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Research

Risk of binge eating behavior among university women, quality of their diet and their perception of their body image

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Background

Binge eating disorder (BED) is an emerging public health concern, particularly among young adult women.

Objective

This study aimed to evaluate the relationship between BED risk and key behavioral and psychological factors - specifically, dietary quality, physical activity, and body image perception - among university-going women in Mumbai.

Methods

A cross-sectional study was conducted among 100 female students aged 18–25 years. Binge eating risk was assessed using the Binge Eating Scale. Dietary intake was measured through 24-hour recall and diet quality evaluated using the Global Diet Quality Score. Body image was assessed using the Body Image Questionnaire, while physical activity was evaluated using the International Physical Activity Questionnaire–Short Form. Anthropometric measurements were recorded, and statistical analyses, including Pearson's correlation, ANOVA, and chi-square tests, were conducted using SPSS v20.

Results

Fifteen percent of participants showed moderate BED risk, and another fifteen percent showed severe risk. BED risk positively correlated with daily energy ($r = 0.821$, $p < 0.05$), carbohydrate ($r = 0.903$, $p < 0.01$), and fat intake ($r = 0.936$, $p < 0.01$), while negatively correlating with diet quality ($r = -0.354$, $p < 0.01$), physical activity levels ($r = -0.226$, $p < 0.05$), and body image satisfaction ($r = -0.323$, $p < 0.01$).

Conclusions

The study highlights that higher BED risk is significantly associated with poor diet quality, lower physical activity, and body dissatisfaction. These findings underscore the importance of multi-dimensional interventions that address both nutritional and psychological aspects of binge eating behavior among young adult women.

INTRODUCTION

WHO defines eating disorders as involving abnormal eating habits, a preoccupation with food, and body image disturbances. Among these, binge eating disorder (BED) is the most prevalent, more common than anorexia and bulimia, and often lasts 6 to 9 years (Hudson et al. 2007; Taylor et al. 2006).

The American Psychological Association defines BED as recurrent episodes of uncontrolled eating, at least once a week for three months, often accompanied by distress and behaviors such as eating rapidly or when not hungry.

BED is linked to poor physical and mental health, and is more common in individuals with body dissatisfaction or weight-related teasing (Stice et al. 2002; Haines et al. 2007). It is often associated with restrictive dieting, irregular meals,

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and consumption of high fat “forbidden” foods (Stice et al. 2008; Hadigan et al. 1992).

Frequent binge eating is associated with a reduced quality of life, increased medical comorbidities, and a range of psychological issues including depression and anxiety (Hudson et al. 2007). These associations have been reaffirmed in recent research, which highlights links between binge eating disorder (BED) and physical conditions such as obesity, hypertension, and metabolic dysfunctions (Sun et al. 2024), as well as significant psychological distress. BED remains particularly prevalent among adolescents who report high levels of body dissatisfaction and concerns about weight or shape (Stice et al. 2002; Neumark-Sztainer et al. 2007), a relationship also confirmed in a large Finnish cohort study identifying body dissatisfaction and low self-esteem as major risk factors (Karvonen et al. 2024).

Weight-related teasing further exacerbates binge eating behaviors, likely through psychological distress and negative affect. This has been supported in recent studies where teasing predicted emotional eating and disordered eating patterns in youth, independent of body weight (Puhl et al. 2021), and in Chinese adolescents where teasing correlated strongly with binge eating episodes (Sun et al. 2022).

Notably, higher body satisfaction among overweight adolescent girls has been linked to a lower risk of initiating binge eating, suggesting a protective psychological factor (Sonneville et al. 2012). In terms of nutritional patterns, binge eating episodes tend to involve high-fat, energy-dense, and often "forbidden" foods, with a lower proportion of protein and carbohydrates compared to regular meals (Rosen et al. 1986; Van der Ster Wallin et al. 1994).

While most studies focus on Western clinical populations, there is limited research on non-clinical young women in India. This study aims to assess BED risk among Indian university women aged 18 to 25 and examine its relationship with diet quality and body image perception.

METHODS

STUDY DESIGN AND PARTICIPANTS

This cross-sectional study included 100 women aged 18 to 25 years, enrolled in universities across Mumbai, India. The sample size was based on feasibility and aligned with prior studies on disordered eating behaviors. Participants were randomly selected from the purposive and convenience sampling we did within university settings to choose those who met the inclusion criteria, assessed using a structured screening form. Individuals were excluded if they had a history of diagnosed eating disorders such as anorexia nervosa, bulimia nervosa, binge eating disorder, avoidant restrictive food intake disorder, other specified feeding and eating disorders, pica, or rumination disorder. Additionally, individuals with diagnosed mental illnesses, including depression, anxiety disorders, schizophrenia, and addictive behaviors, as well as those with major health issues such as diabetes, pre-diabetes, cardiovascular diseases, and polycystic ovarian syndrome, were excluded.

DATA COLLECTION PROCEDURES

All data collection procedures were carried out by the author, who also served as the research assistant. The principal investigator was informed of the process and study design.

Participants completed self-administered questionnaires via Google Forms, which included sections on demographic characteristics, medical and psychological history, binge eating behavior, body image perception, physical activity, and diet quality. Height and weight were taken using tools like a measuring tape for height and a calibrated digital scale for weight. A single 24-hour dietary recall interview was conducted in person by the author to document all foods and beverages consumed in the previous day. Standardized household measures were used to estimate portion sizes, with reference to recommended dietary allowances (Salesse et al. 2024).

VALIDATED TOOLS

The following validated tools were employed:

- Binge Eating Scale (BES) (Gormally et al. 1982): A 16-item tool assessing behavioral and emotional components of binge eating. The overall scores range from 0 to 46, with higher scores indicating more severity.
- Body Image Questionnaire (BIQ) (Bruchon-Schweitzer et al. 1987): Comprises 19 bipolar items rated on a 5-point scale. Total scores range from 19 to 95, with higher scores reflecting greater body satisfaction.
- International Physical Activity Questionnaire – Short Form (IPAQ-SF) (Lee et al. 2011): Assesses the intensity and duration of physical activity over the last 7 days, yielding total Metabolic Equivalent of Task (MET) - min/week scores. Activity levels were categorized as low (<20), moderate (20–30), or high (30–49).
- Global Diet Quality Score (GDQS) (Bromage et al. 2021): A food-based index evaluating the intake of both healthy and unhealthy food groups. Higher scores denote better overall diet quality.

STATISTICAL ANALYSIS

Data were analyzed using SPSS version 20. Descriptive statistics (frequencies and percentages) were used to summarize categorical variables such as food patterns, physical activity levels, and socio-demographic characteristics. Chi-square tests were employed to assess associations between categorical variables, including socio-demographic factors and the likelihood of BED risk. For continuous variables, differences in body image satisfaction and diet quality were evaluated using Student’s t-tests or one-way ANOVA, as appropriate. A p-value of <0.05 was considered statistically significant.

ETHICAL CONSIDERATIONS

The study protocol was approved by the Intersystem Biomedica Ethics Committee (Approval No. ISBEC/NR-14/KM-KM/2024). Informed consent was obtained electronically via Google Forms. Participants were clearly informed about the study’s purpose, procedures, confidentiality of data, voluntary nature of participation, and their right to withdraw at any time without consequences.

RESULTS AND DISCUSSION

A total of 102 participants completed the screening form. Based on the inclusion and exclusion criteria, 2 individuals were excluded due to medical or psychological conditions. The final sample included 100 young adult women aged 18 to 25 years, 70 of whom had "none to mild" symptoms of BED; 15 had "moderate" and another 15 had "severe" symptoms.

Table 1 presents the socio-demographic characteristics of the study participants classified into three groups by the risk of BED.

Table 1. Socio-demographic characteristics of the study participants when classified according to binge eating disorder risk

Characteristics	None to mild (N=70) n(%)	Moderate (N=15) n(%)	Severe (N=15) n(%)	p-value
Mean age	21.41	20.1	22.1	0.44*
Mean binge eating disorder score*	8.4	21.6	39	
Education level				
Undergraduate program	27 (58.7)	12 (26.1)	7 (15.2)	< 0.0001*
Post-graduate and above	43 (79.6)	3 (5.6)	8 (14.8)	
Employment status				
Not working	56 (73.7)	12 (15.8)	8 (10.5)	0.007*
Working	14 (58.3)	3 (12.5)	7 (29.2)	

* p-value for ANOVA

Students at postgraduate level have a lower risk of BED than undergraduates. Working while studying is presumably stressful, and the data in Table 1 show that it is associated with a higher risk of BED.

Table 2. Presents the anthropometric measurements of study participants categorized by BED risk. Although prior studies have demonstrated a positive association between BED severity and BMI, particularly in post-bariatric surgery patients where binge eating behaviors predicted recurrent weight gain (Cali et al. 2025), our findings did not reveal statistically significant differences in BMI across groups. This could relate to the length of time that students have been suffering from BED symptoms. In addition, for an Asian population such as ours, a BMI of 23 kg/m² or higher is considered overweight (WHO, 2004). Therefore, the higher BMI in the Severe BED category, though not statistically significant, may have different health implications for Asian participants.

Table 2. Anthropometric measurements (mean + SD) of the study participants when classified according to binge eating disorder risk

Anthropometric Measurements	None to mild (N=70)	Moderate (N=15)	Severe (N=15)	p-value
Height (cm)	157.7 (6.6)	159.8 (8.9)	156.7 (5.6)	0.445
Weight (kg)	53 (9.8)	55.8 (11.2)	57 (12.1)	0.311
BMI (kg/m²)	21.4 (4.5)	21.6 (3.5)	23.3 (5.5)	0.352

Table 3 reveals that macronutrient intake varied notably across BED risk categories. Higher symptom severity was associated with greater energy intake – particularly from carbohydrates and fats – and lower Global Diet Quality Scores (GDQS), indicating poorer diet quality.

These findings align with previous studies linking BED to energy-dense, nutrient-poor diets and increased fat and carbohydrate consumption – often at the expense of nutritional balance (Smith et al. 2018; Latner et al. 2008; Raymond et al. 2003; Wiklund et al. 2022). (Cali et al. 2025) further observed that post-bariatric patients with binge tendencies experienced increased caloric intake and weight regain – underscoring the clinical significance of dietary regulation.

Although the absolute fat intake (in grams) significantly increased with BED severity – from 44.7 g in the None to Mild group to 55.4 g in the Severe group ($p = 0.0001$) – the percentage of total energy derived from fat remained relatively stable across categories (29.3% to 31.0%). Despite reaching statistical significance ($p = 0.001$), this appears to be driven by the greater variability within the Severe group (SD = 7.7) rather than a consistent directional trend. Therefore, while fat intake in absolute terms rose with BED severity, the proportion of energy from fat did not follow a clear or meaningful pattern.

Protein intake showed no significant variation – supporting evidence that binge episodes favor highly palatable foods rich in sugar and fat, but not protein (Goldschmidt et al. 2014). These results underscore the need for dietary interventions targeting both energy intake and macronutrient balance in BED management. Together, these findings reinforce the association between BED and unhealthier dietary profiles, marked by increased caloric and fat intake.

Table 3. Daily macronutrient intake (mean ± SD) of the study participants when classified according to binge eating disorder risk

Nutrients	None to mild (N=70)	Moderate (N=15)	Severe (N=15)	p-value
Energy (kcal)	1329.2 (223.9)	1568.6 (231.1)	1568.9 (368.4)	0.042
% RDA met for energy	80.1 (13.5)	94.5 (13.9)	94.5 (22.2)	0.042
Protein (g)	37.2 (7.7)	37.1 (7.4)	35.3 (5.9)	0.679
% RDA met for Protein	81.4 (17)	81.1 (16.2)	77.3 (13)	0.679

Table 3. Continue

% Energy met from protein	9.7 (2.5)	9.6 (2.6)	10.8 (2.6)	0.283
Carbohydrates (g)	196.5 (44)	230.3 (54.3)	240.3 (47.4)	0.0001
% Energy met from carbohydrate	58.6 (4.3)	59.1 (7.5)	60.9 (4.4)	0.594
Fats (g)	44.7 (8.4)	51 (10)	55.4 (29.1)	0.0001
% Energy met from fat	30.4 (4.3)	29.3 (4.5)	31 (7.7)	0.001
Global diet quality score	27.7 (7.5)	23.4 (9.3)	20.3 (7.2)	0.002

*All values are Mean ± SD

Similar to the present study's findings, (Smith et al. 2018) reported that individuals with a heightened risk of binge eating tended to consume more energy-dense, nutrient-poor foods. Similarly, Jones et al. (2016) observed significant differences in macronutrient intake among risk categories of binge eating disorder, with those at higher risk consuming increased amounts of carbohydrates and fats.

The findings of the present study are thus consistent with findings of the prior research, which underscores distinct dietary patterns among individuals with BED compared to non-BED obese cohorts. (Engel et al. 2009) linked binge episodes to elevated sucrose and fat intake, while (Wiklud et al. 2022) observed heightened energy and saturated fat consumption in individuals with binge-type eating disorders. (Raymond et al. 2003) reported that BED participants demonstrated significantly greater total calorie intake and a higher proportion of calories derived from fat compared to non-BED obese counterparts. Moreover, (Raymond et al. 2012) reported substantially higher self-reported calorie consumption among BED individuals than weight-matched non-BED peers, with BED participants averaging 2,707 kcal compared to 1,869 kcal in the non-BED group.

Table 4. Presents the Physical activity levels (PAL) of the study participants categorized by the risk of BED. The physical activity (PA) score exhibited variations across different risk categories, with participants categorized as having none to mild risk demonstrating a significantly higher mean PA score (11.3 ± 8.1) as compared to those with severe risk category (5.7 ± 3.5).

Table 4. Physical activity level and classification of study participants according to binge-eating disorder risk

Physical activity level	None to mild (N=70) n(%)	Moderate (N=15) n(%)	Severe (N=15) n(%)	P-value
Physical activity score*	11.3 (8.1)	8.4 (5.2)	5.7 (3.5)	0.019
Good	54 (54)	14 (14)	15 (15)	
Moderate	13 (13)	1 (1)	0 (0)	
Poor	3 (3)	0 (0)	0 (0)	

*values are Mean + SD; a higher score means the participant habitually engages in more exercise; p-value for Analysis of Variance

The data suggests that lower physical activity levels may be seen in individuals with a higher risk of BED. Similar findings have been reported from previous studies (Vancampfort et al. 2014; Vancampfort et al. 2015) who found that individuals diagnosed with BED often abstain from engaging in any form of exercise. Other research (Pendleton et al. 2002; Fossati M et al. 2004; McIver S et al. 2009; Mama SK et al. 2015) has significant benefits of PA interventions for individuals with BED. PA interventions have also been found to reduce the number of binge-eating episodes more than other interventions.

Figure 1 presents the scores from body image questionnaire for study participants categorized by the risk of BED. The higher the BIQ score, the greater the body satisfaction. The mean BIQ score significantly varied across risk categories (p-value = 0.001).

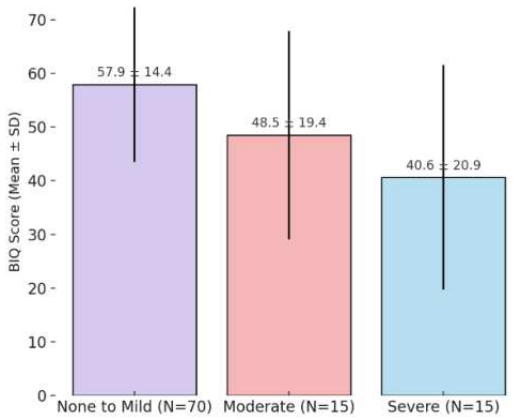

Figure 1. Body image questionnaire scores by BED risk category

The higher the BIQ score, the greater the body satisfaction.

Individuals reporting such concerns experience more severe eating disorder symptoms, lower self-esteem, and higher depression levels (Grilo et al. 2010; Harrison et al. 2016). These findings resonate with the study, reinforcing the significance of understanding the psychological aspects and severity of BED.

The positive correlations observed between BED risk and factors such as energy intake, percentage of recommended daily energy intake, carbohydrate intake, and fat intake underscore the significant role of dietary patterns in BED (Gendall et al. 1999; Roustaee et al. 2018; Siega-Riz et al. 2008; Elran-Barak et al. 2014; Raymond et al. 2003). Individuals at higher BED risk tend to gravitate towards energy-dense foods, indicating a potential link between binge eating behavior and specific food preferences, which could perpetuate or worsen BED symptoms (Goldschmidt et al. 2014). However, it is noteworthy that while energy-dense foods high in carbohydrates and fats may be favored during binge episodes, protein intake does not follow the same pattern.

CONCLUSION

The study discovered strong links between BED risk and a variety of lifestyle and psychological variables, including body image satisfaction, physical activity levels, and

nutritional intake. As the risk of BED increased, participants reported lower body image satisfaction and less physical activity. Furthermore, higher BED risk was associated with increased consumption of energy-dense meals, notably carbohydrates and lipids. These findings underline the multidimensional nature of BED and the significance of integrated approaches that take into account both psychological and behavioral components when assessing and managing it.

AUTHOR CONTRIBUTIONS

AYS conceptualized and designed the study, conducted participant recruitment and interviews, performed transcription, data analysis, and theme development, and wrote the original manuscript. AYS was responsible for all stages of the research. MN provided supervision and critical review of the analysis and manuscript drafts. All authors approved the final version of the manuscript.

CONFLICT OF INTEREST

The authors declare that they have no other potential conflicts of interest.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN SCIENTIFIC WRITING

During manuscript preparation, the author used ChatGPT (OpenAI, 2025) for language refinement and formatting. All content was carefully reviewed, edited, and validated by the author to ensure accuracy and originality.

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