

# The Prevalence of Body Dysmorphic Disorder in the United States Adult Population

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## ABSTRACT

**Objective:** In clinical samples, body dysmorphic disorder (BDD) is associated with substantial suffering and reduced quality of life. Limited surveys report widely varying prevalence estimates. To better establish the prevalence of BDD, we conducted a United States nationwide prevalence survey.

**Method:** We conducted a random sample national household telephone survey in the spring and summer of 2004 and interviewed 2,513 adults, of whom 2,048 qualified for the BDD-module administration. The computer-assisted, structured interviews, conducted by trained lay interviewers, addressed *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* criteria for BDD, along with information regarding several impulse-control disorders and the respondents' financial and demographic data.

**Results:** The rate of response was 56.3%, which compared favorably with rates in federal national health surveys. The cooperation rate was 97.6%. Respondents included a higher percentage of women and people  $\geq 55$  years of age than in the US adult population, and a lower percentage of Hispanics. The estimated point prevalence of DSM-

### Needs Assessment

Body dysmorphic disorder (BDD), a distressing or impairing preoccupation with an imagined or slight defect in appearance, is associated with substantial suffering, suicide attempts and reduced quality of life. Limited surveys report widely varying prevalence estimates. To better establish the public health importance of BDD in the United States, we conducted a nationwide prevalence survey of BDD, the first of its kind in this country.

### Learning Objectives

At the end of this activity, the participant should be able to:

- Describe the range of estimates of the prevalence of body dysmorphic disorder.
- Discuss the limitations in the available data, including those embedded in the current study.
- Discuss the data that future epidemiological studies should gather to inform treatment efforts.

**Target Audience:** Neurologists and psychiatrists

### CME Accreditation Statement

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This activity has been peer-reviewed and approved by Eric Hollander, MD, chair at the Mount Sinai School of Medicine. Review date: March 17, 2008. Dr. Hollander does not have an affiliation with or financial interest in any organization that might pose a conflict of interest.

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Faculty Disclosures: Dr. Koran is a member of the speaker's bureau of Forest and receives grant/research support from Eli Lilly, Forest, Jazz, Ortho-McNeil, and Somaxon. Dr. Abujaoude is a member of the speaker's bureau of Forest. Drs. Large and Serpe do not have an affiliation with or financial interest in an organization that might pose a conflict of interest.

Funding/Support: This work was supported in part by an unrestricted educational grant from Forest.

Submitted for publication: November 19, 2007; Accepted for publication: March 6, 2008.

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IV BDD among respondents was 2.4% (49/2,048) (by gender: 2.5% for women, 2.2% for men), exceeding the prevalence of schizophrenia and bipolar disorder type I and about that of generalized anxiety disorder. BDD prevalence decreased after 44 years of age, and a larger proportion of BDD respondents were never married. Of those meeting *DSM-IV* criteria for BDD, 90% (45/49) met the *DSM-IV* distress criterion, and 51% (25/49) met the interference-with-functioning criterion.

**Conclusion:** A study using clinically valid interviews is needed to evaluate these results. Such studies could inform treatment by documenting rates of seeking treatment from various sources, suicide attempt rates, and the prevalence of comorbid conditions.

*CNS Spectr.* 2008;13(4):316-322

## INTRODUCTION

Body dysmorphic disorder (BDD), a distressing or impairing preoccupation with an imagined or slight defect in appearance, causes great suffering<sup>1-4</sup> and is associated with a poor quality of life<sup>5</sup> and suicide attempts.<sup>2,6</sup> This disorder has received relatively little study, perhaps because it is believed to be rare. A recent nationwide prevalence study in Germany,<sup>7</sup> which utilized a self-report questionnaire, reported a point prevalence of 1.7% for *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*-criteria BDD, but no nationwide prevalence study has been conducted in the United States.

The most careful US study<sup>8</sup> of BDD prevalence in adults focused on women 36–44 years of age (318 depressed, 658 non-depressed) from seven Boston metropolitan-area communities; it produced a point prevalence of 0.7% for *DSM-IV* BDD. This study utilized structured clinical interviews. Since it focused only on women within an 8-year age range and a restricted geographic area, the results cannot be generalized to the US population. A survey conducted in Florence, Italy,<sup>9</sup> utilizing *DSM-III-R* criteria and interviews by general practitioners trained in psychiatry nonetheless lends some credibility to this prevalence figure, although *DSM-III-R* did not require clinically significant interference

with functioning or clinically significant distress and the questions asked are not reported. The Florence study produced a 1-year prevalence estimate of 0.7% (among 673 individuals).

A study conducted in the Baltimore-Washington area<sup>10</sup> examined the prevalence of *DSM-IV* BDD in 373 individuals (73 randomly selected community subjects and their first-degree relatives) and reported a lifetime prevalence of probable or definite BDD of 1.1%. The study, however, was relatively small and the diagnostic questions were not reported. Other studies focused on German<sup>11</sup> or American<sup>12-14</sup> college students have produced higher prevalence estimates (2.5% to 13%). Because they are derived from self-report questionnaires without clinical verification, these estimates may be less accurate. An older study<sup>15</sup> that utilized the less stringent *DSM-III-R* criteria, also produced a higher estimate.

To establish a firmer estimate in US adults and thereby further examine the importance of BDD to public mental health, we conducted a large, random sample, nationwide telephone survey.

## METHODS

### Data and Sampling

The data were generated in the spring and summer of 2004 from a national household telephone survey that we designed, which included 2,513 adults  $\geq 18$  of age. The survey addressed BDD criteria along with financial and demographic information and questions about three impulse-control disorders: compulsive buying, Internet "addiction," and skin picking. The interviews were conducted from the Social and Behavioral Research Institute (SBRI) at the California State University-San Marcos by interviewers with an average of 14 months experience in health-related telephone surveys and specific training for this project. The SBRI conducts health surveys for the US Health and Human Services Agency and the Centers for Disease Control and Prevention (CDC), for numerous health agencies, and academic researchers. Interviewers used a computer-assisted telephone interviewing system that guarded against errors of omission and presentation. For additional quality control, the first author monitored pilot interviews and provided feedback. During data collection, supervisors (one for eight interviewers) monitored

performance of randomly selected interviews. To obtain informed consent, interviewers identified themselves, the survey organization, study sponsor and survey topics, and stated that the interview was voluntary, anonymous, terminable by the respondent at any time, included no incentive, and might be monitored by a supervisor. The interviews, averaging 11.3 minutes, were conducted with the first person  $\geq 18$  years of age answering the telephone.

The sample was obtained via random-digit-dial telephone calls within the continental US, stratified by state. All listed and unlisted residential telephone numbers had an equal chance of inclusion. Cell phone numbers were not included. This household sampling method over-samples women and under-samples younger individuals and some minorities. In order to ensure that busy individuals were represented, telephone numbers were called until finalized or 15 call attempts had been made. A respondent was defined as a person who completed a full or partial interview. A status of "unknown study eligibility" could be assigned to a telephone number after, for example, persistent busy signals or repeated answers by a telephone-answering device. The proportion of those with unknown eligibility status who were then assumed to be eligible was set as equal to the proportion of eligible persons among people who were actually reached.

The response rate was 56.3% according to formula RR4 of the American Association of Public Opinion Researchers (AAPOR),<sup>16</sup> which is approved by both the AAPOR and the Council of American Survey Research Organizations. Formula Response Rate 4 defines the response rate as the ratio of respondents ( $n=2,513$ ) divided by the sum of: respondents ( $n=2,513$ ), refusals and break-offs ( $n=61$ ), those unable to be contacted ( $n=0$ ), those unable to respond (eg, because of illness or language barriers) ( $n=6$ ), and the proportion of those with unknown eligibility who are assumed to be eligible ( $n=1,881$ ). The study's response rate is comparable with those obtained in national health surveys by the CDC.<sup>17</sup> The CDC's Behavioral Risk Factors Surveillance System surveys have a median response rate of 53.2% (range: 34.4% to 67.3%, excluding one outlier).

The cooperation rate in the present study was established using AAPOR cooperation-rate formula COOP4, which is the number of respondents

divided by the sum of respondents plus refusals and break-offs. The cooperation rate was 97.63%, demonstrating a low rate of refusal.

The presence/absence of the *DSM-IV* diagnostic criteria for BDD was evaluated with a series of questions slightly modified from those of Phillips,<sup>18</sup> which have excellent reliability ( $\kappa=.96$ ). Preoccupation with appearance (*DSM-IV* criterion A) was evaluated by asking, "Have you ever been worried about your appearance in any way?" Those answering "Yes" were asked to choose from a list: "Which part or parts of your body do you think or worry about the most (currently)?" They were next asked, "Have you thought your (body part) was especially unattractive?" A respondent answering "Yes" was considered to suffer from excessive preoccupation if he or she answered "Yes" to either of two further questions: "Have you thought about this concern a lot and wish you could worry about it less?" "Have others said that you were more concerned about your (body part) than you should have been?" In order to conform to *DSM-IV* criterion C, which states that the appearance preoccupations must not be better accounted for by another mental disorder, such as anorexia nervosa, respondents preoccupied with a body part regarded as especially unattractive were asked, "Is your main concern with how you look that you aren't thin enough or that you may be overweight?" Those answering "Yes" were excluded from further BDD consideration. Clinically significant distress (*DSM-IV* criterion B1) was evaluated by asking: "Would you say that thinking or worrying about your appearance has caused you a lot of distress?" Significant impairment of functioning (*DSM-IV* criterion B2) was evaluated by means of two questions: "How often would you say thinking or worrying about your appearance gets in the way of doing things with friends or dating?" and "How often would you say thinking or worrying about you appearance has caused any problems at work or school or in other activities?" Answers of "Almost always" or "Often" to either question met our interference criterion. Interviewers did not ask for examples to ascertain whether the interference was clinically significant.

A diagnosis of BDD required excessive preoccupation about a body part (other than weight) regarded as especially unattractive, and either excessive distress or interference.

## Data Analysis

The analyses included descriptive and comparison statistics for the sample's demographics; the demographic characteristics of those meeting BDD criteria; the prevalence of BDD; and the distribution of body parts that were the focus of concern. Significance level was set at  $P \leq .05$ , two-tailed, for comparisons of demographic variables. Although missing data were minimal, missing cases result in some variation in the number of cases used in different analyses.

## RESULTS

### Participants' Demographics

Compared with the US adult population, the respondents include a substantially higher percentage of women, and to a lesser extent, a higher percentage of people  $\geq 55$  years of age (Table 1). A little over half (56.7%) of the respondents were married compared with 52.5% in the US population ( $\chi^2=17.33$ ,  $df=1$ ,  $P<.001$ ). The respondents and the subset of respondents administered the BDD module have racial distributions that closely resemble that of the US population, but include a smaller proportion of Hispanic individuals. Because the study sampling method stratified on state, the respondents are representative of the US population with regard to distribution by state.

Of the 2,513 respondents, 2,048 provided sufficient data to evaluate possible BDD. The BDD module respondents did not differ substantially from all respondents in terms of gender, age distribution, ethnicity, marital status, or mean household size (Table 1). Of the 2,048 BDD respondents, 1,356 (66.2%) were concerned about a body part, including weight, if at least one other body part was of concern.

The point prevalence of *DSM-IV* BDD as evaluated by our question set was 2.4% (49/2,048). The point prevalence for women was 2.5% (33/1,309), and for men was 2.2% (16/739) (Fisher's exact test  $P=.65$ ).

Given the small number of cases, we examined the relationship to age by dividing the sample into age groups centered on mid-decades of age. BDD prevalence decreased after 44 years of age: prevalence at 18–24 years of age, 4.4% (6/136); 25–34 years of age, 4.2% (13/310); 35–44 years of age, 3.7% (14/380); 45–54 years of age, 1.4% (6/414);  $\geq 55$  years of age,

1.3% (9/708). The marital status distribution of individuals with BDD differed from that of all other BDD module respondents ( $\chi^2=33.55$ ,  $df=5$ ,  $P<.001$ ). Smaller proportions of the group with BDD were married (36.2% vs 55.5%) or widowed (4.3% vs 9.8%) and larger proportions were separated (10.6% vs 1.5%) or never married (34.0% vs 17.5%). The proportions living unmarried with partners (4.3% and 5.1%) and divorced (10.6% vs 10.6%) were about equal within the BDD and non-BDD groups.

Of the 2,048 BDD module respondents, 1,790 (87.4%) were worried about their appearance. Among respondents who worried about a body part they regarded as especially unattractive (other than weight) ( $n=798$ ), and wished they could worry less about it ( $n=392$ ), the proportion answering in a positive diagnostic direction for each additional BDD diagnostic criterion was as follows: told by others that concern was excessive, 49.0% (192/392); appearance has caused "a lot of distress," 42.3% (166/392); worrying or thinking about appearance interfered "almost always" or "often" with doing things with friends or dating 20.7% (81/391); and, interfered "almost always" or "often" with school or work or other activities 9.4% (37/392).

Among the respondents who met criteria for *DSM-IV* BDD, 90% (45/49) qualified on the basis of the distress criterion, and 51% (25/49) on the basis of the interference-with-functioning criterion. Only 8% (4/49) of those meeting BDD diagnostic criteria qualified on the interference criterion without qualifying on the distress criterion.

The body parts causing distress differed by gender (Table 2). Respondents of both genders meeting *DSM-IV* criteria for BDD were most often distressed by a body part they chose not to name. The specific body part most often mentioned by men was "hair," and by women, "stomach."

## DISCUSSION

This first nationwide survey of the prevalence of BDD found a point prevalence of 2.4%, which, if valid, would make it more common than schizophrenia or bipolar I disorder and about as common as the mid-range estimate for generalized anxiety disorder.<sup>19</sup> Although the study over-sampled women, gender-specific prevalence rates did not differ substantially. The *DSM-IV* distress criterion identified more respondents as having BDD than did the interference-with-functioning

criterion. Respondents meeting *DSM-IV* BDD criteria reported lower rates of ever having been married, which is consistent with the findings of earlier studies of more restricted samples.<sup>2,20</sup>

The study's strengths included drawing a large, random, nationwide sample; utilizing a structured interview incorporating *DSM-IV* diagnostic criteria; and applying stringent quality-control measures. The study also has a number of limitations. First, the interviews were telephonic and the interviewers were not mental health professionals. Second, the sample size, though large and representative of the US adult population by state, over-sampled women, and under-sampled individuals without telephones and younger individuals who rely

solely on cell phones. Moreover, the sample size is modest for accurately estimating a prevalence of the magnitude we found. Third, our prevalence estimate is constrained by our response rate: 56.3%. While substantial, it does not guarantee that our sample is representative of the US adult population with regard to concerns about appearance. This response rate compares favorably, however, with those obtained in nationwide health surveys. Fourth, as in any telephone survey, some respondents may have exaggerated responses (eg, the degree of distress) or, conversely, may have been reluctant to admit unpleasant truths (eg, how much their preoccupation interfered with functioning), or may have lacked insight into the

**TABLE 1.**  
**Demographic Comparison of Study Sample to the US Population\***

<i>Demographics</i>	<i>US Population</i>	<i>Study Sample (N=2,513)</i>	<i>BDD Respondents (n=2,048)</i>
<i>Gender (%)†</i>	<i>N=209,128,094</i>		
Male	48.3	34.5	36.1
Female	51.7	65.5	63.9
<i>Average household size</i>	2.59	2.82	2.82
<i>Age of those ≥20 years (%)</i>	<i>N=200,948,641</i>		
20–24	9.4	6.6	7.0
25–34	19.9	15.1	15.9
35–44	22.5	19.9	19.3
45–54	18.8	22.0	21.3
55–59‡	6.7	9.2	8.8
60–64	5.4	7.6	7.2
65–74	9.2	11.4	11.7
75–84	6.2	6.5	6.9
≥85	2.1	1.6	1.7
<i>Race (%)§</i>	<i>N=281,421,906</i>		
White	75.1	79.7	78.2
Black	12.3	10.3	11.4
American Indian/Alaskan Native	0.9	5.2	5.0
Asian	3.6	2.5	2.5
Hispanic (%)¶	12.5	7.1	7.7

\* US population demographics are derived from sampling individuals, whereas study sample demographics are derived using a household-sampling method. The US population figures are for all states and territories, whereas the study sample reflects only the Continental US.

†  $\chi^2=210.67$ ,  $df=1$ ,  $P<.001$ .

‡  $\chi^2=51.60$ ,  $df=1$ ,  $P<.001$ .

§ For race, US population percentages indicate percentages of all people, and study sample percentages are for adults only.

¶  $\chi^2=111.64$ ,  $df=1$ ,  $P<.001$ .

US=United States.

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excessiveness or irrationality of their preoccupation with appearance. For example, a recent study reported that 27% of BDD subjects were delusional (ie, did not recognize that they suffered from a disorder.)<sup>21</sup> Moreover, like previous studies that relied on self-reports,<sup>7,11-14</sup> our telephone survey could not distinguish between “imagined or slight” defects and more readily seen “defects.” Thus, although we did ask whether others had said the individual was more concerned with the troubling body part than he or she should be, we cannot be certain that clinicians would diagnose BDD in all of those whom our survey identified as having the disorder. Nor can we be certain as to the disorder’s degree of severity in our diagnosed respondents. Finally, the large percentage of subjects who declined to name the body part that concerned them is another significant limitation.

Over-diagnosis of BDD may have occurred because our telephonic interviews could not determine whether the individuals’ perceived “defects” in appearance were, as required by *DSM-IV*, nonexistent or slight. However, 49% of individuals diagnosed with BDD reported that others said they were overly concerned about the

named body part. Since shame prevents many people with BDD from revealing their appearance concerns, this high percentage suggests that the perceived defect was frequently nonexistent or slight. That many BDD subjects declined to name a specific body part also suggests shame. Nevertheless, individuals with BDD may be more willing to report their BDD symptoms over the phone than in person, and we may have over-diagnosed BDD. BDD may have been under-diagnosed because we did not count weight concerns toward a BDD diagnosis even though weight concerns are a relatively common symptom of BDD. Because BDD and eating disorders may be comorbid<sup>23</sup> BDD may have been missed in subjects with both disorders (if the subjects’ main concern was weight [ie, their eating disorder]). In this regard, we cannot be certain how to interpret the finding that among the female BDD subjects, “stomach” was chosen as the most concerning body part (that they would admit to). Studies using in-person interviews by mental health professionals are needed to address the differential diagnosis between BDD and eating disorders. Similarly, by excluding individuals whose main concern was being too thin, we may have missed BDD in the form of muscle dysmorphia.<sup>24</sup>

**TABLE 2.**  
**Which Part or Parts of Your Body do You Think or Worry About the Most?**

<i>Body Part</i>	<i>Men, n (%)</i>	<i>Women, n (%)</i>	<i>Total, n (%)</i>
Other (and decline to state)	7 (35)	19 (42)	26 (40)
Hair	4 (20)	4 (9)	8 (12)
Skin	3 (15)	5(11)	8 (12)
Stomach	2 (10)	9 (20)	11 (17)
Mouth	2 (10)	0 (0)	2 (3)
Hands	2 (10)	0 (0)	2 (3)
Weight	0 (0)	3 (7)	3 (5)
Breasts	0 (0)	2 (4)	2 (3)
Nose	0 (0)	2 (4)	2 (3)
Lips	0 (0)	1 (2)	1 (2)
Jaw	0 (0)	0 (0)	0 (0)
Hips	0 (0)	0 (0)	0 (0)
Genitals	0 (0)	0 (0)	0 (0)
Total	20 (100)	45 (100)	(65) 100

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## CONCLUSION

Although the gender ratio has varied in some clinical samples, our results are consistent with findings from the largest clinical samples, in which males and females were approximately equal<sup>25</sup> or BDD was somewhat more common in women.<sup>23</sup> This suggests that in contrast to major depression and anxiety disorders,<sup>26</sup> where women predominate in clinical but not community samples, men and women with BDD are nearly equally likely to seek treatment. The fall-off of prevalence with age may reflect a number of influences (eg, a greater chance of receiving successful treatment as one ages, differential mortality, or differences in response biases in different age groups). The fall-off seems unlikely to stem from a natural history of recovery, since a continuous course characterizes most sufferers.

Our data suggest that excessive worry about appearance is more often associated in the community with self-reported distress than with self-reported interference with functioning. The data also suggest that interference, when present, is

more likely to affect friendships and dating than work, school, or other activities. However, other studies<sup>5,28,29</sup> have reported that impaired social, familial and occupational functioning is nearly universal in patients with BDD. As noted, we cannot be certain how truthful or accurate our respondents were in acknowledging dysfunction. The high frequency of preoccupation with and worry about appearance reported by our respondents with BDD confirms the importance of the *DSM-IV* decision to add criteria of distress and/or dysfunction in defining BDD as a disorder requiring treatment.

If, as our results suggest, BDD has a nationwide prevalence of one (interference with functioning) or two (substantial distress) in 100 adults, then, given the associated suffering, impaired functioning and high rate of attempted suicide, increased efforts to educate the public and professionals about the disorder, identify cases early, facilitate access to care and develop more effective treatments would be desirable.

Future studies to define nationwide prevalence should utilize a clinically validated, structured interview instrument, preferably administered in person by mental health professionals. Such studies could inform future treatment studies by carefully documenting BDD onset and course, the degree to which and ways in which functioning has been impaired, rates of seeking treatment from various sources, suicide attempt rates, and the lifetime and point prevalence of comorbid conditions. **CNS**

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