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Anxiety and Shame as Risk Factors for Depression, Suicidality, and Functional Impairment in Body Dysmorphic Disorder and Obsessive Compulsive Disorder

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Abstract

Body dysmorphic disorder (BDD) and obsessive compulsive disorder (OCD) are associated with elevated depression, suicidality, functional impairment, and days housebound, yet little research has identified risk factors for these outcomes. Using path analysis, the present study examined anxiety and shame as risk factors for these outcomes across Internet-recruited self-report groups (BDD [$n = 114$], OCD [$n = 114$], and healthy control [HC; $n = 133$]). Paths from anxiety and shame to outcomes were similar and mostly significant across BDD and OCD, compared to non-significant paths for HCs, with one exception: the path from shame to depression was significant in the BDD group ($b = .32$) but non-significant in the OCD group ($b = .07$). Findings underscore similarities in BDD and OCD, supporting their reclassification into the same Obsessive Compulsive Related Disorders category. Results emphasize the importance of targeting shame, in addition to anxiety, in treatments for BDD and OCD.

Keywords

Body dysmorphic disorder; obsessive compulsive disorder; shame; anxiety; depression

The Diagnostic and Statistical Manual – Fifth Edition (DSM-5; American Psychiatric Association [APA], 2013) established a new diagnostic category of Obsessive Compulsive Related Disorders (OCDs), which includes body dysmorphic disorder (BDD) and obsessive compulsive disorder (OCD). This reclassification formalizes long-recognized similarities between these disorders. Both BDD and OCD involve obsessions (repetitive intrusive thoughts, urges, or images that cause distress) and compulsions (rituals completed to reduce distress from obsessions) (APA, 2013). In OCD, the content of obsessions and compulsions can be extremely wide-ranging. In BDD, on the other hand, the content of

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preoccupations focuses on a flaw in one's physical appearance that is either imagined or greatly exaggerated, and rituals are specifically related to reducing distress felt about this imagined appearance flaw (APA, 2013).

BDD and OCD are associated with severe mental health outcomes. In BDD, 53 – 81% of cases present with comorbid major depressive disorder (MDD; Frare et al., 2004; Phillips et al., 2005a; Phillips et al., 2006). In OCD, rates of MDD range from 17 – 60% (e.g., Abramowitz, 2004; Andrews et al., 2002; Frare et al., 2004; Overbeek et al., 2002). In both BDD and OCD, comorbid depression most often develops after BDD or OCD and is most often secondary to BDD or OCD (Abramowitz, 2004; Phillips, 2004). Suicide attempts occur in 24 – 28% of those with BDD (Phillips, 2007; Phillips et al., 2005b; Phillips et al., 2006; Veale et al., 1996) and 11 – 27% of those with OCD (Kamath et al., 2007; Torres et al., 2011). Rates of depression and suicidal ideation are similar in BDD and OCD in some studies (Frare et al., 2004; McKay et al., 1997) and higher in BDD in other studies (Phillips et al., 1998; Saxena et al., 2001).

BDD and OCD are also associated with elevated rates of functional impairment, compared to the population at large and those with other mental illnesses. Unemployment rates in BDD range between 39 – 53% (e.g., Birnbaum et al., 2010). Among those with BDD who do work, avoidance of work activities due to BDD is nearly universal (97–98%; Phillips et al., 2006; Phillips et al., 1993). Almost everyone (96 – 100%) in two BDD samples reported moderate to extreme social dysfunction (Phillips & Diaz, 1997; Phillips et al., 2006), and approximately 30% of a BDD sample reported becoming housebound for at least 1 week due to their BDD symptoms (Phillips et al., 2006). Functional impairment within OCD is also notably elevated. The World Health Organization ranked OCD as the 10th leading cause of impairment among all health-related conditions (Murray & Lopez, 1996). A range of studies have documented unemployment rates between 15 – 41% in OCD (Eisen et al., 2006; Frare et al., 2004; Pinto et al., 2006; Regier et al., 1993). Additionally, 14.2% of an OCD sample received disability due to OCD (Eisen et al., 2006). Again, some studies have found similar levels of functional impairment across BDD and OCD (Didie et al., 2007; Didie et al., 2008; Phillips et al., 1998), whereas others have found greater impairment in BDD compared to OCD (e.g., Frare et al., 2004).

A critical first step in reducing these severe outcomes (i.e., depression, suicide risk, functional impairment) is to identify risk factors for these outcomes in the context of BDD and OCD. One risk factor may be the experience of prominent negative emotions. Given OCD's former classification as an anxiety disorder (APA, 1994), anxiety's relationship to OCD and related conditions like BDD is well established. Moreover, within the broader psychological literature, anxiety has been shown to be a risk factor for depression, suicide risk, and functional impairment (e.g., Batterham et al., 2013; Fawcett, 2013; Löwe et al., 2008; Oglesby et al., 2015). More specifically, within OCD a small amount of research has demonstrated that anxiety may be a risk factor for suicidality (Raines et al., 2014; Storch et al., 2015) and functional impairment (Albert et al., 2010; Rapaport et al., 2005). In BDD, there is preliminary evidence that anxiety is a risk factor for functional impairment (Marques et al., 2011a), and that the presence of comorbid anxiety disorders is associated with increased likelihood of having comorbid MDD (Phillips et al., 2007). Thus, while a handful

of studies demonstrate links between anxiety and adverse outcomes in OCD and BDD, this research base is very small, and additional research is needed.

With OCD's reclassification out of the anxiety disorders diagnostic category, there is increased recognition that a wider variety of emotions beyond anxiety appear central to OCRDs (e.g., Berle & Phillips, 2006; Cisler et al., 2009; Weingarden & Renshaw, 2015). In particular, while the conceptual literature has recognized a prominent role of shame in OCRDs, shame has only recently begun to receive empirical attention in the OCD and BDD literature (e.g., review by Weingarden & Renshaw, 2015). Shame is a highly distressing moral emotion that is felt when a person judges him- or herself broadly as bad or worthless (Tangney & Dearing, 2002). When people feel shame, they respond by withdrawing from others and concealing the focus of their shame (Tangney & Dearing, 2002). These responses to shame tend to worsen one's circumstances. Unsurprisingly, shame is linked with depression, suicide, and impairment in the broader literature (Andrews et al., 2002; Hastings et al., 2000; Tangney, 1993; Tangney, 2000; Tangney & Dearing, 2002). Despite conceptual discussions of the centrality of shame in BDD and OCD, as well as links between shame and adverse outcomes in the broader literature, to the best of our knowledge only one study has examined the link between shame and these outcomes in OCD or BDD. Weingarden and Renshaw (2014) found that shame mediated the link between OCD cognitions and depression symptoms in a nonclinical sample. Thus, there is a substantial gap in the current literature regarding the implications of shame in OCD and BDD. While many types of shame exist (e.g., general shame, symptom-specific shame), the present study focuses on general shame, as capturing proneness to general shame (i.e., the highest-level construct that generalizes across disorders) is optimal for facilitating comparisons of shame across groups.

The present study was designed to increase our understanding of the relationships of anxiety and shame with four severe outcomes (i.e., depression severity, suicide risk, functional impairment, housebound rates) among individuals with BDD, individuals with OCD, and healthy controls (HCs). Our first aim was to examine whether levels of severe outcomes differed across groups. We hypothesized that adverse outcomes would be elevated in our clinical groups compared to HCs, and, drawing from prior research (Frare et al., 2004; Phillips et al., 1998; Saxena et al., 2001), that the BDD group would report more severe outcomes than the OCD group. Our second aim was to compare levels of anxiety and shame across groups. Given OCD's former classification as an anxiety disorder, we expected levels of anxiety to be highest in the OCD group, with the BDD group endorsing significantly higher anxiety than the HC group. Because the literature on shame in OCRDs preliminarily suggests that shame is critical in both disorders, we expected both clinical groups to report similar, elevated levels of shame compared to the HC group. Finally, to better inform our understanding of similarities and differences between these two OCRDs, we conducted exploratory analyses investigating whether the strengths of associations of shame and anxiety with the four outcomes differed between groups.

Material and Methods

Participants

The sample ($N = 361$) consisted of three groups: HC ($n = 133$), BDD ($n = 114$), and OCD ($n = 114$). BDD and OCD participants were recruited through BDD and OCD oriented websites, and HC participants were recruited through non-mental health related websites (see Procedures). The mean age of the sample differed significantly by group, $F(2, 358) = 11.11, p < .001$, with the HC group significantly older than the BDD and OCD groups ($ps < .001$) (see Table 1). Gender also differed significantly by group, $F(2, 358) = 6.13, p < .001$, with a higher percentage of females in the BDD group than in the HC group (see Table 1). In addition, relationship status varied significantly by group, $\chi^2(4) = 24.52, p < .001$ (see Table 1). The proportion of participants from different races did not vary significantly by diagnostic group, $\chi^2(14) = 20.43, p = .11$. Across the sample, 78.6% reported their race as Caucasian, 6.4% reported their race as East Asian, Southeast Asian, or Middle Eastern, 5.6% reported their race as African American or Black, 5.0% reported their race as Hispanic or Latino, and 4.4% reported their race as other.

Measures

Diagnostic Measures—The study employed two self-report measures to evaluate eligibility for the OCD and BDD groups. All participants completed the measures.

Body Dysmorphic Disorder Questionnaire (BDDQ; Phillips, 1996): The BDDQ is a 4-item dichotomous self-report measure of BDD diagnosis. Questions are based on DSM-IV criteria for BDD. The BDDQ has demonstrated 100% sensitivity and 89% specificity in detecting BDD in a clinical sample (Phillips, 1996). The BDDQ includes an item that asks for a qualitative description of appearance concerns. To determine whether participants' appearance concerns were better accounted for by an eating disorder, trichotillomania, or skin picking disorder, the first author (MA-level clinical psychology doctoral student) hand-coded the qualitative description item. A second coder (also MA-level clinical psychology doctoral student) independently hand-scored this item. Inter-rater reliability of coding for individuals who otherwise met criteria for the BDD group indicated slightly low but adequate agreement ($\kappa = .68$; Landis & Koch, 1977). The first author and second coder discussed all cases on which they disagreed. Disagreements were resolved without difficulty, and the agreed-upon score was used.

Yale-Brown Obsessive Compulsive Severity Scale- Self Report (Y-BOCS-SR; Steketee et al., 1996): The Y-BOCS Severity Scale is the gold-standard assessment for OCD, showing strong internal consistency and validity as a measure of past-week severity (Goodman et al., 1989a, 1989b). It contains 10 Likert scale items ranging from 0 (*least severe*) to 4 (*most severe*) (range = 0 – 40). Its self-report version shows strong convergent validity with the clinician-administered format, as well as strong ability to discriminate between OCD and non-clinical comparison groups (Steketee et al., 1996). We used Y-BOCS items that map directly onto DSM-IV criteria for OCD to create a dichotomous self-report screener for OCD diagnosis. For diagnosis, participants were required to meet one of the following: (1) greater than or equal to 1 hour per day spent on obsessions *and* either (a)

severe to *extreme* functional impairment from obsessions or (b) *severe* to *extreme* distress from obsessions; or (2) greater than or equal to 1 hour per day spent on compulsions *and* either (a) *severe* to *extreme* functional impairment from compulsions or (b) *prominent, very disturbing* to *extreme, incapacitating* distress from compulsions. This approach paralleled our approach to establishing BDD diagnosis on the dichotomous BDDQ and also provided a more precise way of establishing whether participants met diagnostic criteria for OCD, rather than using a severity cutoff score.

Symptom severity measures—We wished to obtain independent assessments of diagnostic criteria (above) and BDD and OCD severity, to reduce issues of restricted range. Thus, measures were given to assess BDD and OCD severity. Additionally, we assessed depression and anxiety to ensure that HCs did not endorse high levels of such symptoms.

Self-report BDD Y-BOCS (Phillips et al., 1997): The 12-item clinician-administered BDD Y-BOCS is the gold-standard measure of past-week BDD severity. Following procedures from prior research (e.g., Marques et al., 2011b), we used a 10-item self-report adaptation of the clinician-administered BDD Y-BOCS. This self-report version omits two items from the clinician-administered version, which measure insight and avoidance, because these constructs are difficult to assess accurately via self-report. Each item is scored on a 5-point Likert scale, with the total score ranging from 0 – 40. Higher scores indicate more severe BDD symptoms. The 10-item version has strong reliability, construct validity, sensitivity to change, and factor structure (Phillips et al., 1997). In the present study, internal consistency was strong ($\alpha = .93$).

Obsessive Compulsive Inventory – Revised (OCI-R; Foa et al., 2002): The OCI-R is an 18-item self-report measure of OCD symptom severity. Items are scored on a Likert scale from 0 (*not at all*) to 4 (*extremely*). Total scores range from 0 – 72. The scale has strong internal consistency, test-retest reliability, and convergent validity (Foa et al., 2002). In the present sample, internal consistency was strong ($\alpha = .94$).

Depression Anxiety and Stress Scale – 21 (DASS-21; Lovibond & Lovibond, 1995): Depression and anxiety were assessed via respective 7-item subscales of the DASS-21, a Likert scale with items ranging from 0 to 3. Higher scores indicate greater symptomatology. The depression and anxiety subscales show strong internal consistency (Brown et al., 1997; Henry & Crawford, 2005) and strong concurrent and discriminant validity with depression and anxiety measures (Antony et al., 1998; Lovibond & Lovibond, 1995). In the present study, depression and anxiety subscales showed strong internal consistency ($\alpha = .94$, $\alpha = .86$, respectively).

Other measures—Other constructs of interest included shame, suicidality, and overall functioning (the DASS-21, described above, is used to assess depression as an outcome).

Test of Self-Conscious Affect-4 (TOSCA-4; Tangney et al., 2008): General shame-proneness was assessed using the TOSCA-4 total shame score. The TOSCA scales are the most widely-used measures of shame. The TOSCA-4 assesses one's tendency to respond to situations with shame, guilt, or externalization of blame, by presenting 15 scenarios likely to

evoke these emotions (e.g., “When visiting a favorite relative, you accidentally break something you know is important to them”). It then asks participants to rate their likelihood of reacting to each scenario in various ways (i.e., a shame-driven reaction, a guilt-driven reaction, an externalization-driven reaction) on a 5-point Likert scale from 1 (*not likely*) to 5 (*very likely*). Response options do not explicitly name the emotion associated with each response. This scenario-based approach has been described as a methodological gold-standard in assessment of self-conscious emotions, as it does not rely on participants’ ability to distinguish between their experiences of different self-conscious emotions (Tangney & Dearing, 2002). Participants’ scores for each type of response are summed to create their total shame, guilt, and externalization scores. The TOSCA scales have strong internal consistency and construct validity (Rusch et al., 2007; Woien et al., & Nagoshi, 2003). In the present study, the shame scale had strong internal consistency ($\alpha = .97$).

Suicide Behaviors Questionnaire – Revised (SBQ-R; Osman et al., 2001): The SBQ-R is a 4-item measure of suicide risk. Higher scores indicate greater risk. The SBQ-R has strong internal consistency ($\alpha = .87$), as well as good sensitivity (.80) and specificity (.91) in identifying those who are suicidal from an adult psychiatric sample (Osman et al., 2001). In the present study, the SBQ-R demonstrated strong internal consistency ($\alpha = .83$).

Sheehan Disability Scale (SDS; Sheehan et al., 1996): The SDS uses a Likert scale from 0 (*not at all*) to 10 (*extremely*) to assess impairment in occupational, social, and family domains. It has strong internal consistency and validity (Sheehan et al., 1996). In the present sample, the total score had strong internal consistency ($\alpha = .95$). The SDS has supplemental items inquiring about the number of work days lost and unproductive due to mental health symptoms in the past week. Although we did not use these items, we included an additional item following this format that inquired about number of days housebound in the past week due to mental health symptoms.

Procedures

All procedures were approved by a university IRB and the NIH Office of Human Subjects Research Protections. BDD and OCD participants were recruited via advertisements posted on BDD and OCD clinic and organization websites (e.g., International OCD Foundation [IOCDF]), online BDD or OCD forums (e.g., BDD and OCD Yahoo! Groups), and email listings for BDD or OCD support groups. Participants for the control group were recruited through non-mental health websites (e.g., online research participation webpages, Amazon’s Mechanical Turk) and forums (e.g., Reddit). An Internet-based recruitment strategy was used, because individuals with BDD rarely go to clinics for psychological help (Marques, et al., 2011b), and up to 30% of adults with BDD have been housebound due to BDD (Phillips et al., 2006).

Study advertisements directed potential participants to an online informed consent document. Individuals who clicked an “I agree” button to indicate consent were directed to the online survey via Qualtrics. Participants had to be at least 18 years old. Inclusion criteria for the BDD group also required participants to meet criteria for BDD on the BDDQ, but not for OCD on the diagnostic screener adapted from the Y-BOCS. Inclusion criteria for the

OCD group required that participants meet criteria for OCD on the Y-BOCS, but not for BDD on the BDDQ. Inclusion criteria for the HC group required that participants (1) did not meet inclusion criteria for BDD or OCD and (2) scored within the normal to mild range (i.e., no more than 1 *SD* above the normative mean) on both the DASS-21 depression (i.e., no greater than 13) and anxiety (i.e., no greater than 9) subscales.

Two steps were taken to enhance integrity of data. First, participants were required to complete a CAPTCHA (Completely Automated Public Turing test to tell Computers and Humans Apart) prior to gaining access to the study. CAPTCHAs are effective tools for preventing non-human computer programs (i.e., “bots”) from completing surveys (Von Ahn, Blum, & Langford, 2004). Second, two quality screening questions (e.g., “Choose the correct response to this sentence: The dog has four ____” [a] eyes; [b] teeth; [c] legs; [d] tails) were dispersed in the survey to flag participants who were clicking through without reading questions. A study comparing paper-based vs. Internet-based surveys demonstrated that while paper-based surveys may result in higher completion rates overall, Internet-based surveys demonstrate clear benefits in terms of time and cost efficiency with large samples ($N > 200$) (Uhlig, Seitz, Eter, Promesberger, & Busse, 2014). Upon completing the survey, which took approximately 30 – 75 minutes, participants could enter their email address for a chance to win one of 75 \$30 electronic gift cards that were raffled off as study compensation. Finally, upon completion, all participants were directed to a list of resources, including BDD, OCD, and depression information, as well as national suicide hotlines, with embedded links to websites.

In total, 1,399 individuals clicked the link to the study survey. Forty-five entries were removed for participants who had taken the survey more than once (identified through repeat IP addresses). Of the remaining 1,354 individuals, 1,186 agreed to the informed consent and completed one or more survey items. Six-hundred seventy-three individuals either did not meet inclusion criteria for one of the three groups or did not complete enough measures to fully evaluate whether they met criteria. Of the remaining 468 participants who met criteria for one of the three study groups, 107 did not pass the two quality screening items (22 from the HC group, 38 from the BDD group, 47 from the OCD group), resulting in a final sample of 361 participants.

Data Analysis

We first examined normality of primary variables with visual inspection and examination of skewness and kurtosis values, which did not exceed recommended cutoffs (Kim, 2013). We next examined group differences in (1) primary outcome variables and (2) emotion variables with two one-way MANCOVAs, controlling for demographic variables that differed by group.

To examine how shame and anxiety were associated with each outcome across groups, we used multigroup path analysis (see Figure 1) via Amos 20 (Arbuckle, 2011). Anxiety and shame were modeled as covarying, exogenous variables, and the primary outcomes (i.e., depression severity, suicide risk, functional impairment, housebound rates) were modeled as covarying endogenous variables. Paths were specified from anxiety and shame to each outcome. Demographic variables that differed significantly by group were modeled as

covarying predictors to each outcome (with covariances to anxiety and shame) to control for their effects. Means/intercepts, variances, and covariances were allowed to vary across groups. A small proportion of the sample (range = 9.8 – 16.8%) had missing data on variables of interest; thus, we used full information maximum likelihood to estimate all models.

In our base model, each structural path (i.e., paths from the two exogenous emotions variables to the four outcome variables) was constrained to be equal across groups. To determine whether strengths of associations between shame and anxiety with the four outcomes differed by groups, we then tested a series of broader models in which specific structural paths were unconstrained across groups, using χ^2 -difference scores to determine whether freeing each set of paths resulted in significant improvement in fit. We first freed all structural paths (i.e., from shame and anxiety to the four outcomes) for the HC group, as we hypothesized that associations would be significantly weaker for HCs compared to the clinical groups. We next freed each structural path one-by-one across the BDD and OCD groups. Overall, model fit was evaluated using recommended cutoff values for the comparative fit index (CFI > .90 or .95) and root mean square error of approximation (RMSEA < .08, or .05) (Marsh et al., 2004.)

Results

To evaluate the validity of our diagnostic groups, we examined group differences in BDD and OCD severity, controlling for the demographic covariates of age, sex, and relationship status. BDD severity scores on the BDD Y-BOCS differed significantly across groups, $F(2, 347) = 161.61, p < .001, \eta_p^2 = .48$. Bonferroni-corrected post-hocs showed that the HC group scored significantly lower than the OCD group, which was significantly lower than the BDD group (see Table 1). OCI-R scores also differed significantly across groups, $F(2, 316) = 90.79, p < .001, \eta_p^2 = .37$, with HCs scoring lowest, BDD in the middle, and OCD highest (see Table 1).

Group Differences in Outcomes and Emotions

The one-way MANCOVA examining group differences in the four outcomes, controlling for demographic covariates, was significant, $F(8, 586) = 586.00, \eta_p^2 = .33$. Tests of between-subjects effects were significant for each outcome, showing group differences in depression severity ($F(2, 295) = 131.46, p < .001, \eta_p^2 = .47$), suicide risk ($F(2, 295) = 48.99, p < .001, \eta_p^2 = .25$), functional impairment ($F(2, 295) = 186.65, p < .001, \eta_p^2 = .56$), and days housebound in the past week ($F(2, 295) = 28.12, p < .001, \eta_p^2 = .16$). Follow-up Bonferroni-corrected pairwise comparisons showed that, as hypothesized, the HC group was lower on all outcomes in comparison to BDD and OCD groups (see Table 1). Contrary to hypotheses, the BDD and OCD groups did not differ on depression, suicide risk, or number of days housebound, but the BDD group endorsed less functional impairment than the OCD group (see Table 1).

A one-way MANCOVA examining group differences in shame and anxiety, controlling for demographic covariates, was also significant, $F(4, 582) = 42.31, \eta_p^2 = .23$. Tests of between-subjects effects were significant for shame ($F(2, 291) = 55.76, p < .001, \eta_p^2 = .28$) and

anxiety ($F[2, 291] = 87.74, p < .001, \eta_p^2 = .38$). Follow-up Bonferroni-corrected pairwise comparisons showed that the HC group had significantly lower shame and anxiety scores than the BDD and OCD groups (see Table 1). As hypothesized, BDD and OCD groups did not differ in levels of shame, but the OCD group had significantly higher anxiety than the BDD group (see Table 1).

Associations of Shame and Anxiety with Outcomes

Correlations among primary variables are shown in Table 2. Our base model (see Figure 1), in which structural paths from shame and anxiety to outcomes were constrained across groups, had marginal to acceptable indices of model fit ($\chi^2[46] = 70.32, p = .01$; CFI = .91; RMSEA = .04). Standardized path estimates for the base model are shown in Figure 1. (Full estimates from the model are available from the first author upon request.) All paths from shame and anxiety to outcomes were significant, with the exception of the path from shame to days housebound. Intercepts were free to vary across groups. Consistent with MANCOVA results, intercept values for the HC group were lower than those for the BDD and OCD groups. Thus, results for structural paths must be interpreted with group differences in intercepts in mind.

Our first comparison model allowed structural paths from shame and anxiety to outcomes for the HC group to vary from those in the BDD and OCD groups (which were constrained). As hypothesized, freeing HC structural paths significantly improved model fit, $\chi^2(8) = 15.84, p < .05$. Differences between HCs and clinical groups were for paths from anxiety to suicide risk and housebound rates, and paths from shame to suicide risk and impairment, which were stronger and mostly significant for BDD and OCD, but weaker and non-significant for HCs (see Table 3). Standardized estimates vary slightly across groups when paths are constrained, due to differences in standard errors across groups, but we report standardized estimates for ease of interpretation.

We next tested a series of models in which paths from emotions to individual outcomes were freed across the BDD and OCD groups. The only significant difference that emerged was when the path from shame to depression was freed across groups, $\chi^2(1) = 4.47, p < .05$. For the BDD group, the path from shame to depression was moderately strong and significant ($b = .32, p < .001$), whereas for the OCD group, this path was weak and non-significant ($b = .07, p = .49$). No other associations differed significantly between the BDD and OCD groups, and associations remained nearly identical to those from the first comparison model described above. This final model had adequate indices of model fit ($\chi^2[37] = 50.01; p = .08$; CFI = .95; RMSEA = .03).

Discussion

Despite notably high rates of depression, suicidality, and functional impairment in BDD and OCD, empirical information about risk factors for severe outcomes in these disorders is scarce. While the conceptual literature points to anxiety and shame as potential risk factors for these outcomes, very little empirical information exists to support the conceptual literature. The present study was the first to empirically demonstrate that anxiety and shame are more strongly associated with adverse outcomes in BDD and OCD compared to HCs. Of

note, emotions and outcomes in the HC group had a more restricted range than in BDD and OCD groups, which may have made it difficult to detect significant associations between emotions and outcomes for HCs.

Findings for individuals with BDD and OCD were largely similar, but a few group differences did emerge. Levels of depression, suicide risk, and housebound rates were similar across both groups, but functional impairment was greater for those with OCD than those with BDD. Given that prior research showed similar or more severe outcomes in BDD versus OCD (Didie et al., 2007; Didie et al., 2008; Frare et al., 2004; McKay et al., 1997; Phillips et al., 1998), it is possible that our Internet-based recruitment generated a less severe BDD sample than those in prior research, but it is also possible that this difference arose simply by chance.

Consistent with OCD's prior classification as an anxiety disorder (APA, 1994), anxiety was significantly higher in individuals with OCD than BDD. Despite this difference, anxiety was significantly, similarly associated with depression, housebound rates, and impairment in both groups. Results are consistent with the cognitive-behavioral model and research highlighting the important role of anxiety in distress and impairment within OCD (e.g., Albert et al., 2010; Raines et al., 2014; Rapaport et al., 2005; Storch et al., 2015). Similar associations among those with BDD highlight that, although anxiety is not as elevated in BDD, it may be a similarly strong risk factor for adverse outcomes in BDD as in OCD. In contrast to some prior OCD research (Raines et al., 2014; Storch et al., 2015), anxiety was not significantly associated with suicidality in BDD or OCD in the final model. This difference may be due to the inclusion of shame in our models.

In contrast to anxiety, levels of shame did not differ significantly between BDD and OCD groups, providing novel empirical evidence that shame may be a central emotion to target in both disorders. This finding was consistent with the re-classification of OCD from the anxiety disorders into the OCRD category, a change that emphasizes the critical role of emotions beyond anxiety in the experience of OCRDs. Moreover, as with anxiety, the relationships between shame and outcomes were largely consistent across BDD and OCD. Shame was significantly, similarly associated with suicide risk and functional impairment in both groups, while it was not a significant risk factor for days housebound in either group. The highly similar patterns of results across BDD and OCD provides new evidence that reclassifying BDD and OCD into the same diagnostic category in the DSM-5 may accurately reflect the related nature of these disorders.

With regard to shame's role as a risk factor for depression, a single difference emerged between groups. Shame was a significant risk factor for depression among those with BDD, but not OCD. Given the elevated anxiety in OCD, it is possible that, when anxiety and shame are examined as simultaneous risk factors for depression in OCD, anxiety stands out as the primary risk factor. In BDD, on the other hand, the conceptual literature describes shame as almost inherent to the disorder (Janet, 1903; Weingarden & Renshaw, 2015). When individuals with BDD judge their appearance to be defective, they may extend that judgment to mean that they are broadly worthless and, thus, feel shame. Given that people respond to

shame with intense distress and withdrawal, it makes sense that they would be at increased risk for depression.

Taken together, our results highlight some potential treatment implications for BDD and OCD. Given that anxiety appears to be equally strongly associated with adverse outcomes in BDD as it is in OCD, addressing anxiety may be a particularly important component of BDD treatment. In particular, when treating either disorder, clinicians should be aware that highly anxious BDD or OCD patients may be at elevated risk for becoming housebound. As such, it may be important for clinicians to use a broad range of exposures aimed at reducing anxiety and avoidance, sometimes extending beyond straightforward OCD- and BDD-related targets.

Moreover, in support of the conceptual literature, the present study provides novel evidence that demonstrates shame's associations with severe adverse outcomes in BDD and OCD. Results underscore the importance of broadening our anxiety-focused treatments, in order to also target shame in the treatment of both disorders. Specifically, when working with BDD or OCD patients, it may be beneficial for clinicians to target shame-prone cognitions with cognitive restructuring and shame-driven behaviors (e.g., withdrawal) through behavioral activation. Beyond traditional Cognitive Behavioral Therapy, third wave behavior therapies focused on acceptance and mindfulness, such as Acceptance and Commitment Therapy, Dialectical Behavior Therapy, and Compassion-Focused Therapy may offer rich opportunities to address shame in treatment. Teaching patients to use mindfulness may help them to nonjudgmentally observe experiences of shame and subsequent urges to withdraw or hide, without necessarily acting on those urges. Providing psychoeducation about shame and how the patient responds to their shame (e.g., by withdrawing, by becoming angry) may help the patient to recognize and alter maladaptive responses (Dearing & Tangney, 2011). Additionally, validation of the patient's emotional experience may be shame reducing, as it can help the patient to feel understood and accepted (Dearing & Tangney, 2011). Finally, in addition to incorporating interventions for shame into treatments for BDD and OCD, it may be beneficial to assess levels of shame at the start of treatment. Such assessment may provide a useful tool for therapists to gauge patients' levels of risk and, subsequently, to decide how much risk management to introduce in treatment.

Several limitations to the present study should be considered alongside its findings. Although we recruited through OCD- and BDD-specific websites, diagnoses were established using self-reports rather than gold-standard clinical interviews. Relatedly, because individuals with BDD were not assessed in person, we were unable to determine whether appearance concerns were real or imagined. Prior BDD and OCD research demonstrates that SCID-recruited participants do not differ significantly from Internet-recruited participants (Neziroglu et al., 2014), but further research of emotions-based risk factors using other methods of recruitment is needed. It is also possible that Internet-collected data could suffer from diminished quality. However, prior research shows that surveys completed online do not differ significantly from those completed via paper and pencil (Coles et al., 2007). Moreover, to address concerns, we required that participants accurately complete a CAPTCHA prior to starting the study, and we only included data from participants who had accurately answered two quality-screening items in the study.

Additionally, the present study examined generalized shame, as opposed to disorder-specific shame. At present, measures of disorder-specific shame have substantial limitations or do not exist. However, it is very likely that generalized proneness to shame is strongly related to disorder-specific shame. Finally, the present study was cross-sectional in design, limiting our ability to make causal conclusions about shame and anxiety as earlier risk factors for the development of subsequent severe outcomes. However, the present study is a parsimonious first step demonstrating a cross-sectional pattern of results to support a developmental risk model.

In spite of these limitations, the present study offers novel, clinically-relevant information about the associations of anxiety and shame with some of the most severe outcomes in BDD and OCD and extends our knowledge of similarities and differences between BDD and OCD. Results suggest that longitudinal studies testing anxiety and shame at the time of BDD or OCD diagnosis as risk factors for later development of these outcomes, in addition to potential bidirectional relationships between emotions and outcomes over time, may be warranted. Such research would better enable us to understand whether anxiety and shame are developmental risk factors to these outcomes in BDD and OCD, and whether these outcomes place individuals with BDD and OCD at increased risk for worsened anxiety and shame. Additionally, the current research would be extended through studies testing whether empirically-supported treatments for BDD and OCD effectively reduce shame and anxiety, and whether reductions in shame and anxiety through treatment are associated with reductions in risk for these adverse outcomes across treatment.

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Figure 1.

Base path analysis model with standardized path estimates shown. Demographic controls not shown.

Note: * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 1

Demographics and Means (SDs) of Primary Variables by Group

	HC	BDD	OCD
Age <i>M</i> (<i>SD</i>)	36.44 (13.28) ^a	30.22 (10.86) ^b	30.60 (10.66) ^b
Gender (% female)	76% ^a	92% ^b	86% ^{a,b}
Relationship status:			
% single, divorced, widowed	30.1% ^a	41.2% ^{a,b}	53.5% ^b
% dating, cohabiting (unmarried)	27.8%	31.6%	31.6%
% married	42.1% ^a	27.2% ^b	14.9% ^b
BDD Y-BOCS	5.56 (4.52) ^b	19.85 (5.20) ^b	16.12 (6.82) ^f
OCI-R	6.75 (1.03) ^b	17.43 (1.22) ^b	28.38 (1.17) ^f
TOSCA-4 Shame	58.70 (21.37) ^a	92.75 (26.87) ^b	94.29 (30.42) ^b
DASS-Anxiety	2.17 (2.60) ^b	11.33 (8.47) ^b	16.14 (10.14) ^f
DASS-Depression	3.16 (3.48) ^b	18.61 (11.04) ^b	21.47 (12.13) ^b
SBQ-R	5.23 (1.95) ^b	8.18 (3.70) ^b	9.09 (3.73) ^b
SDS	1.70 (3.92) ^b	12.30 (7.97) ^b	19.26 (7.31) ^f
Days housebound (past week)	0.05 (.27) ^a	1.12 (1.75) ^b	1.40 (1.93) ^b

Note: HC = healthy control; BDD = body dysmorphic disorder; OCD = obsessive compulsive disorder; BDD Y-BOCS = BDD Yale-Brown Obsessive Compulsive Scale; OCI-R = Obsessive Compulsive Inventory-Revised; TOSCA-4 = Test of Self-Conscious Affect-4; DASS = Depression Anxiety Stress Scale-21; SBQ-R = Suicide Behaviors Questionnaire-Revised; SDS = Sheehan Disability Scale.

a, b, c Different superscripts indicate significant group differences ($p < .001$) in variables.

Table 2

Intercorrelations among Primary Study Measures

	1	2	3	4	5
1. TOSCA-4	–	–	–	–	–
2. DASS-Anxiety	.64*	–	–	–	–
3. DASS-Depression	.61*	.68*	–	–	–
4. SBQ-R	.48*	.52*	.69*	–	–
5. SDS	.62*	.65*	.72*	.58*	–
6. Housebound	.32*	.48*	.53*	.42*	.50*

Note: TOSCA-4 = Test of Self-Conscious Affect-4 shame scale; DASS-Anxiety = Depression Anxiety Stress Scale-21 Anxiety subscale; DASS-Depression = Depression Anxiety Stress Scale-21 Depression subscale; SBQ-R = Suicide Behaviors Questionnaire-Revised; SDS = Sheehan Disability Scale.

* $p < .001$.

Table 3

Path Estimates for First Comparison Model (HC paths allowed to vary)

Path	<u>HC</u> Standardized estimate	<u>BDD</u> Standardized estimate	<u>OCD</u> Standardized estimate
Anxiety - Depression	.29 ***	.31 ***	.32 ***
Anxiety – Suicide Risk	.06	.14	.17
Anxiety - Impairment	.14	.14	.18 *
Anxiety - Housebound	.08	.32 ***	.33 ***
Shame - Depression	.33 ***	.22 **	.19 **
Shame – Suicide Risk	.09	.17 *	.16 *
Shame - Impairment	.12	.23 ***	.29 ***
Shame - Housebound	-.01	-.05	-.04

Note: Standardized estimates for paths may vary slightly across BDD and OCD groups due to differences in standard errors between these two groups.

*
 $p < .05$.

**
 $p < .01$.

 $p < .001$.