

# Prevalence of Body Dysmorphic Disorder in Plastic Surgery and Dermatology Patients: A Systematic Review with Meta-Analysis



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**Abstract** The aim of the present study was to evaluate the prevalence of body dysmorphic disorder in plastic surgery and dermatology patients, by performing a systematic review of the literature and meta-analysis. The most relevant studies published originally in any language were analyzed. The literature search was performed using the PubMed, Cochrane Central Register of Controlled Trials (CENTRAL), and Scielo databases. The final sample comprised 33 publications that were submitted to meta-analysis. The study verified that 15.04% of plastic surgery patients had body dysmorphic disorder (range 2.21–56.67%); patient mean age was  $34.54 \pm 12.41$  years, and most were women (74.38%). Among dermatology patients, 12.65% (range 4.52–35.16%) had body dysmorphic disorder; patient mean age was  $27.79 \pm 9.03$  years, and most were women (76.09%). Both plastic surgeons and dermatologists must adequately assess their patients to identify those with a higher likelihood of body dysmorphic disorder and should arrange multidisciplinary care for such individuals.

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**Keywords** Plastic surgery · Dermatology · Body dysmorphic disorder · Prevalence

## Introduction

Body dysmorphic disorder (BDD), also known as dysmorphophobia, is fairly common and is characterized by a distorted perception of one's own body image. Patients have exaggerated concern with an imagined appearance defect or a minute existing body defect [1]. Most individuals with BDD present with some degree of social and occupational impairment, with obsessive complaints about appearance leading to the development of compulsive behaviors and, in more severe cases, suicidal thoughts [2–4].

In the current list of psychiatric disorders (the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders—DSM-5), the only diagnostic category that directly considers the concern with body image is BDD, defined as a concern with one or more defects or flaws in one's physical appearance which are not observable or only subtly perceptible by others [5].

Due to their exaggerated dissatisfaction with body aesthetics, individuals with BDD frequently seek cosmetic treatments, when, in actuality, they should be treated for a psychological disorder [1]. However, due to the limited amount of literature on BDD in the past [6], many health professionals are unable to recognize and/or diagnose potential patients, and perform aesthetic treatments without realizing that such therapy will not result in patient satisfaction.

Thus, considering the need for more information on BDD and its occurrence in patients of specialties other than psychiatry, the present study aimed to verify, by means of a

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systematic review of the literature and performance of a meta-analysis, the prevalence of BDD in plastic surgery and dermatology patients.

## Methodology

To achieve the proposed objective, the most relevant studies published originally in any language before October 2016 (when the search was performed) were analyzed; the PubMed, Cochrane Central Register of Controlled Trials (CENTRAL), and Scientific Electronic Library Online (SciELO) databases were used to perform this research.

With the aim of selecting studies with scientific evidence of quality, publications referring to meta-analyses and randomized controlled clinical trials (RCTs) in humans were selected. The searches were performed separately, according to the specialty.

In searches related to plastic surgery, the following combinations of keywords were used: “body dysmorphic disorder,” “dysmorphophobia,” “body dysmorphia,” “plastic surgery,” “aesthetic surgery,” “cosmetic surgery,” and “prevalence.” In searches related to dermatology, the following combinations of keywords were used: “body dysmorphic disorder,” “dysmorphophobia,” “body dysmorphia,” “dermatology,” “dermatological clinic,” “dermatological treatment,” and “prevalence.”

To identify the study protocols, the terms “randomized controlled trial,” “humans,” and “meta-analysis” were used in the searches for both specialties. No filters were used regarding the dates of publication, with the aim of obtaining the most complete literature results possible.

Inclusion and exclusion criteria were applied as demonstrated in Table 1.

Among the studies that examined the prevalence of BDD in plastic surgery, dermatology, or other specialties, only the data related to the present study specialties were collected. In addition, the data from two studies [7, 8] comparing the prevalence of BDD in plastic surgery and dermatology were included in the meta-analyses of both specialties.

To verify the prevalence of BDD, data referring to the number of patients within the samples and the number of patients diagnosed with BDD were collected. Furthermore, to develop a profile of patients with BDD in each specialty studied, data referring to patient gender and age group were also investigated.

## Results

In total, 33 publications were found within the scope of analysis of this study. Of these, 23 were related to the prevalence of BDD in the specialty of plastic surgery

**Table 1** Inclusion and exclusion criteria and the main results

Inclusion criteria	
Outline	RCT Meta-analysis
Patients	Plastic surgery Dermatology With or without BDD
Intervention	Aesthetic and functional surgical procedures Dermatological clinic BDD diagnosis
Language	Not defined
Exclusion criteria	
Outline	Poorly explained and/or incomprehensible methodology BDD diagnosis performed in a non-standardized/recommended way
Publication method	Abstract only
Main results	
BDD prevalence in plastic surgery and/or dermatology	

(Table 2) and 10 were related to BDD in dermatology (Table 3).

The data obtained from the publications in this meta-analysis are shown in Tables 4 and 5.

There was a 15.04% prevalence of patients with BDD (range 2.21–56.67%) in the specialty of plastic surgery, with mean age of  $34.54 \pm 12.41$  years, and most were women (74.38%).

In dermatology, 12.65% of patients had BDD (range 4.52–35.16%), with mean age of  $27.79 \pm 9.03$  years, and most were women (76.09%).

## Discussion

Despite the importance of adequately managing patients with BDD in the specialties of plastic surgery and dermatology [8], there are few studies in the literature that addressed the identification of patients with this disorder in either specialty, even though 23 studies were related to plastic surgery and 10 to dermatology.

A study was found [7] in which the prevalence of BDD was examined in adult and teenaged patients, students, adult and adolescent psychiatric patients, patients seeking general cosmetic surgery, rhinoplasty, orthognathic surgery, and orthodontic or cosmetic dentistry, and patients in general dermatology, aesthetic dermatology, and acne-specific dermatology. Generally, plastic surgery and dermatology patients showed the highest rates of BDD, with the highest incidence found in plastic surgery.

**Table 2** Publications that comprised the sample for the meta-analysis of the specialty of plastic surgery

References	Title	Language	Objective
Ishigooka et al. [9]	Demographic features of patients seeking cosmetic surgery	English	To describe, from the psychiatric point of view, the demographic characteristics of a large population of patients seeking aesthetic surgery
Sarwer et al. [10]	Body image dissatisfaction and body dysmorphic disorder in 100 cosmetic surgery patients	English	To investigate dissatisfaction with body image and BDD in potential plastic surgery patients
Altamura et al. [11]	Clinical and subclinical body dysmorphic disorder	English	To define the main demographic and clinical characteristics of BDD in individuals seeking plastic surgery services
Vargel and Ulusahin [12]	Psychopathology and body image in cosmetic surgery patients	English	To investigate the presence of psychiatric symptoms and evaluate perceptive, cognitive, and behavioral aspects related to body image in plastic surgery patients
Vindigni et al. [13]	The importance of recognizing body dysmorphic disorder in cosmetic surgery patients: do our patients need a preoperative psychiatric evaluation?	English	To help recognize BDD in patients seeking aesthetic procedures, and analyze psychopathological comorbidities in these patients
Aouizerate et al. [14]	Body dysmorphic disorder in a sample of cosmetic surgery applicants	English	To present the first European report on the prevalence and clinical and functional characteristics of patients with BDD with regards to plastic surgery
Crerand [15]	Rate of body dysmorphic disorder among patients seeking facial cosmetic procedures	English	To determine the prevalence of BDD among patients seeking cosmetic procedures
Castle et al. [16]	Correlates of dysmorphic concern in people seeking cosmetic enhancement	English	To determine the clinical correlations of BDD in patients seeking cosmetic procedures
Bellino et al. [17]	Dysmorphic concern symptoms and personality disorders: a clinical investigation in patients seeking cosmetic surgery	English	To investigate the relationship between personality disorders and dysmorphic symptoms in patients seeking plastic surgery
Vulink et al. [8]	Stoornis in de lichaamsbeleving bij 3–8% van de patiënten op de poliklinieken Dermatologie en Plastische Chirurgie	Dutch	To comparatively determine the prevalence of BDD in a university medical center within the specialties of dermatology and plastic surgery
Hayashi et al. [18]	Importance of a psychiatric approach in cosmetic surgery	English	To evaluate the importance of a psychiatric approach in plastic surgery patients
Lai et al. [19]	Body dysmorphic disorder in patients with cosmetic surgery	English	To calculate, both pre- and post-surgery, the number with BDD among plastic surgery patients
Alavi et al. [20]	Body dysmorphic disorder and other psychiatric morbidity in aesthetic rhinoplasty candidates	English	To investigate the prevalence of BDD among patients seeking aesthetic surgery
Picavet et al. [21]	High prevalence of body dysmorphic disorder symptoms in patients seeking rhinoplasty	English	To determine the prevalence of BDD and its symptoms in patients seeking rhinoplasty, in addition to evaluating the clinical profile of those patients
Fatholoomi et al. [22]	Body dysmorphic disorder in aesthetic rhinoplasty candidates	English	To determine the prevalence of BDD among patients seeking rhinoplasty procedures
Felix et al. [3]	Patients with mild to moderate body dysmorphic disorder may benefit from rhinoplasty	English	To prospectively investigate whether patients with mild and moderate BDD are suitable for rhinoplasty, and evaluate the severity of BDD as well as patient satisfaction with the surgical result 1 year following the intervention
Jeremy et al. [23]	Prevalence of body dysmorphic disorder and impact on subjective outcome amongst Singaporean rhinoplasty patients	English	To determine the prevalence of BDD in Asian patients who underwent cosmetic rhinoplasty and to analyze its impact on the subjective results post-surgery
Metcalfe et al. [24]	Prevalence of body dysmorphic disorder among patients seeking breast reconstruction	English	To estimate the prevalence of BDD in patients seeking breast reconstruction following a mastectomy due to breast cancer
Dey et al. [25]	Body dysmorphic disorder in a facial plastic and reconstructive surgery clinic: measuring prevalence, assessing comorbidities, and validating a feasible screening instrument	English	To measure the prevalence of BDD in patients from a reconstructive and facial plastic surgery clinic
Woolley and Perry [26]	Body dysmorphic disorder: prevalence and outcomes in an oculofacial plastic surgery practice	English	To determine the prevalence, associated factors, and surgical results in patients with BDD in an oculofacial plastic surgery clinic

**Table 2** continued

References	Title	Language	Objective
Brito et al. [27]	Body dysmorphic disorder in patients seeking abdominoplasty, rhinoplasty, and rhytidectomy	English	To estimate the level of body dissatisfaction and prevalence of BDD in patients seeking three plastic surgery procedures
Brito et al. [28]	Prevalence of body dysmorphic disorder symptoms and body weight concerns in patients seeking abdominoplasty	English	To estimate the prevalence and severity of BDD symptoms in patients seeking abdominoplasty
Veale et al. [7]	Body dysmorphic disorder in different settings: a systematic review and estimated weighted prevalence	English	To systematically review the prevalence of BDD in various groups of individuals

**Table 3** Publications that comprised the sample for the meta-analysis regarding the specialty of dermatology

References	Title	Language	Objective
Phillips et al. [29]	Rate of body dysmorphic disorder in dermatology patients	English	To determine the percentage of patients with BDD who seek dermatological treatment
Uzun et al. [30]	Body dysmorphic disorder in patients with acne	English	To investigate the prevalence of BDD in patients undergoing acne treatment
Vulink et al. [8]	Stoornis in de lichaamsbeleving bij 3–8% van de patiënten op de poliklinieken Dermatologie en Plastische Chirurgie	Dutch	To comparatively determine the prevalence of BDD in a university medical center within the specialties of Dermatology and Plastic Surgery
Bowe et al. [31]	Body dysmorphic disorder symptoms among patients with acne vulgaris	English	To determine the prevalence of BDD in patients seeking acne treatment
Hsu et al. [32]	Prevalence of body dysmorphic features in patients undergoing cosmetic procedures at the National Skin Centre, Singapore	English	To evaluate the prevalence of BDD in patients seeking dermatological treatment in Singapore
Conrado et al. [1]	Body dysmorphic disorder among dermatologic patients: prevalence and clinical features	English	To determine the prevalence of BDD in dermatology patients
Kacar et al. [33]	The frequency of body dysmorphic disorder in dermatology and cosmetic dermatology clinics: a study from Turkey	English	To investigate the prevalence of BDD in patients from the specialty of dermatology
Kacar et al. [34]	Frequency of body dysmorphic disorder among patients with complaints of hair loss	English	To determine the prevalence of BDD in patients complaining of hair loss
Thanveer and Khunger [35]	Screening for body dysmorphic disorder in a dermatology outpatient setting at a tertiary care centre	English	To identify patients with BDD among patients seen at a dermatology clinic
Veale et al. [7]	Body dysmorphic disorder in different settings: a systematic review and estimated weighted prevalence	English	To systematically review the prevalence of BDD in various groups of individuals

A study by Vulink et al. [8] specifically examined the prevalence of BDD in plastic surgery and dermatology patients, and found higher prevalence among dermatology patients (8.5%) than in plastic surgery patients (3.16%). Such findings are in contrast to the present study, which showed an increased prevalence of BDD among plastic surgery patients (15.04%) than among dermatology patients (12.65%).

Nonetheless, patients from both specialties showed considerably higher rates of BDD compared with patients in the general population, with prevalence of 0.7–2.4% [36–39]. In individual analysis of the 33 studies that

comprised the sample, only one [21], which evaluated the prevalence of BDD in plastic surgery, reported a percentage within this range (2.21%).

It is important to highlight that women showed high prevalence of BDD, both in plastic surgery (74.38%) and in dermatology (76.09%), and that out of the total of 33 studies included in this sample, only three had a higher prevalence of BDD in males (two studies were on plastic surgery [9, 23] and one on dermatology [30]).

Thus, in view of the high prevalence of BDD found in this study, it is essential for plastic surgeons and dermatologists to be alert to the possibility that their patients may

**Table 4** Data obtained from the publications in this meta-analysis regarding the specialty of plastic surgery

Study	Sample <i>n</i>	BDD		Gender				Mean age
		%	<i>n</i>	Male		Female		
				%	<i>n</i>	%	<i>n</i>	
Ishigooka et al. [9]	415	14.94	62	69	43	31	19	35 ± 13.7
Sarwer et al. [10]	100	7.00	7	0	0	100	7	44.06 ± 14.56
Altamura et al. [11]	478	6.28	30	13	4	87	26	25.8 ± 9.0
Vargel and Ulusahin [12]	40	10.00	4	50	2	50	2	19, 25, 26 and 34
Vindigni et al. [13]	56	53.57	30	17	5	83	25	36 ± 13
Aouizerate et al. [14]	132	9.09	12	17	2	83	10	35 ± 10.8
Crerand [15]	91	7.69	7	29	2	71	5	34.6 ± 15.99
Castle et al. [16]	137	2.92	4	–	–	–	–	–
Bellino et al. [17]	66	16.67	11	27	3	73	8	23.45 ± 14.03
Vulink et al. [8]	475	3.16	15	13	2	87	13	34 ± 14.7
Hayashi et al. [18]	140	7.86	11	27	3	73	8	38.4*
Lai et al. [19]	817	7.71	63	13	8	87	55	47*
Alavi et al. [20]	306	24.51	75	19	14	81	61	23 ± 4.9
Picavet et al. [21]	226	2.21	5	40	2	60	3	33 ± 16
Fatholoomi et al. [22]	130	31.54	41	20	8	80	33	25.9 ± 6.05
Felix et al. [3]	151	52.98	80	15	12	85	68	32 ± 10
Jeremy et al. [23]	47	14.89	7	86	6	14	1	26*
Metcalfe et al. [24]	188	17.02	32	0	0	100	32	51 ± 10
Dey et al. [25]	234	7.69	18	33	6	67	12	36 ± 14
Woolley and Perry [26]	728	6.87	50	30	15	70	35	51.8 ± 19.8
Brito et al. [27]	300	51.67	155	–	–	–	–	40.66 ± 10.5
Brito et al. [28]	90	56.67	51	–	–	–	–	–
Veale et al. [7]	3046	16.19	493	27	133	73	361	–

\*, Data eliminated from the meta-analysis due to lack of standard deviation specification; –, non-discriminated data

**Table 5** Data obtained from the publications included in this meta-analysis regarding the specialty of dermatology

Study	Sample <i>n</i>	BDD		Gender				Mean age
		%	<i>n</i>	Male		Female		
				%	<i>n</i>	%	<i>n</i>	
Phillips et al. [29]	268	11.94	32	25	8	75	24	33.7 ± 14.4
Uzun et al. [30]	159	8.81	14	57	8	43	6	21.6 ± 1.9
Vulink et al. [8]	530	8.49	45	22	10	78	35	33.6 ± 14.9
Bowe et al. [31]	128	35.16	45	–	–	–	–	–
Hsu et al. [32]	198	29.29	58	17	10	83	48	–
Conrado et al. [1]	300	10.33	31	13	4	90	28	–
Kacar et al. [33]	318	6.29	20	25	5	75	15	26.6 ± 7.84
Kacar et al. [34]	142	29.58	42	26	11	74	31	27.1 ± 8.31
Thanveer and Khunger [35]	177	4.52	8	50	4	50	4	24.1 ± 6.83
Veale et al. [7]	1835	11.88	218	–	–	–	–	–

–, Non-discriminated data

have BDD; the correct diagnosis and treatment of this disorder may improve self-esteem and quality of life in these patients, who may need a multidisciplinary approach.

In addition, further research is needed to assess whether submitting patients to aesthetic procedures/treatments reduces or aggravates BDD symptoms.

## Conclusion

Based on the meta-analysis performed on 33 publications that met the inclusion and exclusion criteria established in this study, it was possible to conclude that a higher percentage of patients with BDD were observed in the specialty of plastic surgery (15.04%) than in dermatology (12.65%). However, professionals from both specialties must become aware of these data and of the likelihood of BDD in their patients, especially women aged 25–40 years, who showed a higher prevalence of BDD in the majority of studies.

Both plastic surgeons and dermatologists must adequately assess their patients to identify those with an increased potential for BDD and should arrange multidisciplinary care for such individuals.

## Compliance with Ethical Standards

**Conflict of interest** The author declares that he has no conflicts of interest to disclose.

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