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Body Dysmorphic Disorder (BDD) in a Facial Plastic + Reconstructive Surgery Clinic Measuring Prevalence, Assessing Comorbidities, + Validating a Feasible Screening Instrument

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Abstract

Importance Body dysmorphic disorder (BDD) is underrecognized and underdetected among patients undergoing facial plastic and reconstructive surgery. Patients with BDD require psychiatric care, not cosmetic surgery.

Objectives To measure the prevalence of BDD in a facial plastic and reconstructive surgery clinic, to validate the Body Dysmorphic Disorder Questionnaire (BDDQ) in that setting, to assess the feasibility of implementing a standardized process for identifying patients with BDD accurately in a busy clinical practice, and to assess the comorbidity of BDD, depression, and anxiety in our patient population.

Design, Setting, and Participants We performed a prospective prevalence and instrument validation study in an academic facial plastic and reconstructive surgery clinic. We included 234 consecutive patients 18 years or older presenting to the clinic from March 3 to June 30, 2014.

Main Outcomes and Measures Prevalence of BDD as determined by the BDDQ and the criterion-standard BDD Structured Clinical Interview for *DSM-IV* (BDD SCID). The BDD SCID and a defect severity scale were used to confirm the BDD diagnosis and to validate the BDDQ finding. We also assessed demographic characteristics, depression, and anxiety in all patients.

Results As confirmed by the BDD SCID, 13.1% of patients undergoing cosmetic surgery and 1.8% of those undergoing reconstructive surgery had BDD. We found the BDDQ to be an accurate (91.7%), sensitive (100%), and specific (90.3%) screening instrument for BDD. Patients with a positive BDD finding were most commonly concerned with their nose (10 of 18 [56%]), skin (5 of 18 [28%]), hair (1 of 18 [6%]), chin (1 of 18 [6%]), and ears (1 of 18 [6%]), that is, areas commonly addressed by facial plastic surgeons. Furthermore, compared with

patients who did not have BDD, patients with BDD had elevated depression scores (mean [SD], 12.6 [10.8] vs 3.2 [4.2]). In the non-BDD population, mean (SD) state and trait anxiety scores resembled the norm (30.0 [7.7] and 30.3 [7.7], respectively, for men; 31.7 [10.0] and 32.1 [8.7], respectively, for women); in the BDD population, these scores were elevated (53.8 [23.4] and 50.4 [19.5], respectively, for men; 47.8 [12.7] and 49.0 [11.6], respectively, for women). Depression and anxiety scores were highly correlated in patients with BDD ($r = 0.84$ for patients with a BDDQ-positive screen result; $r = 0.94$ for patients with a positive BDD SCID finding) compared with those who did not have BDD ($r = 0.51$).

Conclusions and Relevance Patients with BDD often seek cosmetic treatment. Given the documented risks and harms of surgery for patients with BDD, a systematic process for identifying such patients who seek cosmetic surgery is imperative. We found a BDD screening instrument (BDDQ) followed by the BDD SCID for patients with a BDDQ-positive screen result to be a feasible and effective way to identify patients with BDD.

Level of Evidence [NA](#).

Introduction

Body dysmorphic disorder (BDD) is a psychiatric condition characterized by excessive preoccupation with nonexistent or minimal defects in one's appearance that cause marked distress and life disruption.¹ Perceived defects of the skin, nose, and hair are the most common.^{2,3} The defect preoccupation and associated behaviors can impair psychosocial functioning through withdrawal from work, family, and social activities and through depression, anxiety, and even suicidal ideation and suicide attempts.³⁻¹⁰

To improve their perceived defect and alleviate these symptoms, people with BDD frequently seek cosmetic surgery. Studies have found that 71% to 76% of patients with BDD seek cosmetic treatment.^{11,12} This statistic poses a problem because (1) BDD is underrecognized and underdetected in cosmetic surgery practices and (2) studies indicate that patients with BDD need psychiatric care, not cosmetic surgery.^{8,11-14} Multiple studies^{3,12,15} show that cosmetic treatments rarely improve BDD, and patients with BDD who receive cosmetic treatments are typically dissatisfied with the result. Not only does cosmetic treatment fail to help the patient with BDD, but it also puts the surgeon at undue risk. Patients with BDD who receive cosmetic treatment often consume the surgeon's time with frequent telephone calls and requests for additional consultations and procedures. These patients are also prone to file malpractice lawsuits and may even become physically violent toward their surgeons.^{14,16-18} These issues highlight the need for accurate identification of patients with BDD presenting for cosmetic treatment.

The main objectives of the present study were (1) to determine the prevalence of BDD in an academic facial plastic and reconstructive surgery practice; (2) to validate an established BDD screening instrument (the Body Dysmorphic Disorder Questionnaire [BDDQ]⁸) in a population of patients undergoing cosmetic and reconstructive surgery; (3) to assess the feasibility of implementing a standardized process for identifying patients with BDD accurately in a busy clinical practice; and (4) to assess the comorbidity of BDD, depression, and anxiety in our patient population. Based on previous studies, we hypothesized that the prevalence of BDD would be higher in patients seeking cosmetic rather than reconstructive

surgery. We further hypothesized that the BDDQ would be a valid screening instrument to identify patients with BDD. Last, we hypothesized that patients with BDD would be more likely to have clinically significant depression and anxiety than our non-BDD population.

Methods

Participants

The institutional review board of the Johns Hopkins University School of Medicine approved this study. Written and oral informed consent were obtained from the patients in this study. We enrolled 251 consecutive patients aged 18 years or older who presented to our facial plastic and reconstructive surgery clinic from March 3 to June 30, 2014. Of these, 17 patients declined to participate or failed to complete the questionnaire, leaving 234 patients whose data were analyzed. As a group, patients who did not complete the questionnaire did not differ by demographic characteristics. The 3 physicians in this clinic (P.J.B., K.D.O.B., and L.E.I.) treat patients seeking cosmetic and reconstructive surgery. [Table 1](#) provides the demographic data of the 234 patients. Data are subdivided to examine those undergoing cosmetic vs reconstructive surgery and the subset of patients with BDD, defined as those with positive findings on the BDD Structured Clinical Interview for *DSM-IV* (BDD SCID).¹⁹

Instruments

The primary instrument was a questionnaire with demographic questions and the BDDQ⁸; the Beck Depression Inventory, second edition (BDI-II)²⁰; and the State-Trait Anxiety Inventory for adults²¹ to assess for BDD, depression, and anxiety, respectively. The BDDQ is a self-report measure that uses the *DSM-IV-TR* diagnostic criteria to screen for BDD as described by Phillips.⁸ According to the *DSM-IV-TR*, the diagnostic criteria for BDD include the following: (1) preoccupation with an imagined defect in appearance, and if a slight physical anomaly is present, the person's concern is markedly excessive; (2) the preoccupation causes significant distress or impairment of social, occupational, or other important areas of functioning; and (3) the preoccupation is not better accounted for by another mental disorder (eg, anorexia nervosa).¹

The secondary instrument was the BDD SCID,¹⁹ which is a clinician-administered, semistructured interview that is considered the criterion-standard diagnostic measure for BDD.¹⁹ After completing the BDDQ, patients were invited to undergo the BDD SCID to quantify the prevalence of BDD more accurately and to validate the screening instrument (the BDDQ) in a facial plastic and reconstructive surgery setting.

Procedure

All patients presenting to the clinic received a paper copy of the BDDQ during check-in. Patients completed the questionnaire as they waited to see their surgeon. Photographs were taken of each patient as standard practice. Patients were then seen by their surgeon. After their appointment, all patients with a BDDQ-positive screen result and 50% of patients with a BDDQ-negative screen result were invited to participate in a short clinical interview in which the investigator administered the BDD SCID. Of the 28 patients with a BDDQ-positive screen result, 25 agreed to take the BDD SCID. We used statistical imputation to predict the BDD SCID status of the 3 patients with a BDDQ-positive screen result who declined to take

the BDD SCID. Although studies^{8,22,23} have found that all patients with a BDDQ-negative screen result have negative BDD SCID findings (100% sensitivity), we administered the BDD SCID to a random subsampling of 93 patients with a BDDQ-negative screen result for this validation study.

To meet the first *DSM-IV-TR* criterion for BDD, the defect must be nonexistent or minimal relative to the patient's concern. Therefore, to confirm BDD status, all participants with a BDDQ-positive screen result had their photographs independently reviewed by 3 experts (P.J.B., K.D.O.B., and L.E.I.). The surgeons rated the presence and severity of facial defects using a Likert scale from 1 to 5 on which 1 indicates no defect is present; 2, a minimal/slight defect is present; 3, a defect is present and clearly noticeable at a conversational distance; 4, a moderately severe defect is present; and 5, a severe defect is present. Severity scores were determined for each patient's defect using the Delphi method.²⁴ As described by Phillips et al,²² a diagnosis of BDD requires a defect severity score of 1 or 2. In the present study, all 28 patients with a BDDQ-positive screen result received an expert-rated defect severity score of 1 (21 patients [75%]) or 2 (7 patients [25%]); that is, their reported defects were minimal or nonexistent.

Data Analysis

Data were entered and stored using the Research Electronic Data Capture process (REDCap; <http://www.project-redcap.org>)²⁵ and analyzed using commercially available statistical software (Stata 12 SE; StataCorp). Demographic data were tabulated separately for the groups undergoing cosmetic and reconstructive procedures. Prevalence of BDD was determined by the BDDQ and the BDD SCID for the cosmetic, reconstructive, and total patient populations. The criterion-standard BDD SCID data were used to validate the BDDQ screening instrument. We calculated the accuracy, sensitivity, specificity, positive and negative predictive values, and positive and negative likelihood ratios. The 95% CIs for these values were calculated with the use of the bias-corrected and accelerated bootstrap method with 10 000 samples. The experiment-wide α was set at .05. Depression and anxiety scores were calculated as mean (SD) for the patients with and without BDD and referenced to the population norms.

Results

[Table 1](#) presents the demographic data for the total and subset patient populations and the subset of patients with BDD. The cosmetic and reconstructive surgery populations were similar in all measured demographic domains except for sex, with more women than men seeking cosmetic procedures. Compared with the total patient population, the patients with BDD were younger and more likely to be single or divorced. Parity by sex was found in the BDD population, with the ratio of women to men reflecting that of the total patient population; this is consistent with the literature finding that BDD affects men and women with equal frequency.^{1,26}

Prevalence

[Table 2](#) shows the prevalence of BDD in our cosmetic and reconstructive surgery populations as determined by the BDDQ and the BDD SCID. As reported by the BDDQ, 12.0% of our

entire population had a BDDQ-positive screen result; however, the prevalence of patients with a BDDQ-positive screen result was much higher in the cosmetic (19.7%) than in the reconstructive (3.6%) populations. As reported by the BDD SCID, the prevalence of BDD in our entire population was 7.7%; again, BDD was more prevalent in the cosmetic (13.1%) than in the reconstructive (1.8%) surgery populations. The BDD SCID data are more conservative and, as the criterion standard, represent a more accurate assessment of the prevalence of BDD in the respective populations. Of the 28 patients with a BDDQ-positive screen result, 25 were administered the BDD SCID. The BDD SCID data for the 3 patients (all in the cosmetic surgery population) who refused to participate in the interview were imputed. The results of the imputation were 2 of the 3 patients classified as having a positive BDD SCID finding and 1 patient as having a negative BDD SCID finding. These data are consistent with our expectations based on the positive predictive value of the BDDQ and the reliability of imputation methods.²⁷⁻²⁹ To provide the most conservative estimates of BDD prevalence, we also calculated prevalence with all 3 of those patients having negative BDD SCID findings, which would not significantly change our BDD SCID prevalence data for the cosmetic (11.5%) and reconstructive (1.8%) surgery populations or for all patients (6.8%).

Validation

Using the self-administered screen (BDDQ) and the clinician-administered, criterion-standard diagnostic instrument (BDD SCID), we calculated the accuracy, sensitivity, specificity, positive and negative predictive values, and positive and negative likelihood ratios. These data were generated from patients to whom the BDD SCID was administered and are presented in [Table 3](#). In this setting, the BDDQ had more than adequate accuracy (91.7%), sensitivity (100%), specificity (90.3%), positive predictive value (64.3%), negative predictive value (100%), and positive likelihood ratio (10.3). These data are supported by those of Phillips,⁸ who found the BDDQ to have 100% sensitivity and 89% specificity in a psychiatric setting and 100% sensitivity and 93% specificity in a dermatology setting. The [Figure](#) plots the pretest and posttest probabilities for the BDDQ. Given the pretest probability (ie, prevalence) of BDD, this graph can be used to determine the posttest probability of a patient having BDD after a BDDQ-positive screen result. Although our data and those of other studies would suggest that all patients with a BDDQ-negative screen result would have negative BDD SCID findings, we administered the BDD SCID to a representative cohort of 93 patients with BDDQ-negative screen results. Reflecting the 100% negative predictive value, all patients with BDDQ-negative screen results had negative BDD SCID findings.

We recorded the defect of greatest concern for the 28 patients with BDDQ-positive screen results and the 18 patients with positive BDD SCID findings. Of the 28 patients with BDDQ-positive screen results, 14 (50%) were most concerned about their nose; 10 (36%), their skin; 2 (7%), their hair; 1 (4%), their chin; and 1 (4%), their ears. The 18 patients with positive BDD SCID findings were most concerned about their nose (10 [56%]), skin (5 [28%]), hair (1 [6%]), chin (1 [6%]), and ears (1 [6%]).

We next assessed depression and anxiety for all patients. The BDI-II has no arbitrary cutoff scores for all purposes. These guidelines provide the following interpretation of the BDI-II scores: 0 to 13 indicate minimal depression; 14 to 19, mild depression; 20 to 28, moderate depression; and 29 to 63, severe depression.^{20,30} The mean (SD) BDI-II score for our non-BDD

population was 3.2 (4.2) and for our BDD population, 12.6 (10.8). For the State-Trait Anxiety Inventory, the literature identifies clinically significant anxiety as a state and/or trait anxiety score greater than 40.³¹ For our non-BDD population, mean state and trait anxiety scores closely represented the normative data for adult men and women in the general population. For men, mean (SD) normative state and trait anxiety scores are 35.7 (10.4) and 34.9 (9.2), respectively.²¹ In our study, men without BDD had state and trait anxiety scores of 30.0 (7.7) and 30.3 (7.7), respectively, and men with BDD had scores of 53.8 (23.4) and 50.4 (19.5), respectively. For women, mean (SD) normative state and trait scores are 35.2 (10.6) and 34.8 (9.2), respectively.²¹ The women without BDD had state and trait anxiety scores of 31.7 (10.0) and 32.1 (8.7), respectively, and women with BDD had scores of 47.8 (12.7) and 49.0 (11.6), respectively. Furthermore, in the non-BDD population, raw depression and anxiety scores were weakly correlated ($r = 0.51$). The correlations were much higher in the populations with BDDQ-positive screen results ($r = 0.84$) and positive BDD SCID findings ($r = 0.94$) ($P < .001$ for all).

Discussion

A collaborative team of plastic surgeons and psychiatrists^{32,33} were among the first to describe BDD in patients undergoing cosmetic procedures before the formal inclusion of BDD as a psychiatric disorder in the *DSM-III-R* in 1987.³⁴ Their detailed reports of patients “insatiable” in their need for cosmetic surgery^{32(p285)} and cosmetic patients with “minimal deformity”³³ are consistent with descriptions of patients diagnosed as having BDD today. In our continuation of the study of BDD in plastic surgery, we aimed to determine the prevalence of BDD in our facial plastic and reconstructive surgery population and to develop and implement a feasible process to identify patients with BDD in our clinic with accuracy. To accomplish these aims, we used the BDDQ and the clinician-administered, criterion-standard BDD SCID, both of which are established tools.

As shown in [Table 1](#), our clinic population is equally divided between patients undergoing cosmetic and reconstructive surgery. Using the BDDQ, we established a prevalence of BDD in the cosmetic surgery population of 19.7% ([Table 2](#)). These findings are consistent with those of other studies showing that 7% to 20% of patients undergoing cosmetic surgery have a BDD-positive screen result.³⁵⁻³⁷ Prevalence studies that rely only on screening instruments are limited because these studies report the percentage of patients with a possible diagnosis of BDD and likely overestimate prevalence. Therefore, we administered the BDD SCID to the patients with a BDDQ-positive screen result to measure the prevalence in our clinic populations with greater accuracy. As determined by the BDD SCID findings, the prevalence of BDD in our patients undergoing cosmetic surgery was 13.1%.

As hypothesized, the prevalence of BDD was much higher in the patients undergoing cosmetic rather than reconstructive surgery. The prevalence of BDD in our reconstructive surgery population (1.8%) was similar to that of the general population (1%-2%).^{10,38} We expected this finding because the first diagnostic criterion for BDD is that the patient’s body image concern must be nonexistent or minimal compared with their perception. Most of our patients undergoing reconstructive surgery have significant facial deformities, and these patients’ concerns about their appearance, if any, are usually proportional to the disfigurement severity.

Our literature review showed that this study was the largest, to our knowledge, of BDD prevalence in a cosmetic surgery population in the United States and the first BDDQ validation study in a facial plastic and reconstructive surgery setting. We therefore established an efficient and reliable process for identifying patients with BDD in our clinic. We compared the BDDQ with the BDD SCID results and found the BDDQ to be a valid and accurate screening tool. The data in [Table 3](#) and the [Figure](#) further document this conclusion. These values are consistent with validation studies in other patient populations.^{8,22,23} In 66 psychiatric outpatients, Phillips et al²³ found the BDDQ to have a sensitivity of 100% and a specificity of 89%; in 46 patients in a dermatology setting, Phillips et al²² reported the BDDQ to have 100% sensitivity and 93% specificity. Our data support these findings that the BDDQ will determine with accuracy whether BDD is present in 100% of the cases. Screening instruments, such as the BDDQ, are beneficial because they are brief, self-administered, and easily used to screen entire patient populations without a significant burden on the surgeon or the staff. The major limitation of such screening instruments is that they cannot diagnose BDD definitively; they only suggest that BDD is present. As described by Phillips,⁸ the ideal use of the BDDQ is as a screening tool given to all patients to identify those with possible BDD, who should then be interviewed by a clinician to confirm the diagnosis.⁸

Given (1) the multitude of studies and reports indicating that cosmetic treatments fail to help patients with BDD and put the treating surgeon at undue risk and (2) the relative ease and effectiveness of screening for BDD, we wondered why plastic surgeons, including ourselves, do not use an established BDD screening instrument as a matter of routine. Perhaps, although most plastic surgeons are aware that BDD exists among their patients, most underestimate the rate at which BDD occurs.¹⁴ Another reason may be that surgeons routinely rely on their gut feeling about whether a patient has BDD or is a candidate for surgery. This reason is problematic because these feelings are easily biased and have been shown to be imprecise. In a survey study,¹⁴ 84% of plastic surgeons said they had performed surgery on a patient only to realize after the operation that the patient had BDD. These data highlight the need for plastic surgeons to use a validated, accurate, standardized, and less biased method to identify BDD.

Given our data, we recommend that cosmetic surgeons screen their patients for BDD as part of standard practice. The BDDQ screening instrument takes 1 to 2 minutes for patients to complete as they wait for their appointment. Grading takes seconds, and a positive screen result should flag the patient for further evaluation. In our clinic, further evaluation involves administration of the BDD SCID and an assessment of the severity of the patient's concern with appearance. The BDD SCID is easily incorporated into a discussion between the surgeon and patient about the patient's concern with appearance. For patients who meet the *DSM-IV-TR* criteria for BDD as established by the BDD SCID and defect severity assessment, we recommend referral to a psychiatrist for further evaluation.

This study also sought to examine some characteristics of our population of patients with BDD. Consistent with the literature, we found them to be younger, with equal incidence in men and women. Depression and anxiety scores were elevated and highly correlated in patients with BDD compared with the non-BDD population. This finding suggests a greater comorbidity of depression and anxiety in patients with BDD. However, a subset of patients

with BDD in our study had no comorbid depression or anxiety. Furthermore, the features of most common concern to our patients with BDD were the nose, skin, and hair.

This study has limitations. We conducted it in a single academic facial plastic and reconstructive surgery clinic; thus, results may not be generalizable to other settings. However, the BDDQ pretest/posttest probability curve ([Figure](#)) can help others to determine the usefulness of the BDDQ screening instrument in their setting based on estimated BDD prevalence. Another limitation is the small number of patients with BDD (n = 18), which limited the power of analyses of depression and anxiety. Furthermore, not all clinic patients participated, and the exclusion of these patients could have influenced our estimation of BDD prevalence.

Conclusions

Body dysmorphic disorder is underdetected in patients presenting for cosmetic surgery, and patients with BDD are highly likely to seek cosmetic surgery. Valid and useful screening and diagnostic instruments for BDD are available. We found a simple screening questionnaire (BDDQ) followed by administration of the BDD SCID for the fraction of patients with a BDDQ-positive screen result to be useful tools to identify these patients, and we also found that administration of these instruments is feasible in a busy practice.

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References

1. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed, text revision. Washington, DC: American Psychiatric Association; 2000.
2. Phillips KA, Menard W, Fay C, Weisberg R. Demographic characteristics, phenomenology, comorbidity, and family history in 200 individuals with body dysmorphic disorder. *Psychosomatics*. 2005;46(4):317-325. [PubMedGoogle ScholarCrossref](#)
3. Veale D, Boocock A, Gournay K, et al. Body dysmorphic disorder: a survey of fifty cases. *Br J Psychiatry*. 1996;169(2):196-201. [PubMedGoogle ScholarCrossref](#)
4. Hollander E, Cohen LJ, Simeon D. Body dysmorphic disorder. *Psychiatr Ann*. 1993;23:359-364. [Google ScholarCrossref](#)
5. Gunstad J, Phillips KA. Axis I comorbidity in body dysmorphic disorder. *Compr Psychiatry*. 2003;44(4):270-276. [PubMedGoogle ScholarCrossref](#)
6. Phillips KA, Menard W, Fay C, Pagano ME. Psychosocial functioning and quality of life in body dysmorphic disorder. *Compr Psychiatry*. 2005;46(4):254-260. [PubMedGoogle ScholarCrossref](#)
7. Aouizerate B, Pujol H, Grabot D, et al. Body dysmorphic disorder in a sample of cosmetic surgery applicants. *Eur Psychiatry*. 2003;18(7):365-368. [PubMedGoogle ScholarCrossref](#)
8. Phillips K. *The Broken Mirror: Understanding and Treating Body Dysmorphic Disorder*. New York, NY: Oxford University Press; 2005.
9. Phillips KA, Coles ME, Menard W, Yen S, Fay C, Weisberg RB. Suicidal ideation and suicide attempts in body dysmorphic disorder. *J Clin Psychiatry*. 2005;66(6):717-725. [PubMedGoogle ScholarCrossref](#)
10. Buhlmann U, Glaesmer H, Mewes R, et al. Updates on the prevalence of body dysmorphic disorder: a population-based survey. *Psychiatry Res*. 2010;178(1):171-175. [PubMedGoogle ScholarCrossref](#)
- 11.

- Phillips KA, Grant J, Siniscalchi J, Albertini RS. Surgical and nonpsychiatric medical treatment of patients with body dysmorphic disorder. *Psychosomatics*. 2001;42(6):504-510.[PubMedGoogle ScholarCrossref](#)
- 12.
- Crerand CE, Phillips KA, Menard W, Fay C. Nonpsychiatric medical treatment of body dysmorphic disorder. *Psychosomatics*. 2005;46(6):549-555.[PubMedGoogle ScholarCrossref](#)
- 13.
- Sarwer DB, Crerand CE, Didie ER. Body dysmorphic disorder in cosmetic surgery patients. *Facial Plast Surg*. 2003;19(1):7-18.[PubMedGoogle ScholarCrossref](#)
- 14.
- Sarwer DB. Awareness and identification of body dysmorphic disorder by aesthetic surgeons: results of a survey of American Society for Aesthetic Plastic Surgery members. *Aesthet Surg J*. 2002;22(6):531-535. [PubMedGoogle ScholarCrossref](#)
- 15.
- Tignol J, Biraben-Gotzamanis L, Martin-Guehl C, Grabot D, Aouizerate B. Body dysmorphic disorder and cosmetic surgery: evolution of 24 subjects with a minimal defect in appearance 5 years after their request for cosmetic surgery. *Eur Psychiatry*. 2007;22(8):520-524. [PubMedGoogle ScholarCrossref](#)
- 16.
- Yazel L. The serial-surgery murder. *Glamour*. May 1999:108-114.[Google Scholar](#)
- 17.
- Goin JM, Goin MK. *Changing the Body: Psychological Effects of Plastic Surgery*. Baltimore, MD: Williams & Wilkins; 1981.
- 18.
- Cotterill JA. Body dysmorphic disorder. *Dermatol Clin*. 1996;14(3):457-463.[PubMedGoogle ScholarCrossref](#)
- 19.
- First MB, Spitzer RL, Gibbon M, Williams J. *Structured Clinical Interview for DSM-IV-TR Axis I Disorders*. New York: Biometrics Research, New York State Psychiatric Institute; 2002.
- 20.
- Beck AT, Steer RA, Brown GK. *Beck Depression Inventory: Second Edition Manual*. San Antonio, TX: Psychological Corp; 1996.
- 21.
- Spielberger CD, Gorsuch RL, Lushene R, Vagg PR, Jacobs GA. *Manual for the State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press; 1983.
- 22.
- Phillips KA, Dufresne RG Jr, Wilkel CS, Vittorio CC. Rate of body dysmorphic disorder in dermatology patients. *J Am Acad Dermatol*. 2000;42(3):436-441.[PubMedGoogle ScholarCrossref](#)
- 23.
- Phillips KA, Alta KD, Pope HG. Diagnostic instruments for body dysmorphic disorder. In: New Research Program and Abstracts From the 148th Annual Meeting of the American Psychiatric Association; May 20-25th, 1995; Miami, Florida.
- 24.
- Daley N, Helmer O. An experimental application of the Delphi method to the use of experts. *Manage Sci*. 1963;9(3):458-467.[Google ScholarCrossref](#)
- 25.

- Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research Electronic Data Capture (REDCap): a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform.* 2009;42(2):377-381.[PubMedGoogle ScholarCrossref](#)
- 26.
- Phillips KA, Diaz SF. Gender differences in body dysmorphic disorder. *J Nerv Ment Dis.* 1997;185(9):570-577.[PubMedGoogle ScholarCrossref](#)
- 27.
- Rubin DB. *Multiple Imputation for Nonresponse in Surveys.* New York, NY: Wiley; 1987.
- 28.
- Lee KJ, Carlin JB. Multiple imputation for missing data: fully conditional specification versus multivariate normal imputation. *Am J Epidemiol.* 2010;171(5):624-632.[PubMedGoogle ScholarCrossref](#)
- 29.
- Lin TH. Missing data imputation in quality-of-life assessment: imputation for WHOQOL-BREF. *Pharmacoeconomics.* 2006;24(9):917-925.[PubMedGoogle ScholarCrossref](#)
- 30.
- Smarr KL, Keefer AL. Measures of depression and depressive symptoms: Beck Depression Inventory-II (BDI-II), Center for Epidemiologic Studies Depression Scale (CES-D), Geriatric Depression Scale (GDS), Hospital Anxiety and Depression Scale (HADS), and Patient Health Questionnaire-9 (PHQ-9). *Arthritis Care Res (Hoboken).* 2011;63(suppl 11):S454-S466.[PubMedGoogle ScholarCrossref](#)
- 31.
- Julian LJ. Measures of anxiety: State-Trait Anxiety Inventory (STAI), Beck Anxiety Inventory (BAI), and Hospital Anxiety and Depression Scale–Anxiety (HADS-A). *Arthritis Care Res (Hoboken).* 2011;63(suppl 11):S467-S472.[PubMedGoogle ScholarCrossref](#)
- 32.
- Knorr NJ, Edgerton MT, Hoopes JE. The “insatiable” cosmetic surgery patient. *Plast Reconstr Surg.* 1967;40(3):285-289.[PubMedGoogle ScholarCrossref](#)
- 33.
- Edgerton MT, Jacobson WE, Meyer E. Surgical-psychiatric study of patients seeking plastic (cosmetic) surgery: ninety-eight consecutive patients with minimal deformity. *Br J Plast Surg.* 1960;13:136-145.[PubMedGoogle ScholarCrossref](#)
- 34.
- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders.* 3rd ed, revised. Washington, DC: American Psychiatric Association; 1987.
- 35.
- Sarwer DB, Wadden TA, Pertschuk MJ, Whitaker LA. Body image dissatisfaction and body dysmorphic disorder in 100 cosmetic surgery patients. *Plast Reconstr Surg.* 1998;101(6):1644-1649.[PubMedGoogle ScholarCrossref](#)
- 36.
- Crerand CE, Sarwer DB, Magee L, et al. Rate of body dysmorphic disorder among patients seeking facial plastic surgery. *Psychiatr Ann.* 2004;34:958-965.[Google ScholarCrossref](#)
- 37.
- Veale D, De Haro L, Lambrou C. Cosmetic rhinoplasty in body dysmorphic disorder. *Br J Plast Surg.* 2003;56(6):546-551.[PubMedGoogle ScholarCrossref](#)
- 38.

Koran LM, Abujaoude E, Large MD, Serpe RT. The prevalence of body dysmorphic disorder in the United States adult population. *CNS Spectr.* 2008;13(4):316-322.[PubMedGoogle Scholar](#)