Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/jptcp.v30i17.2942

FREQUENCY OF UNDERGRADUATE MEDICAL STUDENTS AT RISK OF DEVELOPING EATING DISORDERS

Ehtisham Sohail Khan[1], Emad Munir[2], Bilal Qammar[3*], Faria Zulfiqar[4], Atta Ullah[5], Usama Arshad[6]

[1] Shalamar Hospital, Lahore, Pakistan. Email: ehtisham.khan294@gmail.com
[2] Shalamar Hospital, Lahore, Pakistan. Email: emad_munir@yahoo.com
[3]Shalamar Hospital, Lahore, Pakistan. Email: bilal.qamar.5680@gmail.com
[4]Shalamar Hospital, Lahore, Pakistan. Email: Za63985@gmail.com
[5]Shalamar Hospital, Lahore, Pakistan. Email: attaullahsundhu4161@gmail.com
[6]Shalamar Hospital, Lahore, Pakistan. Email: usama8997@gmail.com

***Corresponding Author:** Bilal Qammar
*Shalamar Hospital, Lahore, Pakistan. Email: bilal.qamar.5680@gmail.com
ORCID: https://orcid.org/0009-0008-7427-6612 Postal Address: 16C Gulberg City, Sialkot road, Gujranwala, Pakistan.

Abstract
Background: Eating disorders (EDs) have frequently been reported among young adults including university students.
Objective: 1) To determine the frequency of undergraduate medical students at the risk of developing EDs based on EAT-26
2) To identify the relation of EDs with socio demographic and behavior factors.
Methods: A descriptive cross-sectional study that also explores associations between eating disorders and other variables. Screening tool is EAT-26 questionnaire. A study sample of 405 participants was recruited by convenient sampling and data was analyzed using SPSS 20. **Results:** data of 401 respondents was analyzed. EAT 26 scores showed: 17.5% were positively at risk of developing eating disorder (score >20) and 82.5% had score <=20. The behavior pattern assessment showed: 21.9% with normal behavior and 82.5% had positive behavior showing risk of developing eating disorder. Chi square test application showed significant association of EAT 26 scores with behavior assessment.
Conclusions: There is higher risk of developing eating disorders among undergraduate medical students, and positive behavior towards eating disorder has significant association with eating disorder scores.

Keywords: Eating disorder, medical student, undergraduate, EAT 26, screening

Introduction

"Eating disorders (ED) are behavioral conditions characterized by severe and persistent disturbance in eating behaviors and associated distressing thoughts and emotions. Types of eating disorders include anorexia nervosa, bulimia nervosa, binge eating disorder, avoidant restrictive food intake disorder, other specified feeding and eating disorder, pica, and rumination disorder [1-3]. Eating

Disorders are among the most genuine and real mental illnesses, with the absolute most noteworthy death rates [4,5]. The associations of eating disorders are multi factorial in nature involving elements such as such as age, marital status, sex, greater exposure to western culture and health-related variables including BMI [6-8]. Another factor is high stress and burn out, a common occurrence in the long, rigorous and challenging journey each medical student must embark upon to become a doctor; which may leave then with such disorders as a side effect [9]. Adding further to the tough career choice university students are known to be the most susceptible group to develop disordered eating and behaviors [10]. A significant proportion of students reside away from home for long periods during their university life, which elevates chance of acquiring many psychological disorders [11]. A study conducted in our very own country, in Karachi amongst 435 Medical students yields reinforcing data where 22.75% of individuals were found to be at high risk of eating disorders, with 87.9% females and 12.1% males. A more global view from recent systematic review of the literature and meta-analysis, showing an equally concerning picture, which pooled 19 cross-sectional studies participants from Brazil, China, India, Malaysia, Pakistan, Turkey, UK, and the US, the overall prevalence of Eating Disorders risk was 10.4% (95% CI 7.8%–13.0%). In more detail, prevalence estimates between studies ranged from 2.2% (China) to 29.1% (India) [12,13].

There exists a significant need to promote awareness about the serious concerns of eating disorders in Healthcare Workers as well as the general populous in Asian cultures. Since people consider most psychiatric illnesses including eating disorders a taboo, very few cases have been reported to Doctors, Practitioners, and Mental Health workers[14,15]. As a result of which, most cases of Eating Disorders are being diagnosed through gastroenterologists with nausea, burning, and indigestion as presenting complaints, while other cases may be diagnosed surprisingly on dental visits due to dental enamel or calcium deficiency in teeth as a result of binging and purging behavior [6-8,16]. These studies and their corresponding data show that Eating disorders in students are unveiled and diagnosed when individuals at high risks are isolated, interrogated and present with detrimental physical manifestations and not actually due to the awareness shared by the community [17,18]. To highlight this apparent gap, we conducted a cross-sectional study as a survey amongst university students to better determine whether they currently have or are at risk of developing Eating Disorders. While eating disorders are described as psychiatric conditions, they can possibly prompt other genuine actual medical issues. Keeping such unfavorable clinical results in notice, it is normally disturbing that the future doctors of Punjab; Pakistan, inclined to such unpleasant conditions may be at fundamentally high risk of developing Eating disorders. The sooner these illnesses are diagnosed and managed, the better the odds are for improved treatment and better recuperation. Along these lines, we mean to embrace an illustrative report to evaluate the rate of high-hazard eating disorders among medical students of Punjab.

The rationale of the study is to investigate the trends of medical students at risk of developing eating disorders. Our main objectives are,
1) To determine the frequency of undergraduate medical students at the risk of developing EDs based on EAT-26.
2) To identify the relation of EDs with socio demographic factors.
Research questions include,
1) What is the pattern of at risk students for developing eating disorder based on EAT -26?
2) What is the association of eating disorders with BMI, socio-demographic factors, and positive behavior trend for eating disorder?

Methodology

It was a descriptive cross-sectional study that also explores associations between eating disorders and other variables. Various medical colleges from public and private sectors in Lahore were in our study setting and it was completed in 3 months duration after approval of IRB. Accessible undergraduate medical students in the medical colleges of Lahore were the study population.

Inclusion criteria: willingness and undergraduate medical students currently enrolled in MBBS program from 1st year till final year in Lahore.
Exclusion criteria: students of Allied health sciences, BDS, Nursing, DPT and Pharm-D; medical students who had taken part in a similar research in the past one year.
Convenient Sampling was applied to recruit the study subjects. Sample size was calculated on Open Epi software using Prevalence of 32.8%, Confidence interval of 95%, and 5% margin of error. Calculated sample size was 405.

Standardized instruments, EAT-26 was used to collect data [19]. EAT 26 is a standardized instrument used for the screening purpose of identifying the risk of eating disorder among the younger population. It has 26 items to measure the risk of eating disorder; a score of >20 is taken as cut off to be labeled as having risk of eating disorder and =<20 is taken as not at risk of developing eating disorder. This questionnaire has another five questions to measure the behavior pattern of the responder towards developing eating disorder. Positive response in a minimum of one item is taken as positive behavior pattern towards developing eating disorder. Positive response to these questions will warrant having a detail look into habits of the respondent by an expert; even if the EAT 26 score is in the normal range. Data collection was done using a Google form; link was shared with the study subjects through email as well as circulated online to the students. Data automatically gathered in a Google sheet, and later transferred to an excel spreadsheet.
Data analysis: 1) Descriptive statistics mean +/- Standard deviation for all variables 2) Eat-26 score categorization 3) scoring on behavior questions 4) Association of EDs scores with BMI, Age, and Gender 5) association between the higher EAT scores with the positive behavior trend for developing eating disorder.
This study was approved by the Institutional review board of Shalamar Medical and Dental College. Study protocols such as confidentiality, anonymity and a participant's right to withdraw at any point in the research were duly observed.

Results

Data of 401 respondents was entered and analyzed on SPSS 20. Our study results showed:

Table 1: Socio demographic characterizes & BMI (n=401)

Variable	**n (%)**
Gender Males Female	145(36.2) 256(63.8)
Age <=21 yr >21 yr	 131(32.7) 270(67.3)
Academic class 1st yr 2nd yr 3rd yr 4th yr Final yr	 19(4.7) 57(14.2) 76(19) 155(38.7) 94(23.4)
Residential status Day scholar Boarder	 235(58.6) 166(41.23)
Institute Shalamar medical and Dental College Others	 213(52.6) 192(47.4)
BMI <18.5 (under weight) 18.5-24.9 (healthy weight) 25.0-29.9 (over weight) >=30.0 (obesity)	 59(14.7) 251(62.6) 69(17.2) 22(5.5)

Table 2: Eating disorder risk on EAT 26 (n=401)

Variable	**n (%)**
Eating disorder risk Positive (>20 score) Negative (<=20 score)	70(17.5) 331(82.5)

Table 3: Behavior pattern at risk of developing eating disorder (n=401)

Variable	**n (%)**
Normal behavior	88(21.9)
Positive behavior pattern towards eating disorder	313(78.1)

Gender based results for the behavior questions, is shown for 256 female and 145 male students:

1) In the past 6 months have you gone on eating binges?

Females: 42.5%-never; 26.1%- once/ month or less; 15.6%- once/ week; 8.9%- 2-3 times/ week. Males: 40%- never; 28.8%- once/ month or less; 11.7%- once/ week; 13.1%- 2-3 times/ week.

2) Ever made yourself sick (vomited) to control or lose weight?

Females: 87.1%- never; 4.2%- 2-3 times/ week; 5.8%- once/ month or less. Males: 88.2%- never.

3) Ever used laxatives or diet pills or diuretics to control weight?

Females: 89.4%- never; 3.5%- once/ month or less; 3.9%- once/ week. Males: 90.3%- never; 3.4%- once/ month or less.

4) Exercise >60 minutes/ day to loose or control weight?

Females: 67.5%-never; 13.6%- once/ month or less; 5.8%- 2, 3 times/ week; 5.8%- once/ week. Males: 41.3%-never; 18.6%- 2, 3 times/ week; 13.7%- 2, 6 times/ week; 13.7%- once/ month or less; 8.2%- once/ week

5) Lost 20 pounds or more in past six months?

Females: 12.8%-maybe; 8.2%-yes; 78.9%- no

Males: 8.2%- maybe; 12.4%- yes; 79.3%- no

Table 4: Association of Eating disorder with behavior pattern of the medical students (n=401)

Variable	**Eating disorder score**		**Total**
Behavior pattern	EAT-26 (-ve) =<20 score	EAT-26 (+ve+ >20 score	
Normal behavior	84	4	88
Positive behavior pattern towards eating disorder	247	66	313
Total	331	70	401(100%)

Chi square= 13.042, p-value <.01

Association with age, gender, residential status, academic class, and BMI were found to be statistically insignificant.

Discussion

Eating disorders are behavioral conditions characterized by severe and persistent disturbances in eating behaviors and associated distressing thoughts and emotions [3,20]. Types of eating disorders include anorexia nervosa, bulimia nervosa, binge eating disorder, avoidant restricted food intake disorder, other specified feeding and eating disorder, pica and rumination disorder. Eating Disorders are among the most genuine and real mental illnesses, with the absolute most noteworthy death rates [4,5].

In our study the findings upon the socio demographic factors and BMI levels is similar to another study conducted in India, which also shows similar trends. Our study found that 17.5% of the students, both genders have EAT 26 score >20; which means that they are at risk of developing eating disorder. The rest of the study subjects in our sample were found to have scored less than 20. This finding is

higher than another study that found 13% of the participants had score >20, putting them on high risk for developing eating disorder. Our study finding on the behavior pattern of the students revealed that 21.9% of the students have not shown any behavior tendency towards developing eating disorder where as 78% have shown positive tendency towards the risk of developing of eating disorder. This is a significant finding of our study and higher behavior tendency towards eating disorder needs to be looked into in detail for further necessary action in this regard. Our gender based results on behavior items show that that positive behavior tendency towards eating disorder risk is present in both gender students. These findings of our study are supported by a past study that found 82.64% of the students when questioned upon the behavior survey, had one or more positive behavior symptom towards eating disorder.

Screening on EAT 26, our study on gender based result revealed that 34.3% of the male and 65.7% of the female students have shown positive risk (>20 score) towards eating disorder. This finding is highly significant and is supported by the past study that found 12.4% males and 13.4% female students reported high risk scores. Our study also revealed that higher eating disorder risk (60.0%) found in >21 year age group; 38.6% in boarder students; and 60% in the BMI category of healthy weight that ranges 18.5-24.9.

Cross tabulation was done between the socio demographic factors, BMI, behavior scoring and EAT 26 scores; and Chi square test of significance was applied. Our study found highly significant association between behavior pattern and eating disorder scores. This finding is strength of the study and is supported by the past study that also found significant association (p-value .004) between the individual behavior symptoms and EAT 26 scores. Though our study did not find significant association between any other factor and the EAT 26 scores, which is similar to the other study that also could not find significant association between BMI and EAT 26 scores. [16] In another study conducted in Malaysia upon 3rd, 4th, 5th year undergraduate medical students, EAT 26 was administered and results showed that 11.0% were at risk of developing eating disorder; and students who had obese BMI (25%) had 3.9 times more likely to develop eating disorder (CI 95%, 1.4-10.9).

Conclusion

The research study yielded compelling findings indicating a significant rise in both the frequency of eating disorders and the susceptibility to their development among medical students. The study revealed a notable increase in the occurrence of eating disorder risk factors within this student population. Notably, the research identified a higher prevalence of individuals at risk of developing eating disorders, along with the presence of a heightened positive behavior pattern that increases the likelihood of such disorders manifesting.

In essence, the study's conclusion underscores the concerning trend of eating disorder-related issues among medical students. Not only did the research identify a larger number of students at risk of developing these disorders, but it also highlighted the presence of behaviors that contribute to this risk. The combination of a heightened frequency of eating disorder risk and the reinforcement of such risks through positive behavior patterns accentuates the urgency of addressing this issue within the medical student community. This conclusion emphasizes the need for targeted interventions and support mechanisms to mitigate the development and progression of eating disorders among medical students.

Limitations

We have focused only on medicals students in colleges from urban set up; time constraint was another factor; convenient sampling had been used.

Way Forward:

It is recommended to conduct additional research that examines the prevalence of eating disorders in both rural and urban environments. Additionally, a crucial limitation to address is the tendency of many individuals with eating disorders to deny their condition, a recurring issue in various studies on this subject. Therefore, it is essential to explore this aspect in relation to the risk factors associated with eating disorders.

Furthermore, it would be beneficial to initiate surveys that establish potential connections between socioeconomic status, ethnicity, and relationship status (such as divorced, married, or single) and the emergence of eating disorders. Given the descriptive nature of this study, more comprehensive data collected from various cities could have resulted in more representative findings.

In our investigation, a heightened risk of eating disorders was identified among medical students, accompanied by a pronounced positive behavior pattern that increases their susceptibility to developing eating disorders.

Recommendations

Students at the risk of eating disorders need more vigilance so they should seek professional help if needed.

Disclaimer: None to declare**.**

Conflict of interest: None to declare.

Funding disclosure: None to declare.

References

1. Javed, F.; Ali, Z.; Ali, S.; Ahmed, N.; Alam, M.K.; Mahmood, Y.; Wali, A. BARLEY BRAN, A NOVEL AGRICULTURAL WASTE FOR THE IMPROVED PRODUCTION OF AN EXTRACELLULAR LACCASE FROM A SOIL-INHABITED Penicillium spp. *Journal of microbiology, biotechnology and food sciences* **2022**, e3631-e3631.
2. Hasan, Z.; Zeshan, B.; Hassan, A.; Daud, N.H.A.; Sadaf, A.; Ahmed, N. Preparation and characterization of edible whey protein nanofibrils and efficacy studies on the quality and shelf-life of chilled food products. *Journal of Food Safety* **2022**, e13034.
3. Ahmed, N.; Karobari, M.I.; Yousaf, A.; Mohamed, R.N.; Arshad, S.; Basheer, S.N.; Peeran, S.W.; Noorani, T.Y.; Assiry, A.A.; Alharbi, A.S. The Antimicrobial Efficacy Against Selective Oral Microbes, Antioxidant Activity and Preliminary Phytochemical Screening of Zingiber officinale. *Infection and Drug Resistance* **2022**, *15*, 2773.
4. Arcelus, J.; Mitchell, A.J.; Wales, J.; Nielsen, S. Mortality rates in patients with anorexia nervosa and other eating disorders: a meta-analysis of 36 studies. *Archives of general psychiatry* **2011**, *68*, 724-731.
5. Harris, C.; Barraclough, B. Excess mortality of mental disorder. *The British journal of psychiatry* **1998**, *173*, 11-53.
6. Şanlier, N.; Yabanci, N.; Alyakut, Ö. An evaluation of eating disorders among a group of Turkish university students. *Appetite* **2008**, *51*, 641-645.
7. Suhail, K. Prevalence of eating disorders in Pakistan: relationship with depression and body shape. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity* **2002**, *7*, 131-138.
8. Tao, Z. Epidemiological risk factor study concerning abnormal attitudes toward eating and adverse dieting behaviours among 12-to 25-years-old Chinese students. *European Eating Disorders Review* **2010**, *18*, 507-514.
9. Fares, J.; Al Tabosh, H.; Saadeddin, Z.; El Mouhayyar, C.; Aridi, H. Stress, burnout and coping strategies in preclinical medical students. *North American journal of medical sciences* **2016**, *8*, 75.
10. Smink, F.R.; Van Hoeken, D.; Hoek, H.W. Epidemiology of eating disorders: incidence, prevalence and mortality rates. *Current psychiatry reports* **2012**, *14*, 406-414.

11. Auerbach, R.P.; Alonso, J.; Axinn, W.G.; Cuijpers, P.; Ebert, D.D.; Green, J.G.; Hwang, I.; Kessler, R.C.; Liu, H.; Mortier, P. Mental disorders among college students in the World Health Organization world mental health surveys. *Psychological medicine* **2016**, *46*, 2955-2970.
12. Ali, Z.; Jatoi, M.A.; Al-Wraikat, M.; Ahmed, N.; Li, J. Time to enhance immunity via functional foods and supplements: Hope for SARS-CoV-2 outbreak. *Altern. Ther. Health Med* **2021**, *27*, 30-44.
13. Al-Hatamleh, M.A.; Alshaer, W.; Hatmal, M.m.M.; Lambuk, L.; Ahmed, N.; Mustafa, M.Z.; Low, S.C.; Jaafar, J.; Ferji, K.; Six, J.-L. Applications of alginate-based nanomaterials in enhancing the therapeutic effects of bee products. *Frontiers in Molecular Biosciences* **2022**, *9*, 350.
14. Ramzan, M.; Karobari, M.I.; Heboyan, A.; Mohamed, R.N.; Mustafa, M.; Basheer, S.N.; Desai, V.; Batool, S.; Ahmed, N.; Zeshan, B. Synthesis of silver nanoparticles from extracts of wild ginger (Zingiber zerumbet) with antibacterial activity against selective multidrug resistant oral bacteria. *Molecules* **2022**, *27*, 2007.
15. Assiry, A.A.; Ahmed, N.; Almuaddi, A.; Saif, A.; Alshahrani, M.A.; Mohamed, R.N.; Karobari, M.I. The antioxidant activity, preliminary phytochemical screening of Zingiber zerumbet and antimicrobial efficacy against selective endodontic bacteria. *Food Science & Nutrition* **2023**.
16. Mussa, A.; Mohd Idris, R.A.; Ahmed, N.; Ahmad, S.; Murtadha, A.H.; Tengku Din, T.A.D.A.A.; Yean, C.Y.; Wan Abdul Rahman, W.F.; Mat Lazim, N.; Uskoković, V. High-dose vitamin C for cancer therapy. *Pharmaceuticals* **2022**, *15*, 711.
17. Amin, Z.S.; Afzal, M.; Ahmad, J.; Ahmed, N.; Zeshan, B.; Hashim, N.H.H.N.; Yean, C.Y. Synthesis, Characterization and Biological Activities of Zinc Oxide Nanoparticles Derived from Secondary Metabolites of Lentinula edodes. *Molecules* **2023**, *28*, 3532.
18. Al-Mhanna, S.B.; Ghazali, W.S.W.; Mohamed, M.; Rabaan, A.A.; Santali, E.Y.; Alestad, J.H.; Santali, E.Y.; Arshad, S.; Ahmed, N.; Afolabi, H.A. Effectiveness of physical activity on immunity markers and quality of life in cancer patient: a systematic review. *PeerJ* **2022**, *10*, e13664.
19. Rizvi, A.; Ahmed, N.; Naeem, A.; Saleem, W.; Ilyas, M.; Ahmed, A. A cross sectional study to evaluate awareness about hepatitis A & E among students in lahore. *Pakistan Journal of Public Health* **2020**, *10*, 160-166.
20. Ahmad, A.; Baig, A.A.; Hussain, M.; Saeed, M.U.; Bilal, M.; Ahmed, N.; Chopra, H.; Hassan, M.; Rachamalla, M.; Putnala, S.K. Narrative on Hydrogen Therapy and its Clinical Applications: Safety and Efficacy. *Current Pharmaceutical Design* **2022**, *28*, 2519-2537.