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Association of body dysmorphic disorder with anxiety, depression, and stress among university students

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الملخص

أهداف البحث: تهدف هذه الدراسة إلى تقدير مدى انتشار اضطراب التشوه الجسمي وعلاقته بالاكتئاب والقلق والتوتر.

طرق البحث: دراسة مقطعية أجريت في جدة، المملكة العربية السعودية. حيث تم توزيع استبانة تم التحقق منها بشأن الخصائص الديموغرافية واضطراب تشوه الجسم والاكتئاب والقلق والتوتر بالإضافة إلى الخصائص الديموغرافية على عينة من ١١١٢ طالبا في جامعة الملك عبد العزيز في عام ٢٠١٩. تم استخدام الإحصاء الوصفي واختبارات مربع كاي ونماذج الانحدار اللوجستي الثنائي لتحليل البيانات. تم استخدام نسبة الأرجحية مع حد الثقة ٩٥٪ لقياس الارتباط بين اضطراب تشوه الجسم مع الاكتئاب والقلق والتوتر.

النتائج: كان معدل الانتشار الإجمالي لاضطراب تشوه الجسم ١٣.٩٪ (حد الثقة ٩٥٪؛ ١١.٨-١٦.٢) وكانت أعلى المواقع المبلغ عنها هي الجلد (٨١.٦٪) والخصر (٦٨.٨٪). وتبين أن الإصابة باضطراب تشوه الجسم مؤشرا للاكتئاب بنسبة ارجحية ٤.٢(٢.٩-٦.١)، والقلق ٢.٢(١.٦-٣.٢)، والتوتر ٣.٢(٢.٢-٤.٧). الطالبات كن أكثر عرضة للقلق بنسبة أرجحية ١.٤(١.١-١.٩) والتوتر ١.٥ (١.١-٢.٠). كان الانتساب إلى كليات الإدارة والفنون والعلوم الإنسانية والاجتماعية أيضا مؤشرا للقلق بنسبة أرجحية ١.٤ (١.١-١.٨).

الاستنتاجات: أظهرت الدراسة أن اضطراب التشوه الجسمي شائع نسبيا بين طلاب الجامعة في جدة ومرتبط بشكل كبير بالاكتئاب والقلق والتوتر.

الكلمات المفتاحية: قلق؛ اضطراب تشوه الجسم؛ اكتئاب؛ توتر؛ السعودية

Abstract

Objectives: This study aims to estimate the prevalence of body dysmorphic disorder (BDD) and identify its association with depression, anxiety, and stress.

Method: We conducted a cross-sectional study in Jeddah, KSA. In 2019, a validated questionnaire with items on sociodemographic characteristics and body dysmorphic disorder, as well as the Depression, Anxiety, and Stress Scale – 21 items (DASS 21) was distributed to 1,112 students of King Abdulaziz University. SPSS version 23 was used for data analysis, which included descriptive statistics, chi-square tests, and binary logistic regression models. The association was presented as an odds ratio (OR) along with its 95% confidence Interval (CI).

Results: The overall prevalence of BDD was 13.9% (95% CI of 11.8–16.2.) with the highest reported sites being the skin (81.6%) and waist (68.8%). BDD was found to be a significant predictor of depression with an OR of 4.2 (95% CI 2.9–6.1), anxiety OR of 2.2 (95%1.6–3.2), and stress OR of 3.2 (2.2–4.7). Females were significantly associated with anxiety, OR of 1.4 (95% CI 1.1–1.9) and stress, OR of 1.5 (1.1–2). Affiliation to the administration, arts, humanities, and social colleges was also a significant predictor of anxiety as reflected by an OR of 1.4 (95% CI 1.1–1.8).

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Conclusions: Our study shows that BDD is relatively common among university students in Jeddah and associated with depression, anxiety, and stress.

Keywords: Anxiety; Body dysmorphic disorder; Depression; Stress; University students

Introduction

BDD is a psychiatric disorder described as a perceived imperfection in physical appearance, which leads to stress or social dysfunction. The Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-V) categorises BDD under obsessive-compulsive and related disorders, characterised by incessant behaviours such as checking one's reflection in the mirror, seeking assurance and affirmation from others, and constantly comparing the site of the perceived defect with that of other people. Aside from these behaviours, the consequent significant stress or psychiatric disorders such as depression and anxiety are also reported.[1,2]

Initially, BDD primarily occurs during adolescence, at an average of 12−13 years of age. Despite this, it is usually only diagnosed during adulthood.[3] In 2016, Veale et al. conducted a systematic review of over 50 multinational studies on BDD, revealing an overall 1.9% weighted prevalence of BDD in the seven studies on adults in the community.[4] Several other studies conducted on college and university students showed an average of 3.3% prevalence of BDD. Extensive research has proved that the most common sites of BDD are the skin, hair, nose, and abdomen.[5,6] A survey conducted on the Arab population supports this claim, with the results indicating that more than half of the respondents exhibited excessive concern for skin defects, followed by concerns about weight, hair, and nose.[1]

Untreated BDD may develop into a chronic disorder linked to a significant increase in the likelihood of suicidal tendencies, psychiatric hospitalisation, and marked functional impairment.[7] Reportedly, 53−81% of BDD cases present with comorbid major depressive disorder, comorbid anxiety disorders, and an increased likelihood of having comorbid major depressive disorder.[8] However, rather than availing psychiatric help services, individuals with BDD often turn to surgery treatments to remedy their perceived defects.[5] Despite this serious risk, BDD remains poorly identified and is rarely diagnosed by psychiatric services. It is suggested that understanding BDD and its common comorbid disorders, such as anxiety and depression, may lead to better identification of BDD.[4] Young people are commonly more worried about their body shape due to the effect of social media filters, which change their perception and affect their self-esteem.[9] This research aims to estimate the prevalence of BDD and its association with anxiety, depression, and stress among King Abdulaziz University (KAU) students.

Materials and Methods

A cross-sectional study was conducted on university students at KAU, Jeddah, KSA. The sample size of 1,112 was calculated using the OpenEpi program, based on an assumption of 95% confidence level, 5% error, and anticipated frequency considered as the default to render the maximum sample size. The multistage sampling technique was adopted. In the first stage, the 'strata' of colleges were selected including science, engineering, medical, administration, art, humanities, and social. In the second stage, random clusters of two classes were selected from each college.

Data collection

A validated three-part electronic questionnaire was distributed to the participants. The first part obtains their sociodemographic information. The second part includes the body dysmorphic questionnaire based on the DSM-IV criteria. BDD is a short self-report screening questionnaire with high sensitivity (100%) and specificity (93%); it includes four questions about preoccupation with appearance, insight regarding BDD beliefs, repetitive compulsive behaviours, and significant distress or impairment in functioning.[10]

The questionnaire presents participants with four "yes/no" questions about concerns regarding their physical appearance. Question 1(two parts), 2, 3, and 4 are about being bothered about one's looks, identifying the main concern with one's look, asking how this problem with one's look has affected life, and determining the time usually spent contemplating one's look/appearance, respectively. Respondents are diagnosed with BDD if their answer to Question 1 is "Yes" to both parts, the answer to Question 3 is "Yes" to any of the question parts, and the total time they spend thinking about their look/appearance is more than one hour every day.

The third part is the DASS-21,[11] which comprises a set of self-reported responses to seven items each on depression, anxiety, and stress. Each question is rated from 0 (Did not apply to me at all) to 3 (Applied to me very much or most of the time). Higher scores reflect more severe symptoms and cut-off scores for severity labels (normal, mild, moderate, severe) were also set according to Figure 1:

The leaders of each selected class were tasked with distributing the questionnaire to their peers via e-mail. Two follow-up reminders were given, with a one-week period between each.

Meaning	Depression	Anxiety	Stress
Normal	0−9	0-7	0−14
Mild	10−13	8-9	15−18
Moderate	14−20	10-14	19−25
Severe	21−27	15-19	26−33
Extremely severe	28+	20+	34+

Figure 1: Depression Anxiety Stress Scales.

Study variables

Dependent variables included anxiety, depression, and stress. The independent variables were body dysmorphic disorder, age, gender, marital status, and family income.

Statistical analysis

The data were entered and analysed using IBM SPSS ver. 23 (IBM Corp., Armonk, NY). Descriptive statistical analysis was used to characterise the study variables. The categorical variables were presented in the form of counts and percentages, while continuous variables were reported as means and standard deviations. For the BDD questionnaire, a score of 4 reflects a positive BDD screening. After computing the (DASS 21) scale scores, cut-off scores for conventional severity labels were used. Afterward, each scale category was converted to either 'Yes' or 'No', where 'Yes' was equal to mild, moderate, severe, and extremely severe and 'No' was equal to normal. A chi-square test was conducted to determine the relationship between categorical variables. Dependent variables were defined as binary outcomes. The significant predictors of each dependent variable were identified using a binary multiple logistic regression model (BMLRM), with backward conditional elimination, by entering criteria = 0.05 and elimination = 0.10 at 95% confidence intervals (CI). Lastly, the standard $p < 0.05$ was the condition for rejecting the null hypothesis. The associations of BDD with depression, anxiety, and stress were presented as an odds ratio (OR) together with its 95% CI.

Results

A total of 1,016 out of 1,112 students responded, with a response rate of 91.4%. Regarding the demographic

Table 1: Demographic characteristics of the studied population.

Baseline Characteristics		Count	%
Gender (n = 1016)	Male	349	34.4
	Female	667	65.6
Age (n = 1016)	18−24	834	82.1
	25−34	158	15.6
	≥35	24	2.4
Year (n = 1016)	First	216	21.3
	Second	143	14.1
	Third	213	21.0
	Fourth	191	18.8
	Fifth	98	9.6
	Sixth	155	15.3
Marital Status (n = 1016)	Married	102	10.0
	Divorced	17	1.7
	Widowed	3	0.3
	Never married	894	88.0
College (n = 1016)	Medical	325	32.0
	Engineering	114	11.2
	Science	106	10.4
	Others	471	46.4
Income (n = 803)	<5000	71	8.8
	5000−10,000	309	38.5
	>10,000-20,000	262	32.6
	>20,000	161	20

Table 2: Prevalence of depression, anxiety, and stress among studied population.

Variables		Number %
Body dysmorphic disorder	No	875 (86.1)
	Yes	141 (13.9)
Depression	No	647 (63.7)
	Mild	127 (12.5)
	Moderate	229 (22.5)
	Sever	13 (1.3)
Anxiety	No	594 (58.5)
	Mild	146 (14.4)
	Moderate	194 (19.1)
	Severe	66 (6.5)
	Extremely severe	16 (1.6)
Stress	No	698 (68.7)
	Mild	283 (27.9)
	Moderate	35 (3.4)

characteristics (Table 1), the majority of students were female (65.6%). Most of the students were ranged between the ages of 18−24 (82.1%) and had never been married (88.0%). A total of 141 (13.9%) students had BDD with a 95% CI of 11.8−16.2. The prevalence of depression, anxiety, stress, and BDD is depicted in Table 2, showing that 369 (36.3%) students had depression, 422 (41.5%) had anxiety, and 318 (31.3%) had stress.

The association between gender and the site of the perceived defect in BDD was evaluated using the chi-square test (Table 3). BDD was 14.7% among females and 12.3% among males. The majority of students with BDD expressed the most concern for the skin (81.6%) and waist (68.8%). The chi-square test revealed that the skin was found to be significantly associated with BDD in both genders, with females (89.8%) being more concerned about this site defect than were males (62.8%). The same significant association was found between BDD and the waist, with more females (74.5%) concerned with this area than their male (55.8%) peers.

The significant predictors of the given dependent variables were evaluated using BMLRM, as shown in Table 4. BDD was found to be a significant predictor of depression − OR 4.2 (95% CI 2.9−6.1); anxiety − OR 2.2 (95% 1.6−3.2); and stress − OR 3.2 (2.2−4.7). Being female was significantly associated with anxiety − OR 1.4 (95% CI 1.1−1.9) and stress − OR 1.5 (1.1−2). Affiliation to the

Table 3: Gender and sites of body dysmorphic disorder.

BDD	Total	Gender		p-value[b]
		Male (n = 349)	Female (667)	
Any site[a] (n = 1016)	141 (13.9%)	43 (12.3%)	98 (14.7%)	0.299
Skin	115 (81.6%)	27 (62.8%)	88 (89.8%)	<0.001
Nose	61 (43.3%)	17 (39.5%)	44 (44.9%)	0.554
Lips	41 (29.1%)	15 (34.9%)	26 (26.5%)	0.315
Breast	65 (46.1%)	17 (39.5%)	48 (49.0%)	0.300
Waist	97 (68.8%)	24 (55.8%)	73 (74.5%)	0.028[a]

[a] more than one site can be reported.
[b] Chi-square.

Table 4: Risk factors of depression, anxiety, and stress using binary logistic regression model.

Variables	Depression			Anxiety			Stress		
	OR	OR (95% C.I)	p-value	OR	OR (95% C.I)	p-value	OR	OR (95% C.I)	p-value
BDD (Yes)	4.2	2.89−6.13	**<0.01**	2.24	1.56−3.23	**<0.01**	3.21	2.22−4.65	**<0.01**
Gender (Female)	1.0	0.79−1.35	0.81	1.44	1.10−1.89	**<0.01**	1.53	1.14−2.04	**<0.01**
College (engineering)	0.7	0.5−1.2	0.2	1.0	0.6−1.6	**1.0**	0.9	0.5−1.5	0.7
College (Science)	0.8	0.5−1.3	0.5	1.5	1.0−2.4	0.08	1.1	0.7−1.7	0.8
College (Others)	0.9	0.7−1.2	0.5	1.4	1.1−1.8	**0.03**	0.8	0.7−1.3	0.8

administration, arts, humanities, and social colleges − OR 1.4 (95% CI 1.1−1.8) − was also a significant predictor of anxiety.

Discussion

In this paper, we estimated the prevalence of BDD and its association with depression, anxiety, and stress. Among the 1,016 participants, 13.9% were diagnosed with BDD. Although this prevalence is comparable to Alomari's findings from Taiba University, which reported that the prevalence of BDD was 12.3%,[12] this percentage is notably higher than those obtained from university students in Germany (5.3%), Australia (2.3%), and Pakistan (5.8%).[13−15] The high prevalence in the current study could be related to the fact that using social media has great psychological effects on body satisfaction when students compare their physical appearances to others. Additionally, in KSA, there is a considerable effect of social media especially Snapchat on body image satisfaction.[16]

The prevalence of BDD among female students in this study was comparable with findings from female subjects in Turkey with no significant gender difference.[17] On the contrary, a study from an Australian university revealed a significant gender difference, with the majority of BDD-positive students being female.[13] A study involving dermatological patients in the Qassim region of KSA also found significant gender differences with BDD, with female respondents having a higher prevalence.[18] General conclusions stating that females have a higher probability of BDD cannot be drawn with certainty due to the varying results correlating BDD and gender; the difference emerges when the researcher compares the sites separately.

This result corresponds to numerous studies, in particular, with Australian and German studies, which concluded that students were most dissatisfied with their skin.[13,14] Additionally, two studies involving female students from Jeddah and Riyadh also revealed that skin was the primary BDD concern followed by obesity.[12,19] In terms of the sites of BDD, only the skin and waist were found to be significantly associated with gender. This is usually because females express higher concern than males about their skin and body shape.[1,20]

Other studies from Turkey and Pakistan report body asymmetry and weight, as the most common BDD concern, respectively, with skin following closely as the second-highest physical preoccupation.[15,17] BDD was found to be significantly associated with DASS. Specifically, there was a significant increase in the probability of having depression, anxiety, and stress among students diagnosed with BDD suggesting that having BDD strongly contributes to these conditions. Concern about a specific area of the body and spending much time looking at or avoiding mirrors can affect daily life, including studies, social life, self-esteem, and relationships, consequently leading to mental disorders including depression, anxiety, and stress.[21,22]

These observations are consistent with the research of DeMarco et al.,[23] which had already established a strong association between stress and BDD. In another study, the Social Interaction Anxiety Scale (SAIS) and DASS-21 were used to survey 615 Italians, revealing that probable BDD respondents had a significantly higher level of social anxiety and depression than did those without BDD.[24] In the university setting, a cross-sectional descriptive study involving Chinese medical students noted that the relationships between dysmorphic concern and anxiety and depression for both male and female respondents were significant.[25] In agreement with these, a study of female students from the medical faculty of King Saud University, KSA, identified a higher, although not statistically significant, level of social anxiety among respondents with probable BDD than among those without BDD.[19] Given that BDD is a mental health disorder that could be detected early, identification and treatment are crucial to prevent depression, anxiety, and stress.

The cross-sectional design is considered a limitation in this study as BDD and the outcomes in terms of depression, anxiety, and stress are measured concurrently. Therefore, it may be difficult to decide whether the BDD preceded or followed the outcome. Another limitation is that this study was based on a sample of governmental university students. Hence, the current results cannot be generalised to other areas in KSA. Additionally, selecting a sample from private universities may provide more comprehensive results of university students.

Although this study was conducted in one city in KSA, it provides information on not only the prevalence and sites of perceived BDD defects among male and female participants, but also the association of several independent variables, including depression, anxiety, and stress.

Conclusion

BDD is relatively common among university students in Jeddah and is significantly associated with depression, anxiety, and stress. The most commonly reported sites are skin and waist circumference.

Recommendation

Early detection of BDD is important for the prevention of the related mental problems. It is recommended that further studies be conducted in other universities including private ones. Another proposition is to explore the measures taken to address the prevalence of BDD, depression, anxiety, and stress in universities within KSA.

Conflict of interest

The authors have no conflict of interest to declare.

Ethical approval

This study was approved by the Ethical Review Committee of King Abdulaziz University (approval no. 409-19) on 10 June 2019. Confidentiality was ensured and the data were used only for the research purpose.

Authors' contribution

RH, DA, and DA designed the study, collected and analysed the data, and were involved in manuscript writing. NA and AF participated in analysing and interpreting the data and reviewing several drafts of the paper. RR is the corresponding author who drafted the manuscript, participated in designing the study, conducted the statistical analyses, and prepared the drafts. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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