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A comparison study of body dysmorphic disorder versus social phobia

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Abstract

Body dysmorphic disorder (BDD) shares many characteristics with social phobia (SP), including high levels of social anxiety and avoidance, but to our knowledge no studies have directly compared these disorders' demographic and clinical features. Demographic and clinical features were compared in individuals with BDD (n=172), SP (n=644), and comorbid BDD/SP (n=125). SP participants had a significantly earlier age of onset and lower educational attainment than BDD participants. BDD participants were significantly less likely to ever be married than SP participants, had a greater likelihood of ever being psychiatrically hospitalized, and had significantly lower mean GAF scores than SP participants. The two groups had different comorbidity patterns, which included a greater likelihood for BDD participants to have comorbid obsessive-compulsive disorder (OCD) or an eating disorder, versus a greater likelihood for SP participants to have a comorbid non-OCD anxiety disorder. The comorbid BDD/SP group had significantly greater morbidity across several domains than the SP only group, but not the BDD only group. In summary, although BDD and SP were similar across many demographic and clinical features, they had important differences. Future studies are needed to confirm these findings and address similarities and differences between these disorders across a broader range of variables.

Keywords

body dysmorphic disorder; dysmorphophobia; comorbidity; social phobia; social anxiety disorder; phenomenology; anxiety disorders

1. Introduction

Body dysmorphic disorder (BDD) is an often severe mental disorder that consists of distressing or impairing preoccupations with nonexistent or slight defects in appearance. BDD appears to be closely related to several anxiety disorders, particularly obsessive-compulsive disorder (OCD) and social phobia (SP) (Phillips et al., 1998; Frare et al., 2004;

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Phillips et al., 2007; Fang and Hofmann, 2010). Much attention has been paid to similarities between BDD and OCD (Phillips et al., 1998; Frare et al., 2004; Phillips and Stout, 2006; Phillips and Kaye, 2007; Phillips et al., 2007; Stewart et al., 2008). Indeed, BDD is often conceptualized as an obsessive-compulsive (OC)-spectrum disorder – i.e., a disorder that shares features with OCD and may be closely related to OCD (Cohen and Hollander, 1997; Goldsmith et al., 1998; Mataix-Cols et al., 2007; Phillips et al., 2010). However, BDD also shares many characteristics with SP (Veale et al., 2003; Pinto and Phillips, 2005; Coles et al., 2006; Kelly et al., 2010), including high levels of social anxiety and social avoidance (Veale et al., 2003; Pinto and Phillips, 2005; Fang and Hofmann, 2010; Kelly et al., 2010). However, to date, no studies to our knowledge have ever directly compared the demographic and clinical features of BDD to SP.

BDD and SP are both characterized by fear of negative evaluation in social situations (Pinto and Phillips, 2005; Bögels et al., 2010) and avoidance of social interactions (Veale et al., 2003; Stangier et al., 2006; Kelly et al., 2010), although in BDD, social fear and avoidance are largely related to anxiety that the bodily “defects” will be perceived by others and considered unacceptable (Kelly et al., 2010). Indeed, although BDD and SP have not been directly compared, levels of social anxiety in BDD are similar to those reported for SP, with social anxiety symptoms in BDD ranging from 1.3-1.7 SD units higher than normative samples on the Social Avoidance and Distress Scale (SADS), the Social Phobia Inventory (SPIN) and Social Phobia scales (Veale et al., 2003; Pinto and Phillips, 2005; Kelly et al., 2010). Social avoidance is particularly marked in BDD and in SP (Schneier et al., 2002; Pinto and Phillips, 2005; Stangier et al., 2006; Kelly et al., 2010), contributing to poor social and occupational functioning in both disorders (Schneier et al., 1994; Wittchen et al., 2000; Kessler, 2003; Kelly et al., 2010).

BDD and SP appear to have other features in common. For instance, individuals with BDD and those with SP are more likely than healthy controls to interpret ambiguous social information (e.g., neutral facial expressions or ambiguous social scenarios) as hostile and threatening (Amir et al., 1998; Stopa and Clark, 2000; Buhlmann et al., 2002, 2006). Both disorders are characterized by a tendency for negative self-focused thoughts (Hofmann and Barlow, 2002; Veale, 2004; Phillips, 2005; Neziroglu et al., 2008) (although these characteristics are shared by other disorders as well). In addition, there is a high lifetime prevalence of comorbid SP in individuals with BDD, with rates ranging from 12%-69% (Hollander et al., 1993; Veale et al., 1996; Phillips and Diaz, 1997; Zimmerman and Mattia, 1998; Gunstad and Phillips, 2003; Phillips et al., 2005a); in the largest studies that examined comorbidity with a standard assessment measure, 37% of 293 participants and 39% of 200 participants with BDD had comorbid lifetime SP (Gunstad and Phillips, 2003; Phillips et al., 2005a). The prevalence of comorbid BDD in individuals with SP appears lower (5%-12%), but to our knowledge has been examined in only two small studies (Brawman-Mintzer et al., 1995; Wilhelm et al., 1997). Furthermore, in some Eastern cultures (e.g., Japan), BDD is considered a type of SP known as Taijin-kyofu-sho (TKS) (Kleinknecht et al., 1997; Maeda and Nathan, 1999; Choy et al., 2008). Taken together, these findings suggest that BDD and SP may be related disorders.

However, BDD and SP appear to have important differences. For instance, BDD, but not SP, is characterized by prominent time-consuming repetitive behaviors (e.g., mirror checking, skin picking, excessive grooming) that are aimed at checking, fixing, hiding, or obtaining reassurance about the perceived appearance flaws. Regarding social anxiety specifically, clinical observations indicate that BDD-related social anxiety focuses specifically on concerns that others will judge the person's physical appearance (e.g., skin, hair, nose) negatively (Phillips, 2009). In a recent study, only 14% of individuals with BDD without comorbid SP had clinically significant social anxiety *not* related to appearance concerns,

whereas 62% had clinically significant social anxiety due to appearance concerns or other sources (for most participants, BDD was the primary diagnosis) (Kelly et al., 2010). Furthermore, in the only prospective observational study of the course of BDD, examination of time-varying associations between BDD and comorbid SP indicated that change in symptoms of BDD and SP were not closely linked in time (however, statistical power was somewhat limited) (Phillips and Stout, 2006). For participants whose SP symptoms remitted, about half still met full DSM-IV criteria for BDD. Overall, these findings suggest that BDD and SP are similar across a number of clinical features and are highly comorbid, but they have some differences and do not appear to be the same disorder.

Currently, the relationship of BDD to disorders with similar features is an important topic of discussion (Mataix-Cols et al., 2007; Fang and Hofmann, 2010; Phillips et al., 2010). A direct comparison of the demographic and clinical features of BDD vs. SP would provide useful information that could shed light on the relationship between them. In turn, this could be useful for classification and assessment.

This report presents comparisons of demographic and clinical characteristics of BDD vs. SP vs. comorbid BDD and SP. Because to our knowledge there have been no previous comparisons of BDD and SP, and because both disorders are associated with significant morbidity and impairment in psychosocial functioning (Phillips et al., 2005b; Keller, 2006), no specific hypotheses were established for comparisons of morbidity in BDD vs. SP. However, we predicted that the comorbid BDD/SP group would have greater morbidity than the BDD only and SP only groups, given that individuals with more comorbidity, including BDD and anxiety disorders, generally have greater functional impairment (Phillips et al., 1998; Belzer and Schneier, 2004; Frare et al., 2004) and suicidality (Phillips et al., 1998; Frare et al., 2004; Sareen et al., 2005; Pfeiffer et al., 2009). Because BDD has been hypothesized to be an OC-spectrum disorder and has similarities with both OCD and eating disorders (Grant and Phillips, 2004; Hrabosky et al., 2009; Phillips et al., 2010), we hypothesized that BDD would be more highly comorbid than SP with proposed OC-spectrum disorders (OCD, hypochondriasis, trichotillomania) and eating disorders (which have also been proposed by some to be OC-spectrum disorders) (Hollander et al., 2007). In addition, as SP has high comorbidity with other anxiety disorders and has many similarities with them, we predicted that a significantly higher proportion of individuals with SP would have comorbid anxiety disorder diagnoses (other than OCD) than individuals with BDD (Pollack, 2001; Keller, 2006).

2. Methods

2.1. Participants

Participants were obtained from three different samples: (1) Individuals seeking assessment and/or treatment of BDD from a BDD clinical and research program (n = 141), (2) participants with BDD from a study investigating the course of BDD (n = 98; only those individuals who were receiving mental health treatment at the time of the initial assessment are included in this report), and (3) psychiatric outpatients seeking treatment at the Department of Psychiatry at Rhode Island Hospital and who participated in the Rhode Island Methods to Improve Diagnostic Assessment and Services (MIDAS) Project (n = 702).

All participants met DSM-IV criteria for BDD or its delusional variant, DSM-III-R or DSM-IV criteria for SP (social anxiety disorder), or both comorbid BDD and SP. Across all samples, participants with BDD who had current or past SP were excluded from the SP group, and participants with SP who had current or past BDD were excluded from the BDD group; these excluded individuals were included in the comorbid BDD/SP group (n=125). As a result, the BDD group included no individuals with comorbid SP (n=172; 55% from

the first sample, 35% from the second sample, 10% from the third sample), and the SP group included no individuals with comorbid BDD (n = 644; 100% from the third sample). The comorbid BDD/SP group (n=125) included 38% from the first sample, 30% from the second sample, and 32% from the third sample. All three samples were drawn from studies approved by the hospitals' Institutional Review Boards. Written informed consent was obtained from all participants.

In the first sample (BDD clinical and research program sample), participants were referred from a wide variety of sources for an in-person assessment or treatment of BDD (e.g., self or clinician referral). All participants were age 18 or older. In the second BDD sample, all participants were available for an in-person interview and did not have cognitive impairment (e.g., organic mental disorder) that would interfere with the validity of interview data. The sample in this report included only participants age 18 or older who were receiving mental health treatment, to make them comparable to the other two samples. Participants in the second sample were obtained from mental health professionals (46.0%), advertisements (38.6%), the BDD program's web site and brochures (10.2%), the participant's friends and relatives (3.4%), and nonpsychiatrist physicians (1.7%).

Participants from the Rhode Island MIDAS Project were drawn from a larger sample of 2,500 psychiatric outpatients age 18 or older presenting for treatment at the outpatient psychiatry practice of Rhode Island Hospital. This practice is affiliated with the same academic medical center as the BDD practice from which samples 1 and 2 were obtained, and the BDD practice and MIDAS project draw participants from the same geographic area. Participants were most frequently referred from primary care physicians (33.6%), family members/friends (15.1%), and mental health clinicians (14.9%). Individuals with significant cognitive limitations were excluded from the study.

No interrater reliability statistics are available for sample 1, since the last author was the sole rater for all assessments. In the second sample, interrater reliability data is not available for all DSM diagnoses, although Shrout-Fleiss interrater reliabilities for BDD severity ratings over the course of a year ranged from 0.91-1.00, with a mean reliability of 0.96, indicating excellent interrater reliability (Phillips et al., 2006b). In the third sample, a kappa derived from 65 interrater reliability evaluations for SP was 0.84. The percentage of BDD diagnoses in sample 3 was too low to derive a kappa from the same sample of 65 interrater reliability evaluations; however, the kappa for somatoform disorders (with which BDD is classified in DSM-IV) was 1.0.

2.2. Measures

All data were obtained by experienced clinical interviewers. This report's last author obtained all data from the first sample. Diagnostic raters for the other two samples included doctoral-level clinical psychologists and research assistants with bachelor's degrees in social or biological sciences. These individuals were extensively trained and closely supervised by each study's respective principal investigator (this report's third and last authors). For the second BDD sample, interviewer training involved watching and discussing videotapes and audiotapes of interviews conducted by this report's last author, watching training videotapes of the SCID training, conducting mock interviews with experienced interviewers, and being closely supervised during training sessions and initial interviews; all interviews were thoroughly edited by the last author and a senior clinician/researcher. Excellent interrater reliability was attained (Phillips et al., 2006b). For the MIDAS project sample, diagnostic raters underwent extensive training that included observing a senior diagnostic rater, conducting interviews while being observed by a senior diagnostician, and demonstrating excellent diagnostic reliability (Zimmerman and Mattia, 1999; Dalrymple and Zimmerman, 2011).

Participants from the first sample (BDD clinical and research program) were assessed with the Structured Clinical Interview for DSM-III-R (SCID-P; (Spitzer et al., 1992; Williams et al., 1992) because the SCID for DSM-IV was not yet available. Since a BDD assessment module was not included in the SCID-P for DSM-III-R, participants were assessed using a reliable semistructured interview based on DSM-IV criteria (Phillips et al., 1995) that followed the format of SCID assessments. All participants from the second and third samples (study on BDD's course and MIDAS project) were assessed with the Structured Clinical Interview for DSM-IV (SCID-I/P) (First et al., 1995) or the SCID I/NP (First et al., 1996) to diagnose BDD, SP, and comorbid disorders. Trichotillomania, which is not in the SCID, was assessed by using SCID-like modules based on DSM-IV criteria. Rates of PTSD, binge eating disorder, eating disorder NOS, and trichotillomania were available for only for samples 2 and 3.

Participants in both studies were also interviewed to obtain information on variables such as age of onset of BDD and SP, lifetime history of suicide attempts and psychiatric hospitalizations, and demographic characteristics (age, gender, marital status, educational attainment). The interviewer-rated Global Assessment of Functioning Scale (GAF) (First et al., 1996), a 100-point scale, assessed global functioning, with lower scores indicating poorer functioning and greater symptom severity.

Prior to combining samples for this report's primary analyses, we compared demographic and clinical characteristics of participants from each study (samples 1, 2, and 3). We compared differences between the BDD groups and the BDD/SP groups (not the SP group, because it was derived from only sample 3). Sample 1 had a higher rate of lifetime hospitalizations in the BDD and BDD/SP groups compared to samples 2 and 3. Only one difference was noted between samples 2 and 3 (i.e., significantly greater likelihood of hospitalization for the comorbid BDD/SP group in sample 2 compared to sample 3). When samples 1 and 2 (BDD studies) were combined and compared to sample 3 (BDD participants from MIDAS), few significant differences were observed on demographic and clinical variables (including GAF scores and comorbidity), indicating that the characteristics of participants in all samples were very similar and appropriate for combined analyses. No differences were observed between any samples in age, gender, marital status, educational attainment, history of suicidality, or GAF.

2.3. Statistical analyses

Means, standard deviations, frequencies, and percentages were calculated. Demographic features, clinical characteristics, and comorbidity were compared in the BDD, SP, and comorbid BDD/SP groups. For between-group comparisons of gender, chi-square tests were used. Gender and age were used as covariates in all analyses, since between-group differences related to age or gender could potentially confound the results (for example, age may affect the likelihood of a previous psychiatric hospitalization). Because any differences in marital status and educational attainment could represent important clinical differences between BDD and SP, we used these as dependent variables in our primary analyses, rather than as covariates. However, since differences in marital status and educational attainment may affect levels of functional impairment, we included these variables as covariates in a secondary analysis of GAF scores. Analysis of covariance (ANCOVA) was used for comparisons of continuous variables. Logistic regression analyses were used to compare differences between BDD, SP, and comorbid BDD/SP groups, and odds ratios were computed. The comorbid BDD/SP group was excluded from analyses of disorder age of onset. All tests were two tailed, and the alpha level was 0.05. Since this is the first study on this topic and is exploratory, we did not adjust the alpha level. To examine possible differences based on use of DSM-III-R criteria (used for sample 1) vs. DSM-IV criteria

(used for samples 2 and 3), additional separate comorbidity analyses were conducted comparing samples 2 versus 3.

3. Results

3.1. Demographic Features

As shown in Table 1, the SP group was significantly older than the BDD group. Individuals with BDD and with comorbid BDD/SP were less likely to ever get married than those with SP only. However, those with BDD only had significantly higher educational attainment than those with SP only, and the comorbid BDD/SP group had significantly higher educational attainment than the SP group.

3.2. Clinical Features

As shown in Table 2, SP had a significantly earlier age of onset than BDD. In the BDD/SP group, the mean age of onset for BDD was 16.8 years (SD=11.4 years), and the mean age of onset for SP in the BDD/SP group was 11.7 years (SD=5.8 years). Individuals in the BDD only group and those in the comorbid BDD/SP group had greater functional impairment as measured by the GAF than the SP only group. When controlling for educational attainment and marital status in a secondary analysis of GAF scores, the results did not change: the BDD only group and BDD/SP group both had significantly greater functional impairment than the SP group ($p=.001$ and $p<.001$, respectively). In addition, individuals with BDD and those with comorbid BDD/SP had a significantly greater likelihood of ever being psychiatrically hospitalized than individuals with SP only. No groups significantly differed with regard to a history of suicide attempts.

3.3. Comorbid Mental Disorders

As shown in Table 3, individuals with BDD only were significantly more likely than those with SP only to have comorbid lifetime OCD and eating disorders, including anorexia nervosa, bulimia nervosa, and eating disorder NOS (excluding binge eating disorder). Those with BDD only were also significantly more likely to have a psychotic disorder. Individuals with SP only were more likely to have dysthymia; a substance use disorder, including a comorbid alcohol use disorder; and an anxiety disorder, including panic disorder, generalized anxiety disorder (GAD), and posttraumatic stress disorder (PTSD) than individuals with BDD only.

The comorbid BDD/SP group was significantly more likely than the BDD only group to have a mood disorder, including comorbid major depressive disorder, dysthymia, an anxiety disorder, and a substance use disorder, including alcohol use disorder (Table 3). The comorbid BDD/SP group was more likely than the SP group to have comorbid major depressive disorder, a psychotic disorder, OCD, trichotillomania, and eating disorders, including anorexia nervosa and bulimia nervosa, as well as somatoform disorders, including hypochondriasis. The SP group was more likely than the comorbid BDD/SP group to have comorbid GAD (Table 3).

In separate analyses of samples 2 versus 3, nearly all of the results were the same as those reported for combined samples 1 and 2 above, with a few exceptions. Participants with BDD did not significantly differ from those with SP only with regard to bulimia nervosa (9.0% vs. 3.3%; $p=0.051$). However, individuals in the BDD only group were more likely than those in the SP only group to have a comorbid drug use disorder (35.9% vs. 21.6%; $p=0.007$). The BDD group and SP only group did not significantly differ with regard to comorbid alcohol use disorders ($p=0.267$).

4. Discussion

BDD and SP had similarities as well as differences. SP was associated with lower educational attainment and an earlier age of onset than BDD. BDD was associated with a higher likelihood of psychiatric hospitalizations, lower likelihood of marriage, and poorer global functioning on the GAF than SP. Variables like marital status and educational attainment are affected by factors such as family background, socioeconomic status, economic environment, aspirations, and attitudes (Forthofer et al., 1996; Luster and McAdoo, 1996; Smock, 1997; Walpole, 2003; Marjoribanks, 2005; Ou and Reynolds, 2008; Greenwood and Guner, 2009). In addition, marital status and educational attainment often reflect morbidity in psychiatric disorders, as psychiatric disorders are associated with substantial social costs and psychosocial impairment (Kessler et al., 1995; Forthofer et al., 1996). Lower rates of marriage and educational attainment in BDD and SP are highly correlated with poorer psychosocial functioning and quality of life (Safren et al., 1996-1997; Didie et al., 2006; Marques et al., 2011), and they can be a direct manifestation of impaired functioning in the sense that anxiety over negative evaluation may prevent individuals with these disorders from engaging in relationships and interacting with people in educational settings (Kessler, 2003; Phillips, 2005). Therefore, lower rates of marriage and educational attainment in BDD and SP, respectively, may reflect not only demographic differences but also differences in areas of psychosocial functioning. Overall, psychosocial functioning was poorer across more domains in the BDD group than the SP group, as BDD subjects had poorer GAF scores and a higher rate of psychiatric hospitalization.

As expected, the comorbid BDD/SP group showed the greatest morbidity, having the lowest mean GAF score and the highest rates of psychiatric hospitalization, but the BDD/SP group was significantly worse in these domains only in comparison to the SP only group (not the BDD only group). In addition, the comorbid BDD/SP group had lower rates of ever being married than the SP group, and higher educational attainment than the SP only group, which mirror the same differences found between the BDD only and SP only groups. The fact that few differences were found between the BDD and BDD/SP group, whereas more differences were found between the BDD/SP group and the SP only group, could represent the composition of the BDD/SP group, the majority of whom were ascertained for BDD (68%). Overall, the addition of comorbid SP to BDD does not appear to significantly increase the risk of poorer functioning on top of the apparent impact of BDD itself.

In partial support of our hypothesis, comorbid OCD and eating disorders, but not hypochondriasis and trichotillomania, were more common in individuals with BDD than in those with SP (power was limited, however, for analyses of the latter two disorders). In addition, among the BDD/SP group -- which consisted primarily of individuals with primary BDD -- comorbid OCD, eating disorders, hypochondriasis, and trichotillomania were more common than in the SP only group. All of these disorders have been variously considered to be OC-spectrum disorders (Hollander et al., 2007; Phillips and Kaye, 2007a; Phillips et al., 2010). These results are consistent with research suggesting that BDD has a strong relationship to OCD across a number of domains, including comorbidity, familiality, treatment approaches, clinical features, and underlying neurobiology (Rauch et al., 2003; Phillips and Kaye, 2007; Feusner et al., 2010; Phillips et al., 2010). Indeed, BDD has historically been considered to have a close relationship to OCD and is often considered an obsessive-compulsive spectrum disorder (Cohen and Hollander, 1997; Goldsmith et al., 1998; Mataix-Cols et al., 2007; Phillips et al., 2010). In fact, current recommendations for BDD's classification in DSM-5 includes formally classifying BDD as an OC-spectrum disorder (Phillips et al., 2010).

Both the BDD and comorbid BDD/SP groups were more likely to have a psychotic disorder than individuals with SP only (psychotic BDD symptoms – i.e., delusional BDD beliefs or delusions of reference -- did not count toward a psychotic disorder diagnosis). This finding is interesting, given that delusional beliefs about appearance are common in individuals with BDD; 39%-60% of those with BDD currently have delusional BDD beliefs (Phillips, 2004; Phillips et al., 2006a; Mancuso et al., 2010). The relationship between BDD and psychotic disorders has received virtually no investigation and needs to be studied.

In contrast, non-OCD anxiety disorders (GAD, panic disorder, and PTSD) were more common in individuals with SP only than in those with BDD only, suggesting relatedness between SP and these other anxiety disorders. This study's findings support previous research showing that OC-spectrum disorders tend to be more prevalent in other OC-spectrum disorders (Richter et al., 2003), whereas non-OCD anxiety disorders are highly comorbid with other non-OCD anxiety disorders (Brown and Barlow, 1992; Rodriguez et al., 2004; Kessler et al., 2005).

Individuals with SP (both the SP only and BDD/SP groups) had elevated rates of dysthymia compared to those with BDD only; more research is necessary to understand potential reasons for this finding. A possible explanation that deserves investigation is that many patients with BDD appear to have fairly chronic major depression and thus are not eligible for a diagnosis of dysthymia.

We found significantly higher rates of alcohol use disorders in the SP group compared to the BDD group; however, we did not find a significant difference between SP and BDD in our separate analyses that used only DSM-IV criteria for alcohol use disorders. It is worth noting the very high rates of alcohol use disorders in the comorbid BDD/SP group (52.4%). These findings support an extensive literature demonstrating that SP and alcohol use disorders commonly co-occur (Grant et al., 2005a; Boschloo et al., 2011), with alcohol often being reported as a method of coping with anxiety and distress associated with social interactions (Morris et al., 2005). This may also be the case with BDD, as 68% of individuals with both BDD and a substance use disorder report that BDD contributes to their substance use (Grant et al., 2005b). The present study's findings of high rates of alcohol use disorders in both SP and BDD, as well as a higher prevalence of a drug use disorder in BDD than in SP in analyses that used only DSM-IV criteria, deserve further investigation.

Lifetime rates of comorbid major depression were notably high across all groups (BDD: 71%; SP: 73%; and comorbid BDD/SP: 82%), as were lifetime rates of attempted suicide (26%-30%), with no significant differences among groups. These findings support previous research showing these two disorders are associated with elevated rates of depression (Fava et al., 2000; Gunstad and Phillips, 2003; Buhlmann et al., 2010; Mathew et al., in press) and suicidality (Cougle et al., 2006; Phillips and Menard, 2006; Stein, 2006).

It is interesting that BDD and SP did not significantly differ in terms of comorbid somatoform disorders, except for an elevated rate of hypochrondriasis in the comorbid BDD/SP group compared to the SP only group. In fact, few individuals in the BDD group were diagnosed with a somatoform disorder, despite BDD being classified in DSM-IV as a somatoform disorder. The lack of significant differences between groups may be due to limited statistical power; however, it is worth noting that the rate of somatization disorder was actually higher in SP than BDD. These results support the current view of BDD as having few similarities with other somatoform disorders (Phillips et al., 2010), including fewer somatic/somatization symptoms in individuals with BDD compared to norms for psychiatric outpatients with a variety of diagnoses (Phillips et al., 2004).

This study has several limitations. Shared severity measures were not available across samples, so it is not possible to compare the relative severity of SP vs. BDD. In addition, participants from the BDD studies could be considered self-selecting because they participated in these studies due to their BDD symptoms, whereas individuals from the outpatient clinic (sample 3) presented for assessment and treatment of a range of psychiatric disorders. Indeed, most SP participants in sample 3 were not seeking treatment primarily for SP (Dalrymple and Zimmerman, 2011); however, it is also likely that not all participants in sample 2 sought their current treatment primarily for BDD (data on this issue are not available). Findings regarding the higher rate of psychiatric hospitalization for BDD vs. SP should be interpreted with caution, as BDD subjects in sample 1 had a higher rate of psychiatric hospitalizations than BDD subjects in samples 2 and 3, and BDD/SP subjects in sample 2 had a higher rate of psychiatric hospitalizations than BDD/SP subjects in sample 3. However, no other differences were observed for the other demographic and clinical variables among BDD subjects, or among BDD/SP subjects, in the three samples.

Although all samples utilized DSM-IV criteria for diagnosing BDD, comorbidity in the SP sample was assessed only with DSM-IV criteria whereas comorbidity for some of the BDD sample was assessed with DSM-III-R criteria. Thus, some between-group differences may possibly be due to differences in diagnostic criteria between DSM-III-R and DSM-IV. However, concordance for DSM-III-R and DSM-IV Axis I diagnoses is excellent for anxiety and mood disorders, bulimia nervosa, and drug abuse and dependence (Sunday et al., 2001). DSM-III-R and DSM-IV criteria for alcohol abuse and dependence and anorexia nervosa criteria significantly changed between DSM-III-R and DSM-IV (Rounsaville et al., 1993; Sunday et al., 2001). Indeed, in separate analyses of the second and third samples, both of which used only DSM-IV criteria, the findings for alcohol use disorders did differ from the primary analyses, as discussed above. However, in analyses that used only DSM-IV criteria, anorexia nervosa remained more prevalent in the BDD groups than the SP group. Overall, other than a few differences, the same pattern of comorbidity results still held when analyses were restricted to participants who were diagnosed with DSM-IV criteria.

Although recruitment methods and sources differed between the two recruitment sites, participants came from the same geographical location, and we made the samples as similar as possible by including only individuals who were seeking or receiving mental health treatment at the time of assessment. Furthermore, analyses between the BDD (samples 1 and 2) and MIDAS samples (sample 3) indicated that they were similar in terms of demographic and clinical characteristics, including marital status, level of educational attainment, history of suicide attempts, GAF scores and comorbidity. In addition, the participants were similar across many features, including age range, gender representation, mental health treatment status, and geographical area of ascertainment. However, the samples used in the present study may not be representative of all patients in the United States or those in other countries with BDD and SP. BDD participants in samples 1 and 2 (BDD studies) are not random samples of individuals with BDD, since they were referred or sought an assessment and treatment for BDD. In addition, the BDD and SP samples from Rhode Island Hospital may be not representative samples of individuals with social phobia, BDD, or both disorders, since they were a sample of individuals who were seeking mental health treatment. Future comparison studies of BDD and SP would benefit from the use of more similarly ascertained samples and samples that may be more representative of the general population of individuals with BDD and SP.

Another limitation is that interrater reliability was not established between the two recruitment sources; however, this report's third and last authors have extensive experience in administration of diagnostic measures and they extensively trained and supervised study staff. The study also has several strengths, including the use of rigorous assessment

methods, large sample sizes, and being the first study to directly compare demographic and clinical features of BDD and SP, including comorbidity patterns.

In summary, this study indicates that BDD and SP have similarities as well as differences. Clinical observations suggest that these disorders have important differences that this study did not examine – for example, BDD is characterized by distorted body image, prominent and time-consuming repetitive behaviors (e.g., mirror checking, skin picking), abuse of anabolic steroids (in patients with the muscle dysmorphia form of BDD), and pursuit of usually ineffective surgical, dermatologic, and other cosmetic treatments as a symptom of their disorder. Indeed, this study's finding of differences across a number of variables suggests that they are not the same disorder, as indicated in prior studies (Phillips and Stout, 2006), although BDD and SP may be closely related (Fang and Hofmann, 2010; Phillips et al., 2010). Future studies are needed to confirm these findings and address possible similarities and differences between BDD and SP across a broader range of variables. In addition, future prospective studies are needed on etiological pathways of BDD vs. SP (e.g., differences between individuals with BDD who develop SP first compared to those who develop BDD first) and on the relationship between different subtypes of SP to BDD. Further evaluation of the relationship between BDD and SP will be clinically useful and may also lead to the development of more effective treatments that can target these disorders' unique and shared features.

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Table 1

Demographic Features in BDD, Social Phobia, and BDD/Social Phobia

Variable	BDD (n = 172)	SP (n = 644)	Comorbid BDD/SP (n = 125)	Test Statistic	df	p
Gender (% male)	69 (40.1)	241 (37.4)	57 (45.6)	$\chi 2 = 3.05$	2	0.217
Age (SD)	33.9 (11.2)	36.8 (11.7)	34.4 (10.7)	F = 5.91	2, 938	0.003

	BDD (n = 172)	SP (n = 644)	Comorbid BDD/SP (n = 125)	OR: BDD vs. SP	p	OR: BDD vs. Comorbid BDD/SP	p	OR: SP vs. Comorbid BDD/SP	p
Marital Status									
Never married (%)	109 (63.4)	289 (44.9)	79 (63.2)	1.89 (1.26-2.85)	0.002	0.93 (0.53-1.63)	0.796	0.49 (0.31-0.79)	0.003
Educational Attainment									
High school/GED or less (%)	43 (25.7)	234 (36.3)	31 (25.0)	0.62 (0.42-0.91)	0.015	1.04 (0.61-1.78)	0.887	1.67 (1.08-2.60)	0.021

Note. BDD = Body Dysmorphic Disorder, SP = Social Phobia, Comorbid BDD/SP = Comorbid Body Dysmorphic Disorder and Social Phobia; Age: BDD<SP, p=0.008.

Table 2

Clinical Features in BDD versus Social Phobia versus Comorbid BDD/Social Phobia

Variable	BDD (n = 172)	SP (n = 644)	Comorbid BDD/SP (n = 125)	Test Statistic	df	p
Age at onset (SD)	16.9 (7.9)	12.1 (8.6)	no comp	F = 44.37	1, 814	<0.001
GAF (SD)	46.8 (12.0)	49.9 (9.3)	43.9 (9.3)	F = 17.69	2, 843	< 0.001

Variable	BDD (n = 172)	SP (n = 644)	Comorbid BDD/SP (n = 125)	OR: BDD vs. SP	p	OR: BDD vs. Comorbid BDD/SP	p	OR: SP vs. Comorbid BDD/SP	p
Any Psychiatric Hospitalizations (%)	85 (49.4)	181 (28.1)	64 (51.2)	0.41 (0.29-0.58)	<0.001	1.09 (0.69-1.73)	0.724	2.65 (1.79-3.92)	<0.001
Ever Attempted Suicide (%)	44 (26.3)	176 (27.4)	37 (30.3)	1.11 (0.75-1.65)	0.592	1.27 (0.75-2.14)	0.377	1.14 (0.74-1.75)	0.557

Note. BDD = Body Dysmorphic Disorder, SP = Social Phobia, Comorbid BDD/SP = Comorbid Body Dysmorphic Disorder and Social Phobia, GAF = Global Assessment of Functioning; GAF: BDD<SP, p=0.008; Comorbid BDD/SP<SP, p<0.001.

Table 3

Lifetime Comorbid disorders in BDD versus Social Phobia versus Comorbid BDD/Social Phobia

Lifetime Psychiatric Diagnosis	BDD (n = 172)	SP (n = 644)	Comorbid BDD/SP (n = 125)	OR: BDD vs. SP	p	OR: BDD vs. Comorbid BDD/SP	p	OR: SP vs. Comorbid BDD/SP	p
Mood Disorders	138 (80.2)	538 (83.5)	111 (88.8)	1.13 (0.73-1.76)	0.572	1.99 (1.01-3.92)	0.046	1.76 (0.96-3.20)	0.066
Major depression	122 (70.9)	469 (72.8)	102 (81.6)	1.02 (0.70-1.48)	0.932	1.84 (1.05-3.23)	0.034	1.81 (1.11-2.95)	0.018
Bipolar disorder†	15 (8.7)	54 (8.4)	7 (5.6)	0.97 (0.53-1.76)	0.908	0.63 (0.25-1.58)	0.321	0.65 (0.29-1.46)	0.295
Dysthymia	8 (4.7)	76 (11.8)	19 (15.3)	2.73 (1.29-5.78)	0.009	3.67 (1.55-8.70)	0.003	1.35 (0.78-2.33)	0.285
Psychotic disorder	11 (6.4)	9 (1.4)	6 (4.8)	0.22 (0.09-0.56)	0.001	0.71(0.25-2.00)	0.516	3.17 (1.10-9.16)	0.033
Anxiety Disorders	87 (50.6)	444 (68.9)	79 (63.2)	2.15 (1.52-3.04)	<0.001	1.73 (1.08-2.78)	0.023	0.81 (0.54-1.21)	0.295
Panic disorder	33 (19.2)	216 (33.5)	32 (25.6)	2.08 (1.37-3.14)	0.001	1.46 (0.84-2.54)	0.182	0.70 (0.46-1.09)	0.113
Specific phobia	21 (12.2)	116 (18.0)	24 (19.2)	1.55 (0.94-2.56)	0.870	1.78 (0.94-3.38)	0.078	1.15 (0.70-1.88)	0.590
GAD	6 (3.5)	178 (27.6)	9 (7.2)	10.29 (4.47-23.69)	<0.001	2.17 (0.75-6.26)	0.153	0.21 (0.10-0.43)	<0.001
PTSD*	12 (15.4)	184 (28.6)	16 (20.5)	2.36 (1.24-4.50)	0.009	1.45 (0.63-3.32)	0.381	0.61 (0.34-1.10)	0.099
OCD	53 (30.8)	86 (13.4)	43 (34.4)	0.36 (0.24-0.54)	<0.001	1.20 (0.73-1.96)	0.476	3.33 (2.15-5.15)	< 0.001
Substance use disorders	69 (40.1)	303 (47.0)	65 (52.4)	1.44 (1.01-2.62)	0.045	1.62 (1.01-2.62)	0.047	1.13 (0.76-1.68)	0.544
Alcohol	51 (29.7)	271 (42.1)	54 (43.2)	1.82 (1.25-2.63)	0.002	1.77 (1.09-2.89)	0.022	0.97 (0.66-1.45)	0.896
Drugs	48 (27.9)	139 (21.6)	37(29.8)	0.77 (0.52-1.13)	0.177	0.77 (0.65-1.81)	0.768	1.41 (0.91-2.19)	0.120
Eating Disorders	40 (23.3)	103 (16.1)	35 (28.0)	0.63 (0.41-0.96)	0.032	1.43 (0.82-2.48)	0.204	2.28 (1.43-3.64)	0.001
Anorexia nervosa	9 (5.2)	11 (1.7)	11 (8.8)	0.32 (0.13-0.80)	0.014	1.89 (0.75-4.76)	0.177	5.87 (2.46-14.02)	<0.001
Bulimia nervosa	14 (8.1)	21 (3.3)	9 (7.2)	0.38 (0.19-0.77)	0.008	0.96 (0.39-2.34)	0.924	2.52 (1.11-5.75)	0.028
Binge Eating Disorder*	7 (9.0)	39 (6.1)	9 (11.5)	0.65 (0.28-1.52)	0.317	1.29 (0.45-3.67)	0.637	1.98 (0.92-4.28)	0.081
Eating Disorder NOS*	11 (14.1)	40 (6.3)	8 (10.3)	0.48 (0.23-0.99)	0.048	0.75 (0.28-2.03)	0.576	1.58 (0.70-3.56)	0.273
Somatoform Disorders	9 (5.2)	25 (3.9)	10 (8.0)	0.71 (0.33-1.57)	0.401	1.62 (0.64-4.11)	0.314	2.26 (1.05-4.86)	0.037
Somatization disorder	1 (0.6)	8 (1.2)	3 (2.4)	2.15 (0.27-17.37)	0.474	4.37 (0.45-42.65)	0.204	2.04 (0.53-7.86)	0.301
Pain disorder	4 (2.3)	9 (1.4)	2 (1.6)	0.61 (0.18-2.01)	0.412	0.67 (0.12-3.73)	0.649	1.11 (0.24-5.24)	0.895

Lifetime Psychiatric Diagnosis	BDD (n = 172)	SP (n = 644)	Comorbid BDD/SP (n = 125)	OR: BDD vs. SP	p	OR: BDD vs. Comorbid BDD/SP	p	OR: SP vs. Comorbid BDD/SP	p
Hypochondriasis	6 (3.5)	10 (1.6)	6 (4.8)	0.41 (0.15-1.16)	0.095	1.45 (0.46-4.64)	0.529	3.51 (1.24-19.91)	0.018
Other Trichotillomania *	1 (1.3)	4 (0.6)	3 (3.8)	0.53 (0.06-4.86)	0.574	3.19 (0.32-31.62)	0.323	6.02 (1.32-27.54)	0.021

Note. BDD = Body Dysmorphic Disorder, SP = Social Phobia, Comorbid BDD/SP = Comorbid Body Dysmorphic Disorder and Social Phobia

† Both Bipolar I and II

* Information for these disorders was only available for the second and third samples (n=800).