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PREVALENCE AND RELATED FACTORS OF EATING DISORDERS AMONG HIGH SCHOOL STUDENTS: A CROSS-SECTIONAL STUDY IN HANOI, VIETNAM

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ABSTRACT

Objectives: This study aimed to use the Eating Attitudes Test-26 to determine the prevalence of eating-disorder risk and its associated factors among students at Nguyen Thi Minh Khai High School, Hanoi, in 2025.

Subjects and methods: A cross-sectional study was conducted using a stratified random sampling method among high school students in Hanoi. Eating-disorder risk was assessed using the EAT-26 questionnaire.

Results: The prevalence of students at risk of eating disorders was 13.4%. Several lifestyle-related factors were significantly associated with eating-disorder risk, including not regularly communicating with family (OR = 1.9; p < 0.05); Using the Internet at night for ≥ 2 hours/day (OR = 2.2; p < 0.05); Self-perceiving as overweight or obese (OR = 3.1; p < 0,01). In addition, BMI-for-age also showed a significant association. Students classified as overweight/obese had a higher risk compared with those with normal BMI (OR = 2.5; p < 0.05).

Conclusion: Eating disorders are an important health issue among high school students and are associated with various psychosocial and nutritional factors. The findings highlight the need for early screening, psychological counseling, and school–family–based interventions to support healthy behaviors and protect adolescent well-being.

Keywords: Eating disorders, EAT-26, high school students.

1. INTRODUCTION

Eating disorders are characterized by persistent abnormalities in eating patterns or related behaviors that substantially interfere with food consumption or nutrient absorption, ultimately leading to physical and/or psychological health impairment. These disorders can occur across all ages, genders, races, and ethnicities. Among them, anorexia nervosa (AN), bulimia nervosa (BN), and binge eating disorder (BED) represent the most prevalent and clinically significant forms[1].

Globally, eating disorders are estimated to affect nearly 10% of the population and were listed among the global disease burden in 2019[2]. Eating disorders have existed for a long time and continue to rise each year. Adolescents aged 15–21 constitute the most vulnerable group, influenced by multiple risk factors such as academic stress, physiological changes, social media exposure, and prevailing beauty standards[3]. Evidence shows that adolescents may account for up to 70.2% of individuals with eating disorders[3]. Prolonged disordered eating can result in micronutrient deficiencies, osteoporosis, and renal complications within this age group. These behaviors not only compromise physical well-being but also heighten the likelihood of psychological conditions, including anxiety, depression, and suicidal ideation. In Viet Nam, epidemiological data remain limited; however, available studies suggest a relatively high burden. A 2023 study among high school students in Hanoi reported a 55.9% prevalence of general eating disorder symptoms[4]. More recently, the rates among adolescents have shown an upward trend, particularly following the COVID-19 pandemic[5].

Understanding the prevalence, characteristics, and associated risk factors of eating disorders in this population is crucial for designing early intervention strategies, psychological support services, and appropriate nutrition education. For adolescents, early detection and timely management–ideally

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implemented during the school years–can reduce treatment costs, enhance therapeutic outcomes, and prevent long-term complications.

From this context, we conducted the study titled "Prevalence and related factors of eating disorders among high school students: A cross-sectional study in Hanoi, Vietnam" with the following objectives:

1. Describe the prevalence of eating disorder symptoms among students at a high school in Hanoi during the 2024 – 2025 academic year.

2. Analyze various factors associated with eating disorder symptoms among these students.

2. SUBJECT AND RESEARCH METHOD

2.1. Research design

The cross-sectional study.

2.2. Study duration and Location

September 2024 to November 2025 at Nguyen Thị Minh Khai High school in Hanoi.

2.3. Study population

Participants were students enrolled at a high school in Hanoi during the 2024 - 2025 academic year.

- Selection Criteria:

+ Students who were formally enrolled in a high school in Hanoi at the time of data collection.

+ Aged 15 - 28 years.

+ Willing to participate in the research.

- Exclusion Criteria:

+ Students who did not complete all items of the EAT-26 eating disorder assessment scale.

2.4. Sample size and Sampling method

- Sample size determination:

The sample size was calculated according to Pourhoseingholi et al. (2013), using The Estimated formula for one ratio:

$$n = Z^2_{1-\alpha/2} \frac{p(1-p)}{(p\varepsilon)^2}$$

- Where:

+ n: Study sample size.

+ α: Level of statistical significance, set at α= 0.05 (corresponding to 95% confidence).

+ $Z_{1-\alpha/2}$: Z-value corresponding to a 95% confidence level → Z = 1.96.

+ p: Prevalence of eating disorders from Chu Hong Ngoc's study is 55.9%, taking p = 0.559[4].

+ ε: Relative margin error between the sample size and the reference population, choosing ε = 0.1 (10%).

Based on these parameters, the final required sample size was 303 students.

In practice, data were collected from 808 participants.

- Sample collection method:

Stratified random sampling was applied.

Procedure:

- Stage 1: Students were divided into three strata according to grade level (Grade 10, Grade 11, Grade 12).

- Stage 2: A list of classes within each stratum was compiled. Using Excel's random selection function, 7 classes from Grade 10, 9 classes from Grade 11, and 6 classes from Grade 12 were randomly selected. All students from the selected classes were invited to participate.

2.5. Study content/ Indicators

- Demographic variables: gender, grade level, household economic classification, birth order within the family, father's educational level, and mother's educational level.

- Lifestyle-related variables: primary meal preparer in the household, frequency of family conversations, daily duration of Internet use, and average daily sleep duration.

- Nutritional status variables:

+ Self-assessed body image: reflected participants' own perception of their nutritional status (underweight, normal, or overweight/obese) after being informed of their current weight and height.

+ Desired body image: was derived from participants' self-reported desired weight (i.e., how much they would like to weigh) using the same height value (underweight, normal, or overweight/obese).

+ Body Mass Index (BMI) classification according to the World Health Organization was calculated from the measured height and current weight.

BMI	Classification
< 18.5	Underweight
18.5-22.9	Normal
≥ 23	Overweight/ Obesity risk

+ Age-adjusted BMI classification:

Category	Percentile Threshold (%)	Interpretation
1. Underweight	< 5th percentile	Undernutrition
2. Normal	5th – <85th percentile	Adequate nutrition
3. At risk of overweight	85th – <95th percentile	Weight monitoring recommended
4. Obese	≥ 95th percentile	High health risk

- Eating Attitudes Test - 26: EAT-26 is an abbreviated 26-item version of the EAT-40, created by Garner et al.[6] The EAT-26 was developed to enhance the efficiency and applicability of screening procedures in both clinical and non-clinical populations.

The instrument assesses multiple dimensions of eating

behavior, including dieting, binge eating, food preoccupation, and oral control—reflecting self-regulation in eating. To score the EAT-26, items 1–25 are re-scored to a 4-point scale, corresponding to always (3), usually (2), often (1), sometimes (0), rarely (0), and never (0), with item 26 reverse-scored. Its structure allows respondents to indicate the frequency with which they engage in specific behaviors and thoughts related to eating disorders.

+ A total EAT-26 score of ≥ 20 is considered within the clinical range for potential eating disorder severity.[6] This cut-off point was also applied in the present study.

+ In addition, to provide a more detailed assessment of specific eating disorder subtypes, the study employed an additional cut-off score of ≥ 11 proposed by Orbitello et al.[7], indicates the presence of eating disorder–related behaviors. Subscale classifications include:

++ Dieting / Anorexic tendencies: (13 items) is closely correlated with a distorted body image;

++ Bulimia and Food Preoccupation: (six items) is closely associated with body weight; it provides information about body image and tendency towards bulimic behaviour;

++ Oral Control: (seven items) reflects the tendency to self-control. High scores in this area are related to low weight and to the absence of bulimia.

2.6. Statistical analysis

- Collected data was entered using Google Forms, cleaned using Microsoft Excel, and analyzed with STATA 16.0.

- Descriptive statistics: variables and indicators were summarized using frequencies, percentages, and means.

- Inferential statistics: Chi-square test and logistic regression analysis were applied.

2.7. Research Ethics

The study is a component of Committee Decision No. 6240/QĐ-ĐHYHN dated 18 October 2024, under the foundational project of the Institute of Preventive Medicine and Public Health in 2024.

3. RESULT

3.1. First objective: Describe the prevalence of eating disorder symptoms among students at a high school in Hanoi during the 2024 – 2025 academic year.

The demographic profile of the 808 participating students indicated that females constituted the majority of the sample (66.2%). Students in Grade 11 represented the largest proportion (42.8%), followed by those in Grade 10 (31.8%) and Grade 12 (25.4%). In terms of socioeconomic status, the household monthly income group of 20–30 million VND comprised the highest percentage (45.2%). Most participants were either the first-born (47.9%) or second-born (36.1%) child in their families. With respect to parental educational attainment, 61.1% of fathers and 73.5% of mothers held a college or university degree or higher.

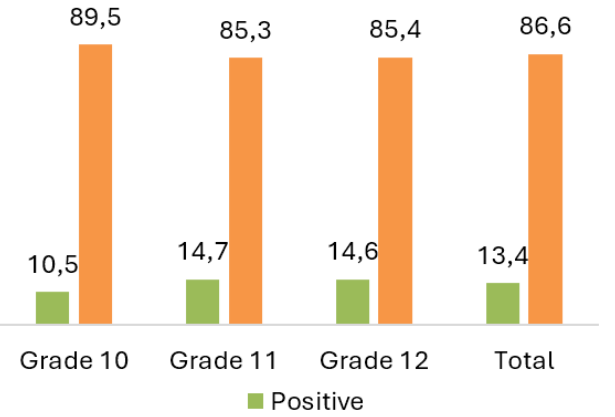

Figure 1. Distribution of eating disorder prevalence by grade level

Figure 1 presents the distribution of eating disorder (ED) prevalence among students across grade levels. Overall, 13.4% of students were identified as being at risk for ED, whereas 86.6% were not. Grade 10 demonstrated the lowest prevalence (10.5%), while Grade 11 recorded the highest (14.7%), with Grade 12 showing a similar rate (14.6%).

Table 2. Severity of eating disorders based on EAT-26 scores by gender (n = 808)

Eating disorder classification	Gender		Total
Clinical cut-off	Male (n = 273) n (%)	Female (n = 535) n (%)	
≥ 20%	37 (13.6)	71 (13.3)	108 (13.4)
≥ 11%	57 (20.9)	127 (23.7)	184 (22.8)
Dieting	44 (16.1)	109 (20.4)	153 (18.9)
Bulimia	7 (2.6)	6 (1.1)	13 (1.6)
Oral Control	6 (2.2)	12 (2.2)	18 (2.2)

Note: A total score of ≥ 20% and subscale scores of ≥ 11% for Dieting, Bulimia, and Oral Control were determined based on the sum of the corresponding items.

Table 2 summarizes the severity levels of eating disorder symptoms, as measured by the EAT-26, among high school students by gender. Overall, proportions were comparable between males (13.6%) and females (13.3%). Dieting behaviors were the most prevalent symptom category (18.9%), occurring more frequently in females (20.4%) than in males (16.1%). Bulimic symptoms were uncommon, with an overall prevalence of 1.6%, and appeared relatively similar between males (2.6%) and females (1.1%). Oral Control symptoms were reported in 2.2% of students, with no substantial gender differences.

Table 3. Nutritional status by gender (n = 808)

Characteristics	Gender		Total	p
	Male n (%)	Female n (%)		
Self-assessed body image				
Overweight/ Obese	59 (21.6)	119 (22.2)	178 (22.0)	0.00*
Normal	124 (45.4)	320 (59.8)	444 (55.0)	
Underweight/ Severely underweight	90 (33.0)	96 (17.9)	186 (23.0)	
WHO classification				
Obese / Obesity risk	46 (16.9)	38 (7.1)	84 (10.4)	0.00*
Normal	214 (78.4)	456 (85.2)	670 (82.9)	
Underweight	13 (4.8)	41 (7.7)	54 (6.7)	
Desired body image				
Overweight/ Obese	25 (9.2)	5 (0.9)	30 (3.7)	0.00*
Normal	244 (89.4)	512 (95.7)	756 (93.6)	
Underweight	4 (1.4)	18 (3.4)	22 (2.7)	

Table 3 presents the nutritional status of students stratified by sex. More than half of the participants perceived their body size as normal (55.0%), whereas 23.0% viewed themselves as thin and 22.0% considered themselves overweight or obese. Based on the WHO classification, 82.9% were categorized as normal weight, 10.4% as overweight or at risk, and 6.7% as underweight. Regarding body shape preference, 93.6% expressed a desire for a normal body shape. Statistically significant differences between males and females were observed ($p < 0.01$).

3.2. Second objective

Analyze various factors associated with eating disorder symptoms among students at a high school in Hanoi during the 2024 – 2025 academic year.

Table 4. Analysis of the association between demographic characteristics, lifestyle habits, and disordered eating (n = 808)

Characteristics	Eating disorder		OR (95%CI)	p
	Negative n(%)	Positive n(%)		
Gender				
Female	464 (66.3)	71 (65.7)	0.98 (0.6-1.5)	0.9
Male	236 (33.7)	37 (34.3)	1	
Grade				
Grade 12	175 (25.0)	30 (27.8)	1.5 (0.1-0.2)	0.1
Grade 11	295 (42.1)	51 (47.2)	1,5 (0.9-2.4)	0.1
Grade 10	230 (32.9)	27 (25.0)	1	
Time spent communicating with family				
No	103 (14.7)	28 (25.9)	2.0 (1.3-3.3)	0.00*
Yes	597 (85.3)	80 (74.1)	1	
Internet use after 10 PM				
Not using	43 (6.1)	8 (7.4)	1.7 (0.8-3.9)	0.2
≥ 2 hours/ day	135 (19.3)	44 (40.7)	3.0 (2.0-4.7)	0.00*
< ≥ 2 hours/ day	522 (74.6)	56 (51.6)	1	
Self-assessed body image				
Overweight/ Obese	135 (75.8)	43(24.2)	2.6 (1.6-4.0)	0.00*
Under-weight/ Severely underweight	395 (89.0)	49 (11.0)	0.8 (0.4-1.4)	0.36
Normal	170 (91.4)	16 (8.6)	1	

Table 4 examines the relationships between key demographic factors, lifestyle behaviors, and the likelihood of eating disorder risk among students. Not engaging in regular communication with family was significantly associated with higher ED risk (OR = 2.0; 95% CI: 1.3–3.3; p = 0.00). Additionally, using the Internet after 10 PM for ≥ 2 hours per day showed a strong association with increased risk (OR = 3.0; 95% CI: 2.0–4.7; p = 0.00). Students who perceived themselves as overweight or obese also had elevated odds of experiencing eating disorder symptoms (OR = 2.6; 95% CI: 1.6–4.0; p = 0.00). Gender, grade level, and total daily Internet usage

did not demonstrate statistically significant associations (p > 0.05).

Table 5. Analysis of the association between age-adjusted BMI and eating disorder risk (n = 808)

BMI-for-age	Eating disorder		OR (95%CI)	p
	Negative n(%)	Positive n(%)		
Overweight/ Obese	63 (75.0)	21 (25.0)	2.3 (1.3-3.9)	0.00*
Underweight	52 (96.3)	2 (3.7)	0.3 (0.1-1.1)	0.07
Normal	585 (87.3)	85 (12.7)	1	

Table 5 shows the association between age-adjusted BMI and eating disorder risk. Students classified as overweight or obese demonstrated a 2.3-fold increase in the likelihood of eating disorders compared with those in the normal BMI range (OR = 2.3; 95% CI: 1.3–3.9; p = 0.00). The underweight group did not exhibit a statistically significant association (p = 0.07), although the prevalence of eating disorders in this category was relatively low.

4. DISCUSSION

The present study identified a 13.4% prevalence of eating disorder risk among high school students. This proportion is lower than estimates reported in several previous investigations conducted both within Viet Nam and internationally. A 2023 study among high school students in Hanoi documented a substantially higher prevalence of 55.9%.[4] Such differences may stem from variations in assessment instruments, sample characteristics, and sociocultural factors across study populations. Divergence in screening tools–including BITE, DASS-21, or the SCOFF questionnaire–can also contribute to inconsistent prevalence estimates. For instance, a Vietnamese study from 2020 employing both the EAT-26 and BITE reported a prevalence of 44.5%. [8] Despite these discrepancies, the overall body of evidence suggests that the burden of eating disorder risk among adolescents in Viet Nam is on the rise.

Regarding sex differences, the study findings indicate that females represented nearly twice as many cases as males (65.7% vs. 34.3%). This finding is consistent with previous studies, including the 2023 research by Chu Hong Ngoc and the majority of international literature.[2], [4] Negative body image, heightened appearance-related pressures, and greater levels of psychological distress may contribute to the higher vulnerability among female students. Although the overall prevalence of eating disorder risk in the present study was lower than that reported in several other investigations, the proportion of students exhibiting dieting-related disturbances–a central domain of the EAT-26–remained substantial at 18.9%.

Although no statistically significant association between sex and disordered eating was detected in this study, notable sex-specific differences emerged in self-assessed body image, WHO classification, and body-image preferences (p < 0.01). Several behavioral factors were significantly associated with disordered eating risk. Students who did not regularly engage in conversations with family members had greater odds of disordered eating compared with those who maintained family communication (OR = 2.0; 95% CI: 1.3–3.3; p < 0.05). This result suggests that family connectedness and routine interaction may function as protective factors, potentially mitigating the development of maladaptive eating patterns. Prior studies have similarly emphasized the role of emotional support and family relationship quality in fostering mental well-being and healthier eating behaviors among adolescents.[9-10] Late-night Internet use also showed a significant association with disordered eating (p < 0.01). Students who spent ≥ 2 hours online after 22:00 exhibited a higher prevalence of disordered eating compared with those with shorter durations of use. This observation aligns with international literature indicating that extended exposure to social media—particularly content promoting thinness, dieting, or "ideal body" images—may adversely influence body perception and contribute to disordered eating behaviors.[10-11]

A significant relationship between age-adjusted BMI and disordered eating was identified in this study (p < 0.01). Adolescents with elevated BMI values had more than twice the likelihood of engaging in disordered eating behaviors compared with those within the normal BMI range. This finding aligns with international evidence indicating that overweight adolescents tend to experience greater body dissatisfaction and heightened exposure to sociocultural appearance norms, thereby increasing their susceptibility to maladaptive dieting practices and disordered eating. Previous studies have similarly documented that overweight or obese adolescents are more likely to adopt unhealthy weight-control behaviors than their normal-BMI peers. [12] Importantly, disordered eating behaviors were also reported among students with normal BMI, indicating that such behaviors are not restricted to higher-weight groups. The prevalence of disordered eating among adolescents with normal BMI reached 12.7%, second only to the overweight/obese category (25.0%). This pattern may reflect distorted body perception or heightened concerns about weight control, even among youths whose BMI falls within the normal range. These findings underscore that BMI alone is insufficient as a predictor of disordered eating risk. Incorporating psychosocial dimensions—particularly body image dissatisfaction and weight-related pressures—may allow for a more comprehensive evaluation of vulnerability among adolescents.

This study has several limitations. The use of additional clinical assessments or objective measurements alongside screening tools could provide more accurate findings. Furthermore, the sample size and study setting were limited to a single high school in Hanoi, which

may restrict the generalizability of the results to all Vietnamese high school students.

5. CONCLUSION

This study documented a 13.4% prevalence of disordered eating among high school students, with observable differences across grade levels. Factors significantly associated with disordered eating included limited family communication, Internet use exceeding two hours after 10 p.m., body-image perception, and being classified as overweight or obese based on BMI-for-age. These results highlight disordered eating as a meaningful public health concern in the adolescent population and emphasize the importance of coordinated efforts between families and schools to strengthen screening, early detection, and psychological and nutritional support. The findings offer valuable evidence to guide future intervention and prevention strategies, particularly those aimed at improving health communication, enhancing nutrition education, and promoting positive body-image development among adolescents.

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