BROŻYNA, Aleksandra, BYDLIŃSKI, Arkadiusz, KWIATKOWSKA, Anita, EMERLA, Sara, MAŁEK, Natalia, KARŁOWICZ, Konrad, CIULKIEWICZ, Łukasz, PLUTA, Patryk, LUBOMIRSKA, Julia, FIGUROWSKA, Patrycja and HERMANOWSKA, Maria. What do we know about body dysmorphic disorder - Review of current knowledge. Journal of Education, Health and Sport. 2024;71:51251. eISSN 2391-8306.
https://dx.doi.org/10.12775/JEHS.2024.71.51251
https://apcz.umk.pl/JEHS/article/view/51251

The journal has had 40 points in Minister of Science and Higher Education of Poland parametric evaluation. Annex to the announcement of the Minister of Education and Science of 05.01.2024 No. 32318. Has a Journal's Unique Identifier: 201159. Scientific disciplines assigned: Physical culture sciences (Field of medical and health sciences); Health Sciences (Field of medical and health sciences).
Punkty Ministerialne 40 punktów. Załącznik do komunikatu Ministra Nauki i Szkolnictwa Wyższego z dnia 05.01.2024 Lp. 32318. Posiada Unikatowy Identyfikator Czasopisma: 201159. Przypisane dyscypliny naukowe: Nauki o kulturze fizycznej (Dziedzina nauk medycznych i nauk o zdrowiu); Nauki o zdrowiu (Dziedzina nauk medycznych i nauk o zdrowiu).
The authors declare that there is no conflict of interests regarding the publication of this paper.
Received: 12.04.2024. Revised: 10.05.2024. Accepted: 22.05.2024. Published: 23.05.2024.

What do we know about body dysmorphic disorder? - Review of current knowledge

Aleksandra Brożyna*, student
Medical University of Warsaw, Żwirki i Wigury 61, 02-091 Warsaw, Poland
https://orcid.org/0009-0000-9403-6212, ola.brozyna@icloud.com
Arkadiusz Bydliński*, student
Medical University of Warsaw, Żwirki i Wigury 61, 02-091 Warsaw, Poland
https://orcid.org/0009-0001-4230-661X, bydlinskiarkadiusz@gmail.com
Anita Kwiatkowska, MD
Military Institute of Medicine - National Research Institute, Szaserów 128, 04-141 Warsaw, Poland
https://orcid.org/0009-0009-7250-6194, aw.kwiatkowska@gmail.com
Sara Emerla, student
Medical University of Warsaw, Żwirki i Wigury 61, 02-091 Warsaw, Poland
https://orcid.org/0009-0007-2229-9145, emerlasara@gmail.com
Natalia Małek, MD
Central Clinical Hospital in Warsaw, Banacha 1a, 02-097 Warsaw, Poland
https://orcid.org/0009-0005-9602-2929, n.malek2609@gmail.com
Konrad Karłowicz, MD
Central Clinical Hospital in Warsaw, Banacha 1a, 02-097 Warsaw, Poland
https://orcid.org/0009-0008-4610-6456, konrad.karlowicz@uckwum.pl
Łukasz Ciulkiewicz, MD
Independent Public Healthcare Center in Mińsk Mazowiecki, Szpitalna 37, 05-300 Mińsk Mazowiecki, Poland
https://orcid.org/0009-0005-4531-7532, lukasz.ciulkiewicz@onet.eu
Patryk Pluta, MD
Stanisław Rybicki Regional Polyclinical Hospital in Skierniewice, Rybickiego 1, 96-100 Skierniewice, Poland
https://orcid.org/0009-0005-3251-2267, patrykpluta15@gmail.com
Julia Lubomirska, student
Jan Kochanowski University, Collegium Medicum, al. IX Wieków Kielc 19A, 25-317 Kielce, Poland

https://orcid.org/0009-0008-8557-5108, lubek1999@poczta.onet.pl
Patrycja Figurowska, MD
Independent Public Healthcare Center in Mińsk Mazowiecki, Szpitalna 37, 05-300 Mińsk Mazowiecki, Poland
https://orcid.org/0009-0003-7269-6916, patrycja.figurowska@gmail.com
Maria Hermanowska, student
Jan Kochanowski University, Collegium Medicum, al. IX Wieków Kielc 19A, 25-317 Kielce, Poland
https://orcid.org/0009-0007-5673-6403, marysiah05@gmail.com

*These two authors contributed equally to this work and are designated as co-first authors.
Corresponding author: Aleksandra Brożyna, student, ola.brozyna@icloud.com;

ABSTRACT

Introduction

Body dysmorphic disorder, also known as dysmorphophobia, is a severe psychiatric disorder characterized by DSM-V as preoccupation with one or more perceived defects or flaws in physical appearance, that are not observable or appear slight to others. BDD can cause significant distress or impairment in social and occupational areas of life. It is often comorbid with other psychiatric conditions like major depressive disorder. Current ways of treatment include a combination of pharmacotherapy and cognitive-behavioral therapy.

Aim of the study

To summarize current knowledge of body dysmorphic disorder, its pharmacological and non-pharmacological treatment, outline possible areas for further research, and raise the awareness of the disorder.

Material and methods

The review was based on the PubMed database and was carried out using keywords to determine the latest publications.

Summary

Body dysmorphic disorder is a relatively common and severe condition that greatly diminishes patients' quality of life. While helpful diagnostic tools exist, BDD diagnosis remains relatively uncommon, posing challenges for patients to receive adequate treatment and continuing their suffering. Despite identifying several factors contributing to the disorder, much remains unknown. Many patients do not respond to standard treatment options, highlighting the need for further studies into the disorder's neurobiology, causes, and alternate

treatment approaches to achieve a deeper comprehension of BDD as the number of new cases increases every year.

Keywords: Body dysmorphic disorder, BDD, dysmorphophobia, Body dysmorphic disorder treatment, BDD treatment,

INTRODUCTION

Body dysmorphic disorder is a severe psychiatric condition that is characterized by excessive self-absorption with one's perceived flaws and defects that are invisible to others in their presence or are seen as insignificant. It was described for the first time in 1891 by Italian psychiatrist Enrico Morselli, who invented the term "dysmorphophobia" from the Greek "dysmorphia", meaning: misshapness and ugliness [2]. This condition significantly deteriorates the patient's quality of life. Especially in the social-media era, it deserves more attention and interest than it has been given as the prevalence of BDD and dissatisfaction with self-image gradually arises [19, 20].

CLINICAL MANIFESTATION

Patients with BDD experience intrusive thoughts which consume an average of 3-8 hours daily [14,23,24]. Circa 25% of patients suffering from BDD claim that they are absorbed by their flaws day-to-day for more than 8 hours [2,24]. Those thoughts tend to be unwanted and intrusive, generally uncontrollable. They may vary in intensity from "not right" and "unattractive" to "disgusting", "ugly" or even "deformed" [22] and are accompanied by feelings of shame, discomfort, sadness, remorse, and regret, which can cause much distress. [2,14,24]. To hide what they are ashamed of, they often camouflage it by clothing, wearing hats and glasses, using make-up products, or simply by specific body positions [14]. People experiencing Body Dysmorphic Disorder (BDD) tend to fixate on specific features of their appearance. Any body part might be a source of concern, although the face and head, especially the nose, hair, and skin (features like acne, wrinkles, skin tone, scars) are most commonly affected [2]. Typically, individuals with BDD are preoccupied with 5 to 7 different parts of their body throughout their lifetime [2].

Although the prevalence of the disorder is similar for both genders, there are differences in the way Body Dysmorphic Disorder (BDD) appears. Women usually state concerns about their weight, and the size of breasts, hips, or legs and are more prone to have

co-existing eating disorders, whereas men commonly manifest apprehension about the appearance of their genitalia and their overall physique, a phenomenon termed muscle dysmorphia [22,25]. Individuals (usually fit men) [14] believe their bodies are too small, not slim enough, or lack sufficient muscularity when in most cases their bodies are average and perfectly normal or excessively muscular due to intensive training and/or usage of anabolic steroids [2,14].

Throughout the disorder in response to those unwanted thoughts, patients perform repetitive actions often called compulsions or rituals (named due to their similarity to those experienced in obsessive-compulsive disorder [8,24]) such as checking their appearance in the mirror, undergoing cosmetic procedures, inspecting, skin-picking, or excessive grooming (combing, plucking, hair pulling or shaving). Sometimes those acts might be invisible to others as they tend to be purely mental like comparison, self-assurance, and counting [14,23]. Actions like those mentioned above tend to be hard to resist and uncontrollable and can intensify feelings of anxiousness and distress [22]. Conducted studies have displayed that 24-28% of patients suffering from body dysmorphic disorder attempted suicide [8] and from 17 to 77% of individuals experience suicidal ideations [7]. In general, those suicidal thoughts are linked with one's social isolation, negative ideations and anxiousness which all arise from one's distorted body image [8,17]. What is more, the risk of suicidality rises with the comorbidity of major depressive disorder [14], borderline personality disorder, bipolar disorder, PTSD, or substance use disorder [8].

DIAGNOSING

In the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) presented by the American Psychiatric Association, Body Dysmorphic Disorder is classified in the Obsessive-Compulsive and Related Disorders (OCRD) section [22].

Diagnostic Criteria of Body Dysmorphic Disorder in DSM-V [22]:

A.	Preoccupation with one or more perceived defects or flaws in physical appearance that are not observable or appear slight to others.
B.	At some point during the course of the disorder, the individual has performed repetitive behaviors (e.g., mirror checking, excessive grooming, skin picking, reassurance seeking) or mental acts (e.g., comparing his or her appearance with that

	of others) in response to the appearance concerns.
C.	The preoccupation causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.
D.	The appearance preoccupation is not better explained by concerns with body fat or weight in an individual whose symptoms meet diagnostic criteria for an eating disorder
*	**Specify if:** With muscle dysmorphia: The individual is preoccupied with the idea that his or her body build is too small or insufficiently muscular. This specifier is used even if the individual is preoccupied with other body areas, which is often the case. **Specify if**: Indicate degree of insight regarding body dysmorphic disorder beliefs (e.g., "I look ugly" or "I look deformed"). With good or fair insight: The individual recognizes that the body dysmorphic disorder beliefs are definitely or probably not true or that they may or may not be true. With poor insight: The individual thinks that the body dysmorphic disorder beliefs are probably true. With absent insight/delusional beliefs: The individual is completely convinced that the body dysmorphic disorder beliefs are true.

Individuals with BDD can vary in their insight regarding the disorder. Typically insight is poor [2,15] which in fact can lead to reluctancy in psychiatric treatment and seeking help in aesthetic and cosmetic procedures, therefore many individuals find it hard to accept that they have a psychiatric condition rather than real body deformation and that there is another explanation for their symptoms [2,14]. Studies have displayed that 32-38% of individuals with BDD experience delusional beliefs. Absent insight or delusional thoughts are indicators of a worse prognosis which is usually connected with a more acute and intensive form of the disorder. [2,22]. ICD-11, states the importance of insight and divides individuals into two subcategories: patients with fair to good insight and poor to absent insight. Individuals from the first subcategory can consider that their disorder-related experience might not be accurate and are open to other explanations of their concerns apart from the states of high anxiousness and distress when occasionally this insight may vanish. In poor to absent insight, the patient is mostly or always convinced that their beliefs regarding BDD are

true and cannot possibly acquire other explanations for their experience. This lack of insight remains consistent regardless of their anxiety level [2,25]

Due to patients' preoccupation, high level of emotional distress, and fear of rejection, they usually experience impairment in various aspects of their lives: social, educational, and occupational, and as a result they tend to avoid intimate relationships or withdraw from them and be absent at school or work which sometimes results in complete isolation at home [2].

When it comes to mental status examination, observable findings may vary, there might be visible wounds from hair or skin-picking. The practitioner may also witness compulsive behaviours like grooming, covering certain body parts, or skin-picking. During physical examination, which in contrast to mental status examination is usually performed also outside psychiatric settings it is crucial to distinguish perceived flaws from actual physical defects. Yet the examiner should focus on areas previously indicated by the patient as concerning [23].

Despite its chronic course, prevalence and severity, BDD is still undiagnosed [7]. There are various factors contributing to that state such as poor insight and preferability of choosing a non-psychiatric form of treatment. However, even when a patient decides to seek psychiatric help they are often unlikely to voluntarily present their concerns due to fear of being judged as "vain" or "egocentric".Thus, asking questions directly is critical in forming a diagnosis [1,7]. Reluctance to spontaneously reveal troubling problems [23] and little awareness of the disorder amongst healthcare providers often results in incorrect diagnosis and inaccurate classification of the patient's symptoms as those resulting from another disorder, most often one that frequently coexists with BDD such as major depressive disorder or social anxiety disorder [7].

Regardless of difficulties in stating a diagnosis, screening tools have been created to detect BDD among patients. The Body Dysmorphic Disorder Questionnaire (BDDQ) is a form that healthcare providers can use to assess the probability of BDD in an individual. It consists of 4 main steps that refer to the patient's worry about his appearance, whether and how it has influenced their life and the time they spend every day thinking about their body image. BDDQ has proven high sensitivity (94%–100%) and specificity (89%–93%) in identifying BDD [7]. Apart from BDDQ, the BDD version of the Yale-Brown Obsessive–Compulsive Scale (BDD-YBOCS) has been designed. It consists of 12 steps during which the examiner assesses the intensity of symptoms in the past week. While BDD-YBOCS is considered a gold standard in measuring and evaluating BDD severity, it has limited use in

routine settings due to its length and advancement. A decrease of at least 30% in BDD-YBOCS score from before to after treatment is typically considered a “treatment response”[7].

ETIOLOGY & NEUROIMAGING FINDINGS

It is known that psychological, environmental and biological factors contribute to the development of Body Dysmorphic Disorder [3,4]. The development of BDD is related to painful experiences in the past like trauma, abuse, and neglect [3,4]. One survey conducted among patients with BDD revealed that the majority experienced emotional neglect and abuse in the past (68% and 56% respectively) [3]. What is more around one-third of patients admitted that they were victims of sexual abuse (28.0%), physical neglect (33.3%), and physical abuse (34.7%) [3]

Although neuroimaging is not necessary to diagnose Body Dysmorphic Disorder, various studies have researched brain morphology, neuronal pathways and activation patterns in patients with BDD. Volumetric MRI studies have generated mixed results. While certain studies have identified abnormalities in brain areas linked to obsessive-compulsive disorder (OCD), implying a potential connection between BDD and OCD [9,27], other analyses failed to confirm these results, emphasizing variability among individuals with BDD [9,26]. Moreover, cortical thickness analyses have presented contradictory findings, with some studies detecting differences in particular brain regions while others have noted no significant variations. Diffusion Tensor Imaging (DTI) studies have displayed disruption in white matter tracts connecting visual and emotion/memory processing systems in individuals with BDD [28]. These abnormal findings may lead to difficulty accurately perceiving visual stimuli and contribute to problems with regulating emotions [9]. Functional MRI studies have demonstrated altered brain activation patterns in response to faces and objects and differences in connectivity within visual processing networks. These researches implicate that individuals with BDD may process optical information in an alternative way, potentially leading to a distorted perception of body image [29,30]. Lastly, a SPECT study demonstrates anomalies in the dopaminergic pathway in BDD patients, specifically in regions associated with reward system and habit formation [31]. However, no correlations were detected between dopamine receptor availability and clinical factors such as insight or symptom severity. [9] Despite varied outcomes studies have provided valuable insight into the neural mechanisms behind BDD and highlighted the complex nature of its neurobiological foundation.

PREVALENCE

The estimated prevalence of BDD in a community is 1.9% in adults [1,15]. It appears more common in females (2.1%) than males (1.6%) [1]. However, a study from 2015 suggests that 2.9% of the general population sample meets all the criteria for BDD based on DSM-V [15,18]. BDD typically begins at the age of 17 [4]. The overall weighted prevalence of BDD changes in different settings. It is higher in psychiatric settings: 7.4% and 5.8% for psychiatric inpatients and psychiatric outpatients respectively [1]. Many patients suffering from BDD instead of treating it as a psychiatric condition try to subside their flaws by undergoing aesthetic procedures often with worse satisfaction compared to healthy individuals [21]. Studies have displayed that in cosmetic dermatology and surgery settings, the overall prevalence of patients suffering from BDD was 12.2% (CI 8.4–17.4) [1]. What is more, BDD is still underdiagnosed and the estimated prevalence might be indeed higher than predicted due to misdiagnosing BDD as another psychiatric condition [1,8]. Moreover, failure to seek psychiatric help due to a lack of insight, feeling shame and discomfort [1,8], and little knowledge about possible treatment of their symptoms adds to underestimated occurrence [3].

TREATMENT

The main first-line treatment consists of SSRI and cognitive-behavioral therapy [3,4,5,7,11]. There are no studies regarding whether CBT or pharmacotherapy is more successful in managing symptoms of BDD [2,23]. Because the majority of individuals with BDD have poor or absent insight, repeated encouragement to treatment and psychoeducation are advisable to increase patients' compliance and trust as BDD has a chronic and recurrent course and long-term treatment is usually advised [3].

Pharmacotherapy

Doses of SSRIs used in the pharmacotherapy of BDD are usually higher than those used, for example, in a major depressive episode, and similar to those used in OCD [2,3,14,15] which strikes another problem as more frequent and severe side effects contribute to withdrawal from treatment or incoherence [3,4]. In general, studies have shown that SSRIs are more effective in treating BDD symptoms than placebo [2], however, there is no evidence suggesting the superiority of any particular SSRI in the treatment of BDD [3,23]. The effectiveness of the treatment does not depend on whether delusional thoughts occur or not and therefore it should be treated likewise [11,14]. If one drug from the SSRI group is not

well tolerated or does not alleviate the patient's symptoms, treatment can be switched to another medication within the same class [3]. Escitalopram, sertraline, or fluoxetine are usually preferred as the first-line agents [3]. Augmentation with a second drug such as buspirone, second-generation neuroleptics, clomipramine, or venlafaxine can be considered but further research is required [3,7]. Not only do SSRIs help with the symptoms, but also reduce the risk of suicide and improve the overall quality of life in individuals with BDD [3,14]. Treatment for BDD can also be useful in managing symptoms of comorbid conditions like major depressive episode, OCD, or social anxiety disorder [3,15]. The dose should be gradually increased while monitoring the patient's tolerance to the maximum stated by the manufacturer within 5 to 9 weeks [3]. Response to SSRIs occurs gradually and generally, it takes 12 to 16 weeks to assess response to treatment fully [3,11]. Clomipramine is advised if SSRI treatment is ineffective [3,11], however, clomipramine being a drug from the tricyclic class (TCA) should be administered cautiously as it has a more severe side effect profile than the SSRI group [3]. Patients with BDD who experience symptom improvement should maintain treatment for a relatively long duration of time to decrease the risk of relapse as discontinuation is significantly linked with it [3,11,16]. Continuous therapy may sustain remission but could lead to side effects due to the medication's profile. If discontinuation is chosen, it should be slow and gradual, a tapering process over several months is advised [3].

Psychotherapy

Cognitive-behavioral therapy (CBT) is considered a first-line therapy option for managing the disorder [2,7,14,23]. However, the limited availability of CBT [3,23] and often higher costs compared to pharmacotherapy, make medication a more frequent strategy option [7]. Recent studies have stated a potential use of Internet-based CBT in treating BDD [2,6,23] which could greatly enhance the availability of CBT. It is advised that therapy should last at least 16-24 weeks [2], as one study has shown that only 48% of patients responded to 12-week CBT [14]. Few studies have displayed that CBT was more efficacious in handling BDD than waitlist, supportive therapy, lack of treatment, or anxiety management [2,7,14]. CBT's main core strategies in treating BDD consist of gradual exposure and fear management [2]. Guided management throughout therapy is crucial as many patients feel skeptical and hesitant about treatment due to disbelief and poor insight [2]. The key role of cognitive behavioral therapy is to reduce self-absorption and ruminations, change patients' attitudes toward their bodies, and develop healthy coping mechanisms [2].

Future directions

Although CBT and SSRIs are proven efficacious in the management of the disorder, further research is required about other possible treatment options, as a considerable number of patients do not respond to therapy. There are many factors contributing to this complex state like comorbidity of other psychiatric conditions and severity of the disorder [4]. A recent report of a 50-year-old woman diagnosed with comorbid treatment-resistant major depressive disorder and body dysmorphic disorder found that electroconvulsive therapy, which has proven value in the treatment of medication-resistant depression, resolved and sustained remission of both conditions for 2 months [4]. Although these findings are initial and further research is required, they suggest that electroconvulsive therapy may be useful in managing more severe cases [4,12]. Other studies have found a potential effect of psychedelics in the treatment of primary features in BDD, but more data about safety and efficiency is necessary [10]. Currently, there are studies involving the use of Repetitive transcranial magnetic stimulation (rTMS) in the management of major depressive disorder, psychosis and anxiety disorders [4]. It is believed that rTMS might balance the excitation and inhibition of brain pathways [4]. RTMS administered to the medial prefrontal cortex in both hemispheres led to symptom improvement in a young woman with Autism Spectrum Disorder, particularly in social interaction abilities [4]. This result implies that rTMS could have wider implications for other disorders sharing similar indications, like BDD [4].

CONCLUSIONS

Body dysmorphic disorder is a serious, quite frequent, and debilitating condition that significantly reduces the patient's quality of life. Useful tools helpful with diagnosing have been created, yet BDD diagnosis is relatively uncommon, which generates challenges that patients will not receive appropriate treatment and persist in ongoing distress. Various factors contributing to the development of the disorder have been discovered, however, there is still much unknown, and numerous questions are unanswered. Many individuals are treatment-resistant, indicating that further research into neurobiology, etiology, and alternative treatment options is required to gain a more thorough understanding of the disorder.

Disclosures

Author's contribution:

Conceptualization: Aleksandra Brożyna, Arkadiusz Bydliński;
Methodology: Patryk Pluta; Patrycja Figurowska;
Formal analysis: Natalia Małek, Maria Hermanowska;
Investigation: Sara Emerla, Julia Lubomirska, Łukasz Ciulkiewicz;
Writing-rough preparation: Anita Kwiatkowska, Konrad Karłowicz;
Writing-review and editing: Aleksandra Brożyna, Arkadiusz Bydliński;
Supervision: Aleksandra Brożyna, Arkadiusz Bydliński;
All authors have read and agreed with the published version of the manuscript.
Funding Statement: This Research received no external funding.
Institutional Review Board Statement: Not applicable.
Informed Consent Statement: Not applicable.
Data Availability Statement: Not applicable.
Conflict of Interests: The authors declare no conflict of interest.

REFERENCES

1. 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. Epub 2016 Aug 4. PMID: 27498379.
2. Singh AR, Veale D. Understanding and treating body dysmorphic disorder. Indian J Psychiatry. 2019 Jan;61(Suppl 1):S131-S135. doi: 10.4103/psychiatry.IndianJPsychiatry_528_18. PMID: 30745686; PMCID: PMC6343413.
3. Hong K, Nezgovorova V, Uzunova G, Schlussel D, Hollander E. Pharmacological Treatment of Body Dysmorphic Disorder. Curr Neuropharmacol. 2019;17(8):697-702. doi: 10.2174/1570159X16666180426153940. PMID: 29701157; PMCID: PMC7059151.
4. Hong K, Nezgovorova V, Hollander E. New perspectives in the treatment of body dysmorphic disorder. F1000Res. 2018 Mar 23;7:361. doi: 10.12688/f1000research.13700.1. PMID: 29636904; PMCID: PMC5871801.
5. Fernández de la Cruz L, Enander J, Rück C, Wilhelm S, Phillips KA, Steketee G, Sarvode Mothi S, Krebs G, Bowyer L, Monzani B, Veale D, Mataix-Cols D. Empirically defining treatment response and remission in body dysmorphic disorder.

Psychol Med. 2021 Jan;51(1):83-89. doi: 10.1017/S0033291719003003. Epub 2019 Oct 30. PMID: 31662124; PMCID: PMC7190405.

6. Lundström L, Flygare O, Ivanova E, Mataix-Cols D, Enander J, Pascal D, Chen LL, Andersson E, Rück C. Effectiveness of Internet-based cognitive-behavioural therapy for obsessive-compulsive disorder (OCD-NET) and body dysmorphic disorder (BDD-NET) in the Swedish public health system using the RE-AIM implementation framework. Internet Interv. 2023 Feb 15;31:100608. doi: 10.1016/j.invent.2023.100608. PMID: 36852382; PMCID: PMC9958485.
7. Krebs G, Fernández de la Cruz L, Mataix-Cols D. Recent advances in understanding and managing body dysmorphic disorder. Evid Based Ment Health. 2017 Aug;20(3):71-75. doi: 10.1136/eb-2017-102702. Epub 2017 Jul 20. PMID: 28729345; PMCID: PMC5566091.
8. Eskander N, Limbana T, Khan F. Psychiatric Comorbidities and the Risk of Suicide in Obsessive-Compulsive and Body Dysmorphic Disorder. Cureus. 2020 Aug 17;12(8):e9805. doi: 10.7759/cureus.9805. PMID: 32953317; PMCID: PMC7494407.
9. Machremi E, Bakirtzis C, Karakasi MV, Boziki MK, Siokas V, Aloizou AM, Dardiotis E, Grigoriadis N. What scans see when patients see defects: neuroimaging findings in body dysmorphic disorder. J Integr Neurosci. 2022 Mar 18;21(2):45. doi: 10.31083/j.jin2102045. PMID: 35364633.
10. Ledwos N, Rodas JD, Husain MI, Feusner JD, Castle DJ. Therapeutic uses of psychedelics for eating disorders and body dysmorphic disorder. J Psychopharmacol. 2023 Jan;37(1):3-13. doi: 10.1177/02698811221140009. Epub 2022 Dec 14. PMID: 36515406; PMCID: PMC10197863.
11. Phillips KA. Pharmacotherapy for Body Dysmorphic Disorder. Psychiatr Ann. 2010 Jul;40(7):325-332. doi: 10.3928/00485713-20100701-05. PMID: 27761054; PMCID: PMC5067103.
12. Ma X, Li R. Case Report: Effect of Electroconvulsive Therapy on Obsessive-Compulsive Disorder Comorbid With Body Dysmorphic Disorder. Front Psychiatry. 2021 Aug 2;12:706506. doi: 10.3389/fpsyt.2021.706506. PMID: 34408682; PMCID: PMC8365030.
13. Curtiss JE, Bernstein EE, Wilhelm S, Phillips KA. Predictors of pharmacotherapy outcomes for body dysmorphic disorder: a machine learning approach. Psychol Med.

2023 Jun;53(8):3366-3376. doi: 10.1017/S0033291721005390. Epub 2022 Jan 10. PMID: 35000652; PMCID: PMC9836197.

14. Phillips KA. Body dysmorphic disorder: common, severe and in need of treatment research. Psychother Psychosom. 2014;83(6):325-9. doi: 10.1159/000366035. Epub 2014 Oct 16. PMID: 25322928.
15. Castle D, Beilharz F, Phillips KA, Brakoulias V, Drummond LM, Hollander E, Ioannidis K, Pallanti S, Chamberlain SR, Rossell SL, Veale D, Wilhelm S, Van Ameringen M, Dell'Osso B, Menchon JM, Fineberg NA. Body dysmorphic disorder: a treatment synthesis and consensus on behalf of the International College of Obsessive-Compulsive Spectrum Disorders and the Obsessive Compulsive and Related Disorders Network of the European College of Neuropsychopharmacology. Int Clin Psychopharmacol. 2021 Mar 1;36(2):61-75. doi: 10.1097/YIC.0000000000000342. PMID: 33230025; PMCID: PMC7846290.
16. Phillips KA, Keshaviah A, Dougherty DD, Stout RL, Menard W, Wilhelm S. Pharmacotherapy Relapse Prevention in Body Dysmorphic Disorder: A Double-Blind, Placebo-Controlled Trial. Am J Psychiatry. 2016 Sep 1;173(9):887-95. doi: 10.1176/appi.ajp.2016.15091243. Epub 2016 Apr 8. PMID: 27056606; PMCID: PMC5009005.
17. Angelakis I, Gooding PA, Panagioti M. Suicidality in body dysmorphic disorder (BDD): A systematic review with meta-analysis. Clin Psychol Rev. 2016 Nov;49:55-66. doi: 10.1016/j.cpr.2016.08.002. Epub 2016 Aug 28. PMID: 27607741.
18. 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. Epub 2015 Jan 9. PMID: 25595027.
19. Ateq K, Alhajji M, Alhusseini N. The association between use of social media and the development of body dysmorphic disorder and attitudes toward cosmetic surgeries: a national survey. Front Public Health. 2024 Mar 8;12:1324092. doi: 10.3389/fpubh.2024.1324092. PMID: 38525343; PMCID: PMC10957761.
20. Carter A, Forrest JI, Kaida A. Association Between Internet Use and Body Dissatisfaction Among Young Females: Cross-Sectional Analysis of the Canadian Community Health Survey. J Med Internet Res. 2017 Feb 9;19(2):e39. doi: 10.2196/jmir.5636. PMID: 28183688; PMCID: PMC5324010.

21. Picavet, Valerie A. M.D.; Gabriëls, Loes M.D.; Grietens, Jente; Jorissen, Mark M.D., Ph.D.; Prokopakis, Emmanuel P. M.D., Ph.D.; Hellings, Peter W. M.D., Ph.D.. Preoperative Symptoms of Body Dysmorphic Disorder Determine Postoperative Satisfaction and Quality of Life in Aesthetic Rhinoplasty. Plastic and Reconstructive Surgery 131(4):p 861-868, April 2013. | DOI: 10.1097/PRS.0b013e3182818f02
22. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders, 5th ed.* American Psychiatric Publishing, 2014. DSM-V, doi.org/10.1176/appi.books.9780890425596
23. Nicewicz HR, Torrico TJ, Boutrouille JF. Body Dysmorphic Disorder. 2024 Jan 20. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan–. PMID: 32310361.
24. Phillips KA, Wilhelm S, Koran LM, Didie ER, Fallon BA, Feusner J, Stein DJ. Body dysmorphic disorder: some key issues for DSM-V. Depress Anxiety. 2010 Jun;27(6):573-91. doi: 10.1002/da.20709. PMID: 20533368; PMCID: PMC3985412.
25. International Classification of Diseases, Eleventh Revision (ICD-11), World Health Organization (WHO) 2019/2021 https://icd.who.int/browse11.
26. Feusner JD, Townsend J, Bystritsky A, McKinley M, Moller H, Bookheimer S. Regional brain volumes and symptom severity in body dysmorphic disorder. Psychiatry Res. 2009 May 15;172(2):161-7. doi: 10.1016/j.pscychresns.2008.12.003. Epub 2009 Mar 27. PMID: 19328661; PMCID: PMC2736954.
27. Jenike MA, Breiter HC, Baer L, Kennedy DN, Savage CR, Olivares MJ, O'Sullivan RL, Shera DM, Rauch SL, Keuthen N, Rosen BR, Caviness VS, Filipek PA. Cerebral structural abnormalities in obsessive-compulsive disorder. A quantitative morphometric magnetic resonance imaging study. Arch Gen Psychiatry. 1996 Jul;53(7):625-32. doi: 10.1001/archpsyc.1996.01830070073011. PMID: 8660129.
28. Feusner JD, Arienzo D, Li W, Zhan L, Gadelkarim J, Thompson PM, Leow AD. White matter microstructure in body dysmorphic disorder and its clinical correlates. Psychiatry Res. 2013 Feb 28;211(2):132-40. doi: 10.1016/j.pscychresns.2012.11.001. Epub 2013 Feb 1. PMID: 23375265; PMCID: PMC3570702.
29. Feusner JD, Townsend J, Bystritsky A, Bookheimer S. Visual information processing of faces in body dysmorphic disorder. Arch Gen Psychiatry. 2007 Dec;64(12):1417-25. doi: 10.1001/archpsyc.64.12.1417. PMID: 18056550.

30. Feusner JD, Moody T, Hembacher E, Townsend J, McKinley M, Moller H, Bookheimer S. Abnormalities of visual processing and frontostriatal systems in body dysmorphic disorder. Arch Gen Psychiatry. 2010 Feb;67(2):197-205. doi: 10.1001/archgenpsychiatry.2009.190. PMID: 20124119; PMCID: PMC2853756.
31. Vulink NC, Planting RS, Figee M, Booij J, Denys D. Reduced striatal dopamine D2/3 receptor availability in Body Dysmorphic Disorder. Eur Neuropsychopharmacol. 2016 Feb;26(2):350-356. doi: 10.1016/j.euroneuro.2015.11.018. Epub 2015 Nov 30. PMID: 26711686.