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Body Dysmorphic Disorder in patients undergoing septorhinoplasty surgery. Should we be performing routine screening?

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Running Title: This is a prospective cohort study using the validated body

dysmorphic disorder questionnaire to screen for the prevalence of this condition in septorhinoplasty patients. We provide a model for their management discuss the benefits of operating on such patients.

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## Introduction

People with body dysmorphic disorder (also known as BDD) have a preoccupation with a perceived defect in their appearance. The “flaws” are often either a normal physical variation, or appear objectively only slight to others, yet cause enormous shame and interference in the person’s life.<sup>1</sup> The prevalence of BDD in the general population is approximately 2%.<sup>2</sup> Those affected have much higher rates of cosmetic surgery and suicidal ideation than the general population. The average age of onset is in mid-to-late adolescence but it takes on average 10 years before psychiatric treatment is received<sup>3,4</sup>.

Patients with BDD perform repetitive behaviours such as mirror gazing and have clinically significant distress and impairment in their ability to interact socially and at work<sup>5</sup>. In the diagnosis of BDD, the preoccupation must not be better accounted for by another mental health disorder such as body image problems in anorexia nervosa<sup>6</sup>. To fulfil diagnostic criteria individuals must think about their area of concern for more than 1 hour per day<sup>5</sup>. The mainstay of treatment for those

diagnosed with BDD is cognitive behaviour therapy<sup>7</sup> with medical treatment with a selective serotonin re-uptake inhibitor usually reserved for those who do not respond to this treatment<sup>8</sup>.

Many sufferers present to various specialists such as ear, nose and throat, plastic and maxillofacial surgeons as well as dermatologists with the aim of having the perceived cosmetic defect corrected in the hope that it will improve their quality of life. However satisfaction with cosmetic surgery is highly unlikely and unpredictable in this group of patients<sup>9</sup>. As such, it is critical to identify these patients as early as possible and certainly before any surgery is considered. A study in a dermatology clinic found the rate of BDD among those seeking cosmetic treatment of 14%<sup>10</sup>.

In our large septorhinoplasty practice, experience has shown undiagnosed BDD often results in poor patient satisfaction. The nose is the most common area of concern (56% of patients) among those with a diagnosis of BDD<sup>11,12</sup>.

Method:

Ethical Considerations:

Ethical approval was sought and obtained from our local ethics board.

Objectives:

The main objective was to determine the prevalence of those at risk of body dysmorphic disorder in our practice and whether surgical correction could be considered in these patients

Design:

A prospective cohort study

Setting:

The study was carried out in our tertiary referral rhinology and facial plastics surgery unit at the Royal National Throat, Nose and Ear Hospital in collaboration with the clinical psychology team of the Plastic & Reconstructive Surgery Department of the Royal Free London NHS Foundation Trust.

Participants and Data Collection:

This prospective study was conducted over a 6 month period from September 2014 to March 2015. All patients who were referred to the tertiary level specialist rhinology clinic for consideration of septorhinoplasty surgery for both cosmetic and functional concerns were asked to participate in the study and to give verbal and written consent.

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Patients were asked to complete the body dysmorphic disorder questionnaire (BDDQ) (figure 1) which is a validated screening questionnaire for identifying BDD.

In order to screen positive on the BDDQ the person must answer yes to the first 2 questions, which indicates that they are worried about how they look and wish they could think about their appearance less. Their main concern must not be that they are too fat. The person must then answer yes to at least 2 of the next 4 questions showing evidence of a significant impact on their daily life. In the final question, they must indicate that they think about their appearance either for 1-3 hours or greater than 3 hours per day. The BDDQ has been shown to have a sensitivity of 100% and specificity of 90% for detecting BDD<sup>10</sup>, although its use is as a screening tool and further assessment by an appropriate professional is required to diagnose BDD.

Patients were also asked to complete the sino-nasal outcome test 23 (SNOT-23)<sup>13</sup>. We also performed nasal inspiratory peak flow (NIPF) measurements on all our patients as an objective measure of nasal patency<sup>14</sup>.

Patients underwent consultation with the clinician and those with a high risk of having BDD were referred to the clinical psychologist, if they consented to this. Following this, the patient was then reviewed again in the rhinology clinic and a management plan was agreed based on the clinical findings and the recommendation of the clinical psychologist.

## Controls

We recruited 50 consecutive patients from an otology clinic in whom it was confirmed there was no rhinological history and performed the same screening assessment for BDD with the BDDQ.

## Statistical Methods:

Data was collected using Microsoft Excel and statistical analysis was carried out using SPSS release 21.0 for Windows (SPSS Inc., Chicago, IL, USA). Statistical significance was attributed when  $p < 0.05$ . All results are described as means and standard deviations unless otherwise stated.

## Results:

We recruited 84 patients consecutively into the study. A total of 34 were from the rhinology clinic and had been referred for consideration of septorhinoplasty surgery.

Their mean age was 36.8 [ $\pm 12.3$ ] with 23 (67.6%) males and 11 (32.3%) females.

The mean age of our control group was 51.8 [ $\pm 21.7$ ] of whom 22 (44%) were males and 28 (56%) were females

Of the rhinology patients, 11 (32%) were positive on the BDDQ score indicating a high risk for BDD. 6 of these were male (26% of the total number of males) and 5 were female (45% of the total number of females).

They were all referred for psychological assessment following which 7 (63%) patients were felt to be unsuitable for surgery and were offered psychological treatment by the clinical psychology team.

The mean age in the BDD positive group was 31.8 [ $\pm$ SD] compared to 39.2 [ $\pm$ SD] in the BDD negative group. The subjective patient outcome scores were significantly higher in the BDD positive group than the negative group indicating a greater negative impact on quality of life (SNOT 23: 83.8  $\pm$ 14.3 v 39.4  $\pm$  22.4;  $p < 0.01$ ;  $r=0.521$ ). When we compared the nasal inspiratory peak flow measurements between the groups, there was no significant difference between the BDD positive group and the BDD negative group [NIPF 68.2  $\pm$  25.6 v 82.2  $\pm$  31.9;  $p < 0.2$ ].

In the control group, 2 patients were identified as high risk for BDD, both of whom were female. They all screened negative for rhinological problems indicating no concern with their nose. The prevalence of BDD in the control group as a whole was 4%, all of whom were females.

Many of the patients in this study have not yet undergone their surgery or are only in the early post-operative phase.

There is one patient who was negative on the BDDQ pre-operatively although he did admit to thinking about his nose for 1-3 hours per day. His motivation for surgery was to improve nasal function. This aim was achieved but there was an unintentional

change to his external appearance. His post-operative BDDQ was strongly positive, stating that he now thinks about his appearance more than 3 hours per day.

## Discussion

### Synopsis of key findings

This prospective study has shown a prevalence of 32% of people at high risk of BDD according to the body dysmorphic disorder questionnaire (BDDQ). When gender is taken into account, the prevalence increases amongst females to 45% and decreases to 26% amongst males. The prevalence in our control group was 4% with a higher proportion once again in female patients.

Our study revealed that 63% of those referred for psychological assessment were confirmed to have a presentation consistent with a BDD diagnosis and deemed not to be suitable for nasal surgery as it was felt they would have a poor outcome from a mental health perspective. The remaining patients in the surgery cohort (36%) did exhibit elements of BDD, though it was believed they had realistic functional, aesthetic and psychosocial expectations of what could be achieved through surgery, so that the risk of dissatisfaction was low post-operatively.

We also showed that a high index of clinical suspicion should always remain in spite of a low risk on the BDDQ. In our cohort, we had one patient who developed BDD post-operatively in spite of having a good functional and aesthetic outcome. In



hindsight, he did show a tendency to this condition pre-operatively as although he claimed to have no cosmetic concerns, he admitted to thinking about his appearance for 1-3 hours per day. Attention to any ruminative component is therefore vital as it is one of the essential criteria for a BDD diagnosis. The nature of the BDDQ is such that we expect a number of false positives, however this finding will ensure that we maintain a high index of suspicion for BDD and refer patients on for psychological assessment in spite of a normal BDDQ in the future.

Poirrier et al validated the SNOT 22 questionnaire in the septorhinoplasty population and demonstrated that the emotional questions (frustration and embarrassment) were highly relevant and equally improved following septorhinoplasty surgery<sup>15</sup>. This led to the validation of the SNOT 23 questionnaire. In this study, we utilised the SNOT-23 questionnaire as this has been validated for assessing quality of life in patients undergoing septorhinoplasty surgery<sup>13</sup>. The additional question in this latest version of the questionnaire asks whether the patient is concerned about the appearance of their nose. The SNOT-23 scores were significantly higher in the BDD positive group indicating that they felt that their quality of life was much poorer due to the nasal problem. It is the nature of subjective questionnaires that they are dependent on the individual patient's perception of the problem. Therefore in a patient suffering body dysmorphic disorder related to the nose it would be expected that subjective impairment scores would be higher. It also highlights the difficulty in producing an objective measure of nasal blockage that correlates with subjective evaluation.

Interestingly, the bilateral NIPFs in the BDD group were lower than the non BDD group which, although non-significant, imply increased nasal blockage. However, this does highlight the difficulty in producing an objective measure of nasal blockage that equally correlates with the subjective evaluation of nasal blockage but also measures nasal airflow without patient effort<sup>16</sup>.

While all the patients with BDD answered 'yes' to the question about concerns with appearance of the nose, many of those without BDD gave the same answer. Therefore this question alone could not be used to screen for this condition.

#### Strengths of the study

We know from the literature that patients undergoing septorhinoplasty surgery have a high prevalence of BDD<sup>9</sup>. We perform a large number of septorhinoplasty procedures (> 450/year) in our tertiary referral unit and therefore have a large cohort of patients to recruit from. Although the study was carried out over a 6 month period, we only recruited new patients for the first 2 months. The remaining time was used to follow up the participants. Along with the fact that the pressures of a busy clinic make it difficult to capture all potential participants, this is why the numbers of patients in the study are relatively small.

We are fortunate to work collaboratively with the clinical psychology team of the Plastic & Reconstructive Surgery department which is able to support our practice. In future studies we aim to show that our treatment pathway ensures patients with BDD

are identified and offered appropriate treatment before surgery is considered. This will be achieved with the use of a scale that can show a change in score between the pre and post treatment such as the Cosmetic Procedure Screening Questionnaire<sup>17</sup>. We have a robust system in our unit ensuring that all patients who scored positive on the BDDQ are referred for an assessment by a clinical psychologist. The findings of this study confirm that this process is working effectively. We have also shown that patients with BDD have a poorer quality of life as highlighted by the higher SNOT-23 scores.

#### Comparison with other studies

The finding that 32% of patients referred for consideration of septorhinoplasty surgery to our clinic are at high risk of BDD is higher than expected compared to other studies. However, if we exclude those patients who were assessed as appropriate for surgery, with only borderline BDD, the prevalence is reduced to 20.6%.

Seven previous studies<sup>12,18,19,20,21,22,23</sup> ( $n = 1,001$ ) have examined the prevalence of BDD in rhinoplasty surgery candidates. It ranges from 1.8%<sup>19</sup> to 31.5%<sup>20</sup> which represents a high degree of uncertainty. Veale et al (in submission)<sup>24</sup> calculated a weighted prevalence of 20.1% in these studies with a wide confidence interval (9.9 - 36.7). There was a slightly higher prevalence among males (18.4%) than females (16.7%), with the ratio being 0.91.

A number of factors may have led to there being such a broad range in prevalence of BDD; there was no consistency in the methods of assessment to screen for BDD or in its diagnostic criteria. There could be problems of inter-rater agreement in defining a 'defect' that is not significantly noticeable due to differences in defect evaluation. Also, none of the studies showed prospective evaluation of post-treatment satisfaction or persistence of BDD.

These problems could be mitigated by the use of a standardised assessment for rhinoplasty<sup>25</sup>. This could involve an evaluation of the degree of discrepancy between the patient's assessment of their appearance compared to the clinical rating of the perceived defect<sup>26</sup> or compared to ideal ratings<sup>27</sup> would potentially be of use. Along with similar assessments for post-operative outcome this could help determine if these measures can be used in the diagnosis of BDD or are better predictors of dissatisfaction.

We found a prevalence of BDD in the control group of 4%. A study in Germany of over 2500 participants found a prevalence of 1.8%<sup>4</sup>. A North American study found a prevalence of BDD of 2.4% which, as we also found, showed higher rates among women (2.5%) compared to men (2.2%)<sup>28</sup>. The finding of an increased prevalence in this study could be because the BDDQ picks up mild cases of BDD. This is indicated in the treatment group by the fact that a number of patients who were positive were, following evaluation by a clinical psychologist, deemed suitable for surgery. A study proposing a framework for psychological assessment of patients requesting cosmetic surgery found that appearance related distress is more prevalent in London than other parts of the country<sup>29</sup>. This may also have had an impact on prevalence of BDD in this study.

## Clinical applicability of the study

Through this study we have shown that the BDDQ is a valid tool for identifying patients at risk of BDD. An experienced rhinologist may be able to make a judgement as to the suitability of a patient for surgery based on an assessment in the clinic. However this questionnaire is of particular use to the less experienced rhinologist and also in those cases where it is more difficult to identify if there is a problem.

We have also shown the great advantage of having a close working relationship with a clinical psychologist. In our study the clinical psychologists confirmed that 63% of those patients referred with a positive score on the BDDQ were probably not suitable for surgery. However they felt that the remaining 36% were suitable. In certain cases the suitability was initially withheld until after a number of sessions with the psychologist. Issues that could be addressed during these sessions included helping those with a compulsive element to their condition where they frequently touch the nose. It was also possible to discuss in detail with the patient the realistic aims of the surgery, both functionally and cosmetically. The psychologist could then confidently confirm that the risk of post-operative dissatisfaction was low. The psychologist also helped the patient to consider how to manage in the event that there is a complication so that at least some of their expectations of surgery would be unmet.

Within the National Health Service it is usually only reasonable to be offering functional septorhinoplasty to patients. However, inevitably there is often a cosmetic component to the procedure as a change to the external appearance is sometimes essential to improve function.

## Conclusion

Body dysmorphic disorder is a diagnosis that needs to be identified to ensure patients undergo appropriate treatment in the form of cognitive behaviour therapy and SSRI medication where required. Patients that are not identified and undergo cosmetic procedures have been shown to be more dissatisfied and it can worsen their BDD presentation. We have shown that the prevalence of undiagnosed BDD is high in patients undergoing septorhinoplasty surgery as identified by the body dysmorphic disorder questionnaire and feel that clinicians undertaking these types of procedures should consider utilising the BDDQ in routine practice as well as maintaining a high index of suspicion.

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Figure 1: Body Dysmorphic Disorder Questionnaire

BDDQ Questions	
1. Are you very worried about how you look?	Yes/No
2. Do you think about your appearance problems a lot and wish you could think about them less?	Yes/No
3. Is your main concern with how you look that you aren't thin enough or that you might get too fat?	Yes/No
4. How has this problem with how you look affected your life?	-
a) Has it often upset you a lot?	Yes/No
b) Has it often gotten in the way of doing things with friends or dating?	Yes/No
c) Has it caused you any problems with school or work?	Yes/No
d) Are there things you avoid because of how you look?	Yes/No
5. How much time a day do you usually spend thinking about how you look? (Add up all the time you spend, then circle one)	a) < 1h/day b) 1-3h/day c) > 3h/day