.88, $p < .001$, ΔR^2= .108 for step 2, ΔF (5, 94) = 4.116, p = .002, R^2= .505 for entire model, F (9, 92) = 10.32, $p < .001$.