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The association between Body Dysmorphic Disorder (BDD) and Acceptance of Cosmetic Surgery Scale (ACSS): A nationwide study from 25 medical schools

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RESEARCH

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ABSTRACT

Background

Body dysmorphic disorder (BDD) is a psychological condition that is characterized by obsessive thinking about a perceived flaw in one's appearance that may eventually cause significant distress and impairment in life.

Methods

A cross-sectional study was conducted between January 2021 and August 2021 using a previously validated and published questionnaires — The Body Image Disturbance Questionnaire (BIDQ) and Acceptance of Cosmetic Surgery Scale (ACSS).Distributed to all medical students from 25 universities across all regions of Saudi Arabia.

Results

A total of 1,776 respondents completed the questionnaire. Females represented 57.1 per cent of the study population. More than half of the respondents were concerned and preoccupied with their body appearance (59.4 per cent and 52.8 per cent, respectively). The average of the BIDQ and ACSS scores was significantly higher in females compared to males, while higher socioeconomic status and higher educational level were also significantly related with higher BIDQ and ACSS scores. Furthermore, a higher BIDQ score was associated with higher scores on the ACSS.

Conclusion

BDD is a quite common disorder among medical students, and it affects their attitude toward cosmetic surgeries.

Key Words

Body dysmorphic disorder, Acceptance of Cosmetic Surgery Scale, Body Image Disturbance Questionnaire, Medical student

Background

Body image is a multifaceted concept that integrates the perceptual, behavioral and affective elements of appearance.[1] Disruption of one's body image is a persistent state of distress triggered by a recurrent concern that affects psychosocial functioning. This disruption is also linked to body dysmorphic disorder (BDD),[2] a psychological condition in which a person is concerned with one or more apparently perceived defects or flaws that are not observable or appear slight to others. Individuals suffering from BDD face many challenges in different aspects of their lives, including social, educational or professional, when engaging with others.[3]

The prevalence of BDD in cosmetic practices has been confirmed in recent studies.[4] In the Saudi Arabia population, the relationship between BDD and the attitude toward undergoing cosmetic surgery (facioplastic surgery) has been previously analyzed and was found to be 14.19 per cent.[5] Regarding college students, multiple studies have shown a rise of dysmorphic issues and dissatisfaction with body image. Studies in different countries show that rates of BDD are higher among college students compared to the general population[4,6,7] and that its prevalence among college student populations varies from 2.3 per cent to 5.3 per cent.[7-10] However, in the medical field little is known about BDD, although one study has shown its prevalence to be 4.4 per cent among female medical students.[3]

To our knowledge, no data on the prevalence of BDD and acceptance of cosmetic surgery of medical students are

available in Saudi Arabia. The importance of this research is that it seeks to fill that knowledge gap. The aim of this research is to measure the prevalence and acceptance of BDD among Saudi medical students and the propensity of ongoing cosmetic surgeries.

Subjects and Methods

A cross-sectional study was conducted between January 2021 and August 2021 on medical students and interns. The questionnaire included questions about general demographics and questions from two previously validated questionnaires-the Body Image Disturbance Questionnaire (BIDQ) regarding body dysmorphic disorder and the Acceptance of Cosmetic Surgery Scale (ACSS)-regarding the participants' attitudes toward cosmetic surgery.[11,12] The questionnaire was sent to all universities across all five regions of Saudi Arabia (central, eastern, northern, southern, and western).All participation in the study was voluntary, and IRB approval was issued from the Research Medical Center College of Medicine, Imam Mohammed ibn Saud Islamic University (Reference Number: HAPO-01-R-001).

The BIDQ includes seven questions. Items 1-2 assess the concern with appearance and extent of the preoccupation, item 3 measures perceived distress, and items 4-7 assess functional impairment and avoidance. All items are Likert-scale items scored from 1 to 5, with a higher score indicating a higher level of perceived body image disturbance. Five open-ended questions were are also included to clarify the participants' responses and to collect relevant diagnostic information (Table 1).[11]

The ACSS is a 15-item questionnaire that can be used to measure the acceptance of cosmetic surgery and is the most widely used scale for measuring attitudes toward cosmetic surgery. In Western samples, three subscales were found to be a good fit for the data: intrapersonal (five items measuring attitudes related to the self-oriented benefits of cosmetic surgery), social (five items measuring social motivations for cosmetic surgery) and consider (five items measuring the likelihood that a participant would consider having cosmetic surgery). In non-Western samples, the ACSS was best represented by two factors. Items in the ACSS are scored on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). It has been shown to possess good internal consistency, acceptable test-retest reliability, and good convergent and divergent reliability (Table 2).[12]

Statistical analysis was performed using R version 3.6.3. Counts and percentages were used to summarize the categorical variables, while the mean±standard deviation (SD) was used to summarize the distribution of the BIDQ, ACSS subscales, and the total ACSS score. Non-normal variables were represented by the median and interquartile range (IQR), respectively. To assess the association between the calculated score for the BIDQ and the subscales for the ACSS, Pearson's correlation was used. Linear regression analysis was used to assess the factors associated with the BIDQ score by. Age, gender, education, region, and BMI were included as covariates in the model. The BIDQ questionnaire score was also included in the model to assess whether the association between the BIDQ and ACSS remained statistically significant after adjusting for sociodemographic characteristics. Hypothesis testing was performed at a 5 per cent level of significance.

Results

The questionnaire was completed by 1,776 respondents. Males and females represented 42.9 per cent and 57.1 per cent of the study sample, respectively. Respondents from all five districts were included in the study, with respondents from the central regions representing almost half of the study sample (49.2 per cent, n=873). Respondents from the eastern and western regions represented 5.8 per cent and 20 per cent, respectively. The average monthly income was <1000 SAR for 43.3 per cent of the students and 1000 -3000 SAR for 13.8 per cent (n=245). Only 10.1 per cent of the students (n=179) reported a monthly average income >1000 SAR, while 18.2 per cent (n=324) reported no income. The majority of the respondents were single (n=1,596, 89.9 per cent), and only a small number were married (n=118, 6.64 per cent). Different study years were represented in the sample. Half of the respondents had a normal BMI (18.5–24.9Kg/m^2), one-quarter were overweight (n=435, 24.5 per cent), and obese and extremely obese respondents represented 9.74 per cent and 2.48 per cent of the study sample, respectively (Table 3).

The results showed that less than half (40.6 per cent) of the respondents were unconcerned with their body's appearance and that 47.2 per cent were not preoccupied with the concerns. More than half of the respondents did not report any distress due to defects in their appearance (56 per cent), and one-quarter reported mild non-disturbing distress (26 per cent). Social impairment and interference were reported as occasional or more often by 35.4 per cent and 31.5 per cent of the respondents, respectively. Three-quarters of the respondents did not report any interference with their schoolwork or job (78 per cent), but one-third of the respondents occasionally or often avoided things because of perceived physical flaws (33.6 per cent) (Table 4).

Linear regression was used to assess the factors associated with the average BIDQ score. Education and BMI were used as continuous variables to assess the effect for each

increase of one level in each of these two variables. The results showed that various sociodemographic characteristics were significantly associated with the BIDQ score. Respondents from the eastern (B=0.21, p<0.05) and western regions (B=0.17, p<0.001) had significantly higher average BIDQ scores compared to respondents from the central region, while respondents from the northern region had significantly lower average scores (B=-0.22, p<0.001). The average BIDQ score was significantly lower in males than in females (B=-0.1, p<0.05). Socioeconomic status was significantly associated with the average BIDQ score, which increased with average monthly income up to 5000 SAR and then decreased starting at 5000 SAR, i.e., a statistically significant quadratic trend. Higher levels of education were associated with higher BIDQ scores (B=-0.06, p<0.001), indicating that the average BIDQ score decreased by 0.06 points for each one category increase in education. A higher BMI (Kg/m^2) was also associated with a higher BIDQ score (B=0.2, p<0.001); the average BIDQ score increased by 0.2 points for each one category increase in BMI (Table 5).

A linear regression was used to assess the factors associated with the average total ACSS score, and education and BMI were used as continuous variables to assess the effect for each increase of one level in each of these two variables. The results showed that various sociodemographic characteristics were significantly associated with the BIDQ scores. Respondents from the eastern (B=-0.4, p<0.05) and western regions (B=-0.34, p<0.001) had significantly lower average total ACSS scores compared to respondents from the central region, while respondents from the northern region had significantly higher average scores (B=0.33, p<0.001). Moreover, the average ACSS score was significantly lower in males compared to females (B=-0.33, p<0.001). Although socioeconomic status was not significantly associated with the ACSS total score, higher levels of education level were associated with higher ACSS scores (B=-0.04, p<0.05). This signified that the average ACSS score decreased by 0.04 points for each one category increase in education. A higher BMI (Kg/m^2) was also associated with a higher ACSS score (B=0.07, p<0.001), indicating that the average total ACSS score increased by 0.07 points for each one category increase in BMI. The average BIDQ score was significantly associated with the total ACSS score (B=0.43, p<0.001), with a one unit increase in the BIDQ score being significantly associated with a 0.43 point increase in the average ACSS score (Table 6).

In addition, we studied the standardized loadings for the BIDQ, ACSS factor analysis including Parallel exploratory and Confirmatory analysis, and the reliability, validity, and correlation between all factors as seen in Figure 1-3 and Table 7. The reliability of the BIDQ items was 0.88, which is considered adequate. Exploratory factor analysis showed that one factor explained ~50 per cent of the variability in the individual items. The reliability of the items was 0.88, which was considered adequate. Thus, the average can be reliably used as a summary measure for the BIDQ questionnaire. The average variance extracted was 0.51, which was greater than the 0.5 cut-off values. These results indicate good convergent validity of the BIDQ questionnaire. The comparative fit index (CFI) and Tucker–Lewis Index (TLI) were 0.962 and 0.939. The standardized root mean square residual (SRMR) and he root mean square error of approximation (RMSEA) were 0.035 and 0.09, respectively. Parallel analysis was used to compare the scree of factors of the observed data with a random data matrix of the same size as the original. Item 10 was reversed before the analysis. Exploratory factor analysis (EFA) showed that three factors were a good fit for the data (Figure 2). Confirmatory factor analysis (Figure 3) was then used to test the three-factor model. All loadings were >0.6 except for item 10, which had a loading of 0.27. However, it was kept in the model as the AVE and reliability of the model were appropriate. Pearson's correlation was used to assess the correlation between the BIDQ and ACSS subscales. Results showed that the ACSS scores were strongly correlated (Table 7). The BIDQ score showed a statistically significant positive correlation with ACSS1 (r=0.122, p<0.001), ACSS2 (r=0.237, p<0.001), and ACSS3 (r=0.288, p<0.001). These results support the hypothesis that a higher BIDQ score is associated with higher scores on the ACSS questionnaire's subscales.

Discussion

This study is considered to be the first study worldwide to use the combination of BIDQ and ACSS scores to assess the relationship between BDD and a person's attitude toward cosmetic procedures, finding that more than half of the study's respondents were concerned about and preoccupied with their body appearance. Some studies have suggested that, over the long term, such attitudes may be associated with negative psychological outcomes and behaviours, including depression, social anxiety, and eating disorders.[2]

Although BDD is a psychiatric condition, when looking for solutions, patients present more to dermatologists or plastic surgeons than to psychiatrists.[13] Some studies observed that women show a higher prevalence of BDD, both in plastic surgery and dermatology clinics, than do men.[6] This justifies the findings of our study, which show a higher average ACSS score in women compared to men. Similar to our study, a higher BMI was associated with a higher ACSS score, a major concern in many other studies.[3,6,14,15]

The study's findings also suggest that cultural or societal differences play an important role in BIDQ scores. This might be attributed to sociocultural factors, including the pressure exerted by social media, that promote particular standards of beauty and body shape.[16] In our study, we found that higher socioeconomic status and higher levels of educational were significantly related with higher BIDQ scores. Although a higher ACSS was significantly associated with higher educational levels, it was observed that ACSS was not significantly associated with socioeconomic status. It was noticed throughout this study that the BIDQ scores had a statistically significant positive correlation with the ACSS scores, which supports the hypothesis that a higher BIDQ score is associated with higher scores on the ACSS questionnaire's subscales.

Our study is one of the first trying to study the standardized loadings for the BIDQ, ACSS factor analysis including Parallel exploratory and Confirmatory analysis, and the reliability, validity, and correlation between the factors. In addition, it is the first multiregional study using tow previously validated questionnaires to asset the correlation in medical student. The study had some limitations that should be considered. Despite been a nationwide study, the study focuses on the correlation between BDD and attitudes toward cosmetic procedures among medical students in Saudi Arabia only and it Nis clear that the geographical boundaries indicate the population the sample was drawn from. Since longitudinal studies are recommended to confirm relations, our use of a cross-sectional design is another limitation. Future studies with larger and more diverse populations are encouraged.

Conclusion

The average BIDQ score was significantly higher for females compared to males, whereas the average ACSS score was significantly lower for males than for females. Our results also demonstrated that there is a proportional relationship between the BIDQ's score and the ACSS: The higher the BIDQ score, the higher the ACSS questionnaire subscale scores. Finally, our study recommends a well-structured health education program, including workshops, lectures and media orientation, to be developed and implemented to increase the level of body image acceptance and to decrease behaviours related to low self-esteem and negative self-image among medical students.

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DECLARATION

The study was carried out in accordance with the code of ethics of the Declaration of Helsinki .The study was approved by the ethic and research committee of Al-Imam Muhammad Ibn Saud Islamic University, College of Medicine. Informed consent was obtained from all the participants. All authors have confirmed the submission and that this study did not involve animal subjects or tissue.

AVAILABILITY OF DATA AND MATERIALS

All data generated or analysed during this study are included in this article. Further enquiries can be directed to the corresponding author.

COMPETING INTERESTS

The authors certify no potential conflicts of interest.

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AUTHORS' CONTRIBUTIONS

AlJohar R, Shadid A and Aldaghri F conceived and designed the study. Almansour R, Alshareef A and Alkahtani A drafted the manuscript. Shadid A participated in the data analysis. AlJohar R, AlJohar M participated in the data collection. All named authors meet the International Committee of Medical Journal Editors (ICMJE) criteria for authorship and approved the final manuscript.

Figures and Tables

Figure 1. (A) Standardized loadings for the BIDQ (Body Image Disturbance Questionnaire). The standardized loadings were > 0.6 for all BIDQ items, which were appropriate. (BIDQ) Body Image Disturbance Questionnaire. (B) Parallel exploratory factor analysis for the ACSS (Acceptance of Cosmetic Surgery Scale).

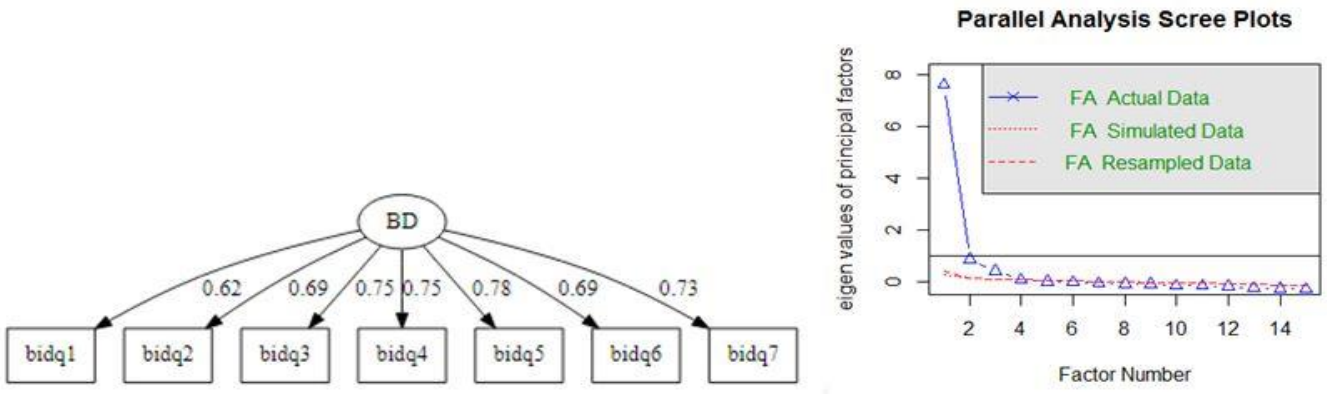

Figure 2. Confirmatory factor analysis for ACSS (Acceptance of Cosmetic Surgery Scale).

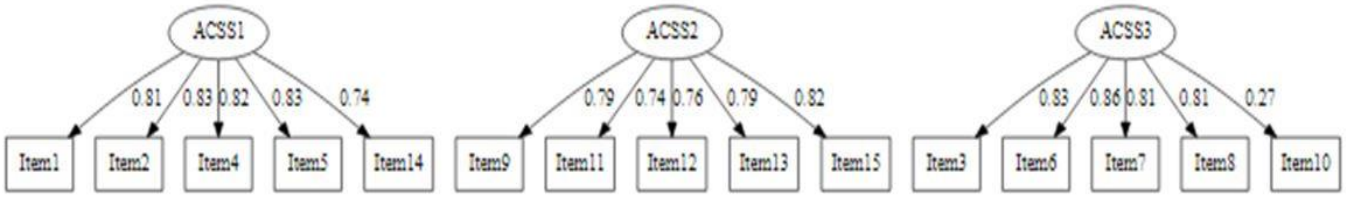

Table 1: BIDQ questionnaire items included in the current study.

Name	Value
BIDQ1	Are you concerned about the appearance of some part(s) of your body which you consider especially unattractive?
BIDQ2	If you are at least somewhat concerned, do these concerns preoccupy you? That is, you think about them a lot and they're hard to stop thinking about?
BIDQ3	Has your perceived physical flaws often caused you a lot of distress, torment, or pain? How much?
BIDQ4	Has your perceived physical flaws caused you impairment in social, occupational or other important areas of functioning? How much?
BIDQ5	Has your perceived physical flaws significantly interfered with your social life? How much?
BIDQ6	Has your perceived physical flaws significantly interfered with your schoolwork, your job, or your ability to function in your role? How much?
BIDQ7	Do you ever avoid things because of your perceived physical flaws? How often?

Table 2: ACSS questionnaire items included in the current study.

Name	Value
ACSS 1	It makes sense to have minor cosmetic surgery rather than spending years feeling bad about the way you look.
ACSS 2	Cosmetic surgery is a good thing because it can help people feel better about them.
ACSS 3	In the future, I could end up having some kind of cosmetic surgery.
ACSS 4	People who are very unhappy with their physical appearance should consider cosmetic surgery as one option.
ACSS 5	If cosmetic surgery can make someone happier with the way they look, then they should try it.
ACSS 6	If I could have a surgical procedure done for free, I would consider trying cosmetic surgery.
ACSS 7	If I knew there would be no negative side effects or pain, I would like to try cosmetic surgery.
ACSS 8	I have sometimes thought about having cosmetic surgery.
ACSS 9	I would seriously consider having cosmetic surgery, if my partner thought it was a good idea.
ACSS 10	I would never have any kind of plastic surgery.
ACSS 11	I would think about having cosmetic surgery to keep looking young.
ACSS 12	If it would benefit my career, I would think about having plastic surgery.
ACSS 13	I would seriously consider having cosmetic surgery, if I thought my partner would find me more attractive.
ACSS 14	Cosmetic surgery can be a big benefit to people's self-image.
ACSS 15	If a simple cosmetic surgery procedure would make me more attractive to others, I would think about trying it.

Table 3: Sociodemographic characteristics of the respondents.

	[ALL]	N
	N=1776	
Region		1776
Central region	873 (49.2%)	
Eastern region	103 (5.80%)	
Northern region	250 (14.1%)	
Southern region	194 (10.9%)	
Western region	356 (20.0%)	
Gender		1776
Female	1014 (57.1%)	
Male	762 (42.9%)	
Economic status		1776
No income	324 (18.2%)	
1000 SAR/month	769 (43.3%)	
Less than 3000 SAR /month	245 (13.8%)	
3000 to 5000 SAR /month	114 (6.42%)	
5000 to 10000 SAR /month	145 (8.16%)	
More than 10000 SAR /month	179 (10.1%)	
Marital status		1776
Single (never married)	1596 (89.9%)	
Married	118 (6.64%)	

Separated	51 (2.87%)	
Widowed	11 (0.62%)	
Education level		1776
Preparatory year	101 (5.69%)	
1st year	205 (11.5%)	
2nd year	234 (13.2%)	
3rd year	275 (15.5%)	
4th year	355 (20.0%)	
5th year	304 (17.1%)	
Internship year	302 (17.0%)	
BMI		1776
<18.5 (underweight)	176 (9.91%)	
18.5-24.9 (normal)	948 (53.4%)	
25-29.9 (overweight)	435 (24.5%)	
30-34.9 (obese)	173 (9.74%)	
>35 (extremely obese)	44 (2.48%)	

Table 4: Summary of responses for the BIDQ questionnaire.

	[ALL]
	N=1776
Concerned with some parts of one's appearance:	
Not at all concerned	721 (40.6%)
Somewhat concerned	465 (26.2%)
Moderately concerned	315 (17.7%)
Very concerned	187 (10.5%)
Extremely concerned	88 (4.95%)
Degree of preoccupation by the concerns:	
Not at all preoccupied	839 (47.2%)
Somewhat preoccupied	528 (29.7%)
Moderately preoccupied	278 (15.7%)
Very preoccupied	99 (5.57%)
Extremely preoccupied	32 (1.80%)
Degree of distress caused by defect:	
No distress	994 (56.0%)
Mild, and not disturbing	462 (26.0%)
Moderate and disabling but still manageable	236 (13.3%)
Severe, and very disturbing	57 (3.21%)
Extreme and disturbing	27 (1.52%)
Social impairment due to defect:	
No limitation	1147 (64.6%)
Mild interference but overall performance not impaired	359 (20.2%)
Moderate, definite interference, but still manageable	194 (10.9%)
Severe, causes substantial impairment	60 (3.38%)
Extreme incapacitating	16 (0.90%)
Social interference due to defect:	
Never	1216 (68.5%)
Occasionally	289 (16.3%)
Moderately Often	153 (8.61%)
Often	76 (4.28%)
Very Often	42 (2.36%)
Work interference due to defect:	
Never	1386 (78.0%)
Occasionally	198 (11.1%)
Moderately Often	120 (6.76%)
Often	52 (2.93%)

Very Often	20 (1.13%)
Avoid things because of perceived physical flaws:	
Never	1180 (66.4%)
Occasionally	347 (19.5%)
Moderately Often	139 (7.83%)
Often	78 (4.39%)
Very Often	32 (1.80%)

Table 5: Association between demographic characteristics and BIDQ score.

Variable		N	Estimate	p
Region:	Central region	873		Reference
	Eastern region	103		0.21 (0.07, 0.35) 0.004
	Northern region	250		-0.22 (-0.33, -0.12) <0.001
	Southern region	194		-0.07 (-0.19, 0.04) 0.200
	western region	356		0.17 (0.08, 0.26) <0.001
Gender:	Female	1014		Reference
	Male	762		-0.10 (-0.17, -0.03) 0.007
Economic status:	No income	324		Reference
	1000 sar/month	769		0.10 (0.00, 0.20) 0.042
	Less than 3000 sar/month	245		0.24 (0.12, 0.36) <0.001
	3000 to 5000 sar/month	114		0.26 (0.10, 0.41) 0.001
	5000 to 10000 sar/month	145		0.12 (-0.02, 0.26) 0.097
	More than 10000 sar/month	179		0.05 (-0.09, 0.18) 0.501
Education		1776		-0.06 (-0.08, -0.04) <0.001
BMI category		1776		0.20 (0.16, 0.24) <0.001

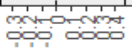

Table 6: Association between sociodemographic characteristics and total ACSS score.

Variable		N	Estimate	p
Region:	Central region	873		Reference
	Eastern region	103		-0.40 (-0.67, -0.14) 0.003
	Northern region	250		0.33 (0.14, 0.53) <0.001
	Southern region	194		0.07 (-0.13, 0.28) 0.479
	western region	356		-0.34 (-0.50, -0.17) <0.001
Gender:	Female	1014		Reference
	Male	762		-0.33 (-0.47, -0.20) <0.001
Economic status:	No income	324		Reference
	1000 sar/month	769		0.10 (-0.09, 0.28) 0.300
	Less than 3000 sar/month	245		0.33 (0.11, 0.55) 0.003
	3000 to 5000 sar/month	114		0.14 (-0.14, 0.43) 0.316
	5000 to 10000 sar/month	145		-0.02 (-0.28, 0.25) 0.911
	More than 10000 sar/month	179		0.15 (-0.09, 0.40) 0.220
Education		1776		0.04 (0.01, 0.08) 0.016
BMI category		1776		0.07 (-0.00, 0.14) 0.054
BIDQ		1776		0.43 (0.34, 0.51) <0.001

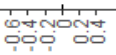

Table 7: Reliability, validity, and correlation between factors.

	BIDQ	ACSS1	ACSS2	ACSS3	Total ACSS
Cronbach's alpha	0.88	0.9	0.89	0.84	
AVE	0.51	0.65	0.61	0.57	
Mean ± SD	1.67±0.74	4.33±1.53	3.63±1.55	3.89±1.49	3.95±1.35
BIDQ					
ACSS1	0.122***				
ACSS2	0.237***	0.691***			
ACSS3	0.288***	0.794***	0.85***		
Total ACSS	0.216***	0.866***	0.87***	0.902***	

*** $p<0.001$
(SD) Standard deviation
(BIDQ) Body Image Disturbance Questionnaire
(ACSS) Acceptance of Cosmetic Surgery Scale