Iran J Orthod. 2023 June; 18(1):e1099. doi:10.22034/IJO.2023.1983270.1099.
Published online 2023 June 1
Research Article **Open Access**

Investigating the Prevalence of Body Dysmorphic Disorder (BDD) in Orthosurgery Patients

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Received: 2022 December 21; **Revised:** 2023 March 08; **Accepted:** 2023 April 15

Abstract

Aim: Body Dysmorphic Disorder (BDD) is a psychiatric diagnosis in the spectrum of obsessive compulsive disorder wherein the patient has a damaging mental preoccupation with a slight deficiency in his physical appearance. Awareness of this disease and its symptoms is essential for proper diagnosis and management of the patient.
Methods: This cross-sectional study was performed on 86 patients who underwent orthognathic surgery. A demographic information questionnaire, Yale-Brown Obsessive Compulsive Scale modified for the BDD questionnaire, BDI-II questionnaire (Depression Scale) and Beck Anxiety Scale questionnaire were completed by patients to assess BDD disorder, depression, and anxiety. Data were described using appropriate statistical tables and graphs to express indicators and frequency distribution. Shapiro-Wilk, Mann-Whitney, Kruskal-Wallis, and Fisher tests were used to analyze the data.
Results: This study was performed on 86 patients with a mean age of 23.19±4.5 years. The percentage of BDD in women (20%) was higher than in men (14%), but this difference was not statistically significant ($p=0.685$). The prevalence of depression was significantly higher ($p<0.001$) in patients with BDD (53%) than in those without this disorder (11%). The prevalence of anxiety was significantly higher ($p<0.001$) in patients with BDD (67%) than in those without this disorder (23%). With increasing age, the BDD scores decrease slightly, but this difference was not statistically significant ($p=0.113$).
Conclusion: The prevalence of BDD in the study population was 17.4%. The high prevalence of the disorder in orthognathic surgery patients compared to the general population requires the serious attention of dentists to this disorder.

Keywords*:* Body Dysmorphic Disorder, Orthognathic Surgery, Orthodontic, Prevalence

Introduction

Body dysmorphic disorder (BDD) is a psychiatric diagnosis in the spectrum of obsessive-compulsive disorders (OCD) in which the patient has a destructive preoccupation with a slight deficiency in his physical appearance. This deficiency is either imaginary or if there is a physical abnormality, the patient's anxiety about it is extreme and agonizing (1). Body dysmorphic disorder, previously termed dysmorphophobia, was first proposed in 1886 by Morcellini, and in 1987, it was recognized as a disorder by the American Psychiatric Association (2). Those affected with BDD have excessive concern about appearance defects that can be directed to any part of the body; however, the most concern is regarding the facial area. For this reason, dentists, plastic surgeons, oral and maxillofacial surgeons, and orthodontists are often the first medical professionals to encounter BDD patients (3). The prevalence of BDD in the United States of America is reported to be 2% of the entire population. BDD patients presenting for cosmetic treatments and American skin clinics are estimated between 6%-15% (4), and BDD is reported between 3%-53% among plastic surgery patients (5,6).

Published studies on the prevalence of this disorder in orthognathic surgery patients are limited. In 2008, a study was conducted by Vulink et al. to investigate the prevalence of BDD in orthosurgery patients. In this study, 160 patients (54 men and 106 women) were studied. According to the results of this study, 10% of all patients (9.3% of men and 10.4% of women) had BDD (7).

Another study was done in 2014 and conducted by Collins et al. in the USA to investigate the prevalence of BDD in orthosurgery patients. In this research, a total of 99 patients (46 men and 53

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women) were studied (8). According to the results of this study, 13.1% of all patients (6.5% of men and 18.9% of women) had BDD. In this study, other mental disorders were also studied, and it was found that 29.3% of patients had obsessive-compulsive disorder, 16.2% of them had major depression, and 23.2% of them had anxiety. It has been reported that a majority of BDD patients treated in psychiatric centers had comorbid mental disorders such as major depressive disorder, which was reported in quite a few studies. Avoidant personality disorder also commonly occurs with BDD. Furthermore, BDD patients experience unusually high levels of stress and poor quality of life (8,9).

Patients with BDD have a significantly higher history of cosmetic surgery (15.6% vs. 3%), a higher rate of suicide (31% vs. 3.5%), and suicide attempts due to appearance (22.2% against 2.1%) compared to people without the disorder (10). Also, these patients are difficult to treat and are often dissatisfied with their treatment. In research, it was shown that only 13% of patients reported improvement in BDD symptoms through skin treatment (11).

Since the studies conducted for BDD in orthognathic patients show conflicting results, the aim of this study was to investigate the prevalence of BDD in orthosurgery patients.

Methods

This study was conducted in 2021 at the Dental Clinic of the Mashhad University of Medical Sciences. The present study is a cross-sectional descriptive-analytical study. The participants were selected from orthosurgery patients referred to the Dental Clinic of the Mashhad University of Medical Sciences. Inclusion criteria include willingness to participate in the design and completion of the questionnaire. Exclusion criteria were the history of the existence of a known mental illness, the presence of obvious physical problems and disabilities, the presence of craniofacial syndromes and cleft palate and lip, and previous orthodontic treatment history.

The information was obtained by examining the questionnaires completed by patients who were candidates for orthosurgery treatment and whose orthodontic treatment had started or were in the very early stages of treatment. The presence of BDD symptoms was assessed by the modified Yale-Brown Obsessive Compulsive Scale. This tool, presented in 1997 by Phillips et al., is a modified version of the Yale-Brown Obsession Scale, presented in 1989 by Goodman et al. Phillips et al. obtained the reliability of this questionnaire by the retest method, with a one-week interval of 0.88, and the Cronbach's alpha coefficient for internal consistency was 0.8, which indicates the high internal consistency of this scale. This is a reliable and valid 12-item semi-structured measure; the scores range from 0 to 48. Rabiee et al. used this tool on an Iranian sample of students and examined its psychometric properties and showed that it has good validity and reliability (12).

Depression was measured by the second version of the Beck Depression Inventory, which is a self-reported instrument. A total score of 0-13 is considered the minimal range, 14-19 is mild, 20-28 is moderate, and 29-63 is severe. Hamidi et al. conducted a study to evaluate the validity and reliability of BDI-II, and it was found that this tool is valid and reliable for depression (13).

Anxiety was measured by the Beck Anxiety Scale (BAI). The Beck Anxiety Questionnaire is a self-report questionnaire designed to measure the intensity of anxiety in adolescents and adults. The BAI scores are classified as minimal anxiety (0 to 7), mild anxiety (8 to 15), moderate anxiety (16 to 25), and severe anxiety (30 to 63). The studies conducted by Rafiei et al. show that this questionnaire has high validity and reliability (14). Considering the age of patients and the fact that orthosurgery treatment is performed in adult patients, using this scale is more suitable than scales such as Spielberger's State-Trait Anxiety Inventory (STAI). Also, the same scale has beenused in other similar studies on the relationship between BDD and orthosurgery.

Data description was done by using appropriate statistical tables and graphs to express indicators and frequency distribution. Shapiro-Wilk, Mann-Whitney, Kruskal-Wallis, and Fisher tests were used in data analysis. The study was explained to the participants, and only those who were willing to participate in the project were included in the study. It was explained to the participants that cooperation in this study is completely voluntary, and their non-participation has no adverse effect on their treatment process.

Results

This study was conducted on 86 patients presenting for orthodontic treatment via orthosurgery and who were referred to the Dental Clinic of the Mashhad University of Medical Sciences. Table 2 describes the studied variables.

Next, the normality of data distribution of age, BDD, anxiety, and depression variables in the compared groups was investigated using the Shapiro-Wilk test. Based on this, it was found that most of the

variables had a non-normal distribution.

In Table 3, age does not have a statistically significant relationship with BDD, depression, and anxiety variables. BDD has a direct and significant relationship with depression and anxiety (p<0.001 for each variable). Depression has a direct and significant relationship with anxiety (p<0.001).

Table 4 shows the number, mean, standard deviation, median, interquartile range, the lowest and highest variable of the mean scores of BDD, depression, and anxiety by gender, marital status, and education. The average scores of BDD, depression, and anxiety between men and women were not significant (p=0.685, p=0.531, p=0.387, respectively). The average scores of BDD, depression, and anxiety between the different marital statuses were not significant (p=0.895, p=0.602, p=0.622,respectively). The average score of BDD, depression, and anxiety between various education levels was not significant (p=0.805, p=0.341, p=0.557, respectively).

Table 1. Description of the studied variables

Variable		Number	Percentage
Gender	Male	37	43
	Female	49	57
Marital status	married	21	24/4
	Single	61	70/9
	With a history of divorce	4	4/7
Education	High school	11	12/8
	Diploma and postgraduate diploma	41	47/7
	Bachelors and Masters	31	36
	PhD and above	3	3/5
BDD	No	71	82/6
	Yes	15	17/4
Depression	does not have	70	81/4
	mild	11	12/8
	moderate	4	4/7
	intense	1	1/2
Anxiety	does not have	60	69/8
	mild	19	22/1
	moderate	7	8/1

Table 2. The relationship between age, BDD, depression and anxiety (number=86)

Variable	BDD	Depression	Anxiety
Age	Rsp = - 0.172 p = 0.113	Rsp = - 0.148 p = 0.174	Rsp = - 0.076 p= 0.489
BDD		Rsp = 0.578 P < 0.001	Rsp = 0.552 P < 0.001
Depression			Rsp = 0.726 P < 0.001

Rsp: Spearman's correlation coefficient

P: P-value

Table 3. Comparison of BDD, depression and anxiety according to gender, marital status and education level

Variable		Number	Mean ± SD	Median (interquartile range)	p-value
Gender	Male	37	12.97± 7.82	12/0 (8/0)	0.685
	Female	49	13.84±8.20	13/0 (10/0)	
BDD	married	21	13.95±8.57	12/0 (6/0)	
marital status	Single	61	13.23±7.99	13/0 (9/0)	0.895
With a history of divorce		4	14.50 ±6.56	14/0 (12/0)	
education	High school	11	14.55 ±7.76	15/0 (8/0)	0.805
	Diploma and postgraduate diploma	41	13.12±7.56	12/0 (7/0)	
	Bachelors and Masters	31	13.42±8.89	12/0 (11/0)	
	PhD and above	3	14.67±8.96	10.0 (00.0)	
Gender	Male	37	8.70±7.14	5/0 (12/0)	0.531
	Female	49	7.57±7.20	5/0 (5/0)	
	married	21	7.48±6.15	5/0 (11/0)	
marital status	Single	61	8.28±7.70	5/0 (6/0)	0.602
Depression	With a history of divorce	4	7.75±3.10	7/0 (6/0)	
	High school	11	6.55±3.75	6/0 (4/0)	
education	Diploma and postgraduate diploma	41	8.02±6.20	6/0 (7/0)	0.341
	Bachelors and Masters	31	8.16±9.13	5/0 (8/0)	
	PhD and above	3	13.00±6.08	16.0 (00.0)	
Gender	Male	37	7.46±5.11	6/0 (5/0)	0.387
	Female	49	6.55±3.93	5/0 (5/0)	
	married	21	6.43±4.51	5/0 (6/0)	
marital status	Single	61	7.13±4.60	6/0 (5/0)	0.622
Anxiety	With a history of divorce	4	6.75±2.22	6/0 (4/0)	
	High school	11	7.36±2.66	6/0 (6/0)	
education	Diploma and postgraduate diploma	41	6.54±3.99	5/0 (4/0)	0.557
	Bachelors and Masters	31	7.13±5.40	5/0 (7/0)	
	PhD and above	3	9.00±7.00	(00.0)	

Discussion

The main aim of the present study was to investigate the prevalence of BDD in orthosurgery patients. Other objectives pursued in the study included measuring the level of anxiety and depression in the targeted population and investigating the relationship between anxiety, depression, and BDD.

This cross-sectional study was conducted on 86 orthosurgery patients who were in the initial orthodontic stage before surgery. The main findings of the study after data analysis are stated.

The prevalence of BDD in the studiedpopulation was 17.4%. With increasing age, thescores of each variable of BDD, depression, and anxiety decrease slightly, but this difference was not statistically significant. The prevalence of BDD in women (20%) was higher than in men (14%), butthis difference was not statistically significant. The prevalence of BDD was higher in those with a history of divorce (25%) than in married individuals (19%) and in married individuals more than single individuals (16%), but this difference was not significant. The prevalence of BDD was higher in those with higher education than in individuals withlower education, but the difference was notsignificant.

Sixteen patients (18.6%) had depression, and 26 (30.2%) had anxiety. The prevalence of depression was significantly higher in those with BDD (53%) than in those without this disorder (11%). The prevalence of anxiety was significantly higher in

individuals with BDD (67%) than in those without this disorder (23%). There was no statistically significant difference in the prevalence of depression and anxiety according to age, gender, marital status, and education level in the studied patients.

Based on marital status, the highest average score of BDD and the highest prevalence of this disorder were found in patients with a history of divorce. Just as personality traits are one of the important factors in divorce, divorce also has a great impact on life, mental state, and personality traits of the person in question. In this study, the relationship between the history of divorce and BDD was not significant, which may be due to the small sample size. By conducting specific studies on individuals with a history of divorce and their relationship with BDD, more reliable results can be achieved in this matter.

Based on educational status, the highest average score of BDD was related to individuals with a PhD degree or higher. The lowest percentage of prevalence of this disorder was related to individuals who have an education below a high school diploma, and the highest percentage of prevalence was related to individualswith a PhD and higher. As the level of education increased, the prevalence of BDD increased. The elevation of one's education level, and subsequently the change in an individual's social status, may cause a person to pay more attention and focus on their appearance and move towards idealism regarding appearance. However, this relationship was not significant in the present study.

In the review of similar articles, we examined two studies that investigated the prevalence of BDD in orthosurgery patients. Published studies on BDD in orthosurgery patients are limited to these two studies. Vulink et al conducted a study in 2008 on 160 orthosurgery patients in the Netherlands to investigate the prevalence of BDD. The diagnostic tool in this study was a 20-question questionnaire (BDD questionnaire). According to the results of this study, the prevalence of this disorder in the studied population was 10%. There was no significant relationship between BDD and age, sex, marriage, or history of previous treatments (7).

Collins et al. conducted a study in 2014 on 99 orthosurgery patients in the USA to investigate the prevalence of BDD and its relationship with anxiety, depression, and OCD.

The diagnostic tools used in the Collins study were for BDD: Body Image Disturbance Questionnaire (BIDQ), for anxiety: Beck Anxiety Inventory (BAI), for depression: Patient Health Questionnaire-9 (PHQ-9), and for OCD: Florida Obsessive Compulsive Index (FOCI). According to the results of this study, there was no significant relationship between BDD and age, sex, marriage, and history ofprevious treatments. The prevalence of this disorder in the studied population was 13%. A significant correlation was observed between BDD and anxiety, depression, and OCD. Also, there was no significant relationship between BDD and age, sex, race, and marriage (8).

Comparing the results of the present study with the two reviewed studies shows that there is no significant relationship between BDD and age, sex, race, and marriage in any of these three studies. Also, the present study, like the Collins study, investigated BDD and its relationship with anxiety and depression. Although the diagnostic tools in the present study are different from the Collins study and only the anxiety diagnostic scale (BAI) is similar, the results of these two studies regarding the relationship between BDD and depression and anxiety are similar. Both show that BDD has a significant direct relationship with anxiety and depression. This means that in the group of patients who have this disorder, the level of anxiety and depression is higher than in the group who do not have this disorder.

One of the limitations of the present study is the limited sample size. Considering that the samples were derived from patients referred to the Dental Clinic of the Mashhad University of Medical Sciences, the samples do not represent the true population, which limits the external validity of the study. Therefore, the prevalence of BDD reported here may be different from the general population.

Conclusion

The prevalence of BDD in the studiedpopulation was 17.4%. BDD has a direct and significant relationship with depression and anxiety. In other words, individuals with BDD have more depression and anxiety than those without this disorder. No statistically significant difference was observed in the prevalence of BDD according to age, gender, marital status, and education level in the studied patients. There was no statistically significant difference in the prevalence of depression and anxiety according to age, gender, marital status, and education level in the studied patients.

Conflicts of interest: None to declare.

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