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Eating habit, body image, and gender – is there any association? – A comparative study among medical students from southern India

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Abstract:

BACKGROUND: An increase in overweight and obesity among young adults are major health concerns which can influence their self-perception about body image. Body image has received a great deal of attention among young people. Body dissatisfaction is an extremely powerful construct that pervades our self-esteem, resulting in psychological impact and disordered eating. This study examines the association of body image dissatisfaction, disordered eating, and body mass index among medical students and its relationship with gender.

MATERIALS AND METHODS: This cross-sectional study was conducted among 493 medical students. Body shape questionnaire (BSQ), Eating attitude test (EAT 26), and the Figure Rating Scale questionnaire were administered. Body mass index (BMI) and waist circumference (WC) were calculated using standard tools.

RESULTS: Around half the participants (54%) had a concern with regard to their body shape with a female preponderance, and one-fourth of the study population (25%) had a higher risk for eating disorder. BSQ and EAT26 questionnaires had a significant positive correlation with BMI and WC.

CONCLUSION: This study highlights a high prevalence of body image dissatisfaction among medical students who have direct positive correlation with BMI and WC. Health education programs addressing optimal weight and active lifestyle should be emphasized to reduce psychological burden in future.

Keywords:

Body image, eating disorder, obesity

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Introduction

Globally, there is an increase in the prevalence of overweight and obesity among adolescents, which is associated with an increased risk of noncommunicable diseases and psychological morbidity at later adulthood.^[1,2] Body image is the subjective self-perception of individuals about their physical appearance, irrespective of their outlook, which is one of the key components of weight regulation. A person's body image is influenced by several factors, including gender, family, personality, environment,

cultural experience, anthropometric measures, and mass media.^[3-6] Body image distortion (BID) refers to one's feelings of being dissatisfied with one's appearance. It can be in the form of overestimation or underestimation of body image. Studies have shown that there is a bidirectional relationship between eating disorders like anorexia nervosa, Bulimia nervosa, and BID, which leads to serious mental health problem among adolescents and young adults.^[7,8]

BID and eating disorders were initially a phenomenon of the western world;^[9] post COVID-19 pandemic, there is an increase in

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prevalence noticed in developing countries like India due to globalization and the shift in demography, increased media exposure, and reduction in physical activity among young Indian adults.^[10]

Studies from India had reported increasing prevalence of overweight, obesity, and declining fitness levels among medical students, which is supported by increased prevalence of BID and eating disorders. Young medical students are vulnerable to BID and eating disorders as they have to deal with high academic demands, social changes, busy schedules, and decreased physical activity. In addition, they are frequently exposed to western cultures due to academic and nonacademic activities. Several studies have individually attempted to determine relation between body weight, eating behaviors, body image, physical activity, and so on.^[3,4] Research in this field is a need of the hour in the post-COVID period considering association between all the above-mentioned factors and its relationship with gender in medical students.

Methods and Materials

Study design and setting

This is a cross-sectional comparative study conducted among 493 medical students to assess the association of body image dissatisfaction, disordered eating, and body mass index and its relationship with gender. The study was conducted in Physiology research laboratory from January 2021 to July 2021.

Study participants and sampling

493 age-matched male and female medical students of age 18 and 25 years who consented to take part in the study were recruited by a convenient sampling technique. Sample size (493) was calculated based on the prevalence of BID as 14% among medical students with a confidence level of 95% and 5% precision and the level of significance set at $P < 0.05$.^[11]

Data collection tool and technique

Height and weight were measured to determine BMI. A nonstretchable tape was used for measuring waist circumference (WC) at the midpoint between the costal margin and iliac crest with the subject standing and at the end of a gentle expiration.

Asian BMI criteria were considered as the standard for defining overweight and obesity. BMI of 18.5–22.99 kg/m² was considered normal. BMI of 23–24.99 kg/m² was categorized as overweight and BMI more than or equal to 25 kg/m² was defined as obese.^[12] Central obesity was defined by Asian cutoff points of WC ≥ 90 cm in males and ≥ 80 cm in females.^[13]

The Body Shape Questionnaire (BSQ)-16^[14] modified by Evans and Dolan is a 16-item self-report measure designed to assess negative feelings about one's body size and shape by evaluating the fear of putting on weight and feelings of low self-esteem because of one's appearance, the desire to lose weight, and body dissatisfaction. The internal reliability of English-modified BSQ-16 ranged from .92 to .96. The Cronbach's alpha of BSQ-16 in present study was 0.92.

The Eating Attitude Test (EATS)-26^[15] Questionnaire is a standardized self-report questionnaire used to screen EDs based on attitudes, feelings, and actions linked to eating and Eating symptoms and determines the risk of disordered eating attitudes and behaviors. It consists of 26 items screening tool that measures a broad range of symptoms characteristic of abnormal attitudes toward food and eating. The EAT-26 Questionnaire is divided into three subscales, 1: Dieting, 2: Bulimia and food preoccupation, and 3: Oral control. Participants will be categorized into two groups, namely, low risk for eating disorder (EATS-26 score < 20) and increased risk for eating disorder (EATS-26 score ≥ 20). The internal reliability of EAT-26 was between 0.86 to 0.90. The Cronbach's alpha of EAT-26 in present study was 0.89.

The Figure Rating Scale (FRS):^[16] Self and body sizes were assessed by the use of the Stunkard FRS. It consists of nine silhouettes ranging from very thin (a value of 1) to very obese (a value of 9). The participants were also required to put a double tick against the 'ideal' figure they desired—or "how they prefer to look" and circle how they look currently. The discrepancy between the two figures is seen as an indication of dissatisfaction.

The BID variable was calculated by subtracting the participant's current body size FRS score from the ideal body size FRS score. A BID score of 0 was considered to indicate that a participant was satisfied with his or her body.

Ethical consideration

This study was approved by the Institutional Research Committee and the Institutional Human Ethics committee (IHEC No: MGMCRI/IRC/04/2020/32/IHEC/179). The study was carried out in accordance with the Declaration of Helsinki and National Ethical Guidelines for Biomedical and Health Research 2017 by the Indian Council of Medical Research.

Statistical analysis

Statistical analysis was done using SPSS 17.0 (IBM Corp., Armonk, NY, USA) software. Shapiro–Wilk test was done to check for data normality. All normally distributed data were represented as mean and standard deviation. Non-normally distributed data were represented as median and interquartile range. Independent *t* test

and Mann–Whitney U test was done to find the gender difference. Pearson correlation analysis was done to find the association of BMI and WC with BSQ 16 and EAT 26; *P* value < 0.05 was considered statistically significant.

Results

The mean age and mean BMI were comparable between male and female. Around half (49%) of the male participants A higher percentage of males were obese with increased WC when compared to females [Table 1].

Based on EAT-26 scores, around one-fourth (25.6%) of the participants had a higher risk of eating disorder. Females have higher scores compared to males. The dieting scale, Bulimia and food preoccupation, and oral control subscale also had higher scores in females [Table 2].

BSQ 16 scores indicate 54.1% had a concern with regard to their body shape. Males had a lesser score compared to females, and the percentage of people in the moderate and severe concern groups was higher among females [Table 3]. Cronbach’s alphas were computed to ascertain the internal consistency of the scales.

Table 1: General characteristics of study population

Parameter	Male (n=263)	Female (n=230)
Age (years) [#]	20.7±2.2	20.572.2
BMI (kg/m ²) [#]	24.9±4.7	24.6±5.2
WC (cm) [#]	82.2±11.6	79.6±12.3*
BMI category n (%)		
Underweight	25 (9.5%)	23 (10%)
Normal weight	73 (27.8%)	79 (34.3%)
Overweight	36 (13.7%)	37 (16.1%)
Obese	129 (49%)	91 (39.6%)

**P*<0.01. [#]Expressed in mean±SD and frequency and proportion

Table 2: EAT-26 among study population

Parameter	Male	Female
Eat-26 score [#]	9 (6-18)	14 (8-22)**
Eat-26 score <20	211 (80.2%)	156 (67.8%)
Eat-26 score ≥20	52 (19.8%)	74 (32.2%)
Diet scaling [#]	3 (0-11)	7 (1-13)*
Oral control [#]	4 (2-6)	5 (4-7)**
Preoccupation with food [#]	2 (0-3)	2 (1-4)*

[#]Expressed in median and interquartile range and frequency and proportion. **P*<0.01, ***P*<0.001

Table 3: Body shape questionnaire-16 among study population

Parameter	Male	Female
BSQ-16 scores	35.36±13.2	43.83±14.6**
No concern	155 (58.9%)	76 (33%)
Mild concern	76 (28.9%)	83 (36.1%)
Moderate concern	26 (9.9%)	56 (24.3%)
Severe concern	6 (2.3%)	15 (6.5%)

[#]Expressed in mean±SD and frequency and proportion. ***P*<0.001

The results of these analyses indicated that both the EAT-26 ($\alpha = 0.89$) and the BSQ ($\alpha = 0.92$) are validated and reliable to be used in this population.

Figures 1 and 2 show the association of BSQ ($r = .766$, $P < 0.01$) and EAT 26 ($r = .718^\circ$, $P < 0.01$) with BMI, which indicates higher BMI is associated with higher concern about the body image and high risk of eating disorder.

WC shows a significant positive correlation with BSQ ($r = .754$, $P < 0.01$) and EAT 26 ($r = .750$, $P < 0.01$).

Figure 3 shows the mean score of EAT 26 on different severity of body shape concern. As the severity of body shape concern increased, the mean (SD) score of the EAT26 also increased. BSQ also showed a positive correlation with EAT 26 ($r = .745$, $P < 0.01$).

Table 4 shows the distribution of BID based on silhouette images. 20.1% of males want to be heavier than the current body image, whereas 66.9% of females want to be thinner, indicating a higher preponderance toward leanness.

Discussion

The present study evaluates the relationship between BMI and its association with body image, eating behaviors, and its significance in relation to gender among Indian medical students.

In this study, the BMI and WC of male participants outweigh females, which is in line with another Indian study, where the BMI, WC, and fat percentage distribution were more in males compared to females of the same age group, and they also found it to be increased with age, indicative of an increase in adiposity and central obesity with progressing age.^[17]

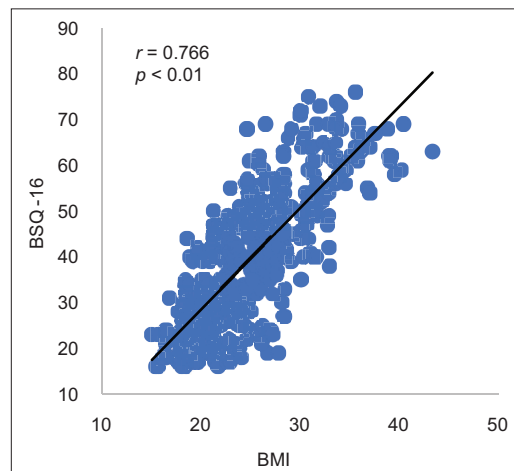


Figure 1: Association between the BSQ 16 scores and BMI

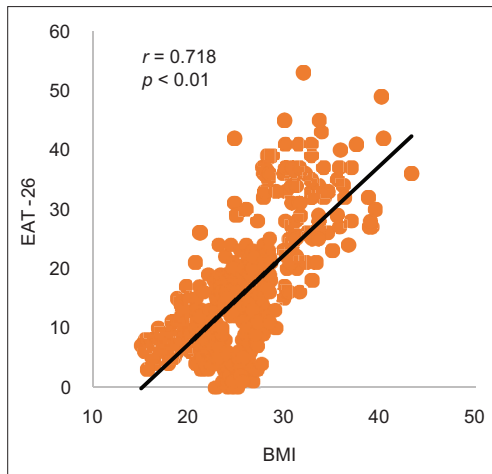


Figure 2: Association between the EAT 26 scores and BMI

This study shows a higher prevalence of body image concern among medical students. There is an increasing trend toward prevalence of body image concerns over the last few years ranging from 22% to 35%.^[3,18-22] These findings need further study to understand the reason underlying this observation. Studies conducted among young adults showed there was a significant difference in their body image concerns among the underweight, normal, overweight, and obese groups, indicating strong positive association between BMI and body image concern.^[23]

The body size of an individual can be over- or underestimated based on their anthropometric factors (BMI), psychological factors (low self-esteem), and sociocultural factors such as media portrayal of the ideal female or male body image.^[24]

In the present study, 25.6% had a higher risk of an eating disorder. In line with our study, several studies among students reported to have high risk of eating disorders ranging from 13% to 37.6%.^[25-27]

Studies done by Kumar *et al.* and Doninger *et al.* have reported positive association between BMI and EAT 26.^[28,29] In contrast to the present study, study by Iyer *et al.*^[27] reported BMI was not associated with EAT 26 score.

Trans diagnostic model conveys that patient with eating disorder experience low self-esteem, which increases their risk for over negative evaluation of body, whereas cognitive behavior model conveys that cognitive schema like fear of fatness, over concern with body size, shape, internalization of thin ideal size, and perfectionism were other possibilities for eating disorder.^[30]

Disordered eating habits represent an important precursor to ED. There is a strong relationship between

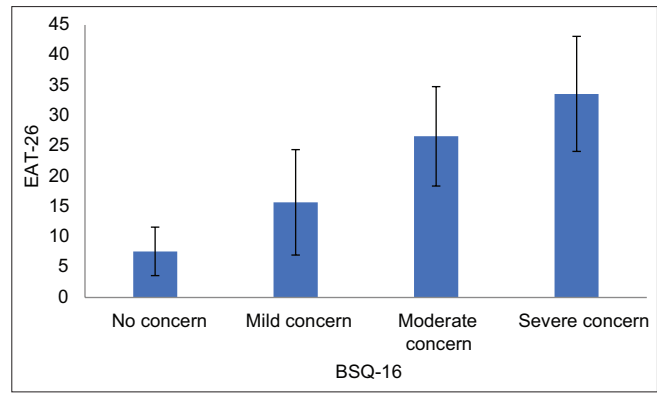


Figure 3: EAT 26 score at different BSQ 16 scores

Table 4: Distribution of BID based on silhouette images

Parameters	Male	Female
Desire to be heavier (≤ -2)	18 (6.8%)	4 (1.7%)
Desire to be heavier(-1)	36 (13.3%)	9 (3.9%)
Remain same 0	135 (51.3%)	63 (27.4%)
Desire to be thinner (1)	25 (9.5%)	86 (37.4%)
Desire to be thinner ≥ 2	49 (18.6%)	68 (29.5%)

*Expressed as frequency and proportion. *A positive score indicates the dissatisfaction due to being overweight and a negative score indicates dissatisfaction from being underweight

psychological perception about one’s own body image and their behavioral component of eating habits. Weight-related behaviors like physical activities and food restrictions are often influenced by individuals’ BMI, which is supported by a study finding done by Lynch *et al.*,^[31] where women with obesity based on BMI saw themselves as obese tried to lose weight, whereas women with obesity who perceived their weight as normal gained weight.

BMI and WC are found to have a significant direct association with BSQ and EAT scores, which indicates that an increase in body weight and central obesity is a risk factor for BID and associated disordered eating habits. This may lead to the development of a negative self-image, thereby leading to untoward behavior like an eating disorder later.

Young people with deviant body weight based on their BMI may focus on the discrepancy between what is considered to be the “ideal” body shape and their perceived “actual” body shape, which can contribute to BID.^[32] Interestingly, we found concerns about ideal body image differing between genders, where men prefer to gain more weight and muscles and women desire to lose weight and appear thin, which is comparable to other studies.^[22,24]

Our present study found BSQ also showed a high correlation coefficient with the EAT26 scores, which leads to the hypothesis dissatisfaction with one’s body

image, as excessive preoccupation with appearance and desire to lose or gain weight can cause negative feeling, resulting in a change in the eating behavior. Individual self-perception about body dissatisfaction is a potential risk factor for an upcoming eating disorder. A study by Nichols *et al.*^[33] has shown that the positive correlation between EAT 26 and BSQ 16 was 0.63 and 0.55 in males and females, respectively. A study by Iyer *et al.*^[27] reported the positive correlation between EAT26 scores and BSQ was $r = 0.683$ and was statistically significant.

In this study, we found females were more likely than males to be dissatisfied with their current body image. They were also at increased risk for disordered eating behaviors. These findings have been demonstrated in a number of studies and suggest that the gender differences in these behaviors may be cross-cultural. One of the explanations for the development of BID and disordered eating behaviors among females is the sociocultural pressure resulting from the standards of female beauty imposed by modern society and exposure to media, drive for thinness, and peer influence.^[34,35] In contrast to the present study, Alharballeh *et al.*^[23] reported males had higher BID.

Findings from our study suggest there is increasing body image concern among young adults. Henceforth, we recommend body image assessment to be incorporated during the initial medical screening for young adults. Addressing body image misconceptions and abnormal eating behavior among high-risk young adults by creating awareness programs can prevent physical and psychological morbidity in the future.

Limitation and recommendation

Causal association between body dissatisfaction and unhealthy eating behaviors cannot be established as it is a cross-sectional study. Our study findings cannot be generalizable as it involves participants from one institution. Lifestyle factors like skipping break are not included in present study. Future studies can also consider factors like role of culture and lifestyle factors including cultural and psychological comorbidity, in relation to negative self-image perceptions, and eating habits can be evaluated as it could be a potential confounding factor.

Conclusion

This study reveals a concerning prevalence of BID among medical students. The body image perceptions are negatively associated with both BMI and WC, suggesting a complex interplay between physical health and mental well-being. Future interventions addressing weight management programs, active lifestyle, and a multipronged approach that promotes body acceptance

and fosters healthy self-esteem should be emphasized to reduce psychological burden and improve overall mental health in future.

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Conflicts of interest

There are no conflicts of interest.

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