Running Head: CORRELATES OF QUALITY OF LIFE

Word Count: 10,565

Tables: 5

Figures: 0

Correlates of Quality of Life and Functional Disability in Body Dysmorphic Disorder

Nicole J. LeBlanc

Tufts University, Medford MA

Massachusetts General Hospital, Boston MA

Abstract

Objective: Body Dysmorphic Disorder (BDD) is a chronic mental illness characterized by low quality of life and functional disability across multiple domains. Despite the clinical importance of understanding psychosocial impairment in BDD, there has been little research examining the factors that contribute to these outcomes. The present study was designed to examine the socio-demographic and clinical correlates of low quality of life as well as work, social, and family disability in a sample of individuals with BDD symptoms. **Method:** Participants completed an internet survey designed to gather information on demographics, BDD phenomenology, treatment, and impairment. Participants' surveys were included in the final sample (N=256) only if they had completed all study measures and received a score of ≥ 16 on the 10-item Yale-Brown Obsessive Compulsive Scale, Modified for BDD (BDD-YBOCS), indicating the presence of clinical BDD symptoms. Quality of life and functional disability were assessed with the Quality of Life Enjoyment and Satisfaction Scale – Short Form (Q-LES-Q SF) and the Sheehan Disability Scale (SDS). **Results:** BDD symptom severity was negatively associated with quality of life and positively associated with disability in all domains. In addition, being female, having no medical insurance, being older, having more severe depression symptoms, having more severe anxiety symptoms, and having more body-parts concerns were predictive of lower quality of life. Public medical insurance and more severe depression symptoms were predictive of greater work disability while Asian ethnicity, single marital status, and more severe depression symptoms were predictive of greater social disability. Older age, more severe depression symptoms, and more severe anxiety symptoms were predictive of increased family disability. **Conclusion:** Results suggest the multidimensional nature of quality of life and functional disability. Implications for research and treatment are discussed.

Correlates of Quality of Life and Functional Disability in Body Dysmorphic Disorder

Body Dysmorphic Disorder (BDD) is a debilitating mental disorder that is characterized by the presence of an excessive preoccupation with a slight or imagined defect in physical appearance (APA, 2000). To merit a diagnosis of BDD, this preoccupation must cause clinically significant distress and/or impairment and must not be better accounted for by another mental disorder such as anorexia nervosa (APA, 2000). Individuals with the disorder most often endorse preoccupations with the skin, hair, face, and body shape, however any body part can become the focus of fixation in BDD (Phillips, Menard, Fay, & Weisberg, 2005; Veale, Boocock, Gournay, & Dryden, 1996), and the majority of individuals with BDD report excessive concern with more than one body part (APA, 2000; Veale, et al., 1996). BDD patients often engage in frequent checking of their perceived defect as well as repetitive safety behaviors (e.g., excessive grooming, make-up application, camouflaging, and skin-picking) that are performed to lessen anxiety about the defect (APA, 2000; Phillips, Menard, Fay, & Weisberg, 2005). Insight in BDD is characteristically poor or absent, with approximately 35-40% of BDD patients holding their appearance beliefs with a delusional intensity (Eisen, Phillips, Coles, & Rasmussen, 2004; Phillips, Didie, et al., 2006). The result is that many BDD patients seek non-psychiatric treatments, such as cosmetic surgery, to fix their perceived defect and are often reluctant to accept psychiatric interventions (Phillips, Didie, et al., 2006).

BDD is a fairly common psychological disorder, with point prevalence estimates of 0.7%-2.4% in the general population (Koran, Abujaoude, Large, & Serpe, 2008; Otto, Wilhelm, Cohen, & Harlow, 2001; Rief, Buhlmann, Wilhelm, Borkenhagen, & Brachler, 2006) and 6.7%-16% in the psychiatric inpatient population (Conroy, et al., 2008; Dyl, Kittler, Phillips, & Hunt, 2006; Grant, Kim, & Crow, 2001). The disorder is slightly more prevalent in women than in

men (Rief, Buhlmann, Wilhelm, Borkenhagen, et al., 2006) and is commonly found in dermatology and in cosmetic surgery patient populations (Phillips, 2006). Onset is typically in adolescence (Phillips, Menard, Fay, & Weisberg, 2005) after which point the disorder assumes a chronic course with low rates of remission (Phillips, Pagano, Menard, & Stout, 2006). Individuals with BDD also suffer from high rates of psychiatric comorbidity, with the most common comorbid disorders being major depressive disorder (MDD), social anxiety disorder (SAD), obsessive-compulsive disorder (OCD), and substance use disorders (Gustad & Phillips, 2003). Individuals with BDD also report extremely high rates of suicidal ideation, suicide attempts, and completed suicide (Phillips & Menard, 2006; Rief, Buhlmann, Wilhelm, Brachler, & Borkenhagen, 2006). The suicide rate for BDD is approximately 45 times higher than the rate for the general United States population and is higher than rates reported for individuals with MDD, eating disorders, and bipolar disorder (Phillips, 2007).

Considering the distress, comorbidity, and mortality associated with BDD, it is not surprising that individuals who suffer from the disorder report extremely low quality of life. Decrements in quality of life have been documented in numerous studies and across a variety of BDD populations (Phillips, Conroy, et al., 2006; Phillips, Didie, et al., 2006; Pope, et al., 2005; Ruffolo, Phillips, Menard, Fay, & Weisberg, 2006). One study demonstrated that BDD patients' scores on the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36) mental health-related quality of life subscale were 2.1 standard deviations poorer than U.S. population norms and 0.44 standard deviations poorer than means for patients with depression/dysthymia (Phillips & Rasmussen, 2004). In another study, researchers used the Quality of Life Enjoyment and Satisfaction Questionnaire Short Form (Q-LES-Q SF) to measure quality of life and found that BDD participants had a mean converted score of 49.9%, which was 2.2 standard deviations

lower than community norms as well as lower than means reported for patients with MDD, dysthymia, SAD, panic disorder (PD), and posttraumatic stress disorder (PTSD; Phillips, Menard, Fay, & Pagano, 2005). Together these studies demonstrate that individuals with BDD have extremely poor quality of life and often report far lower quality of life than individuals with many other mental disorders.

Pervasive impairment across multiple domains of functioning is another central feature of BDD (Phillips, Menard, Fay, & Pagano, 2005; Phillips & Rasmussen, 2004). Individuals with BDD often find their preoccupation difficult to control and devote hours each day to thinking about and attempting to hide their perceived defect (APA, 2000). For individuals with BDD, the result of devoting so much time and energy to the disorder is severe functional disability associated with work, school, leisure activities, household functioning, and social situations (APA, 2000; Phillips, Menard, Fay, & Pagano, 2005; Phillips, Quinn, & Stout, 2008; Phillips & Rasmussen, 2004). Researchers have used the Range of Impaired Functioning Tool (LIFE-RIFT) and the Global Assessment of Functioning (GAF) to evaluate global disability in BDD and have consistently found BDD patients to score at the most severe end of the spectrum (Phillips, Menard, Fay, & Pagano, 2005; Phillips & Rasmussen, 2004). Furthermore, prospective research demonstrates that global functioning in BDD remains stably poor over time (Phillips, et al., 2008).

Individuals with BDD suffer particularly from occupational disability. In some studies, a full 100% BDD patients report some job/academic interference imposed by BDD, and as many as 77% report that this interference is moderate, severe, or extreme (Phillips & Diaz, 1997; Phillips, Menard, Fay, & Weisberg, 2005). A significant percentage of individuals with BDD are not working (36-39%) or attending school (32%) because of psychopathology (Didie,

Menard, Stern, & Phillips, 2008; Phillips & Diaz, 1997; Phillips, Menard, Fay, & Pagano, 2005). In addition, many BDD patients (17-23%) receive disability insurance (Didie, et al., 2008; Phillips, Menard, Fay, & Weisberg, 2005). These data are striking and demonstrate that BDD symptoms significantly impair an individual's ability to fulfill basic role obligations at work and school.

Disability associated with social and family situations is also common for individuals with BDD. Shame about their perceived defect may cause individuals with BDD to avoid public activities, leading to extreme social isolation (APA, 2000). In severe cases, avoidance of social situations may cause BDD patients to become completely housebound (Hollander & Aronowitz, 1999). BDD sufferers often have few friends, avoid dating, and experience marital difficulties or divorce (APA, 2000; Phillips, 1996), perhaps explaining why a relatively small percentage (24%) of individuals with BDD are married (Veale, et al., 1996). In fact, 100% of BDD sufferers report some social interference imposed primarily by BDD (Phillips, Menard, Fay, & Weisberg, 2005). Researchers using standardized measures of psychosocial functioning have reported that BDD patients demonstrate poor functioning in relation to friends, extended family members, parents, the family unit, and primary relationships (Phillips, Menard, Fay, & Pagano, 2005). BDD is also highly comorbid with SAD, and it is believed that SAD may precede the onset of BDD in many cases (Coles, et al., 2006). Overall, BDD patients demonstrate extremely poor social and familial functioning, often leading to the loss of important relationships and social isolation (Phillips, Menard, Fay, & Pagano, 2005).

Despite the diminished quality of life and extreme disability associated with BDD, there has been little research on the correlates of quality of life and disability for individuals with this disorder. One study demonstrated that there is a negative relationship between BDD symptom

severity and quality of life and a positive relationship between BDD symptom severity and functional disability (Phillips, Menard, Fay, & Pagano, 2005). However in this study, BDD symptom severity accounted for only a small portion of the variance in participants' quality of life and disability scores (Phillips, Menard, Fay, & Pagano, 2005). For example, participants' scores on the Yale-Brown Obsessive Compulsive Scale Modified for BDD (BDD-YBOCS), a measure of BDD symptom severity, accounted for only 8% of the variance in participants' Q-LES-Q SF scores. In addition, studies demonstrate that treatment results in small (Phillips & Rasmussen, 2004) or nonexistent (Phillips, Menard, Fay, & Weisberg, 2005) differences in quality of life and disability scores for individuals with BDD. Together these studies illustrate that factors other than symptom severity impact quality of life and disability for individuals with BDD, and that these additional factors are likely not being addressed by standard BDD treatments that exclusively target symptom improvement.

Studies of related psychological disorders, such as MDD and OCD, provide evidence that socio-demographic and clinical variables such as age, ethnicity, education, employment status, marital status, insurance status, age of disorder onset, and comorbid psychological disorders are relevant to our understanding of quality of life and functional disability for individuals with mental illness (Rodriguez-Salgado, et al., 2006; Trivedi, et al., 2006). However, very few studies have examined individual correlates of quality of life and functional disability in BDD. Preliminary research indicates that delusional symptoms and comorbid depression are negatively associated with quality of life in individuals with BDD (Phillips, 2000; Phillips, Didie, & Menard, 2007). Being older, being male, having less education, and having comorbid depression have also been linked to worse occupational functioning for BDD patients (Didie, et al., 2008; Phillips, et al., 2007). However, no study has systematically examined the composite

relationship between numerous socio-demographic and clinical variables on impairment in BDD. The goal of the present study was to address this gap in the literature.

An understanding of the correlates of functional disability and quality of life in BDD will be of direct relevance to mental-health clinicians who treat the disorder. Data on the correlates of quality of life could be used to identify those BDD patients especially at risk of suffering from diminished quality of life and to predict treatment adherence and outcome for BDD patients (Basu, 2004; Fogel, Fauerbach, Ziegelstein, & Bush, 2004; Pyne, et al., 2001). In addition, this information could help clinicians directly target improvements in quality of life in treatment and set realistic treatment goals for patients (Basu, 2004). Likewise, information about the correlates of functional disability in BDD will be invaluable to clinicians, as functional disability may require interventions and research efforts that differ from those required for psychiatric symptoms (Didie, et al., 2008). The development of treatments that successfully reduce functional disability in BDD could help lessen the economic impact of the disorder by reducing the number of patients who are unemployed or who receive disability insurance (Didie, et al., 2008).

Considering the clinical importance of understanding quality of life and functional disability in BDD, the goal of the present study was to investigate the correlates of these constructs in a sample of individuals with BDD symptoms. Bearing in mind prior research on BDD, we hypothesized that BDD symptom severity would be negatively associated with quality of life and positively associated with functional disability in all domains (Didie, et al., 2008; Phillips, Menard, Fay, & Pagano, 2005; Phillips, et al., 2008). Also in accordance with the BDD literature, we hypothesized that neither gender (Phillips, Menard, & Fay, 2006) nor treatment status (Phillips, Menard, Fay, & Weisberg, 2005) would be associated with differences in quality

of life and functional disability for participants in the present study. Considering prior research on both BDD and OCD, we predicted that depressive symptom severity would be negatively associated with quality of life and positively associated with functional disability (Phillips, et al., 2007; Rodriguez-Salgado, et al., 2006). In addition, in light of research demonstrating that ethnic minorities in the United States have lower health-related quality of life than Caucasian Americans (Services, 2001), we hypothesized that Asian Americans, African Americans and Latinos with BDD symptoms would report lower quality of life and more functional disability than Caucasians with BDD symptoms. Finally, we hypothesized that additional socio-demographic and clinical variables such as education, marital status, employment status, insurance status, age, age of onset, anxiety symptoms, and the number of body parts of concern would be relevant to our understanding of quality of life and functional disability in BDD, as similar variables have been identified as correlates of quality of life and functional disability in MDD and/or SAD (Acarturk, Graaf, Straten, Have, & Cuijpers, 2008; Trivedi, et al., 2006). However due to the lack of prior research on these variables and quality of life/functional disability in BDD, no specific directional hypotheses were made for these variables.

In order to evaluate these hypotheses in the present study, we used an internet survey to collect information on demographics, BDD phenomenology, quality of life, and functional disability from individuals with self-reported BDD symptoms. We then used multiple regression to determine which socio-demographic and clinical variables were uniquely predictive of poor quality of life as well as work, social, and family disability, while controlling for other significant socio-demographic and clinical variables including BDD symptom severity.

Method

Study Procedure

The present study was part of a larger internet survey that was designed to examine the epidemiological characteristics of individuals with BDD symptoms. The internet survey was created and managed through the website surveymonkey.com (Finley, 1999). Participants accessed the survey through an internet link that was posted in study advertisements. Upon entering the survey, participants were first required to read and agree to an informed consent page. Participants then went on to complete a series of questionnaires and measures designed to gather information on demographics, BDD symptoms, and BDD phenomenology. Because of the lack of prior research on this topic, the socio-demographic and clinical variables used in the present study were modeled after variables used in a similar investigation on quality of life in depression (Trivedi, et al., 2006). The survey instructions indicated that participants could skip any question they did not want to answer. After submitting the survey, participants were given a $10 electronic gift certificate. To discourage duplicate responses, only one survey could be submitted from a single IP address. The Massachusetts General Hospital and Tufts University Institutional Review Boards reviewed and approved all study procedures.

Study Participants

Participants were recruited through advertisements posted on BDD clinic websites, in online BDD forums, and on billboards in the Boston, Massachusetts area. Advertisements called for individuals who had body image concerns, were at least 18 years old, and were proficient in reading and writing English. Data were collected from a total of 782 participants during the time that the internet survey was active (November 2008 – January 2009). The sample was then limited to those surveys that met the following inclusion criteria: (1) participants had to have completed all study measures and (2) participants had to have scored greater than or equal to 16 on the 10-item BDD-YBOCS. A cut-off score of greater than or equal to 16 on the BDD-

YBOCS was used because scores in this range are generally considered to be consistent with a diagnosis of BDD (Phillips, Hollander, Rasmussen, & Aronowitz, 1997). Surveys were excluded if participants indicated on the Body Dysmorphic Disorder Questionnaire (BDDQ) that their primary body image concerns were weight concerns. A total of 256 participants met full inclusion criteria for the present study and comprised the final sample used for data analysis.

Measures

Assessment of socio-demographic and clinical variables. A multiple choice demographics questionnaire was used to obtain characteristics of the present sample. This questionnaire asked participants about their age, sex, ethnicity, education, marital status, employment status, and insurance status.

Depression Anxiety Stress Scales – 21 Item Version (DASS-21; Lovibond, 1995). The DASS-21 was used to measure participants' symptoms of depression (sadness, worthlessness, *etc.*) and anxiety (physical arousal, fear, *etc.*) over the past week. Individual items are scored on a four-point Likert scale with zero indicating no symptoms and three indicating symptoms present most of the time. The seven items for each subscale are then summed and multiplied by two to obtain the Depression, Anxiety, and Stress Subscale scores. Higher scores are indicative of more severe symptoms. The DASS-21 has demonstrated excellent internal consistency (α = 0.82-0.94 for Depression and 0.87-0.9 for Anxiety) as well as good convergent and discriminant validity (Antony, Bieling, Cox, Enns, & Swinson, 1998; Crawford & Henry, 2003; Henry & Crawford, 2005). The DASS-21 Depression and Anxiety subscales demonstrated excellent reliability in this sample (α= 0.91 and α = 0.86, respectively).

Treatment History Questionnaire (THQ). The THQ was designed for the present study to assess participants' lifetime treatment utilization for BDD. The items in this questionnaire were

modeled after items used in previous studies that have examined similar treatment history variables (Cachelin, Rebeck, Veisel, & Striegel-Moore, 2001). Specifically, the THQ was used in the present study to assess the age of BDD symptom onset and participants' current treatment status. BDD onset was measured with the question, "At what age in years did your BDD symptoms first appear?" and treatment status was assessed with the questions, "Are you still in treatment currently?"

Measures of Body Dysmorphic Disorder symptoms and sequalae.

The Yale Brown Obsessive-Compulsive Scale Modified for BDD (BDD-YBOCS; Phillips, Hollander, Rasmussen, Aronowitz, et al., 1997) was used to assess the severity of BDD symptoms over the past week. The 10-item version of the BDD-YBOCS was adapted for the present study to make it appropriate for use as a self-report measure. Scores on the 10-item BDD-YBOCS range from 0-40 with higher scores indicating more severe BDD symptoms. The original 12-item version of the BDD-YBOCS has good reliability, factor structure, convergent and discriminant validity, and sensitivity to change, and the 10-item version has been shown to have comparable psychometric properties (Phillips, Hollander, Rasmussen, Aronowitz, et al., 1997). In the present study, the BDD-YBOCS demonstrated adequate reliability ($\alpha = 0.74$).

The Body Dysmorphic Disorder Questionnaire (BDDQ; Phillips, 1996) was used to limit the sample to participants whose symptoms were consistent with a BDD diagnosis. Specifically, BDDQ question two was used to exclude those participants whose primary concerns were weight concerns.

The Body Checklist was created for the purposes of the present study to assess the number of participants' distinct body-dysmorphic concerns. Separate questions assessed various body image concerns pertaining to different regions of the body (i.e. "Do you have appearance

concerns related to you hair such as: (1) Thinning/balding? (2) Unruly? (3) Too curly? *etc.*) The Body Checklist described a total of 67 concerns. The total reported number of concerns was summed to obtain a total 'body parts concerns' score for each participant.

Measures of Quality of Life and Functional Disability

The Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form (Q-LES-Q SF; Endicott, Nee, Harrison, & Blumenthal, 1993). The Q-LES-Q SF was used to measure participants' subjective quality of live over the past week. The Q-LES-Q SF assesses quality of life across multiple domains including physical health, mood, work, household activities, social relationships, family relationships, leisure time activities, ability to function in daily life, sexual drive and interest, economic standard, living situation, ability to get around physically, vision, and overall sense of well being to produce an overall quality of life score. Individual items are scored on a five-point Likert scale ranging from one (very poor satisfaction) to five (very good satisfaction). Overall quality of life scores are reported as the percent of the maximum possible score, with higher scores indicating higher quality of life. The Q-LES-Q SF has good test-retest reliability (r =.63-.89), internal consistency (α =.90-.96), discriminate validity, and sensitivity to change (Endicott, et al., 1993). The Q-LES-Q SF demonstrated excellent reliability in this sample (α = 0.91).

Sheehan Disability Scale (SDS; Sheehan, 1983). The SDS was used in the present study to assess participants' work, social, and family disability as a result of their body dysmorphic symptoms. Each item is rated on a 0-10 Likert scale with 0 indicating no impairment and 10 indicating extreme impairment. The sum of the three items was also taken to obtain a measure of global impairment. For all items, higher scores are indicative of greater disability. The SDS has

high internal consistency (α = .89), validity, sensitivity (.83) and specificity (.69) (Sheehan, 1996). The SDS demonstrated good reliability in the present study (α = 0.84).

Analytical Approach

Analyses were conducted on 256 participants who met inclusion criteria for the current study and had provided complete information for all study variables and measures. Intercorrelations between the outcome variables (Q-LES-Q, SDS Work, SDS Social, SDS Family) were conducted to assess for multicollinearity (Table 2). None of the intercorrelations exceeded the 0.70 criterion for multicollinearity (Tabachnick & Fidell, 2007), therefore subsequent analyses were conducted separately for each outcome measure.

In order to understand the magnitude and the direction of the relationship between the individual predictors and the four outcome variables, univariate analyses were first conducted. For binary predictors (e.g., sex), t-tests were used to assess for differences in quality of life and functional disability. For categorical predictors with more than 2 groups (e.g. ethnicity), One-Way ANOVA was used to assess for group differences in quality of life and functional disability. If the omnibus test detected a significant effect, post-hoc analyses using the Least Significant Difference (LSD) Test were conducted to isolate the significant effects. Finally, for continuous predictors (e.g. BDD-YBOCS), Pearson's correlation coefficients were obtained to measure the association between the variable of interest and quality of life or functional disability.

Finally, regression analyses using the backward elimination procedure were performed to determine which variables uniquely predicted quality of life and functional disability, above and beyond BDD symptom severity and the remaining socio-demographic and clinical variables. Categorical independent variables were dummy coded to provide a beta coefficient for each level of the independent variable. All variables were entered into each regression model. Backwards

elimination regression analysis begins by incorporating all independent variables into the regression model and then removing the variable that contributes least to the model. This step is repeated until each of the remaining independent variables uniquely accounts for a significant proportion of the variance in the outcome variable at a significance level of $p < 0.10$.

Results

Demographics

Demographics are presented in Table 1. The mean age of the sample was 31.08 (*SD* = 9.48) years. The sample was predominately female (76%) and Caucasian (73%). The majority of participants had a college education (68%), were single (44%) or married/cohabitating (50%), were employed (57%), and had private medical insurance (65%).

Participants mean BDD-YBOCS score was 22.15 (*SD* = 4.16), indicating that the sample suffered from moderately severe BDD symptoms (Phillips, Hollander, Rasmussen, Aronowitz, et al., 1997). Consistent with previous BDD samples, the mean age of BDD onset was in adolescence (Conroy, et al., 2008; Phillips, Menard, Fay, & Weisberg, 2005). The mean number of body parts concerns was 21.62 (*SD* = 12.74) and the majority of participants were not currently in treatment for their BDD symptoms (75%).

Participants had a mean quality of life score on the Q-LES-Q SF of 44.77 (*SD* = 18.44) and a mean global disability score on the SDS of 16.84 (*SD* = 7.44), indicating more severe impairment than has been found for healthy controls as well as patients with generalized anxiety disorder (GAD), SAD and OCD (Diefenbach, Abramowitz, Norberg, & Tolin, 2007; Huppert, Simpson, Nissenson, Liebowitz, & Foa, 2009; Revicki, Brandenburg, Matza, Hornbrook, & Feeny, 2008).

Factors Associated with Quality of Life and Functional Disability

The socio-demographic and clinical variables that were significantly associated with quality of life or functional disability prior to controlling for any remaining variables appear in Table 3 (categorical variables) and Table 4 (continuous variables).

As seen in Table 3, significant group differences in quality of life were observed for sex, ethnicity, education, employment, and insurance status. Male participants reported higher quality of life relative to female participants ($t(254) = 3.23$, $p = 0.001$), while Asian participants reported higher quality of life relative to Caucasian participants ($F(4, 251) = 3.13$, $p = 0.016$). In addition, participants who had completed only high school reported a lower quality of life relative to participants who had completed college ($F(2, 253) = 3.05$, $p = 0.049$) and participants who were unemployed/disabled reported a lower quality of life than participants who were employed ($F(2,253) = 4.72$, $p = 0.010$). Finally, participants with private medical insurance reported higher quality of life than participants with public insurance and those without coverage ($F(2, 253) = 6.67$, $p = 0.002$). As expected, BDD-YBOCS scores were negatively associated with participants quality of life scores (r=-.384, p<.001). Age (r = -0.12, p = 0.05), DASS Depression scores (r = -0.36, p < 0.001), DASS Anxiety scores (r = -0.16, p = 0.009), and the number of body parts of concern (r = -0.312, p < 0.001) were also all negatively associated with participants' quality of life scores.

Significant group differences in work disability were observed for ethnicity, employment and insurance status. Asian participants reported less work disability than Caucasian participants ($F(4, 251) = 2.61$, p = 0.036). Employed participants reported less work disability than unemployed/disabled participants ($F(2, 253) = 4.72$, p = 0.010) and participants with private medical insurance reported less work disability than participants with public medical insurance ($F(2, 253) = 6.43$). BDD-YBOCS (r=.505, p<.001), DASS Depression (r = 0.37, p < 0.001) and

DASS Anxiety ($r = 0.28$, $p < 0.001$), scores were all positively associated with work disability scores.

Significant group differences in social disability were found for ethnicity and marital status. Asian participants again reported less social disability than Caucasian participants ($F(4,251) = 7.28$, $p < 0.001$) and married/cohabitating participants reported less social disability than divorced/separate/widowed participants ($F(2, 253) = 3.58$, $p = 0.029$). BDD-YBOCS (r=.429, p<.001), DASS Depression ($r = 0.38$, $p < 0.001$) and DASS Anxiety ($r = 0.19$, $p = 0.002$) scores were also positively correlated with social disability scores.

Significant group differences in family disability were found for ethnicity, employment, and insurance status. Asian participants reported less family disability than Caucasian participants ($F(4, 251) = 3.64$, $p = 0.007$). Employed participants reported less family disability than unemployed/disabled participants ($F(2, 253) = 4.96$, $p = 0.008$) and participants with private medical insurance reported less family disability than participants with public medical insurance ($F(2, 253) = 4.67$, $p = 0.011$). BDD-YBOCS (r=.506, p<.001), age ($r = 0.14$, $p = 0.025$), DASS Depression scores ($r = 0.38$, $p < 0.001$) and DASS Anxiety scores ($r = 0.37$, $p < 0.001$) were also positively correlated with family disability scores.

Factors Independently Associated with Quality of Life and Functional Disability

The variables independently associated with quality of life and functional disability after statistically controlling for all socio-demographic and clinical variables appear in Table 5.

Age, sex, insurance status, BDD symptom severity, comorbid depression symptoms, and the number of body parts of concern were all significant predictors of quality of life. Age was negatively associated with quality of life ($\beta = -0.155$, $p = .004$), such that older participants reported lower quality of life scores than younger participants. Being female ($\beta = -0.170$, $p =$

.002) and having no medical insurance (β = -0.145, p = .010) were also predictors of lower quality of life. As expected, more severe BDD symptoms were associated with lower quality of life scores (β = -0.195, p = .001). Finally, more severe depression symptoms (β = -0.232, p < 0.001) and more body parts of concern (β = -0.220, p < 0.001) were both associated with lower self-reported quality of life.

Insurance status, BDD symptom severity, and comorbid depression symptoms were all significant determinants of work disability. Participants with public medical insurance reported more severe disability at work when compared to participants with private medical insurance (β = 0.134, p = .015). In addition, more severe BDD symptoms (β = 0.412, p < 0.001) and more severe depression symptoms (β = 0.174, p = .004) were both associated with greater work disability.

Ethnicity, marital status, BDD symptom severity, and comorbid depression symptoms were all significantly associated with social disability. Asian participants reported less social disability than Caucasian participants (β = -0.234, p < 0.001). With regards to marital status, participants who had never been married (β = 0.141, p = 0.018) and participants who were separated, divorced, or widowed (β = 0.143, p = 0.019) reported more social disability than married participants. Finally, more severe BDD symptoms (β = 0.279, p < 0.001) and more severe depression symptoms (β = 0.231, p < 0.001) were again associated with greater social disability.

Age, BDD symptom severity, comorbid depression symptoms, and comorbid anxiety symptoms were all significant predictors of family disability. Not surprisingly, older participants reported more family disability than younger participants (β = 0.163, p = 0.027). More severe BDD symptoms (β = 0.392, p < 0.001), more severe depression symptoms (β = 0.160, p =

0.030), and more severe anxiety symptoms ($\beta = 0.150$, $p = .032$) were also associated with greater disability in the family domain.

Discussion

The present study examined predictors of quality of life and functional disability in an internet sample of 256 participants with moderately severe BDD symptoms. To our knowledge this was the first study to assess the association between numerous socio-demographic and clinical variables with low quality of life/functional disability in BDD. In addition, the present study examined the differential association between these socio-demographic and clinical variables and four different domains (quality of life as well as work, social, and family disability). Replicating past research, the results of the present study indicate that individuals with BDD symptoms suffer from depressed quality of life and elevated disability and that BDD symptom severity is associated with impairment in these domains (Phillips, Menard, Fay, & Pagano, 2005; Phillips, et al., 2008). More interestingly however, the present study illustrates that numerous variables, in addition to BDD symptom severity, are significant predictors of quality of life and functional disability for individuals with BDD symptoms.

Socio-Demographic Correlates of Quality of Life and Functional Disability

Increasing age was found to predict decreasing quality of life and increasing family disability for participants in the present study. These findings may reflect a trend for health related quality of life to decline with increasing age that has been documented in the general population (Lubetkin, Jia, Franks, & Gold, 2005; Prause, et al., 2005), as well as in individuals with related psychological disorders such as MDD and SAD (Rapaport, Clary, Fayyad, & Endicott, 2005). However, this same pattern has not been observed for other anxiety disorders such as PTSD, OCD, or PD (Rapaport, et al., 2005; Rodriguez-Salgado, et al., 2006). This

discrepancy suggests that the debilitating effects of age on quality of life may not be universal. Instead, it is possible that the declining social support and increasing socioeconomic demands associated with increasing age (Sammarco, 2009) may be particularly difficult for individuals with BDD, resulting in lower quality of life and increased disability at home. Another possibility is that age-related changes in BDD patients' body parts of concern may lead to more impairing body dissatisfaction for individuals with the disorder. Research from the body image and eating disorders literature demonstrates that body dissatisfaction does increases for women as they age (Peat, Peyerl, & Muehlenkamp, 2008); however no research specific to BDD could be found to support this hypothesis. At the very least, these findings suggest that older BDD patients may require additional social services and financial assistance as part of their treatment approach.

Contrary to our initial hypothesis, sex was found to be significantly associated with quality of life such that women with probable BDD reported lower quality of life than men with probable BDD. While women in the general population do report slightly lower quality of life than men (Lubetkin, et al., 2005; Prause, et al., 2005), no differences in quality of life by sex have been found for individuals suffering from MDD, PTSD, OCD, or SAD (Rapaport, et al., 2005; Rodriguez-Salgado, et al., 2006; Trivedi, et al., 2006). Therefore, it seems that the sex differences found in the present study may be the result of fundamental differences in the way that BDD is experienced by men and women. Supporting this hypothesis is evidence from one study that examined sex differences in BDD and found that women were concerned with a greater number of body parts, engaged in more BDD-related behaviors (i.e. checking, camouflaging), and worried more about their perceived defects than men (Phillips, Menard, et al., 2006). Sex differences in the presentation of BDD may be partially explained by the fact that attractiveness is a central component of the female sex role and is often considered essential for

social acceptance (Cash & Pruzinsky, 2004). Therefore the body dissatisfaction associated with BDD may be more pervasive and devastating for women with the disorder. Treatments for BDD should address society's tendency to objectify the female body and the media's unrealistic portrayal of the feminine beauty ideal. Finally, it should be noted that previous studies have not reported sex differences in quality of life for BDD patients, though power limitations may account for this discrepancy (Phillips, Menard, et al., 2006). More research is necessary to explore the moderating impact of sex on BDD variables.

Of particular interest was the finding that Asian ethnicity served as a protective factor for individuals with probable BDD, such that Asian participants reported less social disability than Caucasian participants. This result is surprising considering the fact that somatic symptoms as well as symptoms of related disorders such as SAD and MDD have been found to be more prevalent among Asian Americans than Caucasian Americans (Leong, et al., 2007; Okazaki & Kallivayalil, 2002; Services, 2001). These findings, coupled with the fact that BDD symptom severity was controlled for in the final analyses of the present study, suggest that the protective factor for Asian Americans is likely not driven by the severity of BDD symptoms, but rather by the impact that BDD symptoms have on Asian individuals. One explanation is that Asian cultural values place less emphasis on appearance and therefore the body dissatisfaction inherent in BDD does not lead to as severe dissatisfaction and social disability (Diener, Oishi, & Lucas, 2003). Another explanation is that social anxiety, which is such a disabling component of BDD, translates into lower levels of impairment for Asian Americans (Leong, et al., 2007). Research demonstrates that East Asian social norms favor a less dominant, more avoidant style of social interaction (Hong & Woody, 2007). Therefore, the social avoidance and submissiveness characteristic of BDD may be more culturally appropriate for Asian Americans (Hong & Woody,

2007). In addition, Asian Americans come from a more collectivist culture that may serve as a support system to buffer individuals against psychopathology (Leong, et al., 2007). For Asian Americans, high levels of mutual obligation may mean that family members will be available to provide assistance to individuals with BDD, thus lessening the social disability associated with this mental illness. Finally, it is possible that the Asian American participants in this study were underreporting their impairment, due to the increased stigma associated with needing help for a mental illness in Asian cultures (Lee S, 2009; Services, 2001). Additional research is necessary to elucidate which of these hypotheses may account for the protective factor experienced by Asian Americans with BDD and how an understanding of this protective factor could improve treatments for BDD.

Finally, being single was predictive of greater social disability, having no insurance was predictive of lower quality of life, and having public medical insurance was predictive of greater work disability. These findings are consistent with past research on these factors in community and clinical populations (Bharmal & Thomas, 2005; Ganev, 2000; Trivedi, et al., 2006). The finding that married participants experienced less social disability was not surprising and may highlight the importance of social support for individuals with BDD. The connection between inadequate insurance coverage and lower quality of life may have to do with participants' overall health and their ability to pay for medical care.

Clinical Correlates of Quality of Life and Functional Disability

As predicted, BDD symptoms severity was negatively associated with quality of life and positively associated with work, social, and family disability. Similar trends have been observed in prior research on patients with BDD (Phillips, Menard, Fay, & Pagano, 2005; Phillips & Rasmussen, 2004; Phillips, 2000). Consistent with past research, BDD symptom severity

accounted for only a small portion of the variance in quality of life and disability (2.8% for quality of life, 13.5% for work disability, 6.1% for social disability, and 12.4% for family disability), further emphasizing the importance of the present research.

As hypothesized, depressive symptom severity was also found to be a predictor of low quality of life and increased work, social, and family disability. These findings were not surprising in light of past research linking comorbid depression to decrements in quality of life and functioning in BDD (Phillips, et al., 2007) as well as in GAD, SAD, PD, and OCD (Barrera & Norton, 2009; Masellis, Rector, & Richter, 2003; Rapaport, et al., 2005). In fact, some studies have found depressive symptoms to be the single greatest predictor of patients' quality of life (Masellis, et al., 2003), though this was not the case in the present study. Comorbid MDD is extremely common in BDD, with 74% of BDD patients reporting a lifetime diagnosis of MDD and 38% reporting a current diagnosis (Phillips, et al., 2007). In addition, the majority of BDD patients report depressive symptoms that appear to be secondary to BDD (Phillips, 1999; Phillips & Stout, 2006). Some researchers believe that BDD and MDD may be caused by a similar etiological process and therefore exist along a spectrum of affective disorders (Phillips, 1999; Phillips & Stout, 2006). More research is needed to elucidate the relationship between BDD and MDD. However, the present findings suggest that BDD symptoms and comorbid depressive symptoms should be targeted equally in treatment. Clinicians should be aware of the unique presentation of comorbid depression in BDD and of suggested treatment options (Phillips, 1999).

The number of body parts concerns endorsed by participants also negatively predicted quality of life, above and beyond BDD symptom severity. This finding may provide some insight into the reason why BDD symptom severity only accounts for a small portion of the variance in quality of life scores. Quality of life may be more a reflection of how much time

patients devote to their symptoms and how easily they can hide their symptoms than of the severity of their symptoms. For example, a BDD patient concerned with numerous body parts may spend more time checking, covering, or hiding those parts than a BDD patient concerned with only one part, and will therefore have more difficulty working, going out in public, and engaging in social interactions. Interestingly, research on SAD has demonstrated that SAD patients' quality of life is negatively associated with the number of endorsed social fears, possibly mirroring the findings from the current study (Acarturk, et al., 2008). More research is needed to understand why the number of concerns may be just as important as the severity of concerns in determining a patient's quality of life. Treatments such as Cognitive-Behavioral Therapy (CBT) that use techniques to reduce time consuming checking and camouflaging behaviors in BDD may be especially effective in improving patients' quality of life (Wilhelm, Phillips, & Steketee, under agreement).

Finally, as predicted, treatment status was not found to be a significant predictor of quality of life or functional disability, even after controlling for BDD symptom severity and all other variables. These data corroborate past research on BDD which has generally demonstrated that treatment accounts for small or nonexistent differences in quality of life and disability (Phillips, Menard, Fay, & Weisberg, 2005; Phillips & Rasmussen, 2004). This surprising finding in the BDD literature may be explained by the fact that BDD sufferers with the worst quality of life are the most likely to seek treatment, and therefore BDD treatments help these patients improve their quality of life to levels equivalent to untreated BDD sufferers. It is also possible, and perhaps likely, that current treatments for BDD are not adequately addressing factors that contribute to impairment. A comprehensive understanding of the correlates of quality of life and functional disability should help to address this disconnect.

Limitations

The results of the present study should be interpreted in light of several limitations. First, due to the correlational design of the present study, these data do not allow for causal conclusions regarding the direction of the identified associations. In addition, conclusions about the specificity of these findings to BDD are limited, due to the fact that the present study did not include a psychiatric comparison group.

It should also be noted that the internet-delivered, self-report measures used in this study precluded the diagnosis of BDD. Instead, we limited the sample to those whose self-reports met criteria consistent with the diagnosis of BDD. Administering the questionnaire over the internet may have also resulted in a sampling bias, as African Americans, Latinos, and Native Americans in the U.S. report having far less access to the internet than White and Asian Americans (Suarez-Balcazar, Balcazar, & Taylor-Ritzler, 2009). Finally, the study sample was predominately female and Caucasian, limiting the generalizability of these findings.

However, there were also several methodological strengths associated with the use of an internet design. First, due to the fact that many individuals with BDD are ashamed of their illness and/or housebound, the internet design allowed for the collection of a more naturalistic BDD sample. Second, the anonymity afforded by the internet may have provided an opportunity for participants to respond more candidly about their experiences with BDD. Due to the stigma associated with having a mental illness, the use of an internet survey allowed us to gather data from participants who might not have felt comfortable coming to a research or treatment facility to participate in a study.

Future Directions

Quality of life is increasingly being viewed as a highly relevant treatment outcome and is currently one of the three criteria used to assess interventions for mental illness, along with efficacy and safety (Prause, et al., 2005). In addition, improvements in quality of life and disability have the potential to improve patients' treatment adherence and long-term treatment outcome as well as to reduce the economic impact of the disorder (Fogel, et al., 2004; Pyne, et al., 2001). For these reasons, quality of life and functional impairment should be targeted in treatments for BDD. This objective will be aided by a comprehensive understanding of the socio-demographic and clinical factors that are related to impairment in BDD. Specifically, evidence from the present study illustrates that the experience of BDD may differ across gender and ethnic groups. Therefore, clinicians should be sensitive to the meaning of BDD concerns within each patient's particular gender and cultural context and should discuss these issues with patients in treatment. In addition, clinicians should help BDD patients build social support networks while in treatment by encouraging them to develop hobbies, seek employment, or form new relationships (Wilhelm, et al., under agreement). Assisting BDD patients in constructively filling the time that was once dominated by BDD concerns is also a useful relapse prevention strategy (Wilhelm, et al., under agreement). Finally, clinicians should be aware that the severity of depressive symptoms and the number of body parts concerns are both useful indicators of the overall severity of patients' BDD illness. Monitoring and directly targeting these factors in treatment may increase the effectiveness of standard interventions.

Future research on impairment in BDD should explore possible causal pathways between the factors identified in the present study and quality of life/functional disability. Longitudinal studies are needed to determine if targeting these correlates in treatment would truly improve quality of life/functional disability. In addition, studies examining the impact of recommended

medication and therapeutic interventions on impairment in BDD should be conducted. Other factors that may impact quality of life and functional disability, such as genetic makeup, cognitions, and personality characteristics, should also be examined in future research. Finally, BDD researchers using measures of quality of life and disability as outcome variables should be aware of the need to control for the numerous socio-demographic and clinical variables that contribute to these constructs.

References

Acarturk, C., Graaf, R. d., Straten, A. v., Have, M. t., & Cuijpers, M. (2008). Social phobia and number of social fears, and their association with comorbidity, health-related quality of life and help seeking: A population-based study. *Social Psychiatry and Psychiatric Epidemiology, 43*(4), 273-279.

Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment, 10*(2), 176-181.

APA. (2000). *Diagnostic and statistical manual of mental disorders: Fourth Edition; Text Revision* (4th ed.). Washington, DC: Author.

Barrera, T. L., & Norton, P. J. (2009). Quality of life impairment in generalized anxiety disorder, social phobia, and panic disorder. *Journal of Anxiety Disorders*.

Basu, D. (2004). Quality-Of-Life Issues in Mental Health Care: Past, Present, and Future. *German Journal of Psychiatry, 7*(3), 35-43.

Bharmal, M., & Thomas, J., III. (2005). Health insurance coverage and health-related quality of life: Analysis of 2000 medical expenditure panel survey data. *Journal of Health Care for the Poor and Underserved, 16*(4), 643-654.

Cachelin, F. M., Rebeck, R., Veisel, C., & Striegel-Moore, R. H. (2001). Barriers to treatment for eating disorders among ethnically diverse women. *International Journal of Eating Disorders, 30*(3), 269-278.

Cash, T. F., & Pruzinsky, T. (2004). *Body Image A Handbook of Theory, Research, and Clinical Practice*. New York: The Guilford Press.

Coles, M. E., Phillips, K. A., Menard, W., Pagano, M. E., Fay, C., Weisberg, R. B., et al. (2006). Body dysmorphic disorder and social phobia: Cross-sectional and prospective data. *Depression and Anxiety, 23*(1), 26-33.

Conroy, M., Menard, W., Fleming-Ives, K., Modha, P., Cerullo, H., & Phillips, K. A. (2008). Prevalence and clinical characteristics of body dysmorphic disorder in an adult inpatient setting. *General Hospital Psychiatry, 30*(1), 67-72.

Crawford, J. R., & Henry, J. D. (2003). The Depression Anxiety Stress Scales (DASS): Normative data and latent structure in a large non-clinical sample. *British Journal of Clinical Psychology, 42*(2), 111-131.

Didie, E., Menard, W., Stern, A., & Phillips, K. (2008). Occupational functioning and impairment in adults with body dysmorphic disorder. *Comprehensive Psychiatry, 49*(6), 561-569.

Diefenbach, G. J., Abramowitz, J. S., Norberg, M. M., & Tolin, D. F. (2007). Changes in quality of life following cognitive-behavioral therapy for obsessive-compulsive disorder. *Behaviour Research and Therapy, 45*(12), 3060-3068.

Diener, E., Oishi, S., & Lucas, R. E. (2003). Personality, culture, and subjective well-being: Emotional and cognitive evaluations of life. *Annual Review of Psychology, 54*, 403-425.

Dyl, J., Kittler, J., Phillips, K. A., & Hunt, J. I. (2006). Body Dysmorphic Disorder and Other Clinically Significant Body Image Concerns in Adolescent Psychiatric Inpatients: Prevalence and Clinical Characteristics. [Original]. *Child Psychiatry & Human Development, 36*(4), 369-382.

Eisen, J. L., Phillips, K. A., Coles, M. E., & Rasmussen, S. A. (2004). Insight in Obsessive Compulsive Disorder and Body Dysmorphic Disorder. *Comprehensive Psychiatry, 45*(1), 10-15.

Endicott, J., Nee, J., Harrison, W., & Blumenthal, R. (1993). Quality of life enjoyment and satisfaction questionnaire: a new measure. *Psychopharmacology Bulletin, 29*, 321-326.

Finley, R. (1999). SurveyMonkey.com. 2008-2009, from http://www.surveymonkey.com/

Fogel, J., Fauerbach, J. A., Ziegelstein, R. C., & Bush, D. E. (2004). Quality of life in physical health domains predicts adherence among myocardial infarction patients even after adjusting for depressive symptoms. *Journal of Psychosomatic Research, 56*(1), 75-82.

Ganev, K. (2000). Long-term trends of symptoms and disability in schizophrenia and related disorders. *Social Psychiatry and Psychiatric Epidemiology, 35*(9), 389-395.

Grant, J. E., Kim, S. W., & Crow, S. J. (2001). Prevalence and clinical features of body dysmorphic disorder in adolescent and adult psychiatric inpatients. *Journal of Clinical Psychiatry, 62*(7), 517-522.

Gustad, J., & Phillips, K. A. (2003). Axis I comorbidity in body dysmorphic disorder. *Comprehensive Psychiatry, 44*(4), 270-276.

Henry, J. D., & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British Journal of Clinical Psychology, 44*(2), 227-239.

Hollander, E., & Aronowitz, B. R. (1999). Comorbid social anxiety and body dysmorphic disorder: Managing the complicated patient. *Journal of Clinical Psychiatry, 60*(Suppl 9), 27-31.

Hong, J. J., & Woody, S. R. (2007). Cultural mediators of self-reported social anxiety. *Behaviour Research and Therapy, 45*(8), 1779-1789.

Huppert, J. D., Simpson, H. B., Nissenson, K. J., Liebowitz, M. R., & Foa, E. B. (2009). Quality of life and functional impairment in obsessive-compulsive disorder: A comparison of patients with and without comorbidity, patients in remission, and healthy controls. *Depression and Anxiety, 26*(1), 39-45.

Koran, L. M., Abujaoude, E., Large, M. D., & Serpe, R. T. (2008). The prevalence of body dysmorphic disorder in the United States adult population. *CNS Spectrums, 13*(4), 316-322.

Lee S, J. H., Martinez G, Hsu CE, Robinson ES, Bawa J, Ma GX. (2009). Model minority at risk: expressed needs of mental health by Asian American young

adults. *J Community Health, Apr;34*(2), 144-152.

Leong, F. T. L., Ebreo, A., Kinoshita, L., Inman, A. G., Yang, L. H., & Fu, M. (2007). *Handbook of Asian American psychology: Second Edition*. Thousand Oaks, CA US: Sage Publications, Inc.

Lovibond, S. H. L., P.F. . (1995). *Manual for the Depression Anxiety Stress Scales* (2 ed.). Sydney: Psychology Foundation.

Lubetkin, E. I., Jia, H., Franks, P., & Gold, M. R. (2005). Relationship among sociodemographic factors, clinical conditions, and health-related quality of life: Examining the EQ-5D in the U.S. general population. *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care & Rehabilitation, 14*(10), 2187-2196.

Masellis, M., Rector, N. A., & Richter, M. A. (2003). Quality of Life in OCD: Differential Impact of Obsessions, Compulsions, and Depression Comorbidity. *The Canadian Journal of Psychiatry / La Revue canadienne de psychiatrie, 48*(2), 72-77.

Okazaki, S., & Kallivayalil, D. (2002). Cultural norms and subjective disability as predictors of symptom reports among Asian Americans and White Americans. *Journal of Cross-Cultural Psychology, 33*(5), 482-491.

Otto, M. W., Wilhelm, S., Cohen, L. S., & Harlow, B. L. (2001). Prevalence of body dysmorphic disorder in a community sample of women. *American Journal of Psychiatry, 158*(12), 2061-2063.

Peat, C. M., Peyerl, N. L., & Muehlenkamp, J. J. (2008). Body image and eating disorders in older adults: A review. *Journal of General Psychology, 135*(4), 343-358.

Phillips, K. (2006). The Presentation of Body Dysmorphic Disorder in Medical Settings. [Original]. *Primary Psychiatry, 13*(7), 51-59.

Phillips, K. (2007). Suicidality in body dysmorphic disorder. *Primary Psychiatry, 14*(12), 58-66.

Phillips, K., Conroy, M., Dufresne, R., Menard, W., Didie, E., Hunter-Yates, J., et al. (2006). Tanning in body dysmorphic disorder. *Psychiatric Quarterly, 77*(2), 129-138.

Phillips, K., & Diaz, S. (1997). Gender differences in body dysmorphic disorder. *Journal of Nervous and Mental Disease, 195*, 570-577.

Phillips, K., Didie, E., Menard, W., Pagano, M., Fay, C., & Weisberg, R. (2006). Clinical features of body dysmorphic disorder in adolescents and adults. *Psychiatry Research, 141*(3), 305-314.

Phillips, K., & Menard, W. (2006). Suicidality in Body Dysmorphic Disorder: A Prospective Study. *American Journal of Psychiatry, 163*(7), 1280-1282.

Phillips, K., Menard, W., Fay, C., & Pagano, M. (2005). Psychosocial functioning and quality of life in body dysmorphic disorder. *Comprehensive Psychiatry, 46*(4), 254-260.

Phillips, K., Menard, W., Fay, C., & Weisberg, R. (2005). Demographic Characteristics, Phenomenology, Comorbidity, and Family History in 200 Individuals With Body Dysmorphic Disorder. *Psychosomatics: Journal of Consultation Liaison Psychiatry, 46*(4), 317-325.

Phillips, K., Pagano, M., Menard, W., & Stout, R. (2006). A 12-Month Follow-Up Study of the Course of Body Dysmorphic Disorder. [Original]. *American Journal of Psychiatry, 163*(5), 907-912.

Phillips, K., Quinn, G., & Stout, R. (2008). Functional Impairment in body dysmorphic disorder: A prospective, follow-up study. *Journal of Psychiatric Research, 42*, 701-707.

Phillips, K., & Rasmussen, S. (2004). Change in Psychological Functioning and Quality of Life of Patients With Body Dysmorphic Disorder Treated With Fluoxetine: A Placebo-Controlled Study. *Psychosomatics, 45*(5), 438-444.

Phillips, K. A. (1996). *The broken mirror: Understanding and treating body dysmorphic disorder*. New York, NY US: Oxford University Press.

Phillips, K. A. (1999). Body dysmorphic disorder and depression: Theoretical considerations and treatment strategies. *Psychiatric Quarterly, 70*(4), 313-331.

Phillips, K. A. (2000). Quality of life for patients with body dysmorphic disorder. *Journal of Nervous and Mental Disease, 188*(3), 170-175.

Phillips, K. A., Didie, E. R., & Menard, W. (2007). Clinical features and correlates of major depressive disorder in individuals with body dysmorphic disorder. *Journal of Affective Disorders, 97*(1), 129-135.

Phillips, K. A., Hollander, E., Rasmussen, S. A., Aronowitz, B. R., DeCaria, C., & Goodman, W. K. (1997). A severity rating scale for body dysmorphic disorder: development, reliability, and validity of a modified version of the Yale-Brown Obsessive Compulsive Scale. *Psychopharmacology Bulletin, 33*(17-22).

Phillips, K. A., Menard, W., & Fay, C. (2006). Gender Similarities and differences in 200 individuals with body dysmorphic disorder. *Comprehensive Psychiatry, 47*, 77-87.

Phillips, K. A., & Stout, R. L. (2006). Associations in the longitudinal course of body dysmorphic disorder with major depression, obsessive-compulsive disorder, and social phobia. *Journal of Psychiatric Research, 40*(4), 360-369.

Pope, C. G., Pope, H. G., Menard, W., Fay, C., Olivardia, R., & Phillips, K. A. (2005). Clinical features of muscle dysmorphia among males with body dysmorphic disorder. *Body Image, 2*(4), 395-400.

Prause, W., Saletu, B., Tribl, G. G., Rieder, A., Rosenberger, A., Bolitschek, J., et al. (2005). Effects of socio-demographic variables on health-related quality of life determined by the quality of life index--German version. *Human Psychopharmacology: Clinical and Experimental, 20*(5), 359-365.

Pyne, J. M., Bullock, D., Kaplan, R. M., Smith, T. L., Gillin, J. C., Golshan, S., et al. (2001). Health-related quality-of-life measure enhances acute treatment response prediction in depressed inpatients. *Journal of Clinical Psychiatry, 62*(4), 261-268.

Rapaport, M. H., Clary, C., Fayyad, R., & Endicott, J. (2005). Quality-of-Life Impairment in Depressive and Anxiety Disorders. *The American Journal of Psychiatry, 162*(6), 1171-1178.

Revicki, D. A., Brandenburg, N., Matza, L., Hornbrook, M. C., & Feeny, D. (2008). Health-related quality of life and utilities in primary-care patients with generalized anxiety disorder. *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care & Rehabilitation, 17*(10), 1285-1294.

Rief, W., Buhlmann, U., Wilhelm, S., Borkenhagen, A., & Brachler, E. (2006). The prevalence of body dysmorphic disorder: A population-based survey. *Psychological Medicine, 36*(6), 877-885.

Rief, W., Buhlmann, U., Wilhelm, S., Brachler, E., & Borkenhagen, A. (2006). The prevalence of body dysmorphic disorder: A population-based survey. *Psychological Medicine, 36*(6), 877-885.

Rodriguez-Salgado, B., Dolengevich-Segal, H., Arrojo-Romero, M., Castelli-Candia, P., Navio-Acosta, M., Perez-Rodriguez, M. M., et al. (2006). Perceived quality of life in obsessive-compulsive disorder: Related factors. *BMC Psychiatry, 6*.

Ruffolo, J. S., Phillips, K. A., Menard, W., Fay, C., & Weisberg, R. B. (2006). Comorbidity of Body Dysmorphic Disorder and Eating Disorders: Severity of Psychopathology and Body Image Disturbance. [Original]. *International Journal of Eating Disorders, 39*(1), 11-19.

Sammarco, A. (2009). Quality of life of breast cancer survivors: A comparative study of age cohorts. *Cancer Nursing, 32*(5), 347-356.

Services, U. S. D. o. H. a. H. (2001). *Mental health: Culture, Race, and Ethnicity- A Supplement to Mental Health: A Report of the Surgeon General*.

Sheehan, D., Harnett-Sheehan K, Raj BA. (1996). The measurement of disability. *Int Clin Psychopharmacol, 11*(suppl 3), 89-95.

Sheehan, D. V. (1983). The Anxiety Disease. *New York, Scribner's*.

Suarez-Balcazar, Y., Balcazar, F. E., & Taylor-Ritzler, T. (2009). Using the Internet to conduct research with culturally diverse populations: Challenges and opportunities. *Cultural Diversity and Ethnic Minority Psychology, 15*(1), 96-104.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics (5th ed.)*. Boston, MA: Allyn & Bacon/Pearson Education.

Trivedi, M. H., Rush, A. J., Wisniewski, S. R., Warden, D., McKinney, W., Downing, M., et al. (2006). Factors Associated With Health-Related Quality of Life Among Outpatients With Major Depressive Disorder: A STAR*D Report. *Journal of Clinical Psychiatry, 67*(2), 185-195.

Veale, D., Boocock, A., Gournay, K., & Dryden, W. (1996). Body dysmorphic disorder: A survey of fifty cases. *British Journal of Psychiatry, 169*(2), 196-201.

Wilhelm, S., Phillips, K., & Steketee, G. (under agreement). *A Cognitive Behavioral Treatment Manual for Body Dysmorphic Disorder*. New York: Guilford Press.

Table 1

Sample Characteristics

Characteristic	**% of Subjects**	**N**
Sex		
Male	24.2	62
Female	75.8	194
Ethnicity		
Caucasian	73.0	187
Asian American	5.9	30
African American	5.5	14
Latino/a	11.7	15
Other	3.9	10
Education		
High School	13.7	35
College	67.6	173
Graduate School	18.8	48
Marital Status		
Never married	44.1	113
Married/Cohabitating	50.0	128
Separated/Divorced/Widowed	5.9	5.9
Employment Status		
Employed	57.0	146
Unemployed / On Disability	12.5	32
Housewife / Student	30.5	78
Medical Insurance Status		
Private	64.5	165
Public	16.4	42
None	19.1	49
Current Treatment Status		
In Treatment	25.4	65
Not in Treatment	74.6	191
	Mean	**SD**
Age	31.08	9.48
BDD-YBOCS	22.15	4.16
Q-LES-Q	44.77	18.44
SDS		
Work	5.11	2.90
Social	6.65	2.75
Family	5.08	2.91
Global Impairment	16.84	7.44
DASS		
Depression	20.95	10.95
Anxiety	16.31	9.91
Age of BDD Onset	16.99	7.72

# of Body Concerns Endorsed	21.62	12.74

Abbreviations: BDD-YBOCS = Yale-Brown Obsessive Compulsive Scale Modified for BDD, Q-LES-Q = Quality of Life Enjoyment and Satisfaction Scale, SDS = Sheehan Disability Scale, DASS = Depression Anxiety Stress Scale, BDD = Body Dysmorphic Disorder.

Table 2

Intercorrelations between the Outcome Variables

	Q-LES-Q	SDS Work	SDS Social	SDS Family
Q-LES-Q	-	-	-	-
SDS Work	-.311**	-	-	-
SDS Social	-.337**	.704**	-	-
SDS Family	-.356**	.601**	.6**	-

* $p < .05$

** $p < .01$

Abbreviations: Q-LES-Q = Quality of Life Enjoyment and Satisfaction Scale, SDS = Sheehan Disability Scale.

Table 3

Factors Associated with Quality of Life and Functional Disability (categorical variables

Factor	Q-LES-Q		SDS Work		SDS Social		SDS Family	
	Mean(SD)	*p*	Mean(SD)	*p*	Mean(SD)	*p*	Mean(SD)	*p*
Sex		.001		.921		.460		.649
Male	51.24(20.73)		5.15(2.82)		6.42(2.90)		4.94(3.05)	
Female	42.70(12.19)		5.10(2.94)		6.72(2.70)		5.13(2.87)	
Ethnicity		.016		.036		<.001		.007
Caucasian(Ref)	43.02(18.05)		5.30(2.88)		6.88(2.56)		5.32(2.80)	
Asian	55.24(17.88)*		3.53(3.09)*		4.33(3.25)*		3.40(3.38)*	
African Am	42.98(17.97)		5.57(2.59)		7.21(2.83)		4.71(3.05)	
Latino/a	44.29(13.82)		5.33(2.55)		7.93(1.62)		6.20(2.11)	
Other	49.29(25.34)		5.40(2.63)		6.50(2.51)		4.60(2.76)	
Education		.049		.673		.443		.967
High School	37.81(15.95)*		4.89(3.28)		6.51(2.92)		5.20(3.30)	
College(Ref)	45.56(16.83)		5.23(2.87)		6.79(2.74)		5.06(2.83)	
Graduate	46.99(24.07)		4.88(2.76)		6.23(2.64)		5.06(2.93)	
Marital Status		.211		.263		.029		.079
Never Married	46.93(17.98)		5.32(2.89)		6.89(2.82)		4.67(2.88)	
Mar/Cohab(Ref)	43.36(18.66)		4.84(2.90)		6.27(2.67)		5.32(2.87)	
Sep/Divor/Wid	40.48(19.29)		5.87(2.95)		8.00(2.33)*		6.13(3.25)	
Employment		.01		.01		.274		.008
Employed(Ref)	46.51(19.12)		4.94(2.67)		6.53(2.76)		4.98(2.89)	
Unemp/Disability	35.66(16.41)*		6.56(3.18)*		7.38(2.71)		6.53(2.93)*	
Housewife/Student	45.24(16.97)		4.85(3.06)		6.56(2.72)		4.68(2.78)	
Medical Insurance		.002		.002		.083		.011
Private(Ref)	47.75(18.48)		4.68(2.78)		6.39(2.75)		4.72(2.75)	
Public	41.03(20.58)*		6.36(3.06)*		7.36(2.55)		6.17(3.00)*	
None	37.94(13.67)*		5.51(2.85)		6.94(2.79)		5.39(3.13)	
Current tx status		.071		.172		.294		.940
In tx	41.21(15.88)		5.54(3.01)		6.95(2.77)		5.11(3.30)	
Not in tx	45.98(19.11)		4.97(2.86)		6.54(2.74)		5.07(2.77)	

* Denotes groups significantly different from the reference group using Least Significance Difference post-hoc analysis, $p < 0.05$.

Abbreviations: Q-LES-Q = Quality of Life Enjoyment and Satisfaction Scale, SDS = Sheehan Disability Scale, Ref = Reference Group, tx = treatment.

Table 4

Factors Associated with Quality of Life and Functional Disability (continuous variables)

Factor	Q-LES-Q		SDS Work		SDS Social		SDS Family	
	r	*p*	*r*	*p*	*r*	*p*	*r*	*p*
BDD-YBOCS	-.384	<.001	.505	<.001	.429	<.001	.506	<.001
Age in years	-.122	.050	-.063	.317	.022	.722	.140	.025
DASS Depression	-.356	<.001	.368	<.001	.382	<.001	.382	<.001
DASS Anxiety	-.164	.009	.297	<.001	.191	.002	.372	<.001
Age of Onset	-.071	.314	.024	.730	-.002	.979	.050	.478
# of Body Parts	-.312	<.001	.092	.143	.059	.344	.085	.177

Abbreviations: BDD-YBOCS = Yale-Brown Obsessive Compulsive Scale Modified for BDD, DASS = Depression Anxiety Stress Scale, Q-LES-Q = Quality of Life Enjoyment and Satisfaction Scale, SDS = Sheehan Disability Scale.

Table 5

Factors Independently Associated with Quality of Life and Functional Disability

	Q-LES-Q Adjusted R^2=.30			SDS Work Adjusted R^2=.29			SDS Social Adjusted R^2=.30			SDS Family Adjusted R^2=.35		
Factor	β	*p*	sr^2	β	*p*	sr^2	β	*p*	sr^2	β	*p*	sr^2
BDD-YBOCS	-.195	.001	.028	.412	<.001	.135	.279	<.001	.061	.392	<.001	.124
Sex (Ref=Males)												
Female	-.170	.002	.028									
Ethnicity (Ref=Caucasian)												
Asian American							-.234	<.001	.052			
African American							.043	.422	.002			
Latino/a							.097	.069	.009			
Other							-.021	.695	.000			
Marital Status (Ref=Married/Cohabiting)												
Never married							.141	.010	.018			
Separated/Divorced/Widowed							.143	.009	.019			
Medical Insurance Status (Ref=Private)												
Public Insurance	-.068	.216	.004	.134	.015	.017						
No Insurance	-.145	.010	.018	.011	.837	.000						
Treatment Status (Ref=Not in Treatment)												
In Treatment	-.094	.081	.008									
Age	-.155	.004	.023							.163	.002	.027
DASS – Depression Subscale	-.232	<.001	.043	.174	.004	.024	.231	<.001	.042	.160	.030	.012
DASS – Anxiety Subscale										.150	.032	.012
Number of Body Parts Endorsed	-.220	<.001	.045									

Abbreviations: BDD-YBOCS = Yale-Brown Obsessive Compulsive Scale Modified for BDD, DASS = Depression Anxiety Stress Scale, Q-LES-Q = Quality of Life Enjoyment and Satisfaction Scale, SDS = Sheehan Disability Scale, Ref = Reference Group.

Author Note

Nicole J. LeBlanc, Department of Psychology, Tufts University; Obsessive-Compulsive and Related Disorders Program, Department of Psychiatry, Massachusetts General Hospital.

The present study was financially supported by the David Judah Fund through the Department of Psychiatry at Massachusetts General Hospital (MGH).

I would like to thank Luana Marques, a co-principal investigator of the present study, for providing me with the opportunity to contribute to her research. I am truly thankful for her mentorship and instruction in completing this project. In addition, I would like to thank Hilary Weingarden, a volunteer research assistant at the Obsessive-Compulsive and Related Disorders Clinic, who contributed countless hours to the design and implementation of the present study. I would also like to thank Sabine Wilhelm, the Obsessive-Compulsive and Related Disorders Program at MGH and a co-principal investigator of the present study, for her oversight and support on this project.

I am also very thankful to my advisor and mentor at Tufts University, Professor Lisa Shin, for giving me the opportunity to write a senior honors thesis and for helping me with questions, revisions, and my senior thesis defense. In addition, I would like to thank Professor Sam Sommers for serving on my senior thesis committee. Finally, I would like to thank my friends and family for proofreading the final document and for providing support throughout the process.