



## Review

Cosmetic Surgery and Body Dysmorphic Disorder – An Update<sup>☆</sup>S. Higgins, MD<sup>\*</sup>, A. Wysong, MD, MS

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## ABSTRACT

With the increasing volume and popularity of cosmetic procedures and surgeries, physicians in related specialties are increasingly likely to encounter patients with body dysmorphic disorder. Given the ethical, safety, and legal considerations involved in aesthetic procedures in these patients, accurate identification and appropriate selection for procedures is crucial.

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## Introduction

Standards of attractiveness are learned by exposure to culturally imposed ideals (Abbas et al., 2017). These ideals create immense pressure to conform to prevailing beauty standards and consequently have engendered insecurities via their influence on perception of self and body image. Body image encompasses perceptions, thoughts, and feelings about the body that are influenced by development, perception, and sociocultural factors (Pruzinsky, 1990; Sarcu and Adamson, 2017). Its four components include the relative importance of appearance, the degree of dissatisfaction with appearance, the physical reality of appearance, and the perception of appearance (Sarcu and Adamson, 2017). Various processes, such as expectations, motivations, emotions, previous knowledge, and memory, can shape perception. In some patients, perception has been shaped in such a way that it becomes discordant with reality. One of the most common forms of this disorder is body dysmorphic disorder (BDD).

## Body dysmorphic disorder

## History and diagnosis

Body dysmorphic disorder is a psychiatric disorder characterized by preoccupation with an imagined defect in physical appearance or a distorted perception of one's body image (Alavi et al., 2011; Franca et al., 2017; Ribeiro, 2017). BDD was originally called imagined ugliness syndrome and has also been called dysmorphic

syndrome, dermatologic hypochondriasis, body dysmorphia, and dysmorphophobia (Franca et al., 2017; Jordan, 2016). In 1980, the disease was introduced in the psychiatric literature in the Diagnostic and Statistical Manual of Mental Disorders (DSM) by the American Psychiatric Association as an atypical somatoform disorder (Franca et al., 2017).

In the DSM-V, published in 2013, BDD was added to the obsessive-compulsive and related disorders spectrum, and the following four criteria were provided to support a diagnosis: (1) preoccupation with one or more perceived defects or flaws in physical appearance that are not observable or appear slight to others; (2) repetitive behaviors (i.e., mirror checking, excessive grooming, skin picking, reassurance seeking) or mental acts (i.e., compare own appearance with that of others) in response to concerns with appearance; (3) preoccupation causing clinically significant distress or impairment in social, occupational, or other important areas of functioning; and (4) preoccupation with appearance is not better explained by concerns with body fat or weight in an individual whose symptoms meet the diagnostic criteria for an eating disorder (Franca et al., 2017; Sarwer et al., 2015; Sweis et al., 2017; Tadisina et al., 2013).

Clues to a possible diagnosis of BDD include frequent mirror checking, constant comparison with others, excessive grooming, picking skin, camouflaging behavior, frequently changing clothes, and thinking that others are equally disturbed with the perceived defects (referential thinking). Although there is often a need for reassurance with regard to perceived flaws, the constant belief that one is ugly, unattractive, or even repulsive surmounts the patient's entire thought process and reassurance or negation of the defect is of minimal to no consequence (Table 1; Varma and Rastogi, 2015). Additional clues to support a diagnosis include seeking unnecessary dermatological treatment or cosmetic surgery (Anderson, 2003).

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**Table 1**  
BDD signs, symptoms, and demographics by BDD severity

Mild/Moderate	Severe	Both
No significant impairment in global functioning Localized appearance concerns Realistic psychosocial concerns	Avoidant behavior Impairment in global functioning Young Significantly depressed  Significantly anxious  Extremely preoccupied with defect Debilitating compulsive behaviors (i.e., mirror checking or self-mutilation/do-it-yourself surgery) Delusional beliefs about appearance Social isolation Unemployment Unrealistic expectations regarding cosmetic outcome Expectation that cosmetic procedure will be solution to problems in other areas of life	Frequent mirror checking Constant comparison with others Need for reassurance with regard to perceived flaws Seeking unnecessary dermatological treatments or cosmetic procedures Referential thinking: thinking that others are equally disturbed with the defects Camouflaging behavior Abnormal or demanding behavior toward surgeon or staff

BDD, body dysmorphic disorder.

Because patients with BDD often possess unrealistic expectations about the cosmetic outcomes of these surgeries and often expect the cosmetic procedure to be the solution to problems in other areas of life, they frequently experience a dissatisfaction that does not correlate with the objective outcome (Alavi et al., 2011; Sweis et al., 2017). Additionally, as a result of their disease, patients may avoid physical contact with other people, with avoidance behaviors and social withdrawal being cited as contributors to BDD severity and chronicity (Brito et al., 2016).

#### Demographics

BDD often occurs during the adolescent years, with one study reporting that more than 70% of cases are characterized by onset before 18 years of age, although it may also initially manifest after menopause (Anderson, 2003; de Brito et al., 2016). Late-onset BDD is uncommon (de Brito et al., 2016). Up to 1% of the U.S. population is estimated to have BDD, although BDD is thought to be underdiagnosed and underreported (Anderson, 2003).

In adult population-based studies, the point prevalence rates range from 0.7% to 2.4% on the basis of DSM-III-R or DSM-IV criteria (Bouman et al., 2017; Franca et al., 2017; Mollmann et al., 2017; Morselli et al., 2016). Other studies report rates in the general population that are as high as 5.8% (Mollmann et al., 2017). In aesthetic specialties, rates are noticeably higher, with a reported prevalence of 6.7% among general dermatology patients, 14.0% among cosmetic dermatology patients, 10% in the maxillofacial setting, and 21% in patients seeking rhinoplasty (Bouman et al., 2017; Brito et al., 2016; Locatelli et al., 2017). Most studies report a higher prevalence in women, although two reviews report equal prevalence in men and women with differentiating factors being the areas of preoccupation (Danesh et al., 2015; Kyle, 2012). Women are reported to be preoccupied with breasts, hips, legs, and body weight, with particular emphasis on skin, hair, or nose (Anderson, 2003; Dey et al., 2015; Franca et al., 2017; Kyle, 2012), whereas men focus on genitals, height, excess body hair, thinning hair, body build, and muscle size (Anderson, 2003).

An increasingly recognized form of muscle dysmorphia in men is called bigorexia, which is a pathological preoccupation with overall muscularity and leanness (Mosley, 2009). However, a preoccupation with only one part of the body in BDD is rare; on average, most patients focus on three to four body parts during the course of the disease (Anderson, 2003; Sweis et al., 2017). Preoccupations may lead to obsessive thinking and compulsive behaviors that disrupt daily activities (Anderson, 2003).

#### Etiology

The origins of BDD are reportedly rooted in psychological and physiological factors. BDD is reported to be due at least in part to dysfunctional backgrounds, including abuse and unfavorable childhood experiences such as teasing, that lead to low self-esteem and insecurities (Anderson, 2003; de Brito et al., 2016; Franca et al., 2017). Bouman et al. (2017) found that 69% of patients with BDD report some experience with being teased and bullied (Brito et al., 2016).

The increased popularity of social media also provides an additional, increasingly relevant platform for bullying. In a 2016 national representative sample of 4500 U.S. adolescents aged 12 to 17 years, 30.7% of male and 36.3% of female respondents reported a history of being cyberbullied (Patchin, 2016). The susceptibility to these external forces, however, may depend on a number of factors that include personality/temperament, coping strategies, and socioecological factors such as family environment and social support (Rumsey and Harcourt, 2007).

Additionally, unconscious displacement of other emotions, such as guilt, inferiority, and poor self-image, is also reported to be an etiologic factor in BDD (Franca et al., 2017). Physiological explanations include disturbed emotional input as a child, alteration of the neurochemical milieu of the brain caused by inflammatory mediators after a medical illness, and frontal lobe atrophy. No controlled studies have been published to confirm or refute these hypotheses, although neuropsychological and brain imaging studies have suggested that there may be impairment of the frontostriatal and temporoparietoccipital circuits (McConnell et al., 2015; Mufaddel et al., 2013). Abnormalities in visual processing and frontostriatal systems in patients with BDD may be associated with symptoms of obsessive thoughts and compulsive behaviors with regard to physical appearance that drive the pursuit of cosmetic procedures (Mufaddel et al., 2013).

#### Cosmetic procedures and body dysmorphic disorder

##### Volume of cosmetic procedures

In recent years, there have been dramatic increases in the volume of patients seeking cosmetic procedures. In 1992, more than 400,000 Americans underwent cosmetic surgery. In 2015, 21 million surgical and nonsurgical cosmetic procedures were performed worldwide, including 15.9 million in the United States (Lee et al., 2017; Valikhani and Goodarzi, 2017). In the United Kingdom specifically, there has been a 300% rise in cosmetic procedures since 2002 (Ziglinas et al., 2014). The top five countries in which the most surgical and

nonsurgical procedures are performed are the United States, Brazil, South Korea, India, and Mexico (Valikhani and Goodarzi, 2017).

With the increasing rate of cosmetic surgery, an increasing number of dermatologists and cosmetic surgeons will encounter patients with BDD in the clinical setting. There is currently growing controversy with regard to the status of BDD as a contraindication to surgical and nonsurgical cosmetic procedures (Bouman et al., 2017; de Brito et al., 2016; Spriggs and Gillam, 2016).

#### *Body dysmorphic disorder as a contraindication to cosmetic procedures*

Historically, the literature has cited BDD as a clear contraindication to cosmetic surgeries and procedures (Lee et al., 2017). Bouman et al. (2017) conducted an online survey of 173 members of Dutch professional associations for aesthetic plastic surgery, dermatology, and cosmetic medicine and reported that approximately two-thirds of dermatologic surgeons considered BDD a contraindication for cosmetic procedures. These physicians argued that BDD is essentially a body image problem; thus, cosmetic procedures will yield little to no improvement (Bouman et al., 2017).

Instead, the psychological disorder should be treated first because surgical treatment without prior psychological treatment can result in dangerous or even deadly consequences for the surgeon (Alavi et al., 2011; Anderson, 2003; Sweis et al., 2017). Dissatisfied patients may attempt retaliation against the surgeon whom they believe has worsened their defect (Sweis et al., 2017). This may take the form of lawsuits, physical assaults, or in some cases murder (Sweis et al., 2017). One study reported that 2% of plastic surgeons have been physically threatened by a patient with BDD, and 10% have received threats of violence and legal action (Sweis et al., 2017; Wang et al., 2016). In another study, 40% of plastic surgeons reported that they have been threatened by a patient with BDD (Ziglinas et al., 2014). Since 1991, three plastic surgeons have been murdered by patients with BDD who were unhappy with their surgical results (Sweis et al., 2017).

#### *Categorization of body dysmorphic disorder by severity*

An increasing number of physicians believe in more nuanced decision-making on the basis of the severity of the BDD and the patient's overall level of functioning. This has stemmed at least in part from the debate on diagnostic thresholds for BDD and whether body dissatisfaction overall was being drawn into the clinical domain, yielding hard and fast barriers to cosmetic procedures (Veale et al., 2016). Studies report that the level of subjective distress and psychosocial impairment associated with physical appearance may be the most important factors to evaluate in patients who desire cosmetic surgery and can be used to classify BDD symptoms into mild-to-moderate and severe categories (de Brito et al., 2015; Fatholoolomi et al., 2013; Metcalfe et al., 2014; Picavet et al., 2013).

Patients with severe BDD exhibit avoidant behavior and impairment of global functioning (de Brito et al., 2015). They are often younger, more depressed, anxious, preoccupied with their defect, and have more compulsive behaviors such as mirror checking or self-mutilating (i.e., do-it-yourself) surgery (Ziglinas et al., 2014). They are significantly handicapped in their occupation, social life, and intimate relationships and may present with delusional beliefs about appearance and time-consuming camouflaging behavior (de Brito et al., 2016).

Some studies report that these patients are unsuitable for cosmetic procedures but those with mild-to-moderate BDD, no significant impairment in overall functioning, localized appearance concerns, and realistic psychosocial expectations may benefit. Thus, dimensional identification and classification of BDD symptoms (i.e., level of subjective distress and avoidant behavior related to dissatisfaction

with physical appearance) may provide a new perspective for decision support (Bowyer et al., 2016; de Brito et al., 2015, 2016; Morselli and Boriani, 2012).

One study supports the feasibility of this multidimensional approach and reports that 1 year after surgery, 25 of 31 patients (81%) with mild-to-moderate BDD symptoms at baseline experienced full remission and 28 of 31 patients (90%) were satisfied with their surgical outcome (Felix et al., 2014). Validated screening tools may aid in placing patients on the continuum of body dissatisfaction or mild-to-moderate or severe BDD (Veale et al., 2016).

## Screening tools

### *The demand*

In addition to categorizing patients into the mild-to-moderate or severe subtypes of BDD, patients' expectations also play a large role in their level of post-procedure satisfaction (Morselli et al., 2016). Patients with BDD often hold unrealistic expectations regarding cosmetic procedures and are thus dissatisfied regardless of the actual outcome (Naraghi and Atari, 2016). Therefore, preoperative assessment and management of expectations is critical to postoperative satisfaction.

Validated assessment tools are valuable additions to the preprocedural assessment to aid in the evaluation of overall suitability for the procedure in question. In a survey of 265 members of the American Society for Aesthetic Plastic Surgery, 84% of plastic surgeons reported that they had unknowingly operated on patients with BDD (Joseph et al., 2016). Thus, it appears that many surgeons continue to rely primarily on their intuition and intangible information gathered from the clinical encounter to determine whether a patient has BDD (Joseph et al., 2016). However, surgeons have been shown to be poor at screening for BDD compared with standardized surveys, with the former having a sensitivity of only 4.7% and a positive likelihood ratio (1.2; 95% confidence interval, 0.3–5.1; Joseph et al., 2016). Given the implications of operating inappropriately on a patient with BDD, a preoperative psychiatric assessment with validated tools in addition to a detailed face-to-face component is critical.

### *Available screening tools for patients with body dysmorphic disorder*

Validated and efficacious screening tools for the perioperative setting are limited (Morselli et al., 2016). Many available questionnaires are time-consuming and difficult to interpret without formal psychometric training (Table 2). The gold standard for a diagnosis of BDD is the 24-question, structured, clinical interview for a diagnosis for DSM-IV Axis I Disorders, which may take 15 minutes to several hours to administer, making it potentially impractical in a busy clinical context. It has also been developed in the psychiatric setting without validation in the cosmetic surgery setting (Joseph et al., 2016). Screening tools that have been validated in the cosmetic surgery setting include the BDD Questionnaire-Dermatology Version (BDDQ-DV) and Dysmorphic Concern Questionnaire (DCQ; Danesh et al., 2015).

The BDDQ-DV is a shorter version of the BDD Questionnaire (BDDQ; Woolley and Perry, 2015). The BDDQ is a validated, self-administered, brief (1–2 minutes) screening instrument that patients can easily complete while they wait to see the surgeon (Joseph et al., 2016). The BDDQ was developed in the psychiatric setting for BDD screening and was validated in the facial plastic surgery patient population (Joseph et al., 2016). In the surgical setting, the BDDQ was found to have a sensitivity of 100% and specificity of 89% (Joseph et al., 2016; Ziglinas et al., 2014). The BDDQ-DV is reported to have a sensitivity of 100% and a specificity of 94.7%.

The DCQ is another assessment tool, although it is a relatively complex psychiatric screening measure, including items that are not symptoms of BDD (i.e., concern with body odor and sweating), and it does not assess the severity or range of symptoms that are specific to BDD (Danesh et al., 2015; Morselli et al., 2016; Phillips et al., 2001a; Wilhelm et al., 2016). It is composed of seven questions, each with a variable number of points with a score of 9 used as a cutoff point for BDD (Phillips et al., 2001b). The DCQ is reported to have a sensitivity of 72% and a specificity of 90.7%.

The Yale Brown Scale for BDD (BDD-YBOCS) is the most widely used measure of BDD severity in research studies, including studies evaluating the efficacy of psychosocial (cognitive-behavioral) and pharmacologic treatments for BDD (Phillips et al., 2001b). The BDD-YBOCS is composed of 12 questions, each earning a variable number of points. A total score equal to or greater than 20 is the cutoff for the presence of BDD (Phillips et al., 2001b). However, whether this screening tool has been validated in a perioperative cosmetic surgery setting remains unclear.

Tools that have been specifically used in the perioperative setting are the pre- (E-pgm) and post- (S-pgm) operative patient expectations questionnaires. These questionnaires can be used within the context of BDD and otherwise to assess patients' surgical expectations and thus improve the ethical and accurate selection of patients who may benefit from surgery (Morselli et al., 2016). The E-pgm questionnaire investigates the patient's needs and motivations and enlightens surgeons on the specific psychological profile of patients to orient them on the most appropriate global, medical, surgical, and psychological approach (Morselli et al., 2016). The S-pgm is the postoperative counterpart that evaluates positive or negative impressions after surgery (Morselli et al., 2016). Additional tools reported for postoperative use are the Rosenberg self-esteem scale, the multidimensional body self-relations questionnaire-appearance scales, and the Glasgow Benet Inventory (Herruer et al., 2015).

Additional surveys for the preoperative detection of BDD include the BDD examination (BDDE), BDD examination self-report (BDDE-SR), the Body Dysmorphic Symptoms Scale (BDSS), the Mini International Neuropsychiatric Interview, and the Clinical Global Impression

(CGI) Scale (Anderson, 2003; Joseph et al., 2016; Kyle, 2012; Pavan et al., 2017; Sweis et al., 2017; Woolley and Perry, 2015). The BDDE is a reliable diagnostic tool; however, it is time-consuming and consists of a 34-item, clinician-administered examination that may require 30 minutes to complete (Woolley and Perry, 2015). The BDDE is designed to measure dysmorphic concern in patients with eating disorders and provides information with regard to total severity and BDD diagnostic status (Veale and Neziroglu, 2010). Its use as a measure for BDD has waned in recent years, perhaps due to its particular relevance to eating disorders rather than to BDD specifically (Veale and Neziroglu, 2010; Wilhelm et al., 2016). Additionally, it is not suitable for the assessment of patients with more severe BDD and does not assess certain compulsive behaviors that are common in patients with BDD (Phillips et al., 2001b).

The BDSS is a 10-item self-reported measurement of psychopathological symptoms of BDD (Ramos et al., 2016). The CGI was developed for use in National Institute of Mental Health-sponsored clinical trials to provide a brief, standalone assessment of the clinician's view of the patient's global functioning before and after the initiation of a study medication (Busner and Targum, 2007). Although CGI is primarily used in the context of research, it is also reported to be useful for clinicians due to its ease of administration and its ability to track progress, which make it potentially useful for pre- and postoperative assessments (Guy, 1976).

The National Institute for Health and Clinical Excellence has also proposed five questions that may help diagnose BDD: (1) Do you worry a lot about the way you look and wish you could think about it less?; (2) What specific concerns do you have about your appearance?; (3) On a typical day, how many hours per day is your appearance on your mind (more than 1 hour per day is considered excessive); (4). What effect does it have on your life?; and (5) Does it make it hard to do your work or be with friends? (Veer et al., 2014). Other proposed preprocedure questions include the following: I have never been diagnosed or treated for BDD; I have undergone plastic surgery procedures in the past and have not been unhappy with these procedures; I consent to contacting my previous plastic surgeon(s); I recognize that there is a significant emotional

**Table 2**  
Several screening tools used for BDD detection

Survey	Number of Questions	Cosmetic vs. Psychiatric Population	Exclusive to BDD?	Self-Administered vs. Clinician Administered	Validated?
Structured clinical interview for diagnosis for DSM-IV Axis I Disorders	24	Psychiatric	No – All Axis 1 Disorders	Clinician	–
BDDE	34	Psychiatric	Yes	Clinician	Yes
BDDE-Self Report	30	Psychiatric	Yes	Self	Yes
BDDQ	4 sets	Both	–	Self	Yes – Psychiatric & Plastic Surgery
BDDQ-Dermatology Version	11 possible	Cosmetic	–	–	Yes
Dysmorphic Concern Questionnaire	7	Psychiatric	Yes	Self	Yes – Psychiatric & Dermatologic Setting
Yale Brown Scale for BDD	12	–	Yes	Clinician	Yes
Body Dysmorphic Symptoms Scale	10	–	Yes	Self	Yes
Mini International Neuropsychiatric Interview Plus	–	Psychiatric	No	Clinician	Yes
Multi-Dimensional Body Self-Relations Questionnaire	69 or 34	Psychiatric	No – Comprehensive Assessment of Body Image	Self	Yes
Clinical Global Impression Scale	3	Psychiatric	No	Clinician	–
Pre-Operative Patient expectations Questionnaire	11	Perioperative	n/a	Self	Yes
Post-Operative Patient expectations Questionnaire	11	Perioperative	n/a	Self	Yes
Multidimensional body self-relations questionnaire-appearance scales	34	Psychiatric	No – Comprehensive Assessment of Body Image	Self	Yes
Rosenberg self-esteem scale	10	Psychiatric / Social Science	No – Comprehensive self-esteem scale	Self	Yes – Psychiatric Setting

BDD, body dysmorphic disorder; BDDE, body dysmorphic disorder examination; BDDQ, body dysmorphic disorder questionnaire.

component in choosing an elective plastic surgery procedure; and I understand that the procedure I am seeking may not have the exact outcome that I desire (Sweis et al., 2017).

### Legal implications

Preoperative detection of BDD is important to optimize patient outcomes and prevent unwanted legal complications that may result from patient dissatisfaction. There have been legal cases in which the patient's ability to provide consent was brought into question due to a diagnosis of BDD (Sweis et al., 2017). There are four basic elements that a plaintiff must show to successfully prove malpractice on the basis of the informed consent doctrine: (1) The physician has a duty to disclose material risks; (2) the physician failed to disclose or inadequately disclosed those risks; (3) as a direct and proximate result of the failure to disclose, the patient consented to treatment to which he or she otherwise would not have consented; and (4) the plaintiff was injured by the proposed treatment (Sweis et al., 2017).

For informed consent to be considered valid, the patient must be competent, and the consent should be given voluntarily (Sweis et al., 2017). In some jurisdictions, physicians meet their responsibility when they make "a reasonable effort to convey sufficient information, [even] though the patient, without fault of the physician, may not fully grasp it" (Sweis et al., 2017). A review of litigation cases for rhinoplasty procedures was published in 2009 and demonstrated that the most common reasons for litigation after rhinoplasty were first "not obtaining a valid consent" and second "postoperative cosmetic deformity" (which seemed to have stemmed from mismanagement of the patient's preoperative expectations; Veer et al., 2014). Having the preprocedure checklist signed by patients who are suspected of having BDD provides some degree of legal protection for the aesthetic surgeon (Sweis et al., 2017).

### Conclusions

BDD is an underdiagnosed and underreported psychiatric disease that will be seen with increasing frequency by cosmetic surgeons and dermatologists in coming years. Historically, BDD has been considered a contraindication to cosmetic procedures and surgeries, but recent evidence supports more refined decision-making based on BDD severity and patients' overall level of functioning. To select patients who are appropriate for cosmetic procedures, validated preoperative BDD screening tools must be used and working relationships with mental health colleagues must be established. Once the preoperative assessment identifies a potential BDD diagnosis, a multidisciplinary team must be involved in the confirmation of diagnosis, consideration of evidence-based treatments (i.e., cognitive behavior therapy and selective serotonin reuptake inhibitors), and the consideration of appropriateness for the procedure in question (Bowyer et al., 2016; de Brito et al., 2015). Considerations of the appropriateness for the procedure should include a mild-to-moderate or severe disease categorization, patient history, the procedure and defect under consideration, predicted satisfaction, patient safety, and surgeon comfort (Tadisina et al., 2013). Further prospective studies are warranted to determine the outcomes and efficacy of cosmetic procedures in patients with BDD.

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