GLOBAL PSYCHIATRY

GLOBAL PSYCHIATRY — Vol 4 | Issue 2 | 2021

Anton Minty* and Gavin Minty

The prevalence of body dysmorphic disorder in the community: a systematic review

12 Mitchell Avenue, Newcastle-Upon Tyne, NE2 3LA

*email: anton123@doctors.org.uk

Received: 2020-11-19; Accepted: 2021-01-28
DOI: 10.52095/gp.2021.8113

Abstract

Objective: Body dysmorphic disorder (BDD) is an underdiagnosed condition among the general population with significant associated morbidity and mortality. Symptoms of BDD include worrying excessively about a particular part of the body, repeatedly checking oneself in the mirror and attempting to cover up particular areas of the body.

Aim: To determine the prevalence of BDD within the global population. To perform a further subgroup analysis to identify groups that have a higher prevalence than the general population. To assess the modalities of diagnosis BDD and its relative abundance.

Methods: A systematic review using the PubMed database using the search criteria 'BDD' or 'body dysmorphic disorder' and 'prevalence' or 'incidence' from 1 January 1990 to 1 January 2020. 591studies were found, 81 of which were eligible and included in the study. Prevalence was calculated for the global population and subgroups, student, dermatology, surgical and psychiatric patients.

Results: The ranges of prevalence within studies were as follows; within the general population, the prevalence of BDD ranged from 0.5-3.2% (n=8). It was 1.3-5.8% (n=8) in student cohorts, 4.9- 21.1% (n=12) in general dermatology cohorts, 1.3%-5.8% (n=8) in a student population, 0-54.3% (28) in psychiatric cohorts and 2.9- 57% (n=15) in cosmetic surgery cohorts.

Conclusion: Studies found had low heterogenicity. However, there was variation in diagnostic criteria and methods of data collection. This study shows that a significant number of people suffer from BDD. Due to the fact that people with BDD often don't seek help, this number is likely an underestimation. This study identified subgroups of the population that have a higher prevalence of BDD. Targeted screening of individuals in high-risk cohorts, as well as further clinician education, may be of benefit to help aid early recognition and diagnosis. Additionally, structured clinical interviews for DSM (the Diagnostic and Statistical Manual of Mental Disorders), also known as SCID, were the most common and appear to be more effective than normal interviews at identifying individuals with BDD.

Keywords

Body Dysmorphic Disorder, BDD, Prevalence

INTRODUCTION

Body dysmorphic disorder (BDD) is described as a "a mental health condition where a person spends a lot of time worrying about flaws in their appearance. These flaws are often unnoticeable to others." (NHS, 2020). Symptoms of BDD include worrying excessively about a particular part of the body, repeatedly checking oneself in the mirror and attempting to cover up particular areas of the body (NHS, 2020).

The average age of onset of BDD is 16.9 years old (Altamura et al., 2001). The aetiology includes a number of factors including genetics (Monzani et al., 2014), individual temperament (while no personality type is exempt from BDD, a shy, anxious or perfectionist personality may predispose people to develop BDD as described by Veale. BDD may begin as a feeling of shame towards your body and further progress. There is a strong association between BDD and a history of physical or sexual abuse as a child (Veale, 2004).

Phillips et al., (2012) found that in a sample of 68 individuals with BDD, 72% had poor or absent insight into their condition, which is a substantial reason why many sufferers fail to seek help. Furthermore, many patients who seek advice from physicians and are diagnosed with physical conditions go on to receive medical and cosmetic treatments

(Phillips et al., 2001). Up to 76% of the BDD population seeks non-psychiatric treatment and 66% end up receiving it. (Phillips et al., 2001). Unfortunately, very few patients who undergo surgical treatments report an improvement in their symptoms. (Crerand et al., 2005).

BDD is commonly treated with either cognitive behavioural therapy (CBT) or selective serotonin reuptake inhibitors (SSRIs) as described in a review article about to BDD treatment (Phillips and Hollander, 2008). In order to determine the exact service provision within different populations, it is important to establish the prevalence of BDD within the given sample. Identifying risk factors for BDD and increasing awareness may also help ensure the detection of individuals who require these services.

There are variations in the diagnostic criteria for BDD, as the DSM-V requires an individual to demonstrate repetitive behaviours in order to receive a diagnosis of BDD. The addition of repetitive behaviours into the DSM criteria is important given that not every individual with BDD reports these compulsive behaviours (94% do at any one time although 99% do throughout their lifetime). The difference between the DSM-IV and DSM-V criteria is therefore likely to impact upon the prevalence of BDD within population samples.

Furthermore, a wide variety of prevalence have been seen across a range of cohorts. Compiling this information can help identify similarities and differences between different cohorts of individuals, as well as spot trends over time. Therefore, developing a greater understanding of the prevalence of BDD within cohorts could help improve service provisions and identify individuals at high risk of BDD within the community.

A diagnosis is the first step for patients to understand their BDD. Being diagnosed may prevent people from seeking medical or surgical treatments that don't address the underlying cause. BDD very rarely gets better on its own and may get worse over time. Left untreated it can lead to suicidal thoughts and even actions. However, with a diagnosis, there are several successful treatments options. Phycological or pharmacological managements have both shown benefits. Due to the fact that treatments are available, any negative effects, including suicide, that are caused by BDD can be seen as preventable. This study aims to evaluate the prevalence of BDD in order to further assess the burden of disease in the global population. It also seeks to identify subgroups that have a higher prevalence to show populations that should be screened for potential BDD or where additional support would be beneficial.

METHODS

This study was a systematic review of the prevalence of BDD identified within the PubMed database according to the 2009 PRISMA checklist, which is a minimum set of items required for a systematic review (PRISMA, 2015). Prevalence was calculated for the general population as well as the following subgroups: students, dermatologic, psychiatric and surgical patients. Modality of diagnosis was also noted.

The primary outcome was the prevalence of BDD in the general global population. With secondary outcomes being the prevalence in subgroups. There was no protocol registration information or registration number required.

Search strategy

The search was conducted from 1 January 2020. Papers were searched in MEDLINE (PubMed) by the author using the following search terms: (incidence) OR (prevalence) and (BDD) OR (body dysmorphic disorder) in full text. There were no search limits. The references of papers found will be searched for additional papers.

The reason these search terms were selected was that we wanted to include the abbreviation and the term 'body dysmorphic disorder' to encompass a larger number of papers. The study searched for incidence in order to identify the number of new BDD cases and compare this to the prevalence, however, unfortunately, we did not find any papers that specifically observed incidence.

Data collection

All the abstracts of these articles were read. If illegible, papers were excluded. The rest were fully read and all those which adhered to the eligibility criteria were included in the study.

The primary outcome was prevalence; however, 'incidence' was chosen as well as prevalence in order to compare the incidence of one point in time to the prevalence. No papers were found reporting incidence, so a comparison was unmanageable.

Prevalence ranges were calculated by the minimum and maximum values found among all eligible papers. No further analysis was performed. The range of prevalence was used as a comparison between the different cohorts and conclusions drawn were based on the assessment of the differences in prevalence rather than from statistical analysis.

All studies that looked at which areas of the body were most commonly affected by BDD were evaluated. The top three most commonly affected body parts were selected as this was felt to be a sufficient number to provide a variety of body parts if all the available samples were selected.

Inclusion and exclusion criteria

The inclusion criteria was as follows: accessibility to the full paper and primary research. Systematic reviews and metanalysis were excluded. Papers published **before 1990 were** excluded. All study designs were included except review papers and case reports. Due to the primary outcome of prevalence, papers with and without control groups were included. Due to the fact that the average age of onset of BDD is 16.9 years, all ages were included. Studies with no available paper in the English language were excluded.

Risk of bias

The study adhered to predefined objectives and eligibility criteria that were unambiguous in an effort to decrease selection bias. For each study found, all references were searched for additional papers to reduce the chance of missing eligible papers. The study only contains published papers and so there is a risk of publication bias. The Cochrane Bias Risk Assessment tool was used to assess bias in each paper.

RESULTS

The paper selection process is described in Figure 1.

586 abstracts were obtained using the search with either 'BDD' or 'body dysmorphic disorder' and 'prevalence' or 'incidence'. Five other papers were also found from looking through the references of relevant BDD papers, which demonstrated the prevalence of BDD within sample cohorts. This made a total of 591 papers.

All abstracts which made reference to the prevalence of BDD were included – 105 of the abstracts made reference to the prevalence of BDD. The other 486 were therefore discarded. The 105 remaining papers were read, and 24 were discarded because they did not fulfil the eligibility criteria (a prevalence of BDD within a specific cohort e.g. students or dermatological patients). This left a total of 81 papers for review, illustrated in Table 1.

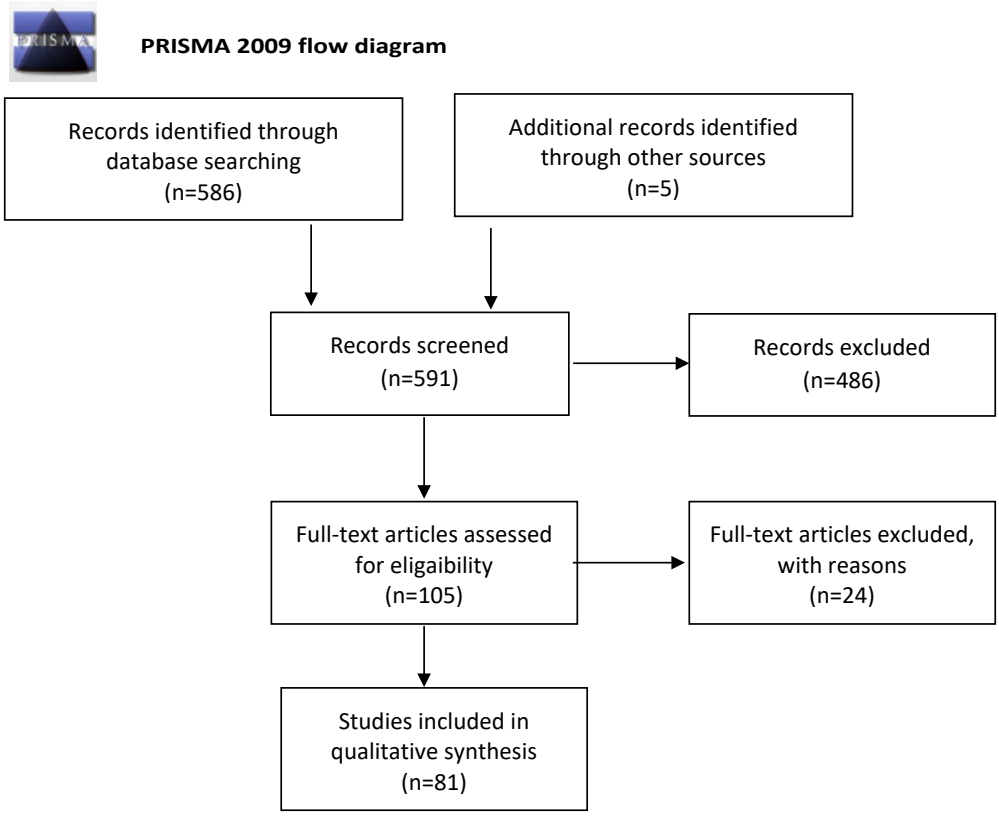

Figure 1: The PRISMA diagram describing the process for identification and selection of BDD papers.

Table 1: This table shows all 81 papers in the systematic review.

Author	Country and Year	Cohort	Prevalence of BDD	Comparator Group	Random vs Non Random Sampling
Ahamed et al.	Saudi Arabia, 2016	365 female medical students	4.40%	None	Non-randomly selected
Akinboro et al.	Nigeria, 2019	114 people with dermatological conditions	36.00%	None	Random selection
Alavi et al.	Iran, 2011	306 patients in cosmetic surgery clinics	24.50%	None	Non-randomly selected
AlShahwan, Mohammed	Saudi Arabia, 2020	497 patients in a dermatology outpatient clinic	14.1%	None	Non-Randomly Selected
Altamura et al.	Italy, 2001	118 BDD or sBDD patients (+control 360)	6.30%	Yes (patients without BDD)	Non-randomly selected
Bjornsson et al.	USA, 2016	207 participants receiving behavourial treatment	7.2%	None	Non-randomly selected
Blashill AJ et al.	USA, 2016	74 female indoor tanners	39.00%	None	Non-randomly selected
Bohne A et al.	Germany, 2002b	133 college students	5.30%	None	Non-randomly selected
Borda et al.	Argentina, 2011	25 depressed female students (+85 control)	44% (clinical sample) 47.00% (non-clinical sample)	Yes (healthy controls without depression)	Non-randomly selected
Bowe et al.	USA, 2007	128 acne patients	14.1%- 21.1%	None	Non-randomly selected
Brakoulias et al.	Australia, 2011	77 OCD patients	3.80%	None	Non-randomly selected
Brignardello-Petersen	Australia 2019	213 dental patients	4.00%	None	Non-randomly selected
Brohede S et al.	Sweden, 2017	425 female dermatology patients	4.90%	None	Non-randomly selected
Brohede S et al.	Sweden, 2015	2,891 female population sample	2.10%	None	Random selection
Buhlmann U et al.	Germany, 2010	2,510 population sample	1.8% (2.0% for females and 1.5% for males)	None	Random selection
Campagna JD, Bowsher B	USA, 2016	722 male entry-level military personnel	13.00%	None	Non-randomly selected
Campagna JD, Bowsher B	USA, 2016	378 female entry-level military personnel	21.70%	None	Non-randomly selected
Cansever A et al.	Turkey, 2003	420 female college students	4.80%	None	Non-randomly selected
Castle DJ et al.	Australia, 2004	137 patients attending cosmetic surgery clinic	2.90%	None	Non-randomly selected
Cerea S et al.	Italy, 2018a	615 population sample	1.63%	None	Non-randomly selected
Cerea S et al.	Italy, 2018b	61 female anorexia nervosa	26.23%	Healthy controls	Non-randomly selected
Collins B et al.	USA, 2014	99 patients from maxillofacial surgery clinic	13.00%	None	Non-randomly selected
Conrado LA et al.	Brazil, 2010	300 dermatology patients (150 cosmetic and 150 general dermatology) +50 control	14.0% cosmetic, 6.7% general dermatology, 2.0% control	Non dermatological patients	Non-randomly selected
Conroy M et al.	USA, 2008	100 adult psychiatry inpatients	11.00%	None	Non-randomly selected
Costa CDL et al.	Brazil, 2012	901 OCD patients	12.10%	None	Non-randomly selected
de Brito MJ et al.	Belgium, 2016a	90 cosmetic surgery patients	57.00%	None	Non-randomly selected

Continued Table 1: This table shows all 81 papers in the systematic review.

Author	Country and Year	Cohort	Prevalence of BDD	Comparator Group	Random vs Non Random Sampling
de Brito MJ et al.	Brazil, 2016b	300 patients undergoing cosmetic surgery	57% (abdominoplasty), 52% (rhinoplasty), 42% (rhytidectomy)	None	Non-randomly selected
De Jongh A et al.	The Netherlands, 2009	170(+878 C) patients from cosmetic dental clinics	4.20%	Yes	Non-randomly selected
Dey JK et al.	USA, 2015	234 outpatient cosmetic and reconstructive surgery sample	SCID: 13.1% (cosmetic), 1.8% (reconstructive) BDDQ: 19.7% (cosmetic) and 3.6% (reconstructive)	None	Non-randomly selected
Dingemans AE et al.	Netherlands, 2012	158 eating disorder patients	45%	None	Non-randomly selected
Dlagnikova A, van Niekerk RL	South Africa, 2015	395 students	5.10%	None	Random Selection
Dyl J et al.	USA, 2006	208 adolescent psychiatric inpatients	6.70%	None	Non-randomly selected
Faravelli C et al.	Italy, 1997	673 Population Sample	0.70%	None	Random selection
Fathololoomi et al.	Pakistan, 2013	130 patients seeking rhinoplasty	31.50%	None	Non-randomly selected
Fontenelle LF et al.	Brazil, 2006	166 psychiatric patients attending obsessions, compulsions and impulsions programme	12%	None	Non-randomly selected
Gieler T et al.	Germany, 2016	2,066 (2002) then 2508 (2013) population sample	0.5% then 1%	None	Random selection
Grant JE et al.	USA, 2001	122 Psychiatric inpatients	13.10%	None	Non-randomly selected
Grant JE et al.	USA, 2002	41 anorexic patients	39%	None	Non-randomly selected
Grant JE et al.	USA, 2019	3,459 college students	1.70%	None	Random selection
Hepburn S, Cunningham S.	UK, 2006	40 (+70 control) orthodontic patients and control group	7.50%	Yes - members of the general public	Non-randomly selected
Hsu C et al.	Singapore, 2009	198 +198 control (total 396) cosmetic surgery patients	29.40%	Yes	Non-randomly selected
Jafferany M et al.	USA, 2019	45 adolescent psychiatric inpatients	37.78%	None	Non-randomly selected
Jaisoorya TS et al.	India, 2003	231 (+200 control) patients with OCD	3.00%	Yes	Non-randomly selected
Joseph AW et al.	USA, 2017a	597 facial plastic or oculoplastic surgery patients	cosmetic: 13.1% vs reconstructive 6.7%	None	Non-randomly selected
Joseph J et al.	UK, 2017b	34 (+50) patients considered for septorhinoplasty	32.00%	50 consecutive patients from otology clinic	Non-randomly selected
Kacar SD et al.	Turkey, 2014	151 male dermatology and 167 cosmetic dermatology clinics	8.6% (cosmetic) and 4.2% (general)	Yes- patients from general dermatology clinic	Non-randomly selected

Continued Table 1: This table shows all 81 papers in the systematic review.

Author	Country and Year	Cohort	Prevalence of BDD	Comparator Group	Random vs Non Random Sampling
Kacar SD et al.	Turkey, 2016	121 (+147) female patients with hair loss	25.60%	General dermatology patients with no hair loss	Non-randomly selected
Kacar SD et al.	Turkey, 2016	121(+147) male patients with hair loss	52.40%	General dermatology patients with no hair loss	Non-randomly selected
Kelly MM et al.	USA, 2015	100 veterans affairs primary care behavioural health clinic	11%	None	Non-randomly selected
Kollei I et al.	Germany, 2013	100 adult psychiatric inpatients with eating disorders	12.00%	None	Non-randomly selected
Lai et al.	Taiwan, 2010	817 people seeking cosmetic surgery	7.70%	None	Non-randomly selected
Liao Y et al.	China, 2010	487 medical students	1.30%	None	Non-randomly selected
Lochner et al.	International, 2014	241 individuals with OCD	8.71%	None	Non-randomly selected
Marron SE et al.	Spain, 2018	81 outpatient dermatology patients	8.6% OR 14.8%	None	Non-randomly selected
Metcalfe DB et al.	USA, 2014	188 female breast reconstruction patients	17%	None	Non-randomly selected
Otto MW et al.	USA, 2001	318 depressed (+658 non depressed) women aged 36-44	0.7%	Yes	Non-randomly selected
Phillips KA et al.	USA, 1998	62 patients with OCD	14.50%	None	Non-randomly selected
Phillips KA et al.	USA, 2000a	118 general dermatology patients +150 cosmetic patients	11.90%	Yes	Non-randomly selected
Picavet VA et al.	Belgium, 2011	226 patients seeking rhinoplasty (+65 control)	33.00%	Yes	Non-randomly selected
Poyurovsky M et al.	Israel, 2006	100 schizophrenia patients with OCD, 100 schizophrenia patients without OCD +35 OCD patients without schizophrenia	8/0%/3	Yes - patients with OCD	Non-randomly selected
Rajkuthumar et al.	India, 2008	50 schizo-affective individuals plus 50 individuals with schizophrenia	6%/0%	Yes - patients with schizophrenia	Non-randomly selected
Rashid H et al.	UK, 2015	280 patients with OCD and other related disorders	11.43%	None	Non-randomly selected
Rief W et al.	Germany, 2006	2,552 population sample	1.70%	None	Random selection
Ritter V et al.	Germany, 2016	252 dermatology outpatient sample	7.90%	None	Non-randomly selected
Rodríguez PC et al.	Australia, 2019	213 dental patients	4% or 7%	None	Non-randomly selected

Continued Table 1: This table shows all 81 papers in the systematic review.

Author	Country and Year	Cohort	Prevalence of BDD	Comparator Group	Random vs Non Random Sampling
Sarwer DB et al.	USA, 1998	100 female cosmetic surgery patients	7.00%	None	Non-randomly selected
Schieber K et al.	Germany, 2015	2,129 population sample	2.9% (DSM-V) and 3.2% (DSM-IV)	None	Random selection
Semiz UB et al.	Turkey, 2005	35 patients with borderline personality disorder	80.00%	None	Non-randomly selected
Sethukumar P et al.	UK, 2018	123 thyroidectomy patients	8.94%	None	Non-randomly selected
Stewart SE et al.	USA, 2008	275 patients with OCD	15.30%	None	Non-randomly selected
Taqui V et al.	Pakistan, 2008	156 medical students	5.80%	None	Random selection
Thanveer F, Khunger N	India, 2016	177 dermatology patients	7.5% (cosmetic complaints). 2.1% (general complaints).	None	Non-randomly selected
Torres AR et al.	Brazil, 2016	1001 patients with OCD	11.70%	None	Non-randomly selected
Torresan	Brazil, 2009	330 individuals with OCD	14.5%	None	Non-randomly selected
Uzun O et al.	Turkey, 2003	159 patients with acne	8.80%	None	Non-randomly selected
van der Meer J et al.	Netherlands, 2012	2,947 psychiatric outpatients	1.80%	None	Non-randomly selected
Veale D et al.	UK, 2015	432 psychiatric inpatients	5.80%	None	Non-randomly selected
Vulink NC et al.	The Netherlands, 2008	160 maxillofacial patients	10.00%	None	Non-randomly selected
Wang Q et al.	China, 2016	106(+100) female patients undergoing medical procedures	14.20%	Female healthy control group	Non-randomly selected
Wilhelm S et al.	USA, 1997	165 patients seeking treatment for anxiety disorders	6.70%	None	Non-randomly selected
Woolley AJ, Perry JD	USA, 2015	728 (+150 control) oculofacial inpatients	6.90%	Healthy control group	Non-randomly selected
Zimmerman M, Mattia JI	USA, 1998	500 SCID sample +500 clinical sample	3.2% (SCID) vs 0% (clinical sample)	Yes	Non-randomly selected
Yassaei	Iran, 2013	270 orthodontic patients	5.5%	None	Non-randomly selected

Both Campagna and Bowsher (2016) and Kacar et al., (2016) documented the results separately for men and women and so these results were treated as two discrete data sets.

All papers were assessed to see whether they included a control group to reduce performance bias and performed random sampling to reduce the risk of selection bias (as shown in Table 1). No formal assessment of bias was performed but steps were taken to limit its impact. The study was aware (as discussed in the limitations) that the systematic review is subject to publication bias due to the fact that studies which demonstrated a result (either positive or negative) were more likely to be published. Study bias also exists within individual studies as well as within the systematic review as a whole. All the studies within the same cohort were assessed to see if there were any differences in methodology (such as the presence of a control cohort) which appeared related to a discrepancy between the outcomes.

Study characteristics

The study could be from any article attribute or article type (apart from systematic reviews, review articles or meta-analyses) from 1 January 1990 to 1 January 2020, in

order to broaden the available search terms and provide a sufficient range of papers. Solely English-language papers were used because none of the authors spoke any other language to a sufficient competency to be able to translate research papers. All of the papers were required to be published to ensure that the research was of sufficient quality.

Results of individual studies

The papers were separated into a number of categories, some of which were overlapping. The categories included:

• **General population samples**

Of the 81 papers included in the review, a total of eight papers used the general population as a cohort (Brohede et al., 2015; Buhlmann et al., 2010; Cerea et al., 2018a; Faravelli et al, 1997; Gieler et al., 2016; Otto et al., 2001; Rief et al, 2006; Schieber et al, 2015).

• **Student samples**

Eight papers studied student cohorts (Ahamed et al., 2016; Bohne et al., 2002b; Borda et al., 2011; Cansever et al., 2003; Dlagnikova and van Niekerk, 2015; Grant et al., 2019; Liao et al., 2010; Taqui et al., 2010).

• **Dermatology cohorts**

Twelve papers covered cohorts that were under the care of dermatologists (AlShahwan, Mohammed, 2020; Akinboro et al., 2019; Bowe et al., 2007; Brohede et al., 2017; Conrado et al., 2010; Kacar et al., 2014; Kacar et al., 2016; Marron et al., 2018; Phillips et al., 2000a; Ritter et al., 2016; Thanveer, Khunger, 2016; Uzun et al., 2003).

• **Psychiatry cohorts (both inpatient and outpatient)**

Twenty-eight studies assessed cohorts under the care of psychiatrists (Altamura et al., 2001; Bjornsson et al., 2016; Borda et al., 2011; Brakoulias et al., 2011; Cerea et al., 2018b; Conroy et al., 2008; Costa et al., 2012; Dingemans et al., 2012; Dyl et al., 2006; Fontenelle et al., 2006; Grant et al., 2001; Grant et al., 2002; Jafferany et al., 2019; Jaisoorya et al., 2003; Kollei et al., 2013; Lochner et al., 2014; Phillips et al., 1998; Poyurovsky et al., 2006; Rajkumar et al., 2008; Rashid et al., 2015; Semiz et al., 2008; Stewart et al., 2008; Torres et al., 2016; Torresan et al., 2009; van der Meer et al., 2012; Veale et al., 2015; Wilhelm et al., 1997; Zimmerman, 1998).

• **Cohorts of patients undergoing surgery**

Eighteen studies evaluated cohorts of patients undergoing or seeking surgery (Alavi et al., 2011; Castle et al., 2004; Collins et al., 2014; de Brito et al., 2016a; de Brito et al., 2016b; De Jongh et al., 2009; Dey et al., 2015; Fathololoomi et al., 2013; Hsu et al., 2009; Joseph et al., 2017a; Joseph et al., 2017b; Kacar et al., 2014; Lai et al., 2010; Picavet et al., 2011; Sarwer et al., 1998; Sethukumar et al., 2018; Vulink et al., 2008; Woolley, Perry, 2015).

• **Different areas of the body affected by BDD**

Twenty-six studies analysed which areas of the body were most commonly affected by BDD (Ahamed et al., 2016; Altamura et al., 2001; Brohede et al., 2017; Cansever et al., 2003; Cerea et al., 2018a; Conroy et al., 2008; de Brito et al., 2016a; Dey et al., 2015; Dingemans et al., 2012; Dyl et al., 2006; Fontenelle et al., 2006; Grant et al., 2001; Hepburn, Cunningham, 2006; Kacar et al., 2014; Kelly et al., 2015; Kollei et al., 2011; Liao et al., 2010; Marron et al., 2018; Möllman et al., 2017; Rief et al., 2006; Schieber et al., 2015; Taqui et al., 2010; Thanveer, Khunger, 2016; Uzun et al., 2003; Veale et al., 2015; Wilhelm et al., 1997).

• **Prior number of individuals diagnosed with BDD**

Fifteen studies looked at the proportion of patients who had been diagnosed with BDD prior to the start of the study. (Cansever et al., 2003; Conrado et al., 2010; Conroy et al., 2008; de Brito et al., 2016b; Dyl et al., 2006; Grant et al., 2001; Grant et al., 2002; Kacar et., 2014; Kacar et al., 2016; Kelly et al., 2015; Kollei et al., 2013; Picavet et al., 2011; Rashid et al., 2015; Uzun et al., 2003; Veale et al., 2015).

Prevalence of BDD within the general population

From our search of the available literature, we found eight general population studies that measured the prevalence of BDD. Here the prevalence ranged 0.5-3.2%, as demonstrated in Table 2.

Five out of the seven general population studies used sample sizes of greater than 1,000 individuals. Three papers based their questionnaire upon the DSM-IV criteria (Brohede et al., 2015; Buhlmann et al., 2010; Rief et al., 2006). However in one paper, GPs performed clinical interviews (Faravelli et al., 1997), one study used the Dysmorphic Concern Questionnaire or DCQ (Gieler et al., 2016) and one study used both the DSM-IV and DSM-V criteria for comparison (Schieber et al., 2015).

Table 2: List of studies on the prevalence of BDD within a population sample.

Author	Country and Year	Cohort	Prevalence of BDD
Brohede et al.	Sweden, 2015	2,891 female population sample	2.10%
Buhlmann et al.	Germany, 2010	2510 population sample	1.8% (2.0% for females and 1.5% for males)
Cerea et al.	Italy, 2018a	615 population sample	1.63%
Faravelli et al.	Italy, 1997	673 Population Sample	0.70%
Gieler et al.	Germany, 2016	2,066 (2002) then 2,508 (2013) Population Sample	0.5% then 1%
Otto MW et al.	USA, 2001	318 depressed (+658 non depressed) women aged 36-44	0.7%
Rief et al.	Germany, 2006	2,552 population sample	1.70%
Schieber et al.	Germany, 2015	2,129 population sample	2.9% (DSM-V) and 3.2% (DSM-IV)

Gieler et al. (2016) noticed an increase in the prevalence of BDD in the German population within an 11-year period, concluding it to be 0.5% in 2002 and 1% in 2013. The study concluded that BDD has likely increased over the last decade (Gieler et al., 2016).

From observing the seven papers available, there appears to be a negative association between the year of the paper and the prevalence of BDD. Evaluating the studies from 2010 or before, the prevalence rates are 1.8%, 1.7%, 0.7%, 0.7% and 0.5%. However, the prevalence rates after 2010 are 2.1%, 1.6%, 1% and 2.9-3.2% (on the graph the prevalence of 2.9% was used as this was obtained using the most updated version of DSM). This has been illustrated in Figure 2.

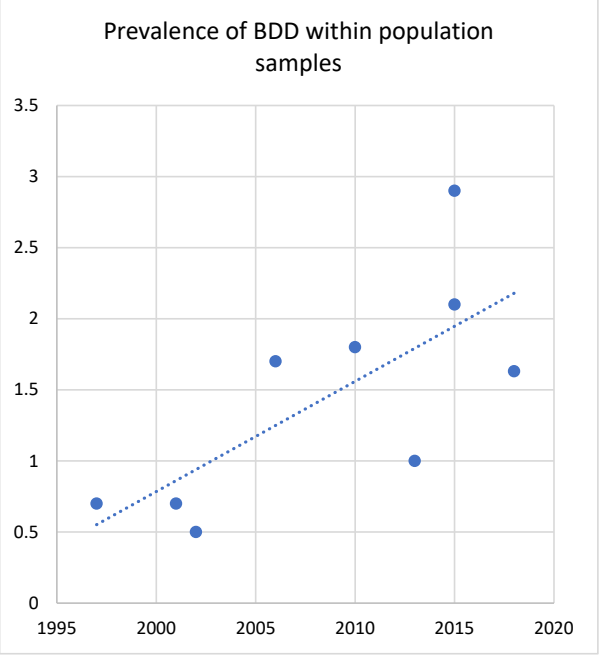

Figure 2: This graph displays the prevalence of BDD found in the general population sample in the year it was published.

Moreover, Gieler et al. (2016) noticed that the prevalence of BDD is increasing for both genders, with clinical BDD increasing in women from 0.8% to 1.2%, and from 0.1% to 0.8% in men. While the difference between genders was not significant, it gives rise to the possibility that the prevalence is increasing more for men than for women (Gieler et al., 2016).

All the general population samples available were performed upon cohorts from western countries and so we are unable to draw any comparisons with other areas of the world.

Prevalence of BDD within the student population

There were a total of eight papers that studied the prevalence of BDD, as demonstrated in Table 3. While, one study concerning female students showed a far higher prevalence of BDD at 47% (Borda et al., 2011), the other seven studies ranged in prevalence from 1.3% to 5.8% (Ahamed et al., 2016; Bohne et al., 2002a; Cansever et al., 2003; Dlagnikova and van Niekerk, 2015; Grant et al., 2019; Liao et al. 2010; Taqui et al., 2010).

There is clearly a large element of overlap in terms of the prevalence of BDD in the general population and in the student population. The prevalence of BDD may be higher in students, however, this is currently unclear.

Three cohorts purely examined medical students and the prevalence of BDD in these studies was found to be 1.3%-5.8% (Ahamed et al., 2016; Liao et al., 2010; Taqui

Table 3: List of studies examining the prevalence of BDD within a student cohort.

Author	Country and Year	Cohort	Prevalence of BDD
Ahamed et al.	Saudi Arabia, 2016	365 female medical students	4.40%
Bohne et al.	Germany, 2002	133 college students	5.30%
Borda et al.	Argentina, 2011	25 depressed female students (+85 control)	44% (clinical sample) 47.00% (non-clinical sample)
Cansever et al.	Turkey, 2003	420 female college students	4.80%
Dlagnikova, van Niekerk	South Africa, 2015	395 students	5.10%
Grant et al.	USA, 2019	3,459 college students	1.70%
Liao et al.	China, 2010	487 medical students	1.30%
Taqui et al.	Pakistan, 2008	156 medical students	5.80%

Table 4: List of papers on the prevalence of BDD within dermatology cohorts.

Author	Country and year	Cohort	Prevalence of BDD
Akinboro et al.	Nigeria, 2019	114 patients with dermatological conditions	36%
AlShahwan, Mohammed	Saudi Arabia, 2020	497 patients in a dermatology outpatient clinic	14.1%
Bowe et al.	USA, 2007	128 acne patients	14.1%- 21.1%
Brohede et al.	Sweden, 2017	425 female dermatology patients	4.90%
Conrado et al.	Brazil, 2010	300 dermatology patients (150 cosmetic and 150 general dermatology) +50 control	14.0% cosmetic, 6.7% general dermatology, 2.0% control
Kacar SD et al.	Turkey, 2014	151 male dermatology and 167 cosmetic dermatology clinics	8.6% (cosmetic) and 4.2% (general)
Kacar SD et al.	Turkey, 2016	121 (+147) female patients with hair loss	25.60%
Kacar SD et al.	Turkey, 2016	121 (+147) male patients with hair loss	52.40%
Marron SE et al.	Spain, 2018	81 outpatient dermatology patients	8.6% or 14.8%
Phillips KA et al.	USA, 2000a	118 general dermatology patients +150 cosmetic patients	11.90%
Ritter V et al.	Germany, 2016	252 dermatology outpatient sample	7.90%
Thanveer, Khunger	India, 2016	245 outpatient dermatology cohort	7.5% (cosmetic complaints). 2.1% (general complaints)
Uzun et al.	Turkey, 2003	159 patients with acne	8.8%

et al., 2010). Therefore, the prevalence of medical student populations does not appear any different to that of the general student populations.

Prevalence of BDD in dermatology patients

Twelve papers involving dermatology patients were evaluated, as demonstrated in Table 4.

Eight papers studied general dermatology patients, and here the prevalence of BDD ranged between 2.1% and 36% (Akinboro et al., 2019; Brohede et al., 2017; Conrado et al., 2010; Kacar et al., 2014; Marron et al., 2018; Phillips et al., 2000a; Ritter et al., 2016; Thanveer, Khunger, 2016). Seven out of the eight papers demonstrated a prevalence of BDD higher than any within the general population and therefore this suggests that the prevalence of BDD among dermatology cohorts may be higher. It is unclear why there is such a large variation in prevalence.

One paper specifically studied individuals with hair loss, and here the data was split into male and female groups for further comparison. The prevalence of BDD was 25.60% in women and 52.40% in men (Kacar et al., 2016). Both are far higher than the prevalences for general population cohorts (which ranged 0.5-3.2%). This suggests that individuals with hair loss may be at a higher risk of developing BDD in comparison to the general public. It also suggests of those individuals who suffer from hair loss, males are more likely to develop BDD given the fact that the prevalence of BDD was far higher in the male group.

Two papers determined the prevalence of BDD amongst individuals with acne, which was noted to be 14.1-21.1% in one sample and 8.8% in another sample (Bowe et al., 2007; Uzun et al., 2003).

Prevalence of BDD in psychiatric cohorts

Twenty-eight papers studied psychiatric patient cohorts. All papers were sorted into either the inpatient setting, the outpatient setting or both. Some studies did not directly say whether they used inpatient or outpatient samples, and therefore in a number of papers the study setting was not specified.

Twelve of these papers analysed purely outpatient cohorts (Borda et al., 2011; Brakoulias et al., 2011; Costa et al., 2012; Fontenelle et al., 2006; Jaisoorya et al., 2003; Lochner et al., 2014; Rashid et al., 2015; Torres et al., 2016; Torresan et al., 2009; van der Meer et al., 2012; Wilhelm et al., 1997; Zimmerman and Mattia, 1998). Eleven papers evaluated a cohort of inpatients (Bjornsson et al., 2016; Conroy et al., 2008; Dyl et al., 2006; Grant et al., 2001; Grant et al., 2002; Jafferany et al., 2019; Kollei et al., 2013; Poyurovsky et al., 2006; Semiz et al., 2008; Stewart et al., 2008; Veale et al., 2015). Three papers examined studies with both inpatient and outpatient cohorts (Cerea et al., 2018b; Dingemans et al., 2012; Phillips et al., 1998). In two studies, the cohort was not specified as either inpatient or outpatient (Altamura et al., 2001; Rajkumar et al., 2008). These papers are all shown in Table 5.

Both of the cohorts studying individuals with depression demonstrated a far higher percentage of BDD in comparison to that of the general public at 47% and 56.3% (Borda et al., 2011; Grant et al., 2002).

Seven papers studied general psychiatry patients: five in the inpatient setting and two in the outpatient setting (Conroy et al., 2008; Dyl et al., 2006; Grant et al., 2001; Jafferany et al., 2019; van der Meer et al., 2012; Veale, 2004; Zimmerman and Mattia, 1998).

Within general psychiatry cohorts, this systematic review found the prevalence in outpatient samples ranged 0-3.2% (van der Meer et al., 2012; Zimmerman, Mattia, 1998) and within inpatient samples, the prevalence ranged 5.8-37.78% (Conroy et al., 2008; Dyl et al., 2006; Grant et al., 2001; Jafferany et al., 2019; Veale et al., 2015). It is interesting to note the prevalence of BDD appears to be higher in the inpatient than the outpatient group. However, there appears to be a large variety in the range of prevalence and therefore perhaps only some psychiatric conditions are associated with a higher prevalence of BDD.

Four studies solely analysed patients with eating disorders (Cerea et al., 2018b; Dingemans et al., 2012; Grant et al., 2002; Kollei et al., 2013), two of which purely focussed upon anorexia (Cerea et al., 2018b; Grant et al., 2002). One paper looked at patients with borderline personality disorder (Semiz et al., 2008). Two studies evaluated the prevalence of BDD in individuals with schizophrenia (Rajkumar et al., 2008; Poyurovsky et al., 2006).

Of the four papers which specifically evaluated patients with eating disorders, these noted some of the highest rates of prevalence across the cohorts of psychiatric patients, measured at 12%, 26.23%, 39% and 45% (Cerea et al., 2018b; Dingemans et al., 2012; Dyl et al., 2006; Kollei et al., 2013). This suggests that the prevalence of BDD is much higher in those with eating disorders compared to the general population.

Dingemans et al. (2012) examined the prevalence of BDD between different types of eating disorders and found there was no difference in the prevalence of BDD between anorexia nervosa, bulimia nervosa and eating disorders not otherwise specified.

Semiz et al. (2008) observed a prevalence of BDD of 54.3% within a sample of 70 individuals with borderline personality disorder. While this is a small study, the prevalence of BDD is extremely high. In this paper, individuals were interviewed using the SCID-I and SCID-II (Semiz et al., 2008) which appears to be an effective interview technique for determining the prevalence of BDD.

Poyurovsky et al. (2006) identified the prevalence of BDD within a sample of 200 schizophrenia patients, 100 with OCD and 100 without, as well as 35 patients solely with OCD. He determined that the prevalence of BDD in the cohort only with schizophrenia to be 0%. Rajkumar et al. (2008) also found a prevalence of 0% in a sample

Table 5: Studies on the prevalence of BDD within psychiatric cohorts.

Author	Country and year	Cohort	Prevalence of BDD
Altamura et al.	Italy, 2001	118 BDD or sBDD patients (+control 360)	6.30%
Bjornsson et al.	USA, 2016	207 participants receiving behavourial treatment	7.2%
Borda et al.	Argentina, 2011	25 depressed female students (+85 control)	44% (clinical sample) 47.00% (non-clinical sample)
Brakoulias et al.	Australia, 2011	77 OCD patients	3.80%
Cerea et al.	Italy, 2018a	61 females with anorexia nervosa	26.23%
Conroy et al.	USA, 2008	100 adult psychiatry inpatients	11.00%
Costa et al.	Brazil, 2012	901 OCD patients	12.10%
Dingemans et al.	Netherlands, 2012	158 eating disorder patients	45%
Dyl et al.	USA, 2006	208 adolescent psychiatric inpatients	6.70%
Fontenelle et al.	Brazil, 2006	166 psychiatric patients attending obsessions, compulsions and impulsions programme	12%
Grant et al.	USA, 2001	122 psychiatric inpatients	13.10%
Grant et al.	USA, 2002	41 anorexic patients	39%
Jafferany et al.	USA, 2019	45 adolescent psychiatric inpatients	37.78%
Jaisoorya et al.	India, 2003	231 (+200 control) patients with OCD	3.00%
Kollei et al.	Germany, 2013	155 adult psychiatric inpatients with eating disorders	1.90%
Lochner et al.	International, 2014	241 individuals with OCD	8.71%
Phillips et al.	USA, 1998	62 patients with OCD	14.50%
Poyurovsky et al.	Israel, 2006	100 schizophrenia patients with OCD, 100 schizophrenia patients without OCD +35 OCD patients without schizophrenia	8/0%/3
Rajkuthumar et al.	India, 2008	50 schizoaffective individuals plus 50 individuals with schizophrenia	6%/0%
Rashid et al.	UK, 2015	280 patients with OCD and other related disorders	11.43%
Semiz et al.	Turkey, 2005	35 patients with borderline personality disorder	54.3%
Stewart et al.	USA, 2008	275 patients with OCD	15.30%
Torres et al.	Brazil, 2016	1001 patients with OCD	11.70%
Torresan	Brazil, 2009	330 individuals with OCD	14.5%
van der Meer et al.	Netherlands, 2012	2947 psychiatric outpatients	1.80%
Veale et al.	UK, 2015	432 psychiatric inpatients	5.80%
Wilhelm et al.	USA, 1997	165 patients seeking treatment for anxiety disorders	6.70%
Zimmerman, Mattia	USA, 1998	500 SCID sample +500 clinical sample	3.2% (SCID) vs 0% (clinical sample)

of 50 individuals with schizophrenia. This suggests that individuals with schizophrenia do not have a greater prevalence of BDD. The studies only used small sample sizes, however, which may have affected the accuracy of the results.

The prevalence of BDD among individuals with OCD ranged from 3.0-15.3% (Brakoulias et al., 2011; Costa et al., 2012; Jaisoorya et al., 2003; Lochner et al., 2014; Phillips et al., 1998; Stewart et al., 2008; Torres et al., 2016; Torresan et al., 2009).

Prevalence of BDD in patients undergoing surgery

Eighteen studies analysed cohorts undergoing surgery (as demonstrated in Table 6).

The prevalence in the cohort undergoing cosmetic surgery ranged between 2.9-57% (Alavi et al., 2011; Castle et al., 2004; de Brito et al., 2016a; de Brito et al., 2016b; De Jongh et al., 2009; Dey et al., 2015; Fathololoomi et al., 2013; Hsu et al., 2009; Joseph et al., 2017a; Joseph et al., 2017b; Kacar et al., 2014; Lai et al., 2010; Picavet et al., 2011; Sarwer et al., 1998; Wang et al., 2016; Woolley and Perry, 2015).

If this is compared to the prevalence of BDD in the general population ranging from 0.5-3.2%, it does appear that cosmetic surgery patients show a greater prevalence than that of the general public although the prevalences do have a small overlap and this cannot be said for certain.

Four papers evaluated the prevalence of BDD in patients undergoing rhinoplasty (including septorhinoplasty) and the prevalence ranged between 31.5-52%, also suggesting an increased prevalence in comparison to the general population.

Four papers studied dental patients with the prevalence of BDD ranging 4-7% (Brignardello-Petersen, 2019; de Jongh et al., 2009; Pérez Rodríguez et al., 2019; Yassaei, 2014).

Two papers studied individuals attending a maxillofacial

Table 6: Studies showing the prevalence of BDD within surgical cohorts.

Author	Country and Year	Cohort	Prevalence of BDD
Alavi et al.	Iran, 2011	306 patients in cosmetic surgery clinics	24.50%
Castle et al.	Australia 2004	137 patients attending cosmetic surgery clinic	2.90%
Collins et al.	USA, 2014	99 patients from maxillofacial surgery clinic	13.00%
de Brito et al.	Belgium, 2016	90 cosmetic surgery patients	57.00%
de Brito et al.	Brazil, 2016	300 patients undergoing cosmetic surgery	57% (abdominoplasty) 52% (rhinoplasty), 42% (rhytidectomy)
De Jongh et al.	The Netherlands, 2009	170(+878 C) patients from cosmetic dental clinics	4.20%
Dey et al.	USA, 2015	234 outpatient cosmetic and reconstructive surgery sample	SCID: 13.1% (cosmetic), 1.8% (reconstructive) BDDQ: 19.7% (cosmetic) and 3.6% (reconstructive)
Fatholol-oomi et al.	Pakistan, 2013	130 patients seeking rhinoplasty	31.50%
Hsu et al.	Singapore, 2009	198 +198 control (total 396) cosmetic surgery patients	29.40%
Joseph et al.	USA, 2017a	597 facial plastic or oculoplastic surgery patients	cosmetic: 13.1% vs reconstructive 6.7%
Joseph et al.	UK, 2017b	34 (+50) patients considered for septorhinoplasty	32.00%
Kacar et al.	Turkey, 2014	151 male dermatology and 167 cosmetic dermatology clinics	8.6% (cosmetic) and 4.2% (general)
Lai et al.	Taiwan, 2010	817 people seeking cosmetic surgery	7.70%
Picavet et al.	Belgium, 2011	226 patients seeking rhinoplasty (+65 Control)	33.00%
Sarwer et al.	USA, 1998	100 female cosmetic surgery patients	7.00%
Sethukumar et al.	UK, 2018	123 thyroidectomy patients	8.94%
Vulink et al.	The Netherlands, 2008	160 maxillofacial patients	10.00%
Woolley, Perry	USA, 2015	728 (+150 control) oculofacial inpatients	6.90%

clinic and observed a prevalence of BDD between 10-13% (Collins et al., 2014; Vulink et al., 2008). One paper studied the prevalence of BDD among oculofacial patients, which was 6.9% (Woolley and Perry, 2015).

Some research suggests that both cosmetic and general dermatology cohorts have similar prevalences of BDD (Phillips et al., 2000a). However, other research suggests that there is indeed a higher prevalence within the cosmetic group. Conrado et al. (2010) noticed a prevalence of BDD of 14% in the cosmetic group, in comparison to a prevalence of 6.7% in the general dermatology group. This difference, however, was not statistically significant. Kacar et al. (2014) discovered a prevalence of 8.6% in the cosmetic group and a prevalence of 4.2% in the general dermatology group, although this was also not statistically significant. It is therefore unclear whether the prevalence of BDD is higher in cosmetic dermatology samples compared to general dermatology cohorts and further evidence here is required.

Dey et al. (2015) observed a prevalence of BDD of 13.1% in the cosmetic surgery group, in comparison to a prevalence of 1.8% in the reconstructive surgery group. Joseph et al. (2017a) found a prevalence of BDD of 13.1% in the cosmetic surgery group, in comparison to 6.7% in the reconstructive group. This suggests that the prevalence of BDD is higher in cosmetic surgery than in reconstructive surgery.

However some reconstructive operations appear to have a particularly high prevalence of BDD, for example, Metcalfe et al. (2014) observed that the prevalence of BDD in patients post-mastectomy was 17%. Furthermore, Sethukumar et al. (2018) observed a prevalence of BDD of 8.94% in thyroidectomy patients.

Areas of the body affected by BDD

Twenty-six papers assessed which parts of the body were most commonly affected in patients with BDD. This data was only taken from individuals with BDD. Any data was therefore excluded if it simply referred to areas of the body from a general population sample, as the majority of these individuals would not suffer from BDD and it would therefore not be representative.

The top three areas of the body most commonly affected within each paper were included, apart from de Brito et al., (2016), Cansever et al. (2003), Thanveer and Khunger (2016) and Uzun et al., (2003), de Brito et al. (2016) had written the four most common body parts but not written the levels of popularity and so all were selected. In regards to the other three papers, the third and fourth areas of the body were equally associated with BDD and therefore both of these areas were included.

Both Conroy et al. (2008) and Dey (2015) noted five areas of the body which were the third most common, and so only the top two areas were chosen for simplicity. With regards to Veal (2004) and Kelly et al. (2015), there were four areas of the body which were all joint third, and so only the top two areas of the body were chosen. Kacar et al. (2014) identified skin and cellulite as two separate categories, and these were condensed into the grouping of skin with nose and weight being the other two most common areas of the body.

The skin was the most commonly affected part of the body, with 53.8% of papers noting this as one of the top three areas of the body most commonly affected. The nose was the second most common body part with 38.5% and hair was the third most common with 34.6%. Of the 25 papers included, only three involved cohorts of dermatology patients (Brohede, 2017; Kacar et al., 2014; Marron et al., 2018). The list of the affected body parts is shown in Table 7.

Research in this area has also highlighted possible gender differences relating to different areas of the body commonly affected. Perugi et al. (1997a) found that among individuals with BDD, women were more concerned about their chest and legs, while men more commonly sited their genitals, height and body hair as areas of concern. It is possible that the cause for these differences is due to different societal

Table 7: Most common areas of the body affected by BDD.

Area of the body	% of papers which listed this body part within the top three most selected by individuals
Arms	3.8
Breast/chest	19.2
Chin	7.7
Ears	3.8
Eyes	11.5
Face	30.8
Fat	3.8
Genitals	3.8
Hair	34.6
Hips	7.7
Nose	38.5
Skin	53.8
Stomach	11.5
Teeth	19.2
Thighs	3.8
Weight/build	30.8

pressures faced by men and women.

Proportion of patients with a prior diagnosis of BDD

Fifteen papers documented whether any individuals had been given a prior diagnosis of BDD, as shown in Table 8.

In regards to Kacar et al. (2014) and Picavet et al. (2011), the authors wrote that a certain proportion of patients had seen a psychiatrist before or had some documented unknown psychiatric history. This number was included within the proportion of patients previously diagnosed and this percentage can therefore be seen as the maximum possible number of individuals who could have received a diagnosis.

The proportion of patients who were already diagnosed was extremely low, with 14 out of 15 papers showing ≤ 10% of patients with a diagnosis prior to the start of the study. Only one paper showed a significant proportion of patients already diagnosed, with 66% of patients having received a formal diagnosis (Rashid et al., 2015).

The patients in this cohort were selected from a specialist outpatient service for OCD and other related disorders. Given the similarities between OCD and BDD, it is likely that the psychiatrists in this service were especially well qualified for diagnosing BDD and this would explain the high proportion of patients diagnosed compared to other cohorts of patients.

It is also important to note that a number of these studies reflect samples where the expectancy of a diagnosis would be far higher than that of the general public. Conroy et al. (2008), Dyl et al. (2006), Grant et al. (2001), Kollei et al. (2011), Uzun et al. (2003) and Veale et al. (2015) all studied psychiatric inpatients. These individuals would likely have had regular contact with the psychiatry team and therefore one would expect that these people would be most likely to be diagnosed.

There was a large variety of cohorts studied, including psychiatric inpatients, anorexic patients, female college students, dermatology cohorts, outpatient psychiatric patients, individuals with hair loss, individuals with acne and people seeking rhinoplasty.

Veale et al. (2015) observed that out of 25 individuals diagnosed with BDD, 22 felt embarrassed, ashamed or too weak to discuss it. Conroy et al. (2008) noted that

Table 8: The fifteen papers showing the number of individuals with a prior diagnosis of BDD.

Author	Country and year	Cohort	Percentage of people previously diagnosed
Cansever et al.	Turkey, 2003	420 female college students	0%
Conrado et al.	Brazil, 2010	300 dermatology patients (150 cosmetic and 150 general dermatology) +50 control	0%
Conroy et al.	USA, 2008	100 adult psychiatry inpatients	6.25%
de Brito et al.	Brazil, 2016	300 patients undergoing cosmetic surgery	1.33%
Dyl et al.	USA, 2006	208 adolescent psychiatric inpatients	7.14%
Grant et al.	USA, 2001	122 psychiatric inpatients	0%
Grant et al.	USA, 2002	41 anorexic patients	0%
Kacar et al.	Turkey, 2014	151 male dermatology and 167 cosmetic dermatology clinics	⩽ 10%
Kacar et al.	Turkey, 2016	142 patients with hair loss (plus 150 control)	0%
Kelly et al.	USA, 2015	100 veterans affairs primary care behavioural health clinic	8.30%
Kollei et al.	Germany, 2011	155 adult psychiatric inpatients	0%
Picavet et al.	Belgium, 2011	226 patients seeking rhinoplasty (+65 control)	⩽ 4%
Rashid et al.	UK, 2015	280 patients with OCD and other related disorders	66%
Uzun et al.	Turkey, 2003	159 patients with acne	0%
Veale et al.	UK, 2015	432 psychiatric inpatients	0%

only 15% of patients with BDD told their clinician about their condition, with 31.3% people saying they felt too embarrassed, 25% said that they were afraid of being judged and that the clinician wouldn't understand. And 18.8% of people said they were not aware that there was any treatment for body image concerns (Conroy et al., 2008).

Joseph et al. (2017a) observed that surgeons could only diagnose 2 out of 43 individuals (4.7%) who were identified as having BDD on the Body Dysmorphic Disorder Questionnaire (BDDQ). Despite their difficulty diagnosing the conditions, the surgeons had a mean certainty of 89.0% in their ability to diagnose BDD accurately. All this research points to the issues that individuals with BDD are reluctant to come forward and seek psychiatric help and it is often difficult to diagnose.

Synthesis of results

The main results of this study are as follows. The prevalence in the global population was 0.5-3.2%. This study looked at several subgroups. The subgroups that had a

prevalence higher than this were inpatient psychiatry cohorts with a prevalence between 5.8-37.78%, eating disorder cohorts with a prevalence of 12-45%, patients undergoing surgery ranged between 2.9-57%, which appeared to largely demonstrate a prevalence greater than that of the general population, although there was an element of overlap.

Outpatient psychiatric samples appeared to show a similar prevalence to that of the general population, with a prevalence between 0-3.2%. Within student cohorts, there was an element of overlap between that and the general population with a prevalence between 1.3-47%. However, one paper used depressed individuals that may have caused the prevalence to be exceptionally high and excluding this paper, the prevalence ranged between 1.3-5.8%.

a systematic review pertaining to the prevalence of BDD was published. The study looked at the prevalence in the general population and the following subgroups: adolescents, students, psychiatric inpatient and outpatients, general cosmetic surgery including rhinoplasty, orthognathic, orthodontics and dermatology groups.

This study looked at the following subgroups: student populations, general dermatological cohorts, psychiatric inpatient and outpatient groups, individuals undergoing cosmetic surgery including rhinoplasty and orthodontics, as well as further subgroups such as acne, hair loss, eating disorders, borderline personality disorder, post-mastectomy patients and post-thyroidectomy patients. This study explored these subgroups in greater detail in order to ascertain how the prevalence differs among different conditions. This study also includes papers published after 2016 and therefore reflects a more up-to-date prevalence.

The prevalence of BDD in the community was found to be severely underestimated, as in 14 out 15 studies ≤10% of individuals with BDD were diagnosed prior to the start of the study.

DISCUSSION

Prevalence of BDD within the general population

Establishing the prevalence of BDD within the general population is important because it helps to identify the burden of disease. In a 2016 systematic review by Veale et al. (2016), the prevalence of BDD in the general population was around 1.9%, ranging 0.7-3.2% (Faravelli et al., 1997; Otto et al., 2001; Rief et al., 2006; Koran et al., 2008, Buhlmann et al., 2010; Brohede et al., 2013; Schieber et al., 2015) using seven papers which covered both male and female cohorts. This concurs with the prevalence range found in this review to be 0.5-3.2%.

There are significant discrepancies in prevalence between the papers potentially attributed to varied diagnostic criteria. There was a variety of different questionnaires used by the papers, such as the BDDQ, Dysmorphic Concern Questionnaire (DCQ) and questionnaires based upon both the Diagnostic and Statistical Mental of Mental Disorders (DSM-IV and DSM-V) criteria. This increases the papers' heterogeneity making comparisons more difficult.

Papers also reported varied response rates to the questionnaires. Brohede et al. (2015) reported a response rate of 42% for participants, the lowest of the seven samples (the second-lowest being 56%) and this may have skewed the overall prevalence.

This study found a positive correlation between the prevalence of BDD and the date of the publication. There are many theories about why the prevalence of BDD could be increasing. One theory is that the disorder is becoming more recognised. The rise in the prevalence of social media may also play a role. (Common Sense Media, 2017).

Prevalence of BDD within the student population

The prevalence of BDD was reported to much higher in the student population. Adolescence and early 20s are stages where body image is highly important, which in turn may be causing a rise in the prevalence of BDD. This echoes the 2016 systematic review by Veale et al. (2016) which evaluated eight papers within student cohorts and determined the prevalence of BDD to be 2.2%, with a range of 1.2-5.8% (Bartsch, 2007; Bohne et al., 2002a; Bohne et al., 2002b; Boroughs et al., 2010; Cansever et al., 2003; Liao et al., 2010; Sarwer et al., 2005; Taqui et al., 2008;). An additional study, consisting of female students only (Borda et al., 2011) observed a prevalence of 47%, suggesting that gender could also play a role.

It would be beneficial for this research to be repeated but with a larger sample size to determine why the prevalence of BDD is so high. Especially (Borda et al. 2011) should be repeated to evaluate the reliability of the results in a single-sex population.

Prevalence of BDD in dermatology patients

The 2016 systematic review by Veale et al. (2016) on BDD prevalence noted that in evaluating five papers with general dermatology cohorts, the prevalence was found to be 11.3%, ranging from 4.2-29.3% (Calderon et al., 2009; Conrado et al., 2010; Hsu et al., 2009; Kacar et al., 2014; Phillips et al., 2000a) One of the papers in the systematic review (Hsu et al., 2009) which observed the highest prevalence of 29.3%, was included within the cosmetic section within this systematic review as individuals were noted to be undergoing an 'aesthetic procedure' and this, therefore, makes a comparison between the prevalences' observed in this review more difficult.

Given that hair loss may be a risk factor for BDD, it is important to consider possible implications of this. There may be some benefit in screening individuals with hair loss in primary care for BDD, especially if the prevalence is as high as 25.60% in women and 52.40% in men. Furthermore, educating both dermatologists and primary care physicians on the association between hair loss and the high prevalence of BDD may be beneficial in helping to identify those people who appear to be developing BDD.

Further research should be performed in this area to find out which other dermatological conditions are strongly associated with higher rates of BDD.

Prevalence of BDD in psychiatric cohorts

The prevalence of BDD in general inpatient psychiatric cohorts ranged 5.8-37.78% whereas the prevalence in the outpatient cohorts ranged 0-3.2%. It is unclear why the prevalence of BDD appears to be higher in the inpatient cohorts, whether this is because individuals who have BDD as a comorbid disease are more likely to be hospitalised, or simply because they receive increased psychiatric input and are therefore more likely to be diagnosed. It is possible that it is a combination of both reasons.

Both anorexia nervosa and BDD are known to have compulsive behaviours, such as repeatedly checking mirrors (Phillips, 1996) and obsessive symptoms are observed in both conditions (Solyom et al., 1982).

Given the similarity of the two conditions, it is possible that they have similar causal origins. Jolanta and Tomasz (2000) observed that in women with anorexia nervosa, 25% had symptoms of BDD at least six months prior to developing an eating disorder. Further research is required in this area in order to both determine and explain the association between BDD and eating disorders. Given the high prevalence of BDD among individuals with eating disorders, this suggests that these two conditions are frequently comorbid. It is possible that they have similar causal origins.

Patients with eating disorders are often excluded from BDD studies because of the similarity in clinical presentation. For example, Buhlmann et al. (2010) and Dlagnikova and van Niekerk (2015) both excluded patients with weight concerns. This unfortunately excludes a crucial group of patients with particularly high rates of BDD and likely skews the data in regards to the prevalence of BDD.

A previous study by Phillips observed that 57% of people with BDD received a diagnosis of a personality disorder (Phillips, 2000b). Cohen et al. (2000) found 87% of individuals with BDD were diagnosed with a personality disorder, and a total of 27% of individuals were diagnosed with a borderline personality disorder. Therefore, this suggests that the prevalence of BDD among individuals with borderline personality disorder is far higher than that of the general public, concurring with the paper by Semiz et al. (2008) which observed the prevalence of BDD to be 54.3% among individuals with borderline personality disorder.

Prevalence of BDD in patients undergoing surgery

The systematic review from 2016 by Veale et al. found a prevalence of BDD among general cosmetic surgery

patients to be 13.2% (Aouizerat et al., 2003; Altamura et al., 2001; Bellino et al., 2006; Ishigook et al., 1998; Lai et al., 2010; Pavan et al., 2006; Sarwer et al., 1998, Vargel and Uluşahin, 2001, Veale et al., 2014; Vindigni et al., 2002).

In this systematic review, the prevalence of BDD among cosmetic surgery cohorts ranged between 2.9-57% from 15 papers. There is clearly a wide range of prevalences as this cohort encompassed a large variety of different interventions.

The prevalence of BDD among individuals undergoing rhinoplasty was 31.5-52% which appears higher than that of 20.1% in the previous systematic review (Alavi et al., 2011; Constanti, 2012; Fathololomi et al., 2013; Felix et al., 2014; Ghadakzadeh et al., 2011; Picavet et al., 2011; Veale et al., 2003).

The prevalence of BDD among dental or orthodontic patients ranged 4-7%, which concurs with the prevalence of 5.2% observed in the previous systematic review (Hepburn and Cunningham, 2006; de Jongh et al., 2009; Yassaei et al., 2014).

Given the high prevalences of BDD following both operations, it is important to consider whether there would be a benefit in BDD screening post-mastectomy and thyroidectomy to identify individuals with BDD. It is also possible that the prevalence of BDD is similarly high post-operative in other surgeries and further research should be done to identify this.

It also raises the question of whether there is any intervention that could be undertaken prior to undergoing the surgery that would reduce the risk of BDD. To our knowledge, there has been no research done on determining whether interventions such as therapy to prepare an individual prior to surgery would be of any benefit in reducing the chance of developing BDD. This would be a beneficial area of research.

Areas of the body affected by BDD

This research shows that while skin, nose and hair appear to be the most common areas involved, a great number of areas of the body can be affected by BDD. It is worth noting, however, that neither hands nor feet were mentioned and so it possible that these two areas are not affected by BDD.

Of the 25 papers included, only three involved cohorts of dermatology patients (Brohede, 2017; Kacar et al., 2014; Marron et al., 2018). The skin, therefore, appears to be a common concern among many non-dermatological BDD cohorts, as well as dermatological samples.

Proportion of patients with a prior diagnosis of BDD

BDD is known to be underdiagnosed, with both inpatient and outpatient studies showing that clinicians consistently miss diagnosing patients with this condition (Zimmerman and Mattia, 1998, Phillips et al., 1993). If clinicians do not ask specific questions in regards to BDD, it is unlikely patients will reveal their concerns as many feel a large sense of shame around their condition (Phillips, 1996). Patients often seek non-psychiatric help for their condition, believing there to be a medical problem (Crerand et al., 2005). Outcomes for patients with BDD after non-psychiatric treatment is generally poor, with little improvement in the severity of BDD (Phillips et al., 2001) and high levels of unhappiness (Lai et al., 2010).

However, once a diagnosis has been achieved, there are treatment options available. Two possibilities are selective serotonin reuptake inhibitors and CBT (Prazeres et al., 2013) which have been shown to improve symptoms (Veale et al., 2014; Hollander, 1998). Early identification of these patients could therefore lead to improved patient outcomes.

This review is therefore consistent with the available literature suggesting that BDD is severely underdiagnosed (Zimmerman and Mattia, 1998). It suggests that this is an area of medicine in which there is potential for significant improvement.

Joseph et al. (2017a) observed that surgeons have significant difficulty diagnosing BDD. Further research would be useful to determine the level of a clinician in regards to BDD in other areas of medicine, areas such as general practice, dermatology or psychiatry. Given the vast number proportion of people undiagnosed within the general population, further education for relevant clinicians (surgeons, general practitioners and dermatologists) is needed to identify a patient with BDD.

In general practice, these tools could identify high-risk patients for BDD, by educating GPs for risk factors associated with BDD they could help to screen for these individuals.

Moreover, perhaps more emphasis should be placed on this condition in medical school in order to make doctors more aware of when to look for the condition. Given that BDD is associated with a poorer quality of life when

compared to the general population (Phillips, 2000c), increased comorbidities and reduced performance at work (Perugi et al., 1997b), and therefore currently has a significant impact upon both the individual and society at large.

It is also useful to be aware of other cohorts who are at high risk of developing BDD. For example, BDD rates appear to be high in the military, with Campagna and Bowsher (2016) observing prevalences of BDD in male and female entry-level personnel to be 13% and 21.7% respectively. Furthermore, Kelly et al. (2015) found a prevalence of BDD of 11% among veterans.

People who regularly go tanning may be at an increased risk of having BDD, with Blashill et al. (2016) found that female indoor tanners had a prevalence of BDD of 39%.

The use of a screening tool has already been recommended in regards to BDD (Higgins and Wysong, 2017). This could be implemented in a variety of clinical settings such as dermatology, cosmetic surgery and general practice. There may also be some benefit in screening people for BDD prior to entering the military.

Comparison of prevalence of BDD between different methods of data collection

As previously noted, there are differences in the diagnostic tools of the DSM-IV and DSM-V. Schieber et al. (2015) demonstrated that within a general population sample, the prevalence of BDD using the DSM-V criteria was 2.9%, while the DSM-IV criteria showed a prevalence of 3.2% in the same German population sample. Furthermore, they also noted that the DSM-V criteria appeared to better categorise BDD as it now includes repetitive acts related to appearance (Schieber et al., 2015).

Furthermore, different studies have been using different methodologies for determining the diagnosis of BDD, which can in turn lead to inherent differences in the prevalence of BDD found.

Zimmerman and Mattia (1998) studied two cohorts of psychiatric outpatients, finding the prevalence of BDD to be 0% in the sample that underwent clinical interviews, whereas in the sample using the Structured Clinical Interview for DSM-IV (SCID), the prevalence of BDD was 3.2%. There were no differences between the two samples in terms of demographics.

Zimmerman and Mattia (1998) suggested that BDD patients are often more difficult to diagnose from clinical interviews and the SCID therefore identifies more individuals suffering from BDD. Grant et al. (2002) studied a cohort of 41 anorexic patients and found that none of the 16 individuals diagnosed with BDD wanted to divulge their concerns to their doctor because of feelings of shame. This was true despite the fact that 25% of individuals considered it to be their greatest concern. This suggests that because individuals dislike divulging this information, therefore standard interviews may not be very effective at identifying people with BDD.

Dey et al. (2015) assessed the BDDQ and compared it to the SCID in terms of accuracy, sensitivity and specificity. Two cohorts were analysed: individuals undergoing either cosmetic surgery or reconstructive surgery. The study concluded that the prevalence of BDD was 13.1% in the cosmetic group and 1.8% in the reconstructive group when using the SCID (Dey et al., 2015). In comparison, when using the BDDQ, the prevalence of BDD was 19.7% in the cosmetic group and 3.6% in the reconstructive group. This led to the conclusion that the BDDQ showed 91.7% accuracy, 100% sensitivity and 90.3% specificity as a tool for diagnosing BDD, using the assumption that the SCID was completely accurate (Dey et al., 2015). Brohede et al. (2013) observed the BDDQ to have a sensitivity of 94% and a specificity of 90% in a female community sample.

The BDDQ has also been validated in the inpatient psychiatric cohort, showing a sensitivity of 100% and specificity of 92.5% (Grant et al., 2001). The BDDQ-DV is a version of the BDDQ modified for dermatology and was found to have a sensitivity of 100% and a specificity of 93% (Drufesne et al., 2001). The DCQ was found to have a sensitivity of 72% and specificity of 90.7% in a dermatology outpatient cohort (Stangier et al., 2003).

The BDDQ appears to perform consistently above or around 90% in terms of specificity and ranges 94-100% in terms of sensitivity. The DCQ, however, appears to have a lower sensitivity. Further research to compare the DCQ and BDDQ within different cohorts may be beneficial in this case. Furthermore, research into the sensitivity and specificity of questionnaires based upon the DSM-IV and DSM-V would be useful to quantify their effectiveness in comparison to other questionnaires.

Strengths and limitations

A large number of research papers were examined and this means that we are more likely to identify potentially useful research. Furthermore, a number of the categories had a large number of research papers in them which

makes drawing conclusions more accurate. BDD is an understudied topic and our study provides additional insight into the global burden of disease.

No risk of bias assessment was performed. The true effect of cumulative bias within papers is unknown. No formal assessment of bias was performed but steps were taken to limit its impact. All papers were assessed to see whether they included a control group to reduce performance bias and performed random sampling to reduce the risk of selection bias.

Since only published papers were included, publication bias is likely to affect the number of papers available for discussion, and that there is likely to be a skew towards those papers which show some association (either positive or negative) in relation to BDD.

MEDLINE (PubMed) was chosen as it was seen as the most comprehensive database, however, it is possible that eligible papers were missed that were stored on other databases. We searched the references of papers found in an effort to account for this. Additionally, due to funding, only papers with open access were included in the study creating a further potential bias against sources that were included on paid sites.

The search strategy is detailed in the methods with an aim to be reproducible. In our study, only one author carried out the search and it was not verified by a second searcher.

The heterogeneity among the different research papers within each cohort was a limitation in the review. There are significant discrepancies in prevalence between the papers potentially attributed to varied diagnostic criteria. There was a variety of different questionnaires used by the papers, such as the BDDQ, the DCQ and questionnaires based upon both the Diagnostic and Statistical Mental of Mental Disorders (DSM-IV and DSM-V) criteria. This increases the papers' heterogeneity making comparisons more difficult. This meant that a comparison between the studies was difficult and conclusions were often limited.

One other limitation is the fact that given that BDD is only a small proportion of a given sample size, in each paper the total number of individuals with BDD are often quite small and this makes it difficult to draw statistical conclusions. If there is no association between variables it is difficult to tell if it is because there genuinely is no association or whether it is due to the small sample size.

CONCLUSION

In conclusion, a number of different variables were evaluated in relation to BDD. Studies varied in their diagnostic tools and this calls for further research into superiority leading to standardisation.

In dermatological patients, hair loss appears to be associated with an increased prevalence of BDD. Psychiatric patients showed a wide difference in the prevalence of BDD, with eating disorder and borderline personality groups showing the highest prevalence. The prevalence of BDD within the general population may well be increasing over time. In the cosmetic surgery population, the prevalence varied widely and was shown to increase over time.

The prevalence of BDD in patients post-mastectomy and post-thyroidectomy was 17% and respectively (Metcalfe et al., 2014; Sethukumar et al., 2018). Therefore, this raises the question of whether any psychiatric intervention can be performed prior to the surgery in order to reduce the risk of this occurring, as well as whether screening post-surgery would be beneficial to identify those who have developed BDD. Screening tools in areas which are a high risk for BDD would likely be beneficial among dermatology and cosmetic surgery cohorts, as these individuals appear to have a higher risk of BDD than the general population.

Finally, out of the 15 papers which documented the proportion of BDD patients who were diagnosed prior to the study, 14 of them had a proportion diagnosed of ≤10%. This concurs with previous research in this area showing that BDD is significantly underdiagnosed (Zimmerman and Mattia, 1998).

Funding
None received.
Conflicts of Interest
None to report.

REFERENCES

Ahamed SS, Enani J, Alfaraidi L, Sannari L, Algain R, Alsawah Z, Al Hazmi A. Prevalence of Body Dysmorphic Disorder and its Association With Body Features in Female Medical Students. Iranian Journal of Psychiatry and Behavioural Sciences. 2016;10(2).

Akinboro AO, Adelufosi AO, Onayemi O, Asaolu SO. Body dysmorphic disorder in patients attending a dermatology clinic in Nigeria: sociodemographic and clinical correlates. An Bras Dermatol. 2019 Oct 17;94(4):422-428. doi: 10.1590/abd1806-4841.20197919.

Alavi M, Kalafi Y, Dehbozorgi GR, Javadpour A. Body dysmorphic disorder and other psychiatric morbidity in aesthetic rhinoplasty candidates. J Plast Reconstr Aesthet Surg. 2011 Jun;64(6):738-41. doi: 10.1016/j.bjps.2010.09.019.

AlShahwan MA. Prevalence and characteristics of body dysmorphic disorder in Arab dermatology patients. Saudi Med J. 2020 Jan;41(1):73-78. doi: 10.15537/smj.2020.1.24784.

Altamura C, Paluello MM, Mundo E, Medda S, Mannu P. Clinical and subclinical body dysmorphic disorder. Eur Arch Psychiatry Clin Neurosci. 2001 Jun;251(3):105-8. doi: 10.1007/s004060170042.

Aouizerate B, Pujol H, Grabot D, Faytout M, Suire K, Braud C, Auriacombe M, Martin D, Baudet J, Tignol J. Body dysmorphic disorder in a sample of cosmetic surgery applicants. Eur Psychiatry. 2003 Nov;18(7):365-8. doi: 10.1016/j.eurpsy.2003.02.001.

Bartsch D. Prevalence of body dysmorphic disorder symptoms and associated clinical features among Australian university students. Clinical Psychologist. 2007;11(1). doi: 10.1080/13284200601178532.

Bellino S, Zizza M, Paradiso E, Rivarossa A, Fulcheri M, Bogetto F. Dysmorphic concern symptoms and personality disorders: a clinical investigation in patients seeking cosmetic surgery. Psychiatry Res. 2006 Sep 30;144(1):73-8. doi: 10.1016/j.psychres.2005.06.010.

Bjornsson A, Magnusdottir S, Wessman I, Beard C, Lee J, Hearon BA, Björgvinsson T. Prevalence and Characteristics of Body Dysmorphic Disorder Among Patients in a Partial Hospital Program. J Nerv Ment Dis. 2016 Jul;204(7):554-7. doi: 10.1097/NMD.0000000000000543.

Blashill AJ, Oleski JL, Hayes R, Scully J, Antognini T, Olendzki E, Pagoto S. The Association Between Psychiatric Disorders and Frequent Indoor Tanning. JAMA Dermatol. 2016 May 1;152(5):577-9. doi: 10.1001/jamadermatol.2015.5866.

Bohne A, Keuthen NJ, Wilhelm S, Deckersbach T, Jenike MA. Prevalence of symptoms of body dysmorphic disorder and its correlates: a cross-cultural comparison. Psychosomatics. 2002a Nov-Dec;43(6):486-90. doi: 10.1176/appi.psy.43.6.486.

Bohne A, Wilhelm S, Keuthen NJ, Florin I, Baer L, Jenike MA. Prevalence of body dysmorphic disorder in a German college student sample. Psychiatry Res. 2002b Jan 31;109(1):101-4. doi: 10.1016/s0165-1781(01)00363-8.

Borda T, Neziroglu F, Santos N, Donnelly K, Rivera RP. Status of body dysmorphic disorder in Argentina. J Anxiety Disord. 2011 May;25(4):507-12. doi: 10.1016/j.janxdis.2010.12.004.

Boroughs MS, Krawczyk R and Thompson JK. Body Dysmorphic Disorder among Diverse Racial/Ethnic and Sexual Orientation Groups: Prevalence Estimates and Associated Factors. Sex Roles. 2010;63(9–10), pp.725–737. doi: 10.1007/s11199-010-9831-1.

Bowe WP, Leyden JJ, Crerand CE, Sarwer DB, Margolis DJ. Body dysmorphic disorder symptoms among patients with acne vulgaris. J Am Acad Dermatol. 2007 Aug;57(2):222-30. doi: 10.1016/j.jaad.2007.03.030.

Brakoulias V, Starcevic V, Sammut P, Berle D, Milicevic D, Moses K, Hannan A. Obsessive-compulsive spectrum disorders: a comorbidity and family history perspective. Australas Psychiatry. 2011 Apr;19(2):151-5. doi: 10.3109/10398562.2010.526718.

Brignardello-Petersen R. Low prevalence of body dysmorphic disorder in specific public and private practices in Australia. J Am Dent Assoc. 2019 Jul;150(7):e105. doi: 10.1016/j.adaj.2019.02.027.

Brohede S, Wingren G, Wijma B, Wijma K. Validation of the Body Dysmorphic Disorder Questionnaire in a community sample of Swedish women. Psychiatry Res. 2013 Dec 15;210(2):647-52. doi: 10.1016/j.psychres.2013.07.019.

Brohede S, Wingren G, Wijma B, Wijma K. Prevalence of body dysmorphic disorder among Swedish women: a population-based study. Compr Psychiatry. 2015 Apr;58:108-15. doi: 10.1016/j.comppsych.2014.12.014.

Brohede S, Wyon Y, Wingren G, Wijma B, Wijma K. Body dysmorphic disorder in female Swedish dermatology patients. Int J Dermatol. 2017 Dec;56(12):1387-1394. doi: 10.1111/ijd.13739.

Buhlmann U, Glaesmer H, Mewes R, Fama JM, Wilhelm S, Brähler E, Rief W. Updates on the prevalence of body dysmorphic disorder: a population-based survey. Psychiatry Res. 2010 Jun 30;178(1):171-5. doi: 10.1016/j.psychres.2009.05.002. Epub 2010 May 8. PMID: 20452057.

Calderón P, Zemelman V, Sanhueza P, Castrillón M, Matamala J, Szot J. Prevalence of body dysmorphic disorder in Chilean dermatological patients. J Eur Acad Dermatol Venereol. 2009 Nov;23(11):1328. doi: 10.1111/j.1468-3083.2009.03154.x.

Campagna JD, Bowsher B. Prevalence of Body Dysmorphic Disorder and Muscle Dysmorphia Among Entry-Level Military Personnel. Mil Med. 2016 May;181(5):494-501. doi: 10.7205/MILMED-D-15-00118.

Cansever A, Uzun O, Dönmez E, Ozşahin A. The prevalence and clinical features of body dysmorphic disorder in college students: a study in a Turkish sample. Compr Psychiatry. 2003 Jan-Feb;44(1):60-4. doi: 10.1053/comp.2003.50010.

Castle DJ, Molton M, Hoffman K, Preston NJ, Phillips KA. Correlates of dysmorphic concern in people seeking cosmetic enhancement. Aust N Z J Psychiatry. 2004 Jun;38(6):439-44. doi: 10.1080/j.1440-1614.2004.01381.x.

Cerea S, Bottesi G, Grisham JR, Ghisi M. Body dysmorphic disorder and its associated psychological and psychopathological features in an Italian community sample. Int J Psychiatry Clin Pract. 2018a Sep;22(3):206-214. doi: 10.1080/13651501.2017.1393545.

Cerea S, Bottesi G, Grisham JR, Ghisi M. Non-weight-related body image concerns and Body Dysmorphic Disorder prevalence in patients with Anorexia Nervosa. Psychiatry Res. 2018b Sep;267:120-125. doi: 10.1016/j.psychres.2018.05.068.

Cohen LJ, Kingston P, Bell A, Kwon J, Aronowitz B, Hollander E. Comorbid personality impairment in body dysmorphic disorder. Compr Psychiatry. 2000 Jan-Feb;41(1):4-12. doi: 10.1016/s0010-440x(00)90124-x.

Collins B, Gonzalez D, Gaudilliere DK, Shrestha P, Girod S. Body dysmorphic disorder and psychological distress in orthognathic surgery patients. J Oral Maxillofac Surg. 2014 Aug;72(8):1553-8. doi: 10.1016/j.joms.2014.01.011.

Common Sense Media. 2017. The Common Sense Census: Media use by Kids aged zero to eight. Available from: https://www.commonsensemedia.org/sites/default/files/uploads/research/csm_zerotoeight_fullreport_release_2.pdf, [Accessed 04/12/2019].

Conrado LA, Hounie AG, Diniz JB, Fossaluza V, Torres AR, Miguel EC, Rivitti EA. Body dysmorphic disorder among dermatologic patients: Prevalence and clinical features. J Am Acad Dermatol. 2010 Aug;63(2):235-43. doi: 10.1016/j.jaad.2009.09.017.

Conroy M, Menard W, Fleming-Ives K, Modha P, Cerullo H, Phillips KA. Prevalence and clinical characteristics of body dysmorphic disorder in an adult inpatient setting. Gen Hosp Psychiatry. 2008 Jan-Feb;30(1):67-72. doi: 10.1016/j.genhosppsych.2007.09.004.

Constantian MB. What motivates secondary rhinoplasty? A study of 150 consecutive patients. Plast Reconstr Surg. 2012 Sep;130(3):667-678. doi: 10.1097/PRS.0b013e31825dc301.

Costa CDL, Chagas Assunção M, Arzeno Ferrão Y, Archetti Conrado L, Hajaj Gonzalez C, Franklin Fontenelle L et al., Body dysmorphic disorder in patients with obsessive-compulsive disorder: prevalence and clinical correlates. Depress Anxiety. 2012 Nov;29(11):966-75. doi: 10.1002/da.21980.

Crerand CE, Phillips KA, Menard W, Fay C. Nonpsychiatric medical treatment of body dysmorphic disorder. Psychosomatics. 2005 Nov-Dec;46(6):549-55. doi: 10.1176/appi.psy.46.6.549.

de Brito MJA, Nahas FX, Cordás TA, Gama MG, Sucupira ER, Ramos TD, Felix Gde A, Ferreira LM. Prevalence of Body Dysmorphic Disorder Symptoms and Body Weight Concerns in Patients Seeking Abdominoplasty. Aesthet Surg J. 2016a Mar;36(3):324-32. doi: 10.1093/asj/sjv213.

de Brito MJA, Nahas FX, Cordás TA, Tavares H, Ferreira LM. Body Dysmorphic Disorder in Patients Seeking Abdominoplasty, Rhinoplasty, and Rhytidectomy. Plast Reconstr Surg. 2016b Feb;137(2):462-471. doi: 10.1097/01.prs.0000475753.33215.8f.

de Jongh A, Aartman IH, Parvaneh H, Ilik M. Symptoms of body dysmorphic disorder among people presenting for cosmetic dental treatment: a comparative study of cosmetic dental patients and a general population sample. Community Dent Oral Epidemiol. 2009 Aug;37(4):350-6. doi: 10.1111/j.1600-0528.2009.00469.x.

Dey JK, Ishii M, Phillis M, Byrne PJ, Boahene KD, Ishii LE. Body dysmorphic disorder in a facial plastic and reconstructive surgery clinic: measuring prevalence, assessing comorbidities, and validating a feasible screening instrument. JAMA Facial Plast Surg. 2015 Mar-Apr;17(2):137-43. doi: 10.1001/jamafacial.2014.1492.

Dingemans AE, van Rood YR, de Groot I, van Furth EF. Body dysmorphic disorder in patients with an eating disorder: prevalence and characteristics. Int J Eat Disord. 2012 May;45(4):562-9. doi: 10.1002/eat.20972.

Dlagnikova A & van Niekerk RL. The prevalence of body dysmorphic disorder among South African university students. South African Journal of Psychiatry. 2015; 21(3). DOI: 10.7196/SAJP.8251.

Dufresne RG, Phillips KA, Vittorio CC, Wilkel CS. A screening questionnaire for body dysmorphic disorder in a cosmetic dermatologic surgery practice. Dermatol Surg. 2001 May;27(5):457-62. doi: 10.1046/j.1524-4725.2001.00190.x.

Dyl J, Kittler J, Phillips KA, Hunt JI. Body dysmorphic disorder and other clinically significant body image concerns in adolescent psychiatric inpatients: prevalence and clinical characteristics. Child Psychiatry Hum Dev. 2006 Summer;36(4):369-82. doi: 10.1007/s10578-006-0008-7.

Faravelli C, Salvatori S, Galassi F, Aiazzi L, Drei C, Cabras P. Epidemiology of somatoform disorders: a community survey in Florence. Soc Psychiatry Psychiatr Epidemiol. 1997 Jan;32(1):24-9. doi: 10.1007/BF00800664.

Fathololoomi Mr, Tabrizi AG, Fattahi BA, Noohi S & Makhdoom A. Body dysmorphic disorder in aesthetic rhinoplasty candidates. Pakistan Journal of Medical Sciences. 2013;29(1), pp.197-200. doi: 10.12669/pjms.291.2733.

Felix GA, de Brito MJ, Nahas FX, Tavares H, Cordás TA, Dini GM, Ferreira LM. Patients with mild to moderate body dysmorphic disorder may benefit from rhinoplasty. J Plast Reconstr Aesthet Surg. 2014 May;67(5):646-54. doi: 10.1016/j.bjps.2014.01.002.

Fontenelle LF, Telles LL, Nazar BP, de Menezes GB, do Nascimento AL, Mendlowicz MV, Versiani M. A sociodemographic, phenomenological, and long-term follow-up study of patients with body dysmorphic disorder in Brazil. Int J Psychiatry Med. 2006;36(2):243-59. doi: 10.2190/B6XM-HLHQ-7X6C-8GC0.

Ghadakzadeh S, Ghazipour A, Khajeddin N, Karimian N, Borhani M. Body Image Concern Inventory (BICI) for identifying patients with BDD seeking rhinoplasty: using a Persian (Farsi) version. Aesthetic Plast Surg. 2011 Dec;35(6):989-94. doi: 10.1007/s00266-011-9718-8.

Gieler T, Schmutzer G, Braehler E, Schut C, Peters E, Kupfer J. Shadows of Beauty - Prevalence of Body Dysmorphic Concerns in Germany is Increasing: Data from Two Representative Samples from 2002 and 2013. Acta Derm Venereol. 2016 Aug 23;96(217):83-90. doi: 10.2340/00015555-2375.

Grant JE, Kim SW, Crow SJ. Prevalence and clinical features of body dysmorphic disorder in adolescent and adult psychiatric inpatients. J Clin Psychiatry. 2001 Jul;62(7):517-22. doi: 10.4088/jcp.v62n07a03

Grant JE, Kim SW, Eckert ED. Body dysmorphic disorder in patients with anorexia nervosa: prevalence, clinical features, and delusionality of body image. Int J Eat Disord. 2002 Nov;32(3):291-300. doi: 10.1002/eat.10091.

Grant JE, Lust K, Chamberlain SR. Body dysmorphic disorder and its relationship to sexuality, impulsivity, and addiction. Psychiatry Res. 2019 Mar;273:260-265. doi: 10.1016/j.psychres.2019.01.036.

Hepburn S, Cunningham S. Body dysmorphic disorder in adult

orthodontic patients. Am J Orthod Dentofacial Orthop. 2006 Nov;130(5):569-74. doi: 10.1016/j.ajodo.2005.06.022.

Higgins S, Wysong A. Cosmetic Surgery and Body Dysmorphic Disorder - An Update. Int J Womens Dermatol. 2017 Nov 20;4(1):43-48. doi: 10.1016/j.ijwd.2017.09.007.

Hollander E. Treatment of obsessive-compulsive spectrum disorders with SSRIs. Br J Psychiatry Suppl. 1998;(35):7-12.

Hollander E, Wong CM. Body dysmorphic disorder, pathological gambling, and sexual
compulsions. The Journal of Clinical Psychiatry. 1995; 58(Suppl 4), pp.7-12; discussion 13.

Hsu C, Ali Juma H, Goh CL. Prevalence of body dysmorphic features in patients undergoing cosmetic procedures at the National Skin Centre, Singapore. Dermatology. 2009;219(4):295-8. doi: 10.1159/000228329.

Ishigooka J, Iwao M, Suzuki M, Fukuyama Y, Murasaki M, Miura S. Demographic features of patients seeking cosmetic surgery. Psychiatry Clin Neurosci. 1998 Jun;52(3):283-7. doi: 10.1046/j.1440-1819.1998.00388.x.

Jafferany M, Osuagwu FC, Khalid Z, Oberbarnscheidt T, Roy N. Prevalence and clinical characteristics of body dysmorphic disorder in adolescent inpatient psychiatric patients-a pilot study. Nord J Psychiatry. 2019 May-Jul;73(4-5):244-247. doi: 10.1080/08039488.2019.1612943.

Jaisoorya TS, Reddy YC, Srinath S. The relationship of obsessive-compulsive disorder to putative spectrum disorders: results from an Indian study. Compr Psychiatry. 2003 Jul-Aug;44(4):317-23. doi: 10.1016/S0010-440X(03)00084-1.

Jolanta JRJ, Tomasz MS (2000) The links between body dysmorphic disorder and eating disorders. European psychiatry, 15(5), pp.302-305.

Jolanta JRJ, Tomasz MS. The links between body dysmorphic disorder and eating disorders. Eur Psychiatry. 2000 Aug;15(5):302-5. doi: 10.1016/s0924-9338(00)00398-9.

Joseph AW, Ishii L, Joseph SS, Smith JI, Su P, Bater K, Byrne P, Boahene K, Papel I, Kontis T, Douglas R, Nelson CC, Ishii M. Prevalence of Body Dysmorphic Disorder and Surgeon Diagnostic Accuracy in Facial Plastic and Oculoplastic Surgery Clinics. JAMA Facial Plast Surg. 2017a Jul 1;19(4):269-274. doi: 10.1001/jamafacial.2016.1535.

Joseph J, Randhawa P, Hannan SA, Long J, Goh S, O'Shea N, Saleh H, Hansen E, Veale D, Andrews P. Body dysmorphic disorder in patients undergoing septorhinoplasty surgery: should we be performing routine screening? Clin Otolaryngol. 2017b Jun;42(3):508-513. doi: 10.1111/coa.12752.

Kacar SD, Ozuguz P, Bagcioglu E, Coskun KS, Uzel Tas H, Polat S, Karaca S. The frequency of body dysmorphic disorder in dermatology and cosmetic dermatology clinics: a study from Turkey. Clin Exp Dermatol. 2014 Jun;39(4):433-8. doi: 10.1111/ced.12304.

Kacar SD, Ozuguz P, Bagcioglu E, Coskun KS, Polat S, Karaca S, Ozbulut O. Frequency of body dysmorphic disorder among patients with complaints of hair loss. Int J Dermatol. 2016 Apr;55(4):425-9. doi: 10.1111/ijd.12758.

Kelly MM, Zhang J, Phillips KA. The prevalence of body dysmorphic disorder and its clinical correlates in a VA primary care behavioral health clinic. Psychiatry Res. 2015 Jul 30;228(1):162-5. doi: 10.1016/j.psychres.2015.04.007.

Kollei I, Schieber K, de Zwaan M, Svitak M, Martin A. Body dysmorphic disorder and nonweight-related body image concerns in individuals with eating disorders. Int J Eat Disord. 2013 Jan;46(1):52-9. doi: 10.1002/eat.22067.

Koran LM, Abujaoude E, Large MD, Serpe RT. The prevalence of body dysmorphic disorder in the United States adult population. CNS Spectr. 2008 Apr;13(4):316-22. doi: 10.1017/s1092852900016436.

Lai CS, Lee SS, Yeh YC, Chen CS. Body dysmorphic disorder in patients with cosmetic surgery. Kaohsiung J Med Sci. 2010 Sep;26(9):478-82. doi: 10.1016/S1607-551X(10)70075-9.

Liao Y, Knoesen NP, Deng Y, Tang J, Castle DJ, Bookun R, Hao W, Chen X, Liu T. Body dysmorphic disorder, social anxiety and depressive symptoms in Chinese medical students. Soc Psychiatry Psychiatr Epidemiol. 2010 Oct;45(10):963-71. doi: 10.1007/s00127-009-0139-9.

Lochner C, Fineberg NA, Zohar J, van Ameringen M, Juven-Wetzler A, Altamura AC et al., Comorbidity in obsessive-compulsive disorder (OCD): a report from the International College of Obsessive-Compulsive Spectrum Disorders (ICOCS). Compr Psychiatry. 2014 Oct;55(7):1513-9. doi: 10.1016/j.comppsych.2014.05.020.

Marron SE, Gracia-Cazaña T, Miranda-Sivelo A, Lamas-Diaz S, Tomas-Aragones L. Screening for Body Dysmorphic Disorders in Acne Patients: A Pilot Study. Actas Dermosifiliogr. 2019 Jan-Feb;110(1):28-32. English, Spanish. doi: 10.1016/j.ad.2018.08.001.

Metcalfe DB, Duggal CS, Gabriel A, Nahabedian MY, Carlson GW, Losken A. Prevalence of Body Dysmorphic Disorder Among Patients Seeking Breast Reconstruction. Aesthet Surg J. 2014 Jul;34(5):733-7. doi: 10.1177/1090820X14531775.

Möllmann A, Dietel FA, Hunger A, Buhlmann U. Prevalence of body dysmorphic disorder and associated features in German adolescents: A self-report survey. Psychiatry Res. 2017 Aug;254:263-267. doi: 10.1016/j.psychres.2017.04.063.

Monzani B, Rijsdijk F, Harris J, Mataix-Cols D. The structure of genetic and environmental risk factors for dimensional representations of DSM-5 obsessive-compulsive spectrum disorders. JAMA Psychiatry. 2014 Feb;71(2):182-9. doi: 10.1001/jamapsychiatry.2013.3524.

NHS. Body Dysmorphic Disorder (BDD). Available from: https://www.nhs.uk/conditions/body-dysmorphia/, [Accessed 10/10/2019].

Otto MW, Wilhelm S, Cohen LS, Harlow BL. Prevalence of body dysmorphic disorder in a community sample of women. Am J Psychiatry. 2001 Dec;158(12):2061-3. doi: 10.1176/appi.

ajp.158.12.2061.

Pavan C, Vindigni V, Semenzin M, Mazzoleni F, Gardiolo M, Simonato P, Marini M. Personality, temperament and clinical scales in an Italian Plastic Surgery setting: what about body dysmorphic disorder? Int J Psychiatry Clin Pract. 2006;10(2):91-6. doi: 10.1080/13651500500487677.

Pérez Rodríguez C, Judge RB, Castle D, Phillipou A. Body dysmorphia in dentistry and prosthodontics: A practice based study. J Dent. 2019 Feb;81:33-38. doi: 10.1016/j.jdent.2018.12.003.

Perugi G, Akiskal HS, Giannotti D, Frare F, Di Vaio S, Cassano GB. Gender-related differences in body dysmorphic disorder (dysmorphophobia). J Nerv Ment Dis. 1997a Sep;185(9):578-82. doi: 10.1097/00005053-199709000-00007.

Perugi G, Giannotti D, Frare F, Vaio SD, Valori E, Maggi L et al., Prevalence, phenomenology and comorbidity of body dysmorphic disorder (dysmorphophobia) in a clinical population. Int J Psychiatry Clin Pract. 1997b;1(2):77-82. doi: 10.3109/13651509709024707.

Phillips KA, McElroy SL, Keck PE Jr, Pope HG Jr, Hudson JI. Body dysmorphic disorder: 30 cases of imagined ugliness. Am J Psychiatry. 1993 Feb;150(2):302-8. doi: 10.1176/ajp.150.2.302.

Phillips KA. 1996. The Broken Mirror: Understanding and Treating Body Dysmorphic Disorder. United States of America: Oxford University Press.

Phillips KA, Gunderson CG, Mallya G, McElroy SL, Carter W. A comparison study of body dysmorphic disorder and obsessive-compulsive disorder. J Clin Psychiatry. 1998 Nov;59(11):568-75. doi: 10.4088/jcp.v59n1102.

Phillips KA, Dufresne RG Jr, Wilkel CS, Vittorio CC. Rate of body dysmorphic disorder in dermatology patients. J Am Acad Dermatol. 2000a Mar;42(3):436-41. doi: 10.1016/s0190-9622(00)90215-9.

Phillips KA, McElroy SL. Personality disorders and traits in patients with body dysmorphic disorder. Compr Psychiatry. 2000b Jul-Aug;41(4):229-36. doi: 10.1053/comp.2000.7429.

Phillips KA. Quality of life for patients with body dysmorphic disorder. J Nerv Ment Dis. 2000c Mar;188(3):170-5. doi: 10.1097/00005053-200003000-00007.

Phillips KA, Grant J, Siniscalchi J, Albertini RS. Surgical and nonpsychiatric medical treatment of patients with body dysmorphic disorder. Psychosomatics. 2001 Nov-Dec;42(6):504-10. doi: 10.1176/appi.psy.42.6.504.

Phillips KA, Hollander E. Treating body dysmorphic disorder with medication: evidence, misconceptions, and a suggested approach. Body Image. 2008 Mar;5(1):13-27. doi: 10.1016/j.bodyim.2007.12.003.

Phillips KA, Pinto A, Hart AS, Coles ME, Eisen JL, Menard W, Rasmussen SA. A comparison of insight in body dysmorphic disorder and obsessive-compulsive disorder. J Psychiatr Res. 2012 Oct;46(10):1293-9. doi: 10.1016/j.jpsychires.2012.05.016.

Picavet VA, Prokopakis EP, Gabriëls L, Jorissen M, Hellings PW. High prevalence of body dysmorphic disorder symptoms in patients seeking rhinoplasty. Plast Reconstr Surg. 2011 Aug;128(2):509-517. doi: 10.1097/PRS.0b013e31821b631f.

Poyurovsky M, Fuchs C, Faragian S, Kriss V, Weisman G, Pashinian A et al., Preferential aggregation of obsessive-compulsive spectrum disorders in schizophrenia patients with obsessive-compulsive disorder. Can J Psychiatry. 2006 Oct;51(12):746-54. doi: 10.1177/070674370605101204.

Prazeres AM, Nascimento AL, Fontenelle LF. Cognitive-behavioral therapy for body dysmorphic disorder: a review of its efficacy. Neuropsychiatr Dis Treat. 2013;9:307-16. doi: 10.2147/NDT.S41074.

Rajkumar RP, Reddy YC, Kandavel T. Clinical profile of "schizo-obsessive" disorder: a comparative study. Compr Psychiatry. 2008 May-Jun;49(3):262-8. doi: 10.1016/j.comppsych.2007.09.006.

Rashid H, Khan AA, Fineberg NA. Adjunctive antipsychotic in the treatment of body dysmorphic disorder - A retrospective naturalistic case note study. Int J Psychiatry Clin Pract. 2015 Jun;19(2):84-9. doi: 10.3109/13651501.2014.981546.

Rief W, Buhlmann U, Wilhelm S, Borkenhagen A, Brähler E. The prevalence of body dysmorphic disorder: a population-based survey. Psychol Med. 2006 Jun;36(6):877-85. doi: 10.1017/S0033291706007264.

Ritter V, Fluhr JW, Schliemann-Willers S, Elsner P, Strauß B, Stangier U. Body dysmorphic concerns, social adaptation, and motivation for psychotherapeutic support in dermatological outpatients. J Dtsch Dermatol Ges. 2016 Sep;14(9):901-8. doi: 10.1111/ddg.12908.

Sarwer DB, Wadden TA, Pertschuk MJ, Whitaker LA. Body image dissatisfaction and body dysmorphic disorder in 100 cosmetic surgery patients. Plast Reconstr Surg. 1998 May;101(6):1644-9. doi: 10.1097/00006534-199805000-00035.

Schieber K, Kollei I, de Zwaan M, Martin A. Classification of body dysmorphic disorder - what is the advantage of the new DSM-5 criteria? J Psychosom Res. 2015 Mar;78(3):223-7. doi: 10.1016/j.jpsychores.2015.01.002.

Semiz U, Basoglu C, Cetin M, Ebrinc S, Uzun O, Ergun B. Body dysmorphic disorder in patients with borderline personality disorder: prevalence, clinical characteristics, and role of childhood trauma. Acta Neuropsychiatr. 2008 Feb;20(1):33-40. doi: 10.1111/j.1601-5215.2007.00231.x.

Sethukumar P, Ly D, Awad Z, Tolley NS. Scar satisfaction and body image in thyroidectomy patients: prospective study in a tertiary referral centre. J Laryngol Otol. 2018 Jan;132(1):60-67. doi: 10.1017/S0022215117002158.

Shaffi Ahamed S, Enani J, Alfaraidi L, Sannari L, Algain R, Alsawah Z, Al Hazmi A. Prevalence of Body Dysmorphic Disorder and its Association With Body Features in Female Medical Students. Iran J Psychiatry Behav Sci. 2016 May 15;10(2):e3868. doi: 10.17795/ijpbs-3868.

Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, et al. Preferred reporting items for systematic review and meta-

analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ 2015(349), p7647.

Solyom L, Freeman RJ, Miles JE. A comparative psychometric study of anorexia nervosa and obsessive neurosis. Can J Psychiatry. 1982 Jun;27(4):282-6. doi: 10.1177/070674378202700404.

Stangier U, Janich C, Adam-Schwebe S, Berger P, Wolter M. Screening for Body Dysmorphic Disorder in Dermatological Outpatients. Dermatol Psychosom. 2003;4, pp.66-71. doi: 10.1159/000072194.

Stewart SE, Stack DE, Wilhelm S. Severe obsessive-compulsive disorder with and without body dysmorphic disorder: clinical correlates and implications. Ann Clin Psychiatry. 2008 Jan-Mar;20(1):33-8. doi: 10.1080/10401230701844463.

Taqui AM, Shaikh M, Gowani SA, Shahid F, Khan A, Tayyeb SM, Satti M, Vaqar T, Shahid S, Shamsi A, Ganatra HA, Naqvi HA. Body Dysmorphic Disorder: gender differences and prevalence in a Pakistani medical student population. BMC Psychiatry. 2008 Apr 9;8:20. doi: 10.1186/1471-244X-8-20.

Thanveer F, Khunger N. Screening for Body Dysmorphic Disorder in a Dermatology Outpatient Setting at a Tertiary Care Centre. J Cutan Aesthet Surg. 2016 Jul-Sep;9(3):188-191. doi: 10.4103/0974-2077.191649.

Torres AR, Fontenelle LF, Shavitt RG, Ferrão YA, do Rosário MC, Storch EA, Miguel EC. Comorbidity variation in patients with obsessive-compulsive disorder according to symptom dimensions: Results from a large multicentre clinical sample. J Affect Disord. 2016 Jan 15;190:508-516. doi: 10.1016/j.jad.2015.10.051.

Torresan RC, Ramos-Cerqueira AT, de Mathis MA, Diniz JB, Ferrão YA, Miguel EC, Torres AR. Sex differences in the phenotypic expression of obsessive-compulsive disorder: an exploratory study from Brazil. Compr Psychiatry. 2009 Jan-Feb;50(1):63-9. doi: 10.1016/j.comppsych.2008.05.005.

Uzun O, Başoğlu C, Akar A, Cansever A, Ozşahin A, Cetin M, Ebrinç S. Body dysmorphic disorder in patients with acne. Compr Psychiatry. 2003 Sep-Oct;44(5):415-9. doi: 10.1016/S0010-440X(03)00102-0.

van der Meer J, van Rood YR, van der Wee NJ, den Hollander-Gijsman M, van Noorden MS, Giltay EJ, Zitman FG. Prevalence, demographic and clinical characteristics of body dysmorphic disorder among psychiatric outpatients with mood, anxiety or somatoform disorders. Nord J Psychiatry. 2012 Sep;66(4):232-8. doi: 10.3109/08039488.2011.623315.

Vargel S, Ulușahin A. Psychopathology and body image in cosmetic surgery patients. Aesthetic Plast Surg. 2001 Nov-Dec;25(6):474-8. doi: 10.1007/s00266-001-0009-7.

Veale D, De Haro L, Lambrou C. Cosmetic rhinoplasty in body dysmorphic disorder. Br J Plast Surg. 2003 Sep;56(6):546-51. doi: 10.1016/s0007-1226(03)00209-1.

Veale D. Advances in a cognitive behavioural model of body dysmorphic disorder. Body Image. 2004 Jan;1(1):113-25. doi: 10.1016/S1740-1445(03)00009-3.

Veale D, Anson M, Miles S, Pieta M, Costa A, Ellison N. Efficacy of cognitive behaviour therapy versus anxiety management for body dysmorphic disorder: a randomised controlled trial. Psychother Psychosom. 2014;83(6):341-53. doi: 10.1159/000360740.

Veale D, Akyüz EU, Hodsoll J. Prevalence of body dysmorphic disorder on a psychiatric inpatient ward and the value of a screening question. Psychiatry Res. 2015 Dec 15;230(2):383-6. doi: 10.1016/j.psychres.2015.09.023.

Veale D, Gledhill LJ, Christodoulou P, Hodsoll J. Body dysmorphic disorder in different settings: A systematic review and estimated weighted prevalence. Body Image. 2016 Sep;18:168-86. doi: 10.1016/j.bodyim.2016.07.003.

Vindigni V, Pavan C, Semenzin S, Grana FM, Gambaro FM, Marini M et al., The importance of recognizing body dysmorphic disorder in cosmetic surgery patients: Do our patients need a preoperative psychiatric evaluation? European Journal of Plastic Surgery, 2002;25, pp.305-308.

Vulink NC, Rosenberg A, Plooij JM, Koole R, Bergé SJ, Denys D. Body dysmorphic disorder screening in maxillofacial outpatients presenting for orthognathic surgery. Int J Oral Maxillofac Surg. 2008 Nov;37(11):985-91. doi: 10.1016/j.ijom.2008.06.005.

Wang Q, Cao C, Guo R, Li X, Lu L, Wang W, Li S. Avoiding Psychological Pitfalls in Aesthetic Medical Procedures. Aesthetic Plast Surg. 2016 Dec;40(6):954-961. doi: 10.1007/s00266-016-0715-9.

Wilhelm S, Otto MW, Zucker BG, Pollack MH. Prevalence of body dysmorphic disorder in patients with anxiety disorders. J Anxiety Disord. 1997 Sep-Oct;11(5):499-502. doi: 10.1016/s0887-6185(97)00026-1.

Woolley AJ, Perry JD. Body dysmorphic disorder: prevalence and outcomes in an oculofacial plastic surgery practice. Am J Ophthalmol. 2015 Jun;159(6):1058-1064.e1. doi: 10.1016/j.ajo.2015.02.014.

Yassaei S, Goldani Moghadam M, Aghili H, Tabatabaei SM. Body dysmorphic disorder in Iranian orthodontic patients. Acta Med Iran. 2014;52(6):454-7.

Zimmerman M, Mattia JI. Body dysmorphic disorder in psychiatric outpatients: recognition, prevalence, comorbidity, demographic, and clinical correlates. Compr Psychiatry. 1998 Sep-Oct;39(5):265-70. doi: 10.1016/s0010-440x(98)90034-7.