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# Validation of the Body Dysmorphic Disorder Questionnaire in a community sample of Swedish women

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## ABSTRACT

Body Dysmorphic Disorder (BDD) is characterized by a distressing and impairing preoccupation with a nonexistent or slight defect in appearance. Patients with the disorder present to both psychiatric and non-psychiatric physicians. A few studies have assessed BDD prevalence in the general population and have shown that the disorder is relatively common. To date, no BDD assessment instruments have been validated in the general population. Our aim was to validate a brief self-screening instrument, the Body Dysmorphic Disorder Questionnaire (BDDQ), in a female community sample. The BDDQ was translated into Swedish and filled out by 2891 women from a randomly selected community sample. The questionnaire was validated in a subsample of 88 women, using the Structured Clinical Interview for DSM-IV (SCID) together with clinical assessment as the gold standard. In the validation subsample, the BDDQ showed good concurrent validity, with a sensitivity of 94%, a specificity of 90% and a likelihood ratio of 9.4. The questionnaire can therefore be of value when screening for BDD in female populations.

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## 1. Introduction

Body Dysmorphic Disorder (BDD) is a psychiatric disorder, defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV as a distressing and impairing preoccupation with an imagined defect in appearance; if a slight physical anomaly is present, the person's concern is markedly excessive (American Psychiatric Association, 2000). BDD is characterized by a pattern of obsessive thoughts, feelings and compulsive behaviors. The pre-occupations are very time consuming (occurring on average 3–8 h a day) and usually difficult to resist or control (Phillips and Hollander, 2008). BDD is associated with significant distress, disability (including social isolation and occupational dysfunction), cosmetic surgery and suicidality (Phillips, 1991, 2007; Crerand et al., 2005; Phillips and Menard, 2006). BDD appears to be relatively common. The three largest studies ( $n > 2000$ ) in general populations found BDD prevalence rates of 1.7–2.4% (Rief et al., 2006; Koran et al., 2008; Buhlmann et al., 2010). Using structured clinical interviews examining community samples, prevalence rates of 0.7–3% have been reported (Faravelli et al., 1997;

Bienvenu et al., 2000; Otto et al., 2001). Studies of psychiatric samples have reported BDD in 2.6–16.0% patients (Zimmerman and Mattia, 1998; Grant et al., 2001; Conroy et al., 2008; Kollei et al., 2011). In dermatology settings, most studies have found BDD rates of 8.8–14% (Phillips et al., 2000; Uzun et al., 2003; Bowe et al., 2007). The ratio of females to males is in the range of 1:1–3:2 (Phillips et al., 2008).

The Body Dysmorphic Disorder Questionnaire (BDDQ) is a brief, self-report measure, which is derived from the DSM-IV diagnostic criteria for BDD. Using close-ended questions it asks the respondents whether their appearance concerns are sources of preoccupation and, if so, it assesses the degree to which they cause distress or interfere with the person's social or occupational functioning (Phillips, 2009). The questionnaire was developed as a screening instrument for BDD in psychiatric settings and was validated in a psychiatric outpatient sample ( $n=66$ ), displaying high sensitivity (100%) and specificity (89%) (Phillips et al., 1995). In a psychiatric inpatient sample ( $n=122$ ) the sensitivity was 100% and the specificity was 93% (Grant et al., 2001). A slightly modified version of the questionnaire was validated in a dermatology patient sample ( $n=46$ ) and presented high sensitivity and specificity (100% and 92% respectively) (Dufresne et al., 2001). Subsequently the BDDQ has been widely used for BDD screening, e.g. with 1000 dermatology and plastic surgery outpatients (Vulink et al., 2006), 100 psychiatric inpatients (Conroy et al., 2008), 160 patients with maxillofacial

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problems (Vulink et al., 2008) and 300 dermatological patients (Conrado et al., 2010).

The above-mentioned psychometric data are dependent on the study setting, including prevalence of the disease in the examined sample. The results of previous prevalence studies suggest that BDD rates vary significantly depending on the population studied, sample size, and assessment methods, which may be a result of methodological differences and limitations (e.g. non-representative populations, small sample sizes and insufficient assessment methods) (Buhlmann and Winter, 2011). To our knowledge, neither the BDDQ nor any other BDD assessment instruments, have been validated in the general population. In Scandinavia, there are no instruments available for screening of BDD that we know of. Presuming that the occurrence of, and undetected suffering from, BDD are at levels similar to other Western countries, translating a screening instrument into Swedish was justified.

### 1.1. Aim

The purpose of this study was to translate the BDDQ into Swedish, and validate the translated version in a community sample. Since BDD seems to be slightly more common in women, a sample from the female population was initially chosen, while planning to subsequently validate the instrument also in men.

## 2. Methods

### 2.1. Translation

Permission to use the BDDQ was given by K.A. Phillips. The questionnaire was translated into Swedish, using centered translation, i.e. verbatim. The questionnaire was translated into Swedish by two of the authors (S. Brohede and K. Wijma), using the wording from the Swedish translation of DSM-IV where applicable. Two independent translators translated the BDDQ back into English. The back-translation was subsequently compared with the original text. The process required three rounds of translation before the Swedish translation was concluded to be satisfactory by all the translators.

### 2.2. Subjects

The study sample comprised 7000 women aged 18–60 in the County of Östergötland, in the southeast of Sweden. Sampling randomization, out of women in the national population register, was made using the Statistical Package for Social Sciences (SPSS). Questionnaires were sent via mail to the selected women on Oct 1st 2009. Enclosed were a return envelope and a letter explaining that by returning a filled out questionnaire, consent to participation would be assumed. A follow-up reminder with a second copy of the questionnaire was sent to the 4700 women who had not responded after 4 weeks. The project was approved by the regional ethical review board for research (Dnr M103-09) and all the participants gave informed consent.

### 2.3. Measures

The questions and scoring of the BDDQ are presented in Table 1. Positive answers to the first two questions: “Are you very concerned about the appearance of some part(s) of your body that you consider especially unattractive?” and “Do these concerns preoccupy you? That is, do you think about them a lot and wish you could think about them less?” were required to continue the questionnaire. A positive answer to at least one part of the third question, assessing distress and impairment caused by the preoccupation, was further required for a BDD diagnosis. The fourth question: “How much time do you spend thinking about your defect (s) per day on average?” had the response alternatives (a) less than 1 h/day, (b) 1–3 h/day and (c) > 3 h/day. When interpreting the BDDQ, Phillips suggests that the time taken up by thinking about the perceived defect should be at least 1 h/day in order to fulfill the DSM-IV BDD diagnosis (Phillips, 1998). Thinking about the appearance flaw “at least an hour per day” is also a (optional) time-criterion when diagnosing BDD according to the Structured Clinical Interview for DSM-IV (SCID) (First et al., 2002). Therefore, positive answers to the first three questions of the BDDQ in combination with answer (b) or (c) on question four were required to fulfill the BDD criteria. The last question: “Is your main concern with your appearance that you aren't thin enough or that you might become fat?” was used to exclude people primarily concerned about not being thin enough, in order not to

over-diagnose BDD when an eating disorder might be a more accurate diagnosis (Phillips, 1998).

For the validation, the BDDQ was scored from 0 to 4 points (Table 1). The scoring from 0 to 4 was made in order to evaluate the questionnaire's capacity to distinguish BDD from non-BDD at increasing levels of appearance concern. A BDDQ score of 4 was equal to the fulfillment of the BDD criteria and was thus considered a positive BDD-screening. The respondents were grouped into the five BDDQ score levels 0, 1, 2, 3 and 4. To ensure a validation of the questionnaire's properties at the different levels of appearance concern, an interview sample was created that included respondents from all these BDDQ score levels. Twenty women were randomly selected from within each group with BDD scores of 0, 1, 2 and 3 respectively. From the group with a BDDQ score of 4, 25 women were randomly selected. More women were selected from this group in order to assess the questionnaire's validity particularly at the critical cut-off at 4 points (i.e. positive BDD-screening). Randomization was carried out using www.random.org. These 105 women were all invited and 88 of them agreed to participate in diagnostic interviews at three hospitals in the County of Östergötland.

Diagnostic interviews were carried out by the first author during the period Nov 2009–Feb 2010. The interview followed a structured diagnostic method: the Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Non-patient Edition (SCID-I/NP) (First et al., 2002). SCID is a standard diagnostic instrument in psychiatry, and the SCID-I module for BDD assesses all three DSM-IV diagnostic criteria. The first author is a medical doctor, with experience in diagnosing BDD using the BDD diagnostic module, a SCID-like manual for BDD (Phillips, 1998), in a previous study of women suffering from hirsutism (Brohede et al., unpublished results). The last author, a clinical psychologist, was available for consultation when necessary. For a second opinion a psychiatrist, who was experienced in diagnosing BDD, could be consulted via telephone. As the physical defect must be nonexistent or slight to meet the diagnostic criteria, the women's perceived appearance flaws were assessed by the interviewer using a Likert-scale, similar to rating scales used in previous research (Dufresne et al., 2001; Conroy et al., 2008; Conrado et al., 2010). The scale ranged from 1 to 3; 1=no flaw present, 2=minimal/slight flaw present, and 3=flaw present and clearly noticeable within conversational distance. BDD was diagnosed if all the diagnostic criteria were met according to the SCID interview and the appearance flaw was rated 1 or 2. The SCID interview, together with the clinical assessment of the perceived appearance flaw, was considered the gold standard for diagnosing BDD. Before the interview, the interviewer was blinded to the interviewees' scoring on the BDDQ. After the interview, the results from the BDDQ were compared to the SCID evaluation.

### 2.4. Statistical analyses

Demographic characteristics of the interview sample were compared with the total sample using Pearson's chi-square analysis (employing Fisher's exact test when indicated) for categorical variables and the Mann–Whitney *U* test for ordinal variables. *P*-value < 0.05 was considered statistically significant in all analyses. Concurrent validity was assessed using sensitivity, specificity, positive and negative predictive value and likelihood ratio (Fletcher et al., 1996).

## 3. Results

### 3.1. Demographic characteristics of the sample

A total of 2891 women participated in the study. Excluding the 80 questionnaires that were returned because the addresses were unknown, the response rate was 42%. Since the response rate was lower than expected, a representativeness analysis was carried out. The sample ( $n=2891$ ) was compared to the source population (women aged 18–60 in the County of Östergötland) using the socio-demographic data available from the respondents and corresponding data available from existing Swedish population statistics. These parameters were age, degree of education completed, employment status and occupation. The respondents did not differ significantly from the population in these parameters (Brohede et al., unpublished results).

One hundred five women were invited for diagnostic interviews and 88 of these women agreed to participate. Table 2 presents the demographic characteristics of the interview sample ( $n=88$ ) compared to the total sample ( $n=2891$ ). There were no statistically significant differences between the two samples regarding age, educational level, occupation and household

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