Body Dysmorphic Disorder and Cosmetic Surgery

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Learning Objectives: After studying this article, the participant should be able to: 1. Identify the diagnostic criteria and clinical features of body dysmorphic disorder. 2. Describe the prevalence of body dysmorphic disorder in cosmetic populations. 3. Identify appropriate treatment strategies for body dysmorphic disorder.

Background: Body dysmorphic disorder is a relatively common psychiatric disorder among persons who seek cosmetic surgical and minimally invasive treatments.

Methods: This article reviews the history of the diagnosis and the current diagnostic criteria. Etiologic theories, clinical and demographic characteristics, and comorbidity, including the relationship of body dysmorphic disorder to obsessive-compulsive spectrum and impulse control disorders, are discussed. The prevalence of body dysmorphic disorder in cosmetic populations is highlighted. Treatments for body dysmorphic disorder, including medical, psychiatric, and psychological interventions, are reviewed.

Results: Body dysmorphic disorder is an often severe, impairing disorder. Among patients presenting for cosmetic treatments, 7 to 15 percent may suffer from the condition. Retrospective outcome studies suggest that persons with body dysmorphic disorder typically do not benefit from cosmetic procedures. Pharmacotherapy and cognitive-behavioral psychotherapy, in contrast, appear to be effective treatments for body dysmorphic disorder.

Conclusions: Because of the frequency with which persons with body dysmorphic disorder pursue cosmetic procedures, providers of cosmetic surgical and minimally invasive treatments may be able to identify and refer these patients for appropriate mental health care. Directions for future research are suggested. (*Plast. Reconstr. Surg.* 118: 167e, 2006.)

PSYCHIATRIC DIAGNOSES IN COSMETIC SURGERY PATIENTS

The popularity of cosmetic procedures has exploded over the past decade, with more than 10 million cosmetic surgical and minimally invasive procedures performed in 2005.[1] Not surprisingly, both surgeons and mental health professionals are interested in the psychological characteristics of this growing population of individuals. Such interest is by no means new and dates back over 40 years to the groundbreaking work of Edgerton and colleagues.[2–4]

We have previously categorized the literature regarding the psychological aspects of cosmetic procedures into three generations of research.[5–10] Studies from each generation shared a common purpose: to determine whether some patients present with psychiatric disorders that make them inappropriate candidates for surgery and to determine whether changes in physical appearance relate to postoperative improvements in psychosocial functioning. The first generation of studies (approximately 1950s to 1960s), which relied heavily on unstructured clinical interviews, implied that psychopathology was the norm among patients presenting for cosmetic surgery. Results regarding postoperative psychological outcomes were mixed; several studies reported postoperative benefits and other studies noted symptom

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exacerbations.[2–4] Second-generation studies (1970s to 1980s), which often included reliable and valid psychometric measures, reported lower rates of psychopathology.[11–18] Furthermore, studies from this generation implied that surgery could lead to postoperative improvements in psychological functioning.[19]

Studies from the third generation of research, including most recent investigations, typically incorporated methodological improvements, such as the use of established diagnostic criteria, preoperative and postoperative assessments, and inclusion of appropriate comparison groups. Clinical interview studies found that 20 to 48 percent of patients present for surgery with a formal psychiatric diagnosis.[20,21] However, these studies did not use well-structured, validated interviews, thus calling into question the accuracy of the findings. Postoperative benefits (e.g., improvements in depressive and anxiety symptoms and quality of life) have been reported in studies that used psychometric measures.[22–29] Many third-generation studies also have focused on the body image concerns of cosmetic surgery patients. Several studies suggest that cosmetic surgery patients typically present with heightened body image dissatisfaction before surgery [30–34] and experience body image improvements postoperatively.[22–25,29,35]

Because of methodological problems from all three generations of research, coupled with the lack of any large-scale investigations of the rate of psychopathology in cosmetic surgery patients, it is difficult to draw firm conclusions regarding the psychological characteristics of cosmetic surgery patients and how they relate to postoperative outcome. We, however, have drawn two tentative conclusions from the three generations of research.[6,7,9,36] First, persons presenting for cosmetic treatments, like those in the general population, likely experience a wide range of psychiatric symptoms and conditions. Second, although it appears that most patients experience improvements in body image following surgery, there currently is not enough evidence to conclude that the majority of patients experience additional psychosocial improvements postoperatively.

All psychiatric disorders are likely to be represented among the large population of persons presenting for cosmetic treatments. Disorders that involve an individual's physical appearance or body image, however, may be especially prevalent. Body dysmorphic disorder, a disorder characterized by extreme appearance preoccupation, may be of particular relevance to plastic surgeons and other physicians who offer cosmetic procedures. Thus, this article provides an overview of body dysmorphic disorder and its relationship to cosmetic surgery. It includes a description of the history of the diagnosis, the current diagnostic criteria, etiologic theories, clinical and demographic features, and comorbidity associated with the disorder. The article then focuses on the prevalence of body dysmorphic disorder, particularly among persons who seek cosmetic treatment. A review of the medical, pharmacologic, and psychotherapeutic treatments for body dysmorphic disorder is also provided. The article concludes with suggestions for future research.

HISTORY OF AND DIAGNOSTIC CRITERIA FOR BODY DYSMORPHIC DISORDER

History of the Diagnosis

Body dysmorphic disorder was initially called "dysmorphophobia" when it first appeared in the European medical literature in 1886.[37] In other early descriptions, body dysmorphic disorder was termed "l'obsession de la honte du corps" (obsession with shame of the body)[38] or "dysmorphophobic syndrome."[39]

In the United States, case reports in the cosmetic surgery and dermatology literature describing symptoms consistent with body dysmorphic disorder appeared before the disorder's inclusion in the *Diagnostic and Statistical Manual of Mental Disorders*. Descriptions of "minimal deformity" and "insatiable" patients were reported in the cosmetic surgery literature in the 1960s.[2,40] Case reports of "dysmorphophobia" and "dermatological nondisease" were also described in the dermatology literature.[41] Similar to persons with body dysmorphic disorder presenting for cosmetic treatments today, these patients requested multiple procedures to improve slight or imagined defects, and, typically, reported high levels of dissatisfaction with their postoperative results.[2]

Body dysmorphic disorder first appeared in *Diagnostic and Statistical Manual of Mental Disorders, Third Edition* in 1980, where it was described as an atypical somatoform disorder.[42] Body dysmorphic disorder was included as a formal diagnosis and officially termed "body dysmorphic disorder" with the publication of the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised* in 1987.[43] Two variations of body dysmorphic disor-

der were included in the *Diagnostic and Statistical Manual of Mental Disorders, Third Revision, Revised*: nondelusional or delusional (or delusional disorder, somatic type). The differentiation between subtypes is less clear in both the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* [44] and the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision*.[45] This likely reflects the growing consensus that the nondelusional and delusional subtypes are variations of the disorder.[46]

Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision Diagnostic Criteria

Body dysmorphic disorder is currently categorized as a somatoform disorder.[45] This classification has been criticized, with some researchers asserting that body dysmorphic disorder should be considered an obsessive-compulsive spectrum disorder[47,48] or an affective spectrum disorder.[48]

Three diagnostic criteria are listed for body dysmorphic disorder in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision*: (1) a preoccupation with an imagined or slight defect in appearance (if a slight physical defect is present, the person's degree of concern is extreme); (2) marked distress or impairment in social, occupational, or other areas of functioning resulting from the appearance preoccupation; and (3) the preoccupation is not attributable to the presence of another psychiatric disorder (e.g., anorexia nervosa).[45] As in previous versions of the *Diagnostic and Statistical Manual of Mental Disorders*, if the appearance preoccupations are held with delusional intensity, a diagnosis of delusional disorder, somatic type can also be applied.

The application of the body dysmorphic disorder diagnostic criteria to cosmetic surgery populations can be challenging.[49] Applied independently, the first diagnostic criterion likely describes the majority of cosmetic surgery patients. Many individuals present for cosmetic surgery to correct slight imperfections or to enhance "normal" features, and cosmetic surgeons, by virtue of their training, are skilled at identifying and correcting these relatively modest appearance imperfections. Thus, the classification of a feature as "abnormal" or "correctable" is often quite subjective.

Furthermore, in cosmetic surgery populations, some degree of distress about the appearance feature for which treatment is desired appears to be normative.[30–34] However, the degree of distress and impairment in functioning may be the most useful indicator of body dysmorphic disorder in these patients. [10,50] For example, a person who reports that his or her appearance concerns interfere with his or her ability to maintain a job likely meets criteria for body dysmorphic disorder. In contrast, the person who denies significant disruption in occupational or social functioning is unlikely to have body dysmorphic disorder.

Etiology

Neurobiological, psychological, and sociocultural factors are thought to play a role in the development of body dysmorphic disorder.[51]

Neurobiological Factors

Although research is limited, there is some evidence to suggest that body dysmorphic disorder has a genetic underpinning. Phillips et al.[52] reported that 20 percent of participants ($n = 200$) in their naturalistic study of body dysmorphic disorder had at least one first-degree family member with the disorder. Other studies suggest that body dysmorphic disorder is more common in families of persons diagnosed with obsessive-compulsive disorder, suggesting that there may be a common genetic link between the disorders.[53]

Abnormal serotonin and dopamine function are thought to play a role in the development of body dysmorphic disorder, as evidenced by the fact that patients seem to respond preferentially to medications that alter levels of these neurotransmitters.[54] Case reports suggest that body dysmorphic disorder may be triggered by medical illnesses involving inflammatory processes that can interfere with serotonin synthesis.[55] Another case study reported that neural injury to the frontotemporal region of the brain resulted in the onset of body dysmorphic disorder symptoms.[56] A study of single-photon emission computed tomographic brain scans conducted on six patients with body dysmorphic disorder revealed deficits in the parietal region of the brain, an area thought to be related to disturbed body perception.[57] Neuropsychological testing of patients with body dysmorphic disorder suggests deficits in verbal and nonverbal memory skills, and with organizational encoding abilities.[58] Such impairments may be indicative of abnormalities in the frontostriatal and dopaminergic systems.[54] A magnetic resonance imaging study of eight women with body dysmorphic disorder revealed abnormal asymmetry of the cau-

date nucleus and increased white matter volume as compared with normal controls.[59] Similar findings have been found among individuals with obsessive-compulsive spectrum disorders. This study provides further evidence that body dysmorphic disorder may be best classified as an obsessive-compulsive spectrum disorder rather than as a somatoform disorder.

Psychologic Factors

The cause of body dysmorphic disorder has been explained by at least two psychological theories. Psychoanalytic explanations suggest that body dysmorphic disorder arises from an unconscious displacement of sexual or emotional conflict or feelings of inferiority, guilt, or poor self-image onto a body part.[60] There is, however, no empirical evidence to support this theory. Explanations from a cognitive-behavioral perspective suggest that the disorder arises from an interaction of cognitive, emotional, and behavioral factors.[61–63]

Cognitive factors that appear to be instrumental in the development and maintenance of body dysmorphic disorder include unrealistic attitudes about body image related to perfection and symmetry, selective attention to the perceived defect, increased self-monitoring for the presence of appearance flaws, and misinterpretation of the facial expressions of others as being angry or critical.[62–64] Persons with body dysmorphic disorder tend to perceive their actual appearance as being far less attractive than their ideal.[65] They also may be more sensitive to aesthetics compared with others. Two studies have found associations between employment or education in the arts and body dysmorphic disorder.[66,67]

From a behavioral perspective, body dysmorphic disorder is thought to arise from positive or intermittent reinforcement of appearance characteristics and social learning (e.g., observing the importance of appearance from the media or peers).[68] Cognitive factors (e.g., negative thoughts about appearance) give rise to anxiety or other negative emotions. Maladaptive behaviors (e.g., excessive mirror checking) then may develop and persist as a means of reducing distress.[62,68,69]

Sociocultural Factors

Sociocultural theories derive explanations for the cause of body dysmorphic disorder from the social histories of patients. For example, being raised in a family that is rejecting, neglectful, and critical, particularly as related to issues of physical appearance, may be associated with the development of body dysmorphic disorder.[60,70] The developmental period of adolescence (the typical age of onset for this disorder) and its accompanying physical and psychological changes may also play a role in the onset of body dysmorphic disorder, particularly if a person is teased about his or her appearance. For example, teasing could cause an individual to question the normality of his or her appearance, even if it is not flawed. The increased emphasis on physical perfection in the media is yet another potential factor in the cause of both general body image dissatisfaction and the appearance preoccupations among persons with body dysmorphic disorder.[6,70,71]

DEMOGRAPHIC AND CLINICAL CHARACTERISTICS

Demographic Features

Age of Onset

Although most persons with body dysmorphic disorder do not seek treatment until their early thirties, the mean age of onset of body dysmorphic disorder, as noted above, is late adolescence.[72,73] In one of the largest studies of persons with body dysmorphic disorder, the mean age of onset was 16.4 ± 7.0 years, although dislike of appearance began at 12.9 ± 5.8 years.[52] Symptom development may be sudden or gradual. It is not uncommon for body dysmorphic disorder to be misdiagnosed, given its comorbid conditions (see discussion below) and the reluctance of persons with body dysmorphic disorder to discuss their concerns with others.[70,73]

Course

Body dysmorphic disorder tends to be continuous rather than episodic.[52] Symptom severity and degree of insight can fluctuate over the course of the disorder. Complete remission of symptoms appears to be rare, even after treatment.[51,70,74] A naturalistic study of the course of body dysmorphic disorder found that persons with severe symptoms of long duration, and those with personality disorders, were less likely to experience partial or full remission at 1-year follow-up.[74]

Gender Differences

Somewhat counterintuitively, body dysmorphic disorder appears to affect men and women with equal frequency.[45,72] Some studies have reported higher frequencies among women[52,73] or men.[20,47] Nevertheless, men and women tend to be similar with respect to most demographic and clinical features.[72,75] Male patients, however, may be more likely to be unmarried.[72]

Clinical Features

To date, no large-scale epidemiologic studies of body dysmorphic disorder have been com-

pleted. However, retrospective studies[72,73] and baseline data from the first naturalistic prospective study of the course of body dysmorphic disorder[52] have provided rich descriptions of the disorder's clinical characteristics.

Preoccupation with Perceived Defects

Most frequently, persons with body dysmorphic disorder become preoccupied with their skin, hair, and nose, although any body part can be a source of concern.[52,72,76] Men may become preoccupied with their genitals, height, hair, and body build, whereas women typically report concerns with their weight, hips, legs, and breasts.[72,75] On average, persons with body dysmorphic disorder report preoccupation with five to seven body parts over the course of the disorder.[52] Some may present with highly specific concerns (e.g., perceived asymmetry of a body part), whereas others may have vague complaints (e.g., concern that the part does not "look right").[70]

Obsessive Thoughts

Persons with body dysmorphic disorder typically experience uncontrollable, intrusive thoughts about their appearance. These thoughts may increase in situations where the person fears that his or her "defect" will be evaluated by others.[61] In severe cases, persons with body dysmorphic disorder may have difficulty thinking about anything aside from their "defect." Insight tends to vary, but it is typically poor.[52] Some persons admit that their concerns are exaggerated, whereas others hold their beliefs with delusional intensity.[77] Up to 77 percent of persons with body dysmorphic disorder held their appearance beliefs with delusional intensity at some point during the course of the disorder.[52]

Compulsive Behaviors

Persons with body dysmorphic disorder often engage in compulsive, time-consuming behaviors as a means of inspecting, improving, or camouflaging their appearance concern.[51,78] They may spend hours each day examining their "defects" in the mirror or other reflective surfaces, applying makeup to camouflage their flaws, or using clothes or body positions to hide areas of concern. Others may avoid mirrors and situations or clothing that may expose their defect. In the largest study of persons with body dysmorphic disorder, all participants reported engaging in at least one compulsive behavior, including comparing themselves to others, mirror checking, and skin picking.[52] These behaviors can consume several hours each day and lead to impairment in relationships and occupational functioning.[61,78] Although these behaviors are undertaken with the goal of reducing anxiety, they typically have the opposite effect. Spending hours in front of the mirror often increases the degree of preoccupation. Engaging in skin picking as a means of improving the appearance of "blemishes" may create or exacerbate a defect.[79] Excessive application of corrective creams and makeup can also damage skin.

Distress and Impairment of Functioning

Body dysmorphic disorder symptoms often cause significant distress. Persons with body dysmorphic disorder report higher levels of depression, anxiety, and anger/hostility compared with other psychiatric outpatients and those free from psychiatric disorders.[80] Studies and case reports suggest that persons with body dysmorphic disorder may become physically violent toward others.[75,81,82] Some become so distressed about their appearance that they attempt "do-it-yourself" cosmetic procedures.[70,83]

Body dysmorphic disorder often causes marked impairment in psychosocial functioning.[52,84] Almost all patients report inference with vocational or academic performance, and 27 percent reported being housebound for more than 1 week at some point during the course of the disorder.[52] Self-esteem and quality of life for persons with body dysmorphic disorder appear to be poor.[84–87] The emotional suffering related to body dysmorphic disorder may lead some persons to contemplate or attempt suicide. Up to 78 percent of persons with body dysmorphic disorder report suicidal ideation and 17 to 33 percent report suicide attempts over the course of the disorder.[72,73,78,79,88] Case reports of attempted and completed suicides have been described in the dermatology literature.[41,89]

Use of Cosmetic Treatments

Persons with body dysmorphic disorder frequently seek cosmetic surgery and other related treatments to improve their "flawed" appearance. Veale et al.[73] reported that nearly half of their sample ($n = 50$) had sought cosmetic or dermatologic treatment, with 26 percent having undergone more than one surgical procedure. In a larger sample ($n = 188$), 70 percent had sought and 58 percent had obtained cosmetic treatments.[72] Two recent studies suggest that 71 to 76 percent sought and 64 to 66 percent received cosmetic treatments.[76,90] Rhinoplasty, liposuction, and breast augmentation were among the most frequently sought surgical procedures. Receipt of minimally invasive (e.g., collagen injections) and dental (e.g., tooth whitening) procedures was also common.[90]

Somewhat encouragingly, providers often refuse to perform procedures on persons with

body dysmorphic disorder. In Phillips et al.'s[76] sample of 250 patients, 35 percent of all requested treatments (n = 785) were not provided, most commonly because the physician deemed the treatment unnecessary. Similarly, in a sample of 200 patients, 21 percent of all sought procedures (n = 528) were not received, primarily because the provider refused to perform the procedure.[90] A survey of 265 cosmetic surgeons found that 84 percent had refused to operate on a patient they suspected of having body dysmorphic disorder.[91] Nonetheless, patients may engage in "doctor shopping" until they find a provider who will perform the desired treatment.[70]

Comorbid Psychopathology

Body dysmorphic disorder frequently occurs with other psychiatric disorders. In the largest study of comorbidity among persons with body dysmorphic disorder (n = 293), on average, participants met criteria for at least two lifetime comorbid Axis I diagnoses.[92] Mood and anxiety disorders, obsessive-compulsive spectrum disorder, substance use disorders, eating disorders, and personality disorders were the most typical comorbid diagnoses.

Mood and Anxiety Disorders

Major depression appears to be the most common comorbid condition. More than 75 percent of patients with body dysmorphic disorder had a lifetime history of major depression, and over half met criteria for current major depression.[92] Anxiety disorders also frequently co-occur. Gunstad and Phillips[92] reported that over 60 percent of patients had a lifetime history of an anxiety disorder. The lifetime co-occurrence rate for social phobia is roughly 38 percent.[72,92] Social phobia tends to predate the onset of body dysmorphic disorder.[92,93]

Obsessive-Compulsive Spectrum Disorders

Body dysmorphic disorder also frequently co-occurs with obsessive-compulsive disorder. Lifetime rates of obsessive-compulsive disorder among persons with body dysmorphic disorder range from 30[92] to 78 percent,[47] and current rates range from 6[73] to 30 percent.[72,78,92] Body dysmorphic disorder shares overlapping features with several other obsessive-compulsive spectrum disorders as well. Data on their co-occurrence are mixed, making it difficult to establish strong connections between the disorders. For example, body dysmorphic disorder and hypochondriasis both involve obsessional thinking and checking behaviors, but the focus of concern in body dysmorphic disorder is on appearance, whereas in hypochondriasis the concerns relate to health status. Phillips et al.[52] found that only 2 percent of their body dysmorphic disorder sample had comorbid hypochondriasis.

Trichotillomania is defined as repetitive pulling out of one's hair, resulting in observable hair loss.[45] The disorder is typically maintained by positive reinforcement rather than by negative reinforcement,[94] which contrasts with body dysmorphic disorder, where negative reinforcement plays a much more prominent role in symptom maintenance. Although the prevalence of trichotillomania has not been examined in a body dysmorphic disorder sample, Soriano et al.[95] found that 26 percent of their small sample of trichotillomania patients had body dysmorphic disorder. The comorbidity of body dysmorphic disorder with other obsessive-compulsive spectrum disorders such as pathologic gambling, tic disorders, and compulsive shopping has yet to be examined systematically.

Substance Use Disorders

Substance abuse and dependence frequently co-occur with body dysmorphic disorder. Gunstad and Phillips[92] reported that lifetime rates of substance abuse disorders ranged from 25 to 30 percent, with rates as high as 47 percent being previously reported.[78] Current rates of substance abuse disorders range from 2[73] to 35 percent.[72,92] In a study of substance use disorders among persons with body dysmorphic disorder, 49 percent had a lifetime history and 17 percent met current criteria for a disorder.[96] Alcohol dependence was the most common lifetime substance use disorder.[96] These findings suggest that some persons with body dysmorphic disorder may use substances to self-medicate distress.[96]

Eating Disorders

Anorexia and bulimia appear to be relatively common in persons with body dysmorphic disorder. The lifetime comorbidity rate ranges from 7 to 14 percent, with a current rate of 4 percent.[92] In a study of 41 patients hospitalized for anorexia, 39 percent met criteria for body dysmorphic disorder.[97]

Personality Disorders

The rate of personality disorders among persons with body dysmorphic disorder appears to be quite high. In a study of Axis II comorbid diagnoses (n = 148), 57 percent met criteria for at least one personality disorder, most commonly avoidant personality disorder.[98] Paranoid, obsessive-compulsive, and dependent personality disor-

ders may also co-occur with body dysmorphic disorder.[73,98,99]

PREVALENCE

Body Dysmorphic Disorder in the General Population

The prevalence of body dysmorphic disorder in the general population has yet to be firmly established. However, body dysmorphic disorder is estimated to affect approximately 1 to 2 percent of the general population.[45] Two large studies of community samples both reported body dysmorphic disorder rates of 0.7 percent.[100,101] Another study of community samples reported that the rate of body dysmorphic disorder ranged from 1 to 3 percent.[53] A study of 566 high school students reported a rate of 2 percent.[102] In college populations, rates of body dysmorphic disorder range from 2.5 to 5 percent.[103–106] Earlier studies of college students suggested higher rates of body dysmorphic disorder (e.g., 13 to 28 percent).[107,108] However, the discrepancy in rates between early and more recent studies is likely attributable to the use of less rigorous assessments in the early studies. Overall, studies suggest that body dysmorphic disorder is not uncommon. Table 1 provides an overview of the prevalence studies that have been conducted to date in a variety of populations.

Body Dysmorphic Disorder in Cosmetic Surgery and Dermatology Populations

Body dysmorphic disorder was initially thought to occur in approximately 2 percent of cosmetic surgery patients, a rate similar to that in the general population.[109] However, empirical studies suggest that the rate of body dysmorphic disorder among cosmetic surgery and dermatology populations appears to be higher than the reported rate in the general population. In American cosmetic surgery populations, 7 to 8 percent of patients met diagnostic criteria for body dysmorphic disorder.[34,110] Internationally, rates of body dysmorphic disorder ranged from 6 to 53 percent among patients presenting for cosmetic surgery.[20,111–115] However, several of these studies had significant methodological flaws, including small sample sizes, selection biases, and the use of unstructured interviews. Two international studies that had larger samples and im-

Table 1. Studies of the Prevalence of BDD among Community, Student, Cosmetic Surgery, Reconstructive Surgery, and Dermatology Samples

Authors	Year	Country	No.	Population	Assessment	Rate (%)
				Community		
Faravelli et al.	1997	Italy	673	Community sample	Clinical interview	0.70
Bienvenu et al.	2000	United States	373	Community sample	Clinical interview	1–3
Otto et al.	2001	United States	976	Community sample	Clinical interview	0.70
				Students		
Fitts et al.	1989	United States	258	College students	Self-report	28
Biby	1998	United States	102	College students	Self-report	13
Mayville et al.	1999	United States	566	High school students	Self-report	2.2
Bohne et al.	2002	Germany	133	College students	Self-report	5.3
Bohne et al.	2002	United States	101	College students	Self-report	4
Cansever et al.	2003	Turkey	420	College students	Self-report, clinical interview	4.8
Sarwer et al.	2005	United States	559	College students	Self-report	2.5
				Cosmetic Surgery		
Sarwer et al.	1998	United States	100	Cosmetic surgery	Self-report	7
Ishigooka et al.	1998	Japan	415	Cosmetic surgery	Clinical interview	15
Altamura et al.	2001	Italy	487	Aesthetic medical	Clinical interview	6.3
Vargel et al.	2001	Turkey	20	Cosmetic surgery	Clinical interview	20
Vindigni et al.	2002	Italy	56	Cosmetic surgery	Clinical interview	53.6
Aouizerate et al.	2003	France	132	Cosmetic surgery	Clinical interview	9.1
Veale et al.	2003	United Kingdom	29	Rhinoplasty	Self-report	20.7
Crerand et al.	2004	United States	91	Cosmetic surgery	Self-report	8
Castle et al	2004	Australia	137	Nonsurgical cosmetic	Self-report	2.9
				Reconstructive Surgery		
Sarwer et al.	1998	United States	43	Reconstructive surgery	Self-report	16
Crerand et al.	2004	United States	50	Reconstructive surgery	Self-report	7
				Dermatology		
Phillips et al.	2000	United States	268	Dermatology	Self-report	11.9
Dufresne et al.	2001	United States	46	Dermatology	Self-report, clinical interview	15
Harth et al.	2001	Germany	13	Dermatology (hyperhidrosis)	Clinical interview	23.1
Uzun et al.	2003	Turkey	159	Dermatology (acne)	Clinical interview	8.8

BDD, body dysmorphic disorder.

proved methodologies reported rates of 6.3 and 9 percent, respectively, rates more consistent with those found in American studies.[113,114]

Two studies have investigated the rate of body dysmorphic disorder among patients presenting for nonsurgical cosmetic procedures. A small German study ($n = 13$) investigated "botulinophilia," a potential subtype of body dysmorphic disorder characterized by persistent demands for Botox injections to treat hyperhidrosis despite the absence of symptoms, and suggested that 23 percent met *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* criteria.[116] A recent study of 137 Australian patients presenting for nonsurgical cosmetic procedures (e.g., Botox injections, chemical peels) reported a rate of 2.9 percent.[117] This rate is significantly lower than the rates reported among cosmetic surgery patients. The lower rate reported in this sample may be attributable to selection bias (e.g., no information about those who refused participation was collected). It is also possible that more people with body dysmorphic disorder present for surgery rather than less invasive procedures because they believe that their "defects" warrant more intensive intervention. Additional study of the rate of body dysmorphic disorder among persons seeking nonsurgical cosmetic interventions is needed.

The rates of body dysmorphic disorder reported in dermatology settings, ranging from 9 to 15 percent, appear to be slightly higher than the rates found in cosmetic surgery populations.[118–120] In the largest study of body dysmorphic disorder in a dermatology setting ($n = 268$), 12 percent met criteria for body dysmorphic disorder.[118] These patients most frequently sought treatment for acne.

In sum, 7 to 15 percent of patients who present for cosmetic surgical or dermatologic treatment may be suffering from body dysmorphic disorder. Among patients presenting for nonsurgical cosmetic procedures, the rate of body dysmorphic disorder appears to be lower, although this finding awaits replication. Nonetheless, these rates suggest that it is important for treatment providers to be aware of body dysmorphic disorder and its presentation in cosmetic populations.[5–7]

Body Dysmorphic Disorder in Other Medical Populations

The rate of body dysmorphic disorder in other medical populations has received less empiric attention. However, there is evidence that the disorder occurs in other patient groups. Among persons seeking reconstructive surgical procedures, 7 to 16 percent reported appearance concerns and distress consistent with body dysmorphic disorder.[110,121] Phillips reported that 4 percent of patients in a general medical clinic were found to have body dysmorphic disorder.[70] Case descriptions of body dysmorphic disorder have been reported in dental practices[122,123] and maxillofacial surgery clinics.[124,125] A study of 30 patients presenting for orthognathic surgery assessed body dysmorphic disorder symptoms using a reliable and valid measure, but failed to report how many patients met criteria for body dysmorphic disorder preoperatively and postoperatively.[126] Two studies have documented that persons with body dysmorphic disorder seek and receive treatments from orthodontists, ophthalmologists, and paraprofessionals.[76,90] Additional empiric studies are needed to document the prevalence of body dysmorphic disorder among these and other medical specialties.

TREATMENT

As noted above, persons with body dysmorphic disorder typically believe that the cause of their distress is a "defective" appearance. Not surprisingly, these patients often turn to plastic surgeons, dermatologists, and other medical professionals for treatment. Patients also present for psychiatric and psychological treatment, often with greater success.

Cosmetic Medical Treatments

To date, no prospective studies of cosmetic medical treatment outcome among individuals with body dysmorphic disorder have been conducted. Thus, what is known about the outcome of such treatments has been gathered from retrospective studies[73,76,90] and reports from the cosmetic surgery literature of poor outcomes among patients thought to have body dysmorphic disorder symptoms.[127] These investigations suggest that cosmetic medical treatments typically produce no change or, even worse, an exacerbation of body dysmorphic disorder symptoms.[76,90] In one of the largest studies, 91 percent of procedures resulted in no change in overall body dysmorphic disorder symptoms.[90] After treatment, some recipients thought that their defect looked better, but they continued to worry about the treated body part (e.g., concerns that the part would become defective again).[90] In other cases, new appearance concerns developed.[90]

Persons with body dysmorphic disorder who receive cosmetic treatments typically report dissatisfac-

tion with their treatment results.[73] Of greater concern, there are reports of patients with body dysmorphic disorder who have threatened or executed lawsuits against their treatment providers.[91,128,129] In a survey of 265 aesthetic surgeons, 29 percent reported that they had been threatened legally by a patient with body dysmorphic disorder.[91] The case of Lynn G v. Hugo also underscored the potential malpractice risks associated with providing treatment to persons with body dysmorphic disorder.[128] In this case, Dr. Hugo was sued by his former patient, Lynn G, who claimed that she had body dysmorphic disorder and therefore could not consent for treatment. As there was no evidence that Lynn G had body dysmorphic disorder, the case was dismissed. Nonetheless, this case brought to light the potential legal concerns associated with treating persons with body dysmorphic disorder.

In addition to the potential legal hazards associated with treating patients with body dysmorphic disorder, reports suggest that these patients may become violent toward their surgeons. A survey of aesthetic surgeons reported that 2 percent had been physically threatened by a patient with body dysmorphic disorder; 10 percent reported that they had received threats of both violence and legal action.[91] At least two surgeons have been murdered by patients who appeared to have symptoms consistent with body dysmorphic disorder.[129,130] Similar reports of violence have been published in the dermatology literature.[131]

Because of the legal and personal safety issues associated with treating persons with body dysmorphic disorder, coupled with the evidence that cosmetic treatments rarely improve body dysmorphic disorder symptoms, there is growing consensus that body dysmorphic disorder should be considered a contraindication for cosmetic treatments.[49,73,76,90,91,127,130,131] Given that persons with body dysmorphic disorder seek cosmetic medical treatments with great frequency, it is important that all patients be assessed for the potential presence of body dysmorphic disorder before undergoing treatment. A general psychological screening, consisting of an assessment of patient motivations and expectations, psychiatric status and history, body image concerns and body dysmorphic disorder symptoms, and an observation of the patient's office behavior, can identify persons for whom surgery may be inappropriate.[132–135] Such a screening may include an interview with the patient and/or use of self-report assessments. Patients with suspected body dysmorphic disorder can be referred to a mental health professional for additional screening and treatment.[7,133]

Pharmacologic Treatment

Unlike cosmetic treatments, pharmacologic treatments appear to be much more effective interventions for persons with body dysmorphic disorder. Until recently, knowledge regarding pharmacotherapy for body dysmorphic disorder was limited to the results of case reports, retrospective chart reviews, and open-label trials.[70,136–141] Despite their inherent methodological weaknesses, these studies consistently suggested that selective serotonin reuptake inhibitors were beneficial in treating body dysmorphic disorder.

Randomized, controlled trials have also provided evidence for the efficacy of selective serotonin reuptake inhibitors in the treatment of body dysmorphic disorder. Hollander et al.[142] reported that the selective serotonin reuptake inhibitor clomipramine was more effective than desipramine, a nonselective serotonin reuptake inhibitor, in their randomized, double-blind, crossover study. More recently, fluoxetine was found to be superior to placebo in a randomized, controlled trial.[143] In this study of 67 patients, 53 percent of those treated with fluoxetine had a favorable response compared with 18 percent of those treated with placebo. Patients who responded favorably to fluoxetine experienced significant improvements in quality of life and daily functioning.[86]

Despite these promising results, many patients treated with selective serotonin reuptake inhibitors experience only partial response to treatment. Some patients need long trials of high dosages of the medication,[139,144] whereas others need to switch to a different selective serotonin reuptake inhibitor.[144] Augmentation studies of selective serotonin reuptake inhibitors with antipsychotic medications such as olanzapine or pimozide have yielded mixed results.[139,145,146] Despite the fact that some patients may be delusional, the use of antipsychotic medications alone for the treatment of either body dysmorphic disorder variant has not been supported.[46,144] The nondelusional and delusional variants of body dysmorphic disorder appear to respond equally well to selective serotonin reuptake inhibitors.[140,142] Although selective serotonin reuptake inhibitor medications have produced the most favorable results thus far, a recent case report suggests that bupropion, an atypical antidepressant, may also improve body dysmorphic disorder symptoms.[147]

Psychotherapeutic Treatment

Cognitive behavioral therapy is another common treatment approach. Cognitive behavioral therapy involves the identification and modification of problematic, appearance-related cognitions and behaviors. Strategies used in cognitive behavioral ther-

apy include self-monitoring of thoughts and behaviors related to appearance (e.g., monitoring the amount of time spent mirror gazing); cognitive techniques (e.g., challenging distorted thoughts about one's appearance); and behavioral exercises (e.g., exposing the patient to a feared situation and preventing engagement in compulsive behaviors).[69] Several studies, including two randomized, controlled clinical trials,[61,62] suggest that cognitive behavioral therapy is an efficacious treatment for body dysmorphic disorder.[148–150]

CONCLUSIONS AND DIRECTIONS FOR FUTURE RESEARCH

Body dysmorphic disorder is characterized by extreme dissatisfaction and preoccupation with a perceived appearance defect that often leads to significant functional impairment. Among patients presenting for cosmetic treatments, 7 to 15 percent may suffer from body dysmorphic disorder. Cosmetic treatment typically does not improve the appearance concerns of individuals with body dysmorphic disorder and, in some cases, may exacerbate symptoms. Patients with body dysmorphic disorder may also be more likely to become litigious or violent toward their treatment providers. Because persons with body dysmorphic disorder frequently seek cosmetic procedures, providers may be able to identify and refer these patients for mental health treatment.

Additional research is needed to further investigate body dysmorphic disorder among cosmetic surgery populations. The rate of body dysmorphic disorder among persons presenting for minimally invasive procedures requires additional study. Investigations of the rates of body dysmorphic disorder among specific cosmetic surgery patient populations are also needed. For example, it is unknown whether the rate of body dysmorphic disorder is higher among patients presenting for facial procedures compared with those presenting for body procedures. The rate of body dysmorphic disorder should also be examined among patients requesting atypical procedures (e.g., craniofacial procedures, genital surgery) and among adolescents requesting cosmetic treatment, given the age of onset of the disorder. Studies are also needed to identify the rate of psychiatric disorders such as social anxiety disorder and eating disorders in cosmetic surgery patients, given their potential overlap with body dysmorphic disorder.

At present, it is unclear whether persons with body dysmorphic disorder who receive cosmetic treatments differ with respect to demographic or clinical characteristics compared with persons with body dysmorphic disorder who do not seek cosmetic treatments. One study[90] found no differences in demographic or clinical characteristics (e.g., symptom severity) in persons with body dysmorphic disorder who had received or not received cosmetic treatment. However, the retrospective design of this study limits the validity of this finding. The willingness of some patients with body dysmorphic disorder to undertake the risks associated with surgery may be indicative of more severe symptomatology.

Studies are also needed to determine effective treatments for body dysmorphic disorder. Clearly, medications and psychotherapy appear to be promising interventions for this disorder, although research in these areas is still in its infancy. Research is needed to identify other medications and implementation strategies that may help manage body dysmorphic disorder symptoms effectively. Also needed are studies that combine pharmacotherapy with psychotherapy.

Cosmetic treatment as a potential intervention for body dysmorphic disorder also warrants further attention. Retrospective studies suggest that persons with body dysmorphic disorder do not benefit from cosmetic treatments. However, surgeons appear to be less convinced of this finding, given that only 30 percent of surgeons in one survey reported that body dysmorphic disorder was *always* a contraindication for surgery.[91] It is possible, however, that cosmetic treatments may benefit some persons with body dysmorphic disorder. Edgerton et al.[151]suggested that some patients with severe psychological disturbances desiring cosmetic treatments could be managed successfully with combined psychiatric and surgical treatment. Cosmetic treatments in conjunction with appropriate psychiatric care may prove to be an effective treatment combination for body dysmorphic disorder, particularly in cases where previous treatments have resulted in observable damage.[152] It is also possible that persons with mild forms of the disorder may benefit from cosmetic treatments or a combination of cosmetic and psychiatric treatments. Clearly, there are ethical concerns to consider before conducting prospective studies such as these. However, such studies could potentially improve the clinical care for persons with this often devastating disorder.

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