Symptoms of body dysmorphic disorder among people presenting for cosmetic dental treatment: a comparative study of cosmetic dental patients and a general population sample

de Jongh, A.; Aartman, I.H.A.; Parvaneh, H.; Ilik, M.

DOI
10.1111/j.1600-0528.2009.00469.x

Publication date
2009

Document Version
Submitted manuscript

Published in
Community Dentistry and Oral Epidemiology

Symptoms of body dysmorphic disorder among people presenting for cosmetic dental treatment

A comparative study of cosmetic dental patients and a general population sample

A. De Jongh

I.H.A. Aartman

H. Parvaneh

M. Ilik

[1]Department of Social Dentistry and Behavioural Sciences, Academic Centre for Dentistry Amsterdam, the Netherlands.

* Corresponding author:
Ad de Jongh, PhD, Department of Social Dentistry and Behavioural Sciences, Academic Centre for Dentistry Amsterdam, Universiteit van Amsterdam, Louwesweg 1, 1066 EA Amsterdam, The Netherlands, Telefax: +31-20-5188233, E-mail: a.de.jongh@acta.nl

De Jongh A, Aartman IHA, 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.

Abstract

Objectives: To determine appearance concerns of patients presenting for cosmetic treatment. *Methods:* This cross-sectional comparative study included consecutive patients of six different cosmetic clinics (n = 170), and a sample of the general population (n = 878). A study-specific self report questionnaire was administered to document demographic and appearance concerns. Presence of Body Dysmorphic Disorder (BDD) was assessed based on DSM-IV criteria. *Results*: Cosmetic dental patients did not differ from the reference sample with regard to happiness, and satisfaction with their appearance. However, differences were found with regard to frequency of previous general cosmetic (16.5 % *vs* 5.9 %) and cosmetic dental (47.9 % *vs* 24.8 %) procedures. Furthermore, a significantly higher proportion of the cosmetic dental patients sufficed for the two key screening criteria of BDD (9.5 % *vs* 5.5 %), and for the full diagnostic screen of BDD (4.2 % *vs* 1.5 %) compared to the respondents of the reference group. *Conclusions*: The results suggest that symptoms of BDD are relatively common among patients attending cosmetic clinics. It is important to assess the long-term effects of comprehensive cosmetic procedures, particularly in patients with disproportionate appearance concerns.

Key words: Body Dysmorphic Disorder (BDD); Esthetic dentistry; Cosmetic procedures; Physical appearance, Cosmetic surgery

Introduction

In our society the emphasis on appearance proves to become increasingly important. The relationship between peoples' physical appearance and the manner in which one is treated throughout life is expressed in the finding that people make decisions in favour of those who are physically attractive (1-3). The more attractive people are, the more likely it is that they have higher status jobs, make more money, and describe themselves as being happy (4). In that light, it is conceivable that people have a strong urge to look their best and that there has been a strong increase in the performance of surgical (e.g., breast augmentation and liposuction) and non-surgical cosmetic procedures (e.g., Botox injections and laser hair removal) (5).

Also in the area of dentistry there is a trend with more people being prepared to improve their physical appearance. A survey among 879 Dutch citizens of 16 years and older revealed that, while about a quarter of the respondents indicated to have ever undergone one or more cosmetic dental treatment(s) in their whole life, about 9 percent indicated to consider cosmetic dental treatment in the coming year (6). These figures suggest that cosmetic dental procedures are among the most prevalent non-surgical cosmetic procedures.

People's need to improve certain aspects of their physical appearance may have a psychological background. Although this seems obvious, scientific support for this idea is lacking. The results of one of the few studies that have been conducted to establish the relationship between psychological variables and dental appearance suggest that the more dissatisfied people are about their appearance, the more unhappy they are about their general physical appearance, and the appearance of their teeth (7). Another study found that people who were dissatisfied with their dental appearance were more likely to undergo dental treatment to improve this imperfection

(8). These findings suggest that unhappiness and dissatisfaction with appearance may motivate people to modify facial or dental aesthetics and seek cosmetic care.

There is considerable evidence to suggest that cosmetic surgery patients typically present with concerns regarding their appearance or suffer from a psychopathological condition termed Body Dysmorphic Disorder (BDD; 9-11). BDD has an estimated prevalence of 1 to 2% in the general population, and is characterized by a distressing or impairing preoccupation with a slight or imagined defect in appearance (12). BDD appears to be associated with severe disruptions of self-esteem and high rates of suicidal ideation and suicide attempts (13).

As far as we are aware, aside from a few case reports of dental patients suffering from BDD (e.g., 14-15), only one study has examined perceived body image concerns and prevalence of BDD characteristics of individuals in relation to dental treatment (6). The two significant predictors for the intention to undergo cosmetic dental surgery in the forthcoming year were having undergone cosmetic treatment in the past and a preoccupation with a perceived defect in one's physical appearance People who reported being preoccupied with a flaw in their appearance were 9 times more likely to consider teeth whitening, and 6 times more likely to consider orthodontic treatment than those without such an appearance concern. Thus, preoccupation with one's physical appearance may be a motivating factor to undergo cosmetic dental procedures. However, this study was limited as people who indicated to consider cosmetic dental procedures in the near future may eventually decide not to undergo such treatments, because of costs or other reasons.

The present study is one of the first investigations to examine appearance concerns of patients attending a cosmetic dental clinic for an aesthetically motivated dental treatment. It was hypothesized that dental patients requesting cosmetic

treatment (1) would generally be less happy (2), would be less satisfied with their appearance, (3) had undergone more previous cosmetic treatments, and (4) would be more likely to display DSM-IV characteristics of BDD, than individuals in the general population.

Methods

Participants

The sample consisted of 170 patients of six different cosmetic clinics, 64 men (37.6%) and 106 women (62.4%) of 16 years and older. All patients were self-referred.

The reference sample consisted of 878 Dutch citizens (55% women) of 16 years and older whose data were obtained by means of a survey (15).

Procedure

The study was carried out between May and October 2006. First, an inventory was made of cosmetic dental clinics in the Netherlands advertising on the Internet. All 49 clinics were contacted by telephone for participation in this study. In addition, an information pack about the study and its aims was sent by mail. After 10 days these clinics were contacted again by telephone. Six clinics ultimately agreed to participate in the study.

Every patient presenting for anterior and full mouth (makeover) reconstructions, teeth whitening and the placement of crowns and veneers (6% of the treatments involved orthodontic treatments, 18% teeth whitening, 36% the placements of crowns, 34% crowns in combinations with other treatments, and 6% miscellaneous) and who had an appointment with a dentist in one of the six clinics during the recruitment

phase was approached individually on the day of their appointment in the waiting room.

The study was conducted in accordance with the Declaration of Helsinki. Patients were asked whether they would be willing to participate in a study involving cosmetic dentistry. Written informed consent was obtained from all patients who agreed to participate following explanation of procedures and possible side effects. Participants were handed the questionnaires and given standardized verbal instructions on how to complete these. There were no exclusion criteria, with the exception of inability to complete assessment measures due to cognitive limitations, being under the age of 16 years or insufficient command of the Dutch language. None of these patients fulfilled the exclusion criteria of the study. Of the 204 patients approached, 170 were willing to participate, while 34 patients refused to take part in the study.

The data from the reference group were derived from a study on cosmetic dentistry among subjects drawn from the Dutch general population (6). They were randomly approached in public places (e.g., supermarkets, cafés, parks and shopping malls, etc.) previously selected to provide a geographically diverse sample (e.g., both urban and rural areas) and sufficient opportunity to complete the questionnaire. If the potential participant agreed to participate, was over 16 years old, and had sufficient command of the written Dutch language, he/she was requested to fill out the same questionnaire as the patients did.

Measures

A structured survey instrument used in our previous study (6) was administered to all study participants. This survey contains 38 items and takes approximately 20 minutes to complete. Demographic variables included participants' age, gender,

marital status, and race/ethnicity, history of cosmetic procedures and dental cosmetic treatments (i.e., jaw correction operations, orthodontic treatments, crowns, facings, whitening, and combinations of these treatments) and the intention to undergo these treatments. Other items pertained to the extent to which the person feels happy (‘very happy, ‘happy’, ‘happy nor unhappy’, ‘unhappy’, ‘very unhappy’), the relative importance of his/her bodily and dental appearance (‘very important, ‘important’, ‘important nor unimportant’, ‘unimportant’, ‘very unimportant’), and the extent to which he/she is satisfied with his/her (dental) appearance (‘very satisfied', 'satisfied’, ‘satisfied nor dissatisfied’, ‘dissatisfied’, and ‘very dissatisfied’). Similar questions were asked about past and future cosmetic dental procedures, and the extent to which the subjects were satisfied with their most recent cosmetic treatment. The research participants were asked to indicate the extent to which these statements applied to them on five point Likert-type scales.

A number of screening questions pertained to features of Body Dismorphic Disorder (BDD). To assess these features the criteria of the *Diagnostic and Statistical Manual for Mental Disorders* (DSM IV-TR, 11) were applied using the same format as used in our previous study (6). The items assess the following symptom criteria: I. Preoccupation with an imagined flaw in appearance. If a slight physical anomaly is present, the person's concern is markedly excessive. II. The preoccupation causes clinically significant distress or impairment in social, occupational, or other important areas of functioning. Preoccupation with a *defect* in appearance was assumed present if the respondent answered the following question in the affirmative: “Are you preoccupied with the idea that your body or a part of your body is unattractive, ugly, deformed or not beautiful enough?” When this question was answered negatively the patient could not fulfill the criteria for BDD and therefore further questions were

skipped. Those who answered the first question affirmatively proceeded to answering four more questions. Firstly, to obtain a conservative check as to whether or not the defect in appearance was mainly or solely the perception of the respondent (an '*imagined defect*') the following screening question was used: "Do you remain convinced that your body or a part of your body is unattractive, ugly, deformed or not beautiful enough even though others are convinced that this is not true?" Secondly, three additional questions assessed distress or impairment in social (e.g., "Does the preoccupation with your appearance cause distress or does it interfere in the way you relate to others?), occupational or other important areas of functioning. Current probable BDD was specified when individuals reported a combination of being preoccupied with the idea of a defect in appearance, holding on to the conviction of being unattractive despite the fact that others say that this is not true, and reporting distress related to the preoccupation or interference in at least one area of daily functioning. A field trial investigating the use of these items as a screening instrument for BDD against the Structured Clinical Interview for DSM-IV (MINI+) as gold standard for the detection of BDD revealed excellent sensitivity (1.0) and very good specificity (0.92) (16).

Statistical analyses

Data from individuals attending a cosmetic dental clinic were compared with those of the reference group on all outcome measures. Gender differences were reported when present. Chi-square tests were used for nominal variables and the Mann-Whitney U test (z-scores) for the ordinal scales. Spearman's rho was used for calculating correlations between ordinal scales. SPSS version 14.0 was used for all analyses. A *P* value of less than 0.05 was considered to indicate statistical significance in almost all

analyses. To reduce the likelihood of a Type I error a *P* value of less than 0.01 was considered as the level of significance in case of multiple testing.

Results

Table I presents the demographic characteristics of the participants of the two samples. Within the group of cosmetic dentistry patients there were significantly more Dutch than non-Dutch persons (X^2=15.51, df=1, p<0.001), and more persons were in a relationship (X^2 = 5.94, df = 1, p = 0.015) than not. In both samples the majority was Dutch. The distribution of gender, marital status and race/ethnicity of the reference sample was comparable with the figures published by the Dutch Central Bureau of Statistics in the Netherlands (17).

Between the group of cosmetic dental patients and the reference sample no significant differences were observed in terms of gender, country of birth and marital status. The mean age of the clinical sample was 45.8 years (SD = 15.5) which proved to be significantly higher than that of reference sample (M = 33.2; SD = 13.7; t = 9.89, df = 9.89 adjusted for unequal variances, p < 0.001).

Table I about here

Happiness

Of the 169 subjects assessed, the majority (79.3%) reported being happy or very happy at the moment of completing the questionnaire. The clinical sample and the reference group did not differ with regard to their sense of happiness (z=-0.84, p=0.40).

Appearance and appearance concerns

Of all cosmetic dental patients, 3.6% (n=6) reported to be dissatisfied or very dissatisfied with their general appearance, and 11.8% (n=19) with the appearance of their teeth. While both groups were equally (dis)satisfied about their general physical appearance ($z = -0.79$, $p = 0.428$), the cosmetic dental patients considered their appearance as significantly more important than the patients of the reference group ($z = -2.78$, $p = 0.005$). Post hoc analysis revealed that this difference only emerged among the female individuals ($z = -3.67$, $p < 0.001$). The proportion of the cosmetic dental patients who considered their general physical appearance as (very) important was 16.0%, against 9.8% in the reference group. Individuals of both groups did not differ regarding their (dis)satisfaction about their appearance of their teeth ($z = -0.68$, $p=0.499$), but the cosmetic dental patients deemed the appearance of their teeth as significantly more important than the respondents of the reference group ($z = -4.88$, $p<0.001$). The proportion of the cosmetic dental patients who considered their dental appearance as (very) important was 26.9%, against 12.3% in the reference group.

The proportion of the cosmetic dentistry patients who indicated that they considered one or more aspects of their body as being unattractive, ugly, deformed, or not beautiful enough was 53.6% (n = 90), which did not differ from the reference group (51.2%; $X^2 = 0.32$, df=1, $p=0.575$). Also the mean number of body parts which patients indicated as dissatisfactory did not differ ($t=-0.18$, df=533, $p=0.857$) between the clinical sample (M = 2.63, SD = 2.1, range: 0-11) and the reference group (M = 2.67, SD = 1.8, range: 0-10). Using a significance level of 1% the only difference between the sample of cosmetic dental patients and the reference group was the proportion of individuals with appearance concerns related to the mouth ($X^2 = 12.61$, df = 1, $p < 0.001$; see Table II).

Among the cosmetic dental patients a greater satisfaction with general appearance was associated with a greater sense of happiness (n = 167, r = 0.24, p = 0.002), but this relationship did not reach significance with regard to dental appearance (n = 161, r = 0.11, p = 0.174). With respect to the sample of the general population these correlation coefficients were 0.33 (n = 876, p < 0.001) and 0.12 (n = 873, p = 0.001), respectively. The association between satisfaction with general appearance and sense of happiness only emerged among the female part of the general population sample (n = 482, r = 0.15, p = 0.001).

Table II about here

Previous cosmetic (dental) treatments

The cosmetic dental patients reported significantly more frequently having had a cosmetic (dental unrelated) operation in their past to improve their general appearance (n = 28, 16.5 %) compared to the Dutch general population (n = 52, 5.9 %; X^2 = 22.26, df = 1, p <0.001). They also reported significantly more often (X^2 = 35.86, df = 1, p < 0.001) to have had some kind of cosmetic dental treatment in their past (n = 78, 47.9 % and n = 216, 24.8 %, respectively).

Characteristics of BDD

The presence of BDD criteria within both samples is displayed in Figure I. The clinical sample (n = 17, 10.1%) and the reference sample (n = 70, 8.1%) did not differ with regard to being preoccupied with the idea of being unattractive, ugly, deformed, or not beautiful enough (X^2 = 0.78, df = 1, p = 0.377). However, the cosmetic dental patients (n = 16, 9.5 %) were significantly more convinced being unattractive, ugly,

deformed, or not beautiful enough despite others denying so compared to the reference group (n = 48, 5.5 %; $X^2 = 3.89$, df = 1, p = 0.049).

Furthermore, it appeared that cosmetic dental patients were significantly more likely to experience impairment in occupational functioning (n = 4, 2.4 % vs n = 6, 0.7 %, $X^2 = 4.1$, df = 1, p = 0.042). Differences in impairment in social functioning (n = 4, 2.4 % vs n = 11, 1.3%, $X^2 = 1.19$, df = 1, p = 0.275), and the experience of marked distress (n = 5, 2.9 % vs n = 12, 1.4 %, $X^2 = 2.16$, df = 1, p = 0.142) did not reach significance.

The proportion of individuals who met the two key screening criteria of BDD was significantly higher among the individuals undergoing cosmetic dental treatment than among those of the reference group (n = 16, 9.5 % vs n = 48, 5.5 %, $X^2 = 3.89$, df = 1, p = 0.049). Post hoc analysis showed that this difference was only significant for the female patients ($X^2 = 8.65$, df = 1, p = 0.009). The held true for the full diagnostic screen of BDD (n = 7, 4.2 % vs n = 13, 1.5 %, $X^2 = 5.31$, df = 1, p = 0.021).

Figure I about here

Discussion

The results of this study suggest that dental patients requesting cosmetic treatment display a number of psychological characteristics that distinguish them from the general population in terms of number of previous cosmetic treatments, and clinical characteristics of the psychiatric condition termed Body Dysmorphic Disorder (BDD). The first two hypotheses were not supported by the present findings. That is, patients of cosmetic dental treatment did not differ from the general population regarding happiness or dissatisfaction with their appearance. This suggests that being unhappy

or dissatisfied with one's appearance is not the major component in peoples' motivation for dental cosmetic treatment. Instead, realistic aesthetic dental concerns, for instance concerning insufficient restorations and irregular tooth position, may be more important reasons to seek treatment at a cosmetic dental clinic. This notion is also reflected in the findings that the cosmetic dental patients had greater concerns regarding the appearance of their mouth than those among the general population, and that they reported to be more dissatisfied with the appearance of their teeth than with their general appearance.

The results of the present study were supportive of the third hypothesis as both samples differed significantly with regard to frequency of previous cosmetic and cosmetic dental procedures. The finding that patients in the cosmetic sample had previously sought relatively more cosmetic treatments suggests that they are generally more inclined to seek cosmetic care to satisfy their aesthetic wishes. To this end, it is conceivable that patients' preoccupation create a need (or urge) to seek treatment in order to improve their mouth-related aesthetics. This would be in agreement with other evidence suggesting that people seek cosmetic enhancement mainly because of dissatisfaction with a specific aspect of their appearance (8, 10).

To our knowledge the present report is the first empirical investigation of the prevalence of characteristics of BDD, a largely under-diagnosed yet severe psychiatric problem, among patients seeking dental treatment. In line with the fourth hypothesis, it was found that almost 1 out of 10 patients sufficed for the two key screening criteria of BDD, while 4.2% fulfilled all screening criteria of this psychiatric condition. This is significantly higher than the 1.5%, being the probable prevalence rate of BDD within the general population (6, 18). On the other hand, the rate of probable BDD found among the patients attending the cosmetic dental clinics

in the present study appears to be much lower than the 7 to 8 percent generally reported among cosmetic surgery and dermatology populations (10, 19). However, when compared to the rates reported in the few studies on patients presenting for other types of non-surgical cosmetic procedures, such as Botox injections and chemical peels, the proportion of patients meeting all diagnostic criteria of BDD in the present study is higher. For example, a study among 137 Australian patients presenting for non-surgical procedures found a rate of 2.9 percent (20). A general explanation for such a low prevalence rate may be that patients are largely secretive about their symptoms, and do not reveal these openly because of embarrassment and shame. It has also been suggested that the relatively low rate of BBD among patients presenting for non-surgical procedures may be attributable to the fact that more people with BDD present for surgery rather than less invasive procedures because they believe that their 'defects' warrant more intensive intervention (13). A more plausible explanation for the relatively low rates of positive screens for BDD in our study may be that the background of patients requesting dental appearance enhancement are more likely to be related to slight or 'normal' appearance imperfections resulting from dental deterioration through caries or other reasons than the dysfunctional or pathological appearance concerns of those requesting for example liposuction, breast augmentation, or eyelid surgery. The notion that BDD is only partially responsible for the wish to undergo cosmetic dental procedures is supported by the finding that the mean number of body parts being reported as dissatisfactory did not differ between the clinical sample and the reference group. It has been established that persons with BDD report preoccupation with a variety of body parts over the course of the disorder (21). Additional study of the rate of BDD among persons seeking dental treatment is needed as our findings awaits replication with a larger sample size.

This study suffers from several limitations. First, the cross-sectional design limits any assignment of causality. Second, few cosmetic dental clinics agreed to participate which may be a threat to generalizability. Further, although the response rate for the cosmetic dental patients was reasonable, this does not negate potential bias. For example, the fact that it was performed in a cosmetic clinic may have led to some bias with respect to patient selection. Therefore, the findings may be only generalizable to patients visiting specialized clinics and not to patients presenting for cosmetic dental treatment in general practice. Third, the proportion of patients with BDD was too small, and thus the results should be considered preliminary. On the other hand, we may be underestimating the rates of BDD because the most impaired group may have been less willing to respond. Finally, through a lack of follow-up data it is unclear whether the presence of BDD characteristics has any negative consequence for those undergoing cosmetic dental treatment.

In conclusion, although our preliminary results do not raise concern about the majority of patients requesting dental care in cosmetic clinics, they suggest that symptoms of BDD may be relatively common among patients attending a cosmetic dental setting. Given the growing availability of cosmetic dental treatment, and the fact that cosmetic procedures are more and more accepted as a means of physical enhancement, there is no reason to believe that its popularity will diminish. Therefore, also in the light of the findings from retrospective outcome studies suggesting that persons with BDD typically do not benefit from cosmetic procedures and even may have contra-productive consequences (13), we encourage future research focusing on the assessment of long-term effects of comprehensive cosmetic procedures in dental patients, particularly those with characteristics of BDD and other forms of dysfunctional preconceived aesthetic perceptions or personality traits.

References

1. Beehr TA, Gilmore DC. Applicant attractiveness as a perceived job relevant variable in selection of management trainees. Acad Manag J 1982;25:607-617.
2. Morrow PC. Physical attractiveness and selection decision making. J. Manage 1990;16:45-60.
3. Shahani C, Dipboye RL, Gehrlein TM. Attractiveness bias in the interview: Exploring the boundaries of an effect. Basic Appl Soc Psych 1993;14:317-328.
4. Umberson D, Hughes M. 'The Impact of Physical Attractiveness on Achievement and Psychological Well Being'. Soc Psychol Quart 1987;50:227–36.
5. American Society for Aesthetic Plastic Surgery. *Cosmetic Surgery National Data Bank 2007 Statistics*. New York: American Society for Aesthetic Plastic Surgery: 2008.
6. De Jongh A, Oosterink FMD, van Rood YR, Vo G, Lie SLSDF, Aartman IHA. Preoccupation with One's Appearance: A Motivating Factor for Cosmetic Dental Treatment? Brit Dent J, in press.
7. Gresnigt-Bekker C, De Jongh A, Vo G, Lie SLSDF, Oosterink FMD, van Rood YR. Welke rol speelt het gebit in het geluk van mensen? [What is the role of the teeth in people's happiness?]. Ned Tijdschr Tandheelkd, in press.
8. Klages U, Bruckner A, Zentner A. Dental aesthetics, self-awareness, and oral health-related quality of life in young adults. Eur J of Orthodont 2004;26:507-14.
9. Sarwer DB, Wadden TA, Pertschuk MJ, Whitaker LA. Body image dissatisfaction and body dysmorphic disorder in 100 cosmetic surgery patients. Plast Reconstr Surg 1998;101:1644-49.

10. Sarwer DB, Wadden TA, Pertschuk MJ, Whitaker LA. The psychology of cosmetic surgery: a review and conceptualization. Clin Psychol Rev 1998;18:1-22.

11. Sarwer DB, LaRossa D, Bartlett SP, Low DW**,** Bucky LP, Whitaker LA. Body image concerns of breast augmentation patients. Plast Reconstr Surg 2003;112:83-90.

12. American Psychiatric Association. Diagnostic and statistical manual of mental disorders, (DSM-IV-TR). Washington, DC: American Psychiatric Association; 2000.

13. Crerand CE, Franklin ME, Sarwer DB. Body dysmorphic disorder and cosmetic surgery. Plast Reconstr Surg 2006;118:167-80.

14. De Jongh A, Adair P. Mental disorders in dental practice: A case report of body dysmorphic disorder. Special Care Dent 2004;24:61-4.

15. Cunningham SJ, Feinmann C. Psychological assessment of patients requesting orthognathic surgery and the relevance of body dysmorphic disorder. Br J Orthod 1998;25:293-8.

16. Van Rood Y R, Den Hollander-Gijsman M E, De Jongh A, De Beurs E. Development and validation of a screening instrument for body dysmorphic disorder, the SI-BDD. Submitted for publication.

17. Dutch Central Bureau of Statistics. *Population figures*. Heerlen: Centraal Bureau voor de Statistiek; 2007; http://statline.cbs.nl/StatWeb.

18. Rief W, Buhlmann U, Wilhelm S, Borkenhagen A, Brahler E. The prevalence of body dysmorphic disorder: a population-based survey. Psychol Med 2006;36:877-85.

19. Crerand C, Sarwer D, Magee L, Gibbons L, Lowe M, Bartlett S, Becker DG, Glat PM, LaRossa D, Low DW**,** Whitaker LA Rate of body dysmorphic disorder among patients seeking facial plastic surgery. Psychiatr Ann 2004;34:958.

20. Castle DJ, Molton M, Hoffman K, Preston NJ, Phillips K. Correlates of dysmorphic concern in people seeking cosmetic enhancement. Aus NZ J Psychiatry 2004;38:439.

21. Phillips KA, Menard W, Fay C, Weisberg R. Demographic characteristics, phenomenology, comorbidity, and family history in 200 individuals with body dysmorphic disorder. Psychosomatics 2005;46:317-325

Table I: Sociodemographic variables of the clinical sample and the reference group.

Variable	Cosmetic dental patients (n=170)		General population (n=878)	
	N	%	N	%
Gender				
Female	106	62.4	484	55.2
Male	64	37.6	393	44.8
Country of birth				
Dutch	149	87.6	638	73.5
Non-Dutch	21	12.4	230	26.5
Marital status				
No relationship	39	22.9	282	32.4
Relationship	131	77.1	589	67.6

Table II. Appearance concerns of patients in the clinical sample and the reference group ordered by body location

Body area	Cosmetic dental patients (n=91)		General population (n=170)	
	N	%	N	%
Abdomen	44	48.4	233	53.1
Teeth	24	26.4	76	17.3
Breasts	15	16.5	53	12.1
Skin of the face	12	13.2	47	10.7
Buttocks	11	12.1	78	17.8
Nose	10	11.0	16	10.5
Hips	10	11.0	69	15.7
Thighs	9	9.9	87	19.8
Mouth	7	7.7*	6	1.4

NOTE. Total is greater than 100% because most subjects indicated to have appearance concerns pertaining to more than one location.
* $p<0.001$ as analyzed using Chi-square tests.

Figure I. Presence of criteria of BDD in both samples