

Prevalence of Body Dysmorphic Disorder and its Association With Body Features in Female Medical Students

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Abstract

Background: Body dysmorphic disorder (BDD) is a distressing psychiatric disorder. So far there have not been any studies on BDD in Saudi Arabia.

Objectives: The aim of this study was to determine the prevalence of body dysmorphic disorder in female medical students and to investigate whether there is an association between BDD and body features of concern, social anxiety and symptoms of BDD.

Materials and Methods: A cross sectional study was carried out on female medical students of the college of medicine, King Saud University, Riyadh, Saudi Arabia during January to April, 2015. Data were collected using the body image disturbance questionnaire, Body dysmorphic disorder symptomatology and social interaction anxiety scale. Descriptive statistics, bivariate and multivariate analysis were used to analyze the results.

Results: Out of 365 students who filled out the questionnaire, 4.4% (95% confidence intervals (CI): 2.54% to 7.04%) were positive for BDD with skin (75%) and fat (68.8%) as the most frequent body features of concern. Ten features (skin, fat, chest, hips, buttocks, arms, legs, lips, fingers, and shoulders) out of twenty-six were significantly associated with BDD. Arms and chest were independently associated with BDD. The odds of presence of body concern related to "arms" was 4.3 (95% C.I.: 1.5, 12.1) times more in BDD subjects than non-BDD subjects, while concern about "chest" was 3.8 (1.3, 10.9) times more when compared to non-BDD subjects. No statistically significant association was observed between BDD and social anxiety ($P = 0.13$).

Conclusions: This was the first study conducted in Kingdom of Saudi Arabia (KSA) on female medical students, which quantified the prevalence of BDD and identified the body features associated with it. Body dysmorphic disorder is prevalent in female medical students but it is relatively rare and an unnoticed disorder.

Keywords: Body Dysmorphic Disorder, Female Medical Students, Social Anxiety

1. Background

Body dysmorphic disorder (BDD) "is a psychological illness in which the individual is preoccupied with one or more perceived defects or flaws in appearance that are not observable or appear slight to others". Individuals suffering from BDD encounter many difficulties when interacting with others in many aspects of their lives such as social, educational or occupational aspects. The concern about body image is not due to other mental disorders such as anorexia nervosa and bulimia (1). They have their thoughts fixated on the perceived defect. Their symptomatology ranges widely from repetitive mirror checking or avoidance of mirrors, masking the affected area, and asking for medical help especially from plastic surgeons. They may experience different emotions such as depression,

anxiety, and low self-esteem, which can be incapacitating, leading to social avoidance and seeking reassurance from family and friends. Any part of the body can be involved but mainly include the apparent parts like the face. Also, this disorder can manifest at any age though adolescence, when puberty sets in, seems to be the phase of one's life where concern with body image becomes accentuated (2). An additional criterion, added to the new DSM V classification, is repetitive behaviors (e.g. grooming, touching the imagined defect, etc.) or mental acts (e.g. comparing appearance to others). According to this new change it has been classified under obsessive-compulsive disorder rather than somatoform disorder. Moreover in the new DSM V, muscle dysmorphia "the belief that one's body is too small or insufficiently muscular" is classified as a subtype

of BDD. Furthermore, many people may have slight dissatisfaction, which is considered to be normal but if this unnoticed dissatisfaction preoccupies the thoughts and actions of an individual it may progress to a more serious condition such as depression, self-harm, and unnecessary plastic surgery (1).

The data collected on the prevalence of BDD does not reflect the actual number of people suffering from the problem because the feeling of shame prevents them from seeking medical advice (2). A few studies have been conducted in different countries. Some studies reported the prevalence rate of BDD to be 1% - 2% in the general population (3, 4). The prevalence of BDD in clinical settings involving psychiatry and dermatology patients was 16% and 6.3%, respectively (5, 6). However, studies conducted in nonclinical settings (involving college students) showed a prevalence rate ranging from 1.3% to 5.8% (7-10). Social anxiety "is a marked and persisting fear of social or performance situation in which embarrassment may occur". They may experience anxiety about being with other people, may feel embarrassed or judged when expressing their opinions in front of others, and may have a hard time making new friends or keeping them. The peak onset of social anxiety is adolescence but may appear during childhood (11). Anxiety and other psychological problems are somewhat associated with body dysmorphic disorder (12, 13). A study done in Iran showed that 19.1% had positive results for BDD, 12.9% of those experienced co-morbid social anxiety (14).

In Saudi Arabia as well as the Mediterranean region, no available data is present on the prevalence of BDD and its association with anxiety. The significance of this study is that it attempts to fill the gap in knowledge. Individuals in the medical field are looked at through an eye of perfection and thought to be free of any physical or mental problems. This makes them more concerned about an ideal body image. Addressing this issue becomes important as early as medical school years since this might have an adverse impact on their performance as future doctors (7).

2. Objectives

This study aimed to determine the prevalence of BDD and social anxiety in female medical students, the association between BDD and social anxiety, and the body features of concern in students with BDD. It was hypothesized that the prevalence of BDD in female medical students of King Saud University is around 10%; the students with BDD have more social anxiety than those without BDD, and that the body features of concern are mainly in the face (nose, eyes and skin) and the hips.

3. Materials and Methods

This cross-sectional, descriptive, observational quantitative study was carried out between January and April 2015 at college of medicine, King Saud University in Riyadh, Saudi Arabia. The study subjects were female medical students from 1st, 2nd, 3rd, 4th and 5th year, which were at a total of 595 students (1st:114, 2nd:137, 3rd:123, 4th:123 and 5th:97). The sample size was calculated by assuming a prevalence of BDD as 10%, with a precision of 3%, at 5% level of significance and assuming a 15% non-response, thus a total of 444 subjects were considered as the sample (15). The 444 students were divided equally to five strata according to their academic year using the systemic random sampling technique. From every academic year, 89 students were sampled with a sampling interval of two.

Self-administered questionnaires with an informed consent were distributed to the randomly selected students in the college. The questionnaire consisted of four parts. The first part included socio-demographic information: age, year of enrollment in medical college, weight and height. The second part included a valid and reliable questionnaire, which was the "body image disturbance questionnaire" (BIDQ) adapted by Cash et al. (16). All the questions were adapted from the original BIDQ without any modifications except for question two, which were added to assess the foci of concern (7). Question 1 and questions 3 - 8 were the seven questions of the BIDQ, which constituted the scoring scale. The score was the mean of the seven items scaled from one to five. A score of > 3.0 was the cut-off for identifying BDD. The third part included a questionnaire about BDD symptomology. These symptoms vary from compulsive touching of the perceived defect, compulsive mirror checking, avoidance of looking into a mirror or being photographed, comparing the perceived defect with people around them or with people from magazines and television, and hiding or concealing the physical defect (7). For more accurate results we added a question to exclude participants with already diagnosed Anorexia Nervosa and Bulimia. The fourth part included a valid and reliable questionnaire, which was the social interaction anxiety scale (SIAS), developed by Mattick and Clarke (17). This questionnaire was used to assess prevalence, severity and treatment outcomes of social phobia and social anxiety disorders. It consisted of 20 questions in which responses were scored on a scale ranging from zero (not at all characteristic of me) to four (extremely characteristic of me). The score was the sum of all 20 items. A score of 43 or more indicated social anxiety, and a score of 34 or more indicated social phobia.

3.1. Reliability and Validity of the Three Instruments (BIDQ, BDD Symptomology & SIAS)

The internal consistency using Cronbach's alpha had values of 0.840 for BIDQ ($P < 0.001$; 95% confidence interval (CI): 0.814 to 0.864), 0.786 for BDD symptomology ($P < 0.001$; 95% CI: 0.75 to 0.818) and 0.852 for SIAS ($P < 0.001$; 95% CI: 0.828 to 0.874). Factor analysis showed that all the items were correlated with other items (at least of 0.50) in each of these three instruments. The Kaiser-Meyer-Olkin measurement of sampling adequacy was 0.849, Bartlett's test of sphericity was $\chi^2 (21) = 972.24$, $P < 0.001$ for BDIQ, 0.812, $\chi^2 (15) = 725.46$, $P < 0.001$ for BDD symptomology and 0.919, $\chi^2 (190) = 2597.77$, $P < 0.001$ for the SIAS instrument. All the three instrument sampling adequacy values were greater than the recommended value of 0.6. By using eigenvalue of > 1 , the one factor extraction (of the seven items) for BIDQ explained 52.12% of total variance and factor loading had a range of 0.601 to 0.812. The one factor extraction (of the six items) for BDD symptomology explained about 51.86% of total variance and factor loading had a range of 0.504 to 0.826. The four factor extraction (of the 20 items) for SIAS explained about 56.41% of total variance and factor loading had range of 0.442 to 0.796. The analysis of our data indicated that the three instruments had good reliability and validity.

3.2. Ethical Consideration

An informed consent was obtained from the study subjects by stating the purpose of the study and confidentiality and anonymity was assured for the participants. Approval from IRB was obtained. There was no conflict of interest in this study.

3.3. Statistical Analysis

Data were analyzed using the SPSS pc + version 21.0 statistical software. Descriptive statistics (frequencies and percentages) were used to describe categorical study and outcome variables. Pearson chi-square test and odds ratios were used to test and measure the association between categorical study and outcome variable. Binary multiple logistic regression was used to identify the independently associated features of body related to BDD. Reliability and validity of instruments were assessed using Cronbach's alpha and factor analysis. $P < 0.05$ and 95% confidence intervals were used to report the statistical significance and precision of results.

4. Results

A total of 444 questionnaires were distributed; 365 students filled out the questionnaire and returned it (a re-

sponse rate of 82.2%). The prevalence of BDD in all the academic years was 4.4% (95% C.I: 2.54% to 7.04%). The prevalence was highest among the students in their first year (8.3%). Second, third, and fifth year students showed prevalence of 3.8%, 3.5%, and 4.8%, respectively. The lowest prevalence was in the fourth year with only one student with BDD (1.5%) (Table 1).

Table 1. Prevalence of Body Dysmorphic Disorder in Relation to Academic Years

Academic, year	Number of Subjects n = 365	BDD No. n = 16 (4.4%)
First	72	6 (8.3)
Second	78	3 (3.8)
Third	85	3 (3.5)
Fourth	67	1 (1.5)
Fifth	63	3 (4.8)

The most common body feature of concern between both BDD and non-BDD subjects was skin with a prevalence of 75% and 43.3%, respectively. Also, those who chose skin as a body feature of concern were 3.93 times (95% CI: 1.24, 12.44) more likely to be screened positive for BDD, when compared with those who did not choose skin as the body feature of concern. The second most common feature of concern was being fat (68.8%) in BDD subjects whereas in non-BDD prevalence was only 29.2%, which indicates that fat is statistically significantly associated with BDD (OR: 5.33; 1.81, 15.92). Ears were the least common feature of concern in both BDD and non-BDD subjects (6.3% and 2.6%), which is not statistically associated with BDD. Ten features (skin, fat, chest, hips, buttocks, arms, legs, lips, fingers and shoulders) out of twenty-six were statically significantly associated with BDD (Table 2). Binary logistic regression showed arms and chest were independently associated with BDD. Arms were found to be the most statistically significant among all other features followed by the chest. Concern about arms was almost 4.27 (1.49, 12.15) times more in BDD subjects than non-BDD, while concern about chest was almost 3.84 (1.35, 10.94) times more when compared to non-BDD subjects (Table 3).

All students who were screened positive for BDD tried to conceal/hide their physical "defect" (e.g. make up, scarves and clothing), and compared it to people in magazines or TV. Five out of six symptoms (compulsively touching the physical "defect", trying to conceal/hide it, observing it in people around them, comparing it to people in magazines, avoiding social gatherings) were significantly higher with BDD when compared to non-BDD students ($P < 0.0001$) (Table 4). Our data showed no statistically significant association between concurrent social anxiety/phobia and BDD.

Table 2. Comparison of Positive Responses to Different Body Features of Concern Among Body Dysmorphic Disorder and Non-Body Dysmorphic Disorder Cases

Body Feature	BDD, n = 16	Non BDD, n = 306	χ^2	OR (95%CI.)	P Value
Skin (yes)	12 (75)	151 (43.3)	6.234	3.93 (1.24, 12.44)	0.013
Fat (yes)	11 (68.8)	102 (29.2)	11.181	5.33 (1.81, 15.72)	0.001
Nose (yes)	9 (56.3)	115 (33.0)	3.702	2.62 (0.95, 7.20)	0.054
Thighs (yes)	9 (56.3)	117 (33.5)	3.495	2.55 (0.93, 7.02)	0.062
Chest/breast (yes)	9 (56.3)	75 (21.5)	10.433	4.70 (1.69, 13.03)	0.001
Buttocks (yes)	9 (56.3)	89 (25.5)	7.365	3.76 (1.36, 10.38)	0.007
Body hair (yes)	9 (56.3)	122 (35)	3.015	2.39 (0.87, 6.58)	0.083
Arms (yes)	8 (50)	56 (16)	12.198	5.23 (1.88, 14.52)	< 0.0001
Hips (yes)	8 (50)	73 (20.9)	7.494	3.78 (1.37, 10.42)	0.006
Waist (yes)	8 (50)	128 (36.7)	1.162	1.73 (0.63, 4.71)	0.281
Facial hair (yes)	8 (50)	100 (28.7)	3.346	2.49 (0.91, 6.82)	0.067
Hair (yes)	7 (43.8)	139 (39.8)	0.098	1.17 (0.43, 3.23)	0.754
Teeth (yes)	7 (43.8)	112 (32.1)	0.946	1.65 (0.60, 4.53)	0.331
Legs (yes)	6 (37.5)	45 (12.9)	7.706	4.05 (1.40, 11.70)	0.006
Lips (yes)	5 (31.3)	43 (12.3)	4.800	3.23(1.07, 9.76)	0.028
Fingers (yes)	5 (31.3)	34 (9.7)	7.416	4.21(1.38, 12.84)	0.006
Height (yes)	4 (25.0)	66 (18.9)	0.366	1.43 (0.45, 4.57)	0.545
Hands (yes)	4 (25.0)	33 (9.5)	4.058	3.19 (0.97, 10.46)	0.044
Feet (yes)	3 (18.8)	35 (10.0)	1.248	2.07 (0.56, 7.62)	0.264
Shoulders (yes)	3 (18.8)	15 (4.3)	6.815	5.14 (1.32, 19.98)	0.009
Thin (yes)	3 (18.8)	30 (8.6)	1.918	2.45 (0.66, 9.09)	0.116
Muscle tone (yes)	3 (18.8)	46 (13.2)	0.408	1.52 (0.42, 5.54)	0.523
Eyes (yes)	2 (12.5)	47 (13.5)	0.012	0.92 (0.20, 4.17)	0.912
Back (yes)	2 (12.5)	22 (6.3)	0.956	2.12 (0.45, 9.94)	0.328
Jaw (yes)	2 (12.5)	23 (6.6)	0.837	2.02 (0.43, 9.45)	0.360
Ears (yes)	1 (6.3)	9 (2.6)	0.769	2.51 (0.30, 21.12)	0.381

^aValues are expressed as No. (%).

Table 3. Body Features Independently Associated With Body Dysmorphic Disorder (by Multiple Binary Logistic Regression)

Body Features	B	S.E	Wald	P Value	OR (95% CI)
Arms	1.451	0.534	7.375	0.007	4.27 (1.49, 12.15)
Chest	1.346	0.534	6.364	0.012	3.84 (1.35, 10.94)

5. Discussion

The prevalence of BDD in female medical students of King Saud University was 4.4% with skin and fat as the most common body features of concern. The most common symptoms among our BDD subjects were hiding the physical defect and comparing it with people on TV and magazines. About 25% of BDD cases had concurrent social anxiety/phobia.

ety/phobia.

Our study showed that the prevalence of BDD was 4.4% in female medical students, which was close to the results of other studies addressing BDD among college students. Lower percentages were seen in Chinese students (1.3%) and American students (4%). However, a higher prevalence of BDD was found in Pakistani, Turkish, and German college

Table 4. Comparison of Responses to the Symptoms of Body Dysmorphic Disorder (BDD) Between BDD and Non-BDD Subjects

Symptoms	BDD, n = 16 (%)	No. BDD, n = 346 (%)	X ² Value	P Value
Do you have a habit of compulsive mirror checking or compulsively glancing at your image in reflective surfaces (e.g. windows, doors)?			1.842	0.398
Never	2 (12.5)	82 (23.8)		
Occasionally and moderately often	9 (56.3)	195 (56.5)		
Very and extremely often	5 (31.3)	68 (19.7)		
Do you compulsively touch your physical "defect"?				
Never	3 (18.8)	160 (46.2)	23.846	< 0.0001
Occasionally and moderately often	6 (37.5)	159 (46.0)		
Very and extremely often	7 (43.8)	27 (7.8)		
Have you tried to conceal/hide your physical "defect"? (e.g. make up, scarves, clothing, beard)				
Never	0	78 (22.5)	14.507	0.001
Occasionally and moderately often	6 (37.5)	190 (54.9)		
Very and extremely often	10 (62.5)	78 (22.5)		
Have you ever measured your physical "defect" against people around you?				
Never	3 (18.8)	96 (27.9)	10.608	0.005
Occasionally and moderately often	5 (31.3)	188 (54.7)		
Very and extremely often	8 (50.0)	60 (17.4)		
Have you ever compared your physical "defect" with people in magazines or on television?				
Never	0	104 (30.1)	13.233	0.001
Occasionally and moderately often	7 (43.8)	169 (48.8)		
Very and extremely often	9 (56.3)	73 (21.1)		
Do these concerns about your physical "defect" make you avoid doing certain things? (e.g. looking into a mirror, getting photographed, and avoiding social gatherings)?				
Never	3 (18.8)	208 (60.1)	74.359	< 0.0001
Occasionally and moderately often	4 (25.0)	125 (36.1)		
Very and extremely often	9 (56.3)	13 (3.8)		

students (5.8%, 4.8% and 5.3%), respectively (3, 7-10). The results of our study were consistent with the results of other studies, and the reason behind this could be due to the similar mean age (20 years \pm 2). Young people are usually more concerned about their looks than older generations and this could be due the physical and psychological changes they go through during this age. Also pressure from peers, family, and media plays a significant role in developing an opinion about one's body appearance and personality. The prevalence found by the current study (4.4%) was higher than the prevalence in community-based studies (0.7% - 1.7%). A possible explanation is that community-based studies include an older age group (above 30 years) (4, 18, 19). Being a female and getting married in the early twenties is a cultural similarity between Saudi Arabia and

turkey, which makes them more concerned of their body image. This might explain the proximity in their prevalence (4.4% and 4.8%) (10).

5.1. Body Features of Concern

Our study showed that skin (75%) and fat (68.8%) were among the top body features of concern similar to other studies (Pakistani, USA, and German) (3, 7, 8). Fat could be distributed anywhere in the body (hips, breast, waist and arms) making it of prime concern. Also, the fashion industry is emphasizing on the notion 'the thinner the prettier', pushing females toward being obsessed over their weight. Since our study addressed college students who are under constant stress, which leads to the development of acne, this could explain the reason why skin had a high

frequency.

The independently associated features of concern with body dysmorphic disorder were arms and chest/breast. No other studies had reported features, which are independently associated with BDD. In our society it is acceptable for women to reveal their arms in gatherings, making them visible to others, which lead women to be self-conscious and become distressed. Also certain body features are considered essential to define a female's body such as chest/breasts, which was one of our findings.

5.2. Body Dysmorphic Disorder Symptomatology

All the symptoms of BDD (repetitive mirror checking, touching the physical defect, comparing with other people around them, hiding or concealing the physical defect, etc.) were significantly associated with BDD yet 'frequent mirror checking' was not significant in both our study and the Pakistani study. 'Hiding the physical defect' and 'comparing it with other people in magazines' had a high statistically significant association with BDD, which is consistent with the findings of another study from Pakistan (7).

5.3. Social-Anxiety

Social anxiety was higher in BDD when compared to non-BDD subjects but not statistically significant ($P=0.13$), unlike the Chinese study, which showed a significant association between social anxiety and BDD. This could be due to the cultural difference of study subjects in Saudi Arabia and China (9). Different dressing pattern and the restricted social movement of Saudi women could be the contributing factors for not having social anxiety, even though they have BDD.

5.4. Limitations

In our study we only targeted female medical students of one college so our results lack external validity. The collected data were in the form of self-reported questionnaires so the information acquired may not be accurate. The BDD assessment in our study was based on subjective responses, whereas an objective criterion of BDD diagnosis provides accurate information.

5.5. Conclusion

To the best of our knowledge, this is the first study in Saudi Arabia conducted among female medical students of King Saud University, which has quantified the prevalence of BDD and identified the body features associated with BDD. Our results suggest that BDD is prevalent but it is relatively rare and an unnoticed disorder. Further evaluation of positively screened students with BDD is recommended to determine the extent of the problem. Providing proper

counseling and guidance is advised to overcome this problem. Organizing awareness campaigns about BDD among school students is essential; as this disorder could have an early onset (may start as early as 12 years old). Further studies are needed to validate the findings of our study.

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Footnotes

Authors' Contribution Dr. Shaik Shaffi Ahamed conceived and designed the study. Lama Alfaraidi, Zainah Alsawah, Rihaf Algain, Jawaher Enani, and Lujain Sannari collected the clinical data. Lama Alfaraidi, Zainah Alsawah, Rihaf Algain, Jawaher Enani, and Lujain Sannari interpreted the clinical data. Lama Alfaraidi, Zainah Alsawah, Rihaf Algain, Jawaher Enani, Lujain Sannari and Dr. Shaik Shaffi Ahamed performed statistical analysis. Lama Alfaraidi, Zainah Alsawah, Rihaf Algain, Jawaher Enani, Lujain Sannari and Dr. Shaik Shaffi Ahamed drafted the manuscript. Dr. Ali Al Hazmi and Dr. Shaik Shaffi Ahamed critically revised the manuscript for important intellectual content.

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