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Risk of Eating Disorders (EDs) among Iranian Medical Students: Perceived Social Support (PSS) and COVID-19-Related Anxiety

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Abstract

Background: Eating disorders (EDs) are characterized by severe difficulties with eating behavior and emotions, increasing among medical students.
Objectives: Since social support can play a preventive role, this study aimed to evaluate the relationship between these conditions considering COVID-19-related anxiety.
Methods: This analytical cross-sectional study was conducted in 2022 at Alborz medical science university, Iran, on 282 medical students who were selected randomly. The Eating Attitude Test (EAT-26), Corona Disease Anxiety Scale (CDAS), and the Multidimensional Scale of Perceived Social Support (MSPSS) questionnaire were used to collect data. The chi-square and Fisher's exact tests were utilized via SPSS software version 23. The level of significance is below 0.05.
Results: In this study, 153 (51.1%) participants were men. The average age (SD) of respondents was 22.06 (1.65). The prevalence of medical students was 17% at risk for eating disorders. Logistic regression indicated that a low level of perceived social support (OR, 14.91; 95% CI, 3.49 - 63.64), a moderate level of COVID-19-related anxiety (OR, 6.36; 95% CI, 2.96 - 13.63), being obese (OR, 6.31; 95% CI, 1.75 - 22.68), and being female (OR, 5.58; 95% CI, 2.13 - 14.62) were significantly related to being at risk of EDs.
Conclusions: Based on the results, the high prevalence of tendency to eating disorders should be taken seriously among medical students. Strong evidence was provided regarding the need for screening and enhancing the perceived social support of medical students.

Keywords: Feeding and Eating Disorders, Social Support, Anxiety, Students, Medical.

1. Background

Eating disorders (EDs) are explained as eating behavior trouble, excessive concern about body weight, and physical and psychosocial complications. EDs can lead to severe psychiatric conditions with high morbidity and mortality rates, which are progressively known in various countries and cultures worldwide, especially in Asia. Biological, psychological, and sociocultural factors are related to EDs' prevalence and incidence, and various preventive and therapeutic interventions are needed regarding the complexity of the causes (1-7). The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) contains "Anorexia nervosa (AN), Bulimia nervosa (BN), Binge-eating disorder (BED), Avoidant/restrictive food intake disorder (ARFID), Pica, Rumination disorder, other specified feeding or eating disorder (OSFED) and unspecified feeding and eating disorders (UFED)" (8). The most common age range for ED diagnosis is between 18 and 26 years for anorexia nervosa and bulimia nervosa diagnosis. College students are faced with a significant problem of EDs. Most studies have represented a high prevalence compared to the general population, and most individuals with EDs receive no treatment. Prevention programs for eating disorders, such as screening measures that may result in earlier diagnosis and interventions, are a key priority (8-10). EDs are highly prevalent among university students worldwide, requiring more consideration (11). Medical students worldwide demonstrate higher prevalence rates of feeding and eating disorder (FEDs) symptoms. The total prevalence rate of FEDs symptoms among medical students is 17.35%, presenting a rise compared to former research in 2018 with an overall prevalence rate of 10.40%.

Non-western medical students also experience more FEDs symptoms (12, 13). The comorbidity of eating and anxiety disorder is high. Women suffering from EDs were found to suffer from at least one anxiety disorder in 65% of studies (14). Partial posttraumatic stress disorder (PTSD) may also be a risk factor for Bulimia nervosa and bulimic symptoms (15). One cross-sectional online survey showed the association between the perceived stress of medical students at Oman national university and EDs (16). The overall anxiety prevalence among medical students was 33.8%, while the majority among the general population was up to 25%. Anxiety is also most prevalent among medical students in the Middle East and Asia (17). The COVID-19 pandemic could raise the prevalence of anxiety among medical students to 38% (18). Various situations can cause anxiety in some persons, and people seek remedies to conquer the dysfunctions produced by anxiety, such as perceived social support (PSS). Studies have demonstrated a significant reverse relationship between perceived social support and anxiety (19-24). On the other hand, a significant positive relationship was observed between PSS and coping capability (25). For instance, a study on 2057 Chinese medical students indicated that anxiety was negatively related to positive coping and positively related to negative coping (26). Incorrect coping strategies are related to adverse outcomes like EDs (27). Two studies by Birmachu and colleagues on university students have advocated that social support may have a protecting role in the occurrence of eating disorder attitudes and behaviors (EDAB). Perceived social support (PSS) was negatively related to the event of EDAB from two dimensions of family and friends. However, high PSS from significant others and high rumination were positively related to EDAB (28, 29).

The mental disorders of anxiety and psychiatric comorbidities are more prevalent in 18-24-year-olds. Moreover, medical students need more time to acquire the necessary knowledge and skills than other majors. The study of medicine is believed to be associated with a significantly higher mental burden. EDs are very prevalent among university students throughout the world (11). Furthermore, the tendency to use EDs is more general and has been reported to be growing among medical students, affecting many unwanted personal and professional costs, such as impaired quality of life, academic performance, professionalism, and empathy toward patients (30). The research hypothesis was that social support can protect medical students from the tendency towards EDs. The relationship between SSP and the risk of EDs has not been studied among Iranian medical students.

2. Objectives

This study aimed to investigate the correlation among SSP, the risk of EDs considering the body mass index (BMI), and the training stage of medical students. Additionally, anxiety related to COVID-19 was assessed as an affecting factor.

3. Methods

This analytical cross-sectional study was conducted in 2022 at Alborz medical science university, and 282 medical students (aged 19 to 25) participated. The sample size was calculated using the sample size equation of "estimating a qualitative trait in society" implied P = 0.075 (30), $\alpha = 0.05$, and d (precision) = 0.032. The minimal sample size was estimated at 261 and increased to 282. At first, the sample size was determined proportionately to the population at each level. In the second step, these students were selected through systematic random sampling based on the class list.

The Nutrition and Attitude Assessment Questionnaire (eating attitude test-26), also known as EAT-26, was used for prevalence rate estimation of students at risk of EDs. This 26-item questionnaire is a screening instrument for finding people with a tendency to EDs (31, 32). The validity and reliability of this questionnaire were confirmed in diverse countries and Iran (33-35). A total of 11 items measure the nutrition attitude, and 15 evaluate diet performance. The responses in EAT-26 are scored on a Likert scale of always (3 points), most of the time (2 points), very often (1 point), and three additional options, including sometimes, rarely, or never (0 points). The 26th item is scored reversely. The highest score calculated for each person is 78, and the lowest is zero. A score of 20 or greater is defined as being at risk of EDs (36). In this study, Cronbach's alpha was as much as 0.93.

The Multidimensional Scale of Perceived Social Support (MSPSS) is a self-report measure to subjectively assess social support. This 12-item scale has three families (Items 3, 4, 8, and 11 (friends, (Items 6, 7, 9, and 12 (and significant other) Items 1, 2, 5, and 10 (subscales, with four items in each subscale. Each item is scored on a scale of 1 to 7 (1 = very strongly disagree to 7 = very strongly agree) (37). Furthermore, the MSPSS scale has good internal and test-retest reliability, as well as moderate construct validity (24). The good psychometric properties of MSPSS have also been proven in measuring social support among medical students (38). Bagherian et al. confirmed the validity and reliability of the Persian form of the multidimensional scale of perceived social support. The Cronbach's α coefficient for the scale was 0.92, and the subscales for

friends, significant others, and family in the healthy sample were 0.89, 0.92, and 0.87, respectively (39). The Cronbach's alpha value was 0.94 for the present study.

An 18-item Corona Disease Anxiety Scale (CDAS) containing psychological and physical domains was used to collect the related data. In the primary validation study by Alipour et al., the good validity of this inventory was shown for measuring COVID-19-related anxiety among the Iranian population (40). In the present study, Cronbach's alpha was 0.89 on the scale for internal consistency.

In addition, the participants were asked about their age, sex, height (m), weight (kg), and stages of the training (preclinical/clinical). The body mass index (BMI) was calculated as weight divided by height squared (kg/m^2).

This study was approved by the Ethics Committee of Alborz University of Medical Sciences (ID code: IR.ABZUMS.REC.1401.041). The study objectives were explained to participants after being selected, and informed consent was obtained.

The data were analyzed using chi-square and Fisher's exact tests via SPSS software version 23. The level of significance was below 0.05.

4. Results

A total of 282 individuals participated in the current study (51.1% male) with an average age (SD) of 22.06 (1.65), and preclinical medical students accounted for 52%. Based on the participant's body mass index (BMI), 5.8% were underweight, 7.6% were obese, and 38.3% were overweight (in order).

The prevalence of the tendency to EDs among studies students was 17%. Table 1 summarizes the descriptive statistics for each level of PSS, the tendency to EDs, and COVID-19-related anxiety.

Table 2 presents the relationship between variables and the tendency to EDs.

As shown in Table 2, the significant relationship between the levels of COVID-19-related anxiety and the tendency to EDs is tested using the chi-square test. A total of 40.3% had moderate levels of COVID-19-related anxiety, and 8.3% of those with low levels of COVID-19-related anxiety tended to EDs (P-value < 0.001). Female and obese students were also more likely to have EDs.

The chi-square test showed a significant relationship between the PSS levels and the tendency to EDs. About 56.2% of students with low levels of PSS and 15.4% of students with high levels of PSS tended toward EDs (P < 0.001) (Table 3). Considering COVID-19-related anxiety, gender, BMI, and training stage status, the mentioned relationship was also observed among males (chi-square, Pearson coefficient = 24.73, P-value = 0.001) and females (fisher exact, P-value = 0.025), obese students (fisher exact, P-value = 0.025), and preclinical medical students (chi-square, Pearson coefficient = 13.97, P-value = 0.001).

Table 1. Descriptive Statistics of PSS, Tendency to EDs, and COVID-19-Related Anxiety

Variables	No. (%)
Perceived social support (PSS)	
Low	16 (5.7)
Moderate	123 (43.6)
High	144 (50.7)
Tendency to eating disorders	
Positive	48 (17)
Negative	234 (83)
COVID-19-related anxiety	
High	0 (0)
Moderate	77 (27.3)
Low	205 (72.7)

Furthermore, the perceived social support among males with EDs was significantly lower in all PSS subscales, and being obese was significantly related to a lower score of significant other and family subscales (Table 4).

Regarding the level of PSS, the frequency of obese with a low level of PSS compared to non-obese was 28.6 vs. 3.9 (chi-square, Pearson coefficient = 21.86, P-value < 0.001), the frequency of men with a low level of PSS compared to women was 9.0 vs. 2.2 (chi-square, Pearson coefficient = 6.89, P-value = 0.032) the frequency of preclinical student with a low level of PSS compared to clinical student was 7.5 vs. 3.7 (chi-square, Pearson coefficient = 1.96, P-value = 0.37)

Tendency to EDs predictors were studied using binary logistic regression (Table 5). Factors with a significant relationship to EDs risk were being female, obese, moderate level of COVID-19-related anxiety (versus low level), and a low level of perceived social support (compared to moderate and high levels). According to logistic regression, students at risk of EDs were 14 times more likely to have low levels of perceived social support (OR, 14.91; 95% CI, 3.49 - 63.64).

5. Discussion

The prevalence rate of a tendency toward EDs among participating medical students was 17%. A recent systematic review and meta-analysis on 21,383 medical students from 35 research (up to 2021) and 20 countries depicted a pooled global prevalence rate of 17.35% (CI 95%:14.15 - 21.10%). However, the raw prevalence of FEDs varied from 5 to 74%, and the result from the EAT-26

Table 2. COVID-19-Related Anxiety, Gender, BMI, Training Stage, and Tendency to EDs [a]

Variables	Tendency to Eating Disorders		Test	P-Value
	Positive	Negative		
COVID-19-related anxiety			Chi-square	< 0.001 [b]
Low	17 (8.3)	188 (91.7)		
Moderate	31 (40.3)	46 (59.7)		
Gender			Chi-square	0.032 [b]
Male	13 (9)	131 (91)		
Female	35 (25.4)	103 (74.6)		
BMI			Fisher Exact	< 0.001 [b]
Non-obese	36 (14.1)	220 (85.9)		
Obese	12 (57.1)	9 (42.9)		
Training stage			Chi-square	0.1
Pre-Clinical	30 (20.5)	116 (79.5)		
Clinical	18 (13.2)	118 (86.8)		

[a] Values are expressed as No. (%).
[b] All relationships were significant at P < 0.05.

Table 3. PSS Levels and Sub-scales and Tendency to EDs [a]

Variables	Tendency to Eating Disorders		Test	P-Value
	Positive	Negative		
Perceived social support			Chi-square	< 0.001 [b]
Low	9 (56.2)	7 (43.8)		
Moderate	17 (13.8)	106 (86.2)		
High	22 (15.4)	121 (84.6)		
PSS sub-scales			Mann-Whitney	0.97
Significant others	5 ± 1.70	5.17 ± 1.27		
Family	4.69 ± 1.70	5.28 ± 1.19	Mann-Whitney	0.092
Friends	4.74 ± 1.63	4.94 ± .95	Mann-Whitney	0.91

[a] Values are expressed as No. (%) or mean SD.
[b] All relationships were significant at P < 0.05.

questionnaire showed an overall prevalence rate of 17.85 (12). A pooled prevalence rate of 10.4% was found for 5722 medical students (1982 - 2017) from 19 studies. However, the range of prevalence rate between studies was 2.2 to 29.1% (13). In addition, 18.5% of Qazvin medical students were at risk of EDs in 2014 (38). The systematic review (2021) showed a frequency rate of being at risk of EDs very close to the result of the present study. In the present study, women and obese students were more likely to tend to EDs. The various frequencies of the tendency for ED among medical students were related to different affecting characteristics such as sociodemographic status, cultures, and research tools (12). Furthermore, evidence has been provided by Jahromi et al. for the role of interactions between risk factors (e.g., age×gender×BMI) in predicting medical students at risk for EDs (41).

The results revealed a significant reverse relationship between the tendency toward EDs and PSS levels. A significant relationship was found between the trend toward EDs and PSS levels among male and female obese and preclinical students. Women, men, obese individuals, and preclinical students with low PSS levels were more likely to be at risk for EDs. Furthermore, highlighted logistic regression indicated that a low level of perceived social support (OR, 14.91; 95% CI, 3.49 - 63.64), a moderate level of COVID-19-related anxiety (OR, 6.36; 95% CI, 2.96 - 13.63), being obese (OR, 6.31; 95% CI, 1.75 – 22.68), and being female (OR, 5.58; 95% CI, 2.13 - 14.62) were significantly

Table 4. PSS Sub-scales and Tendency to EDs Based on Gender and BMI

Variables	Tendency to Eating Disorders		Test	P-Value
	Positive	Negative		
Male				
Significant Others	3.35 (1.75)	4.96 (1.43)	Mann-Whitney	0.005 [a]
Family	4.15 (1.27)	5.06 (1.27)	Mann-Whitney	0.016 [a]
Friends	3.32 (1.86)	4.8 (0.94)	Mann-Whitney	0.009 [a]
Female				
Significant others	4.89 (1.81)	5.56 (1)	Mann-Whitney	0.259
Family	5.54 (1.34)	5.42 (0.99)	Mann-Whitney	0.241
Friends	5.27 (1.18)	5.08 (0.95)	Mann-Whitney	0.356
Non-obese				
Significant others	5.38 (1.63)	5.15 (1.26)	Mann-Whitney	0.1
Family	5.27 (1.30)	5.26 (1.17)	Mann-Whitney	0.71
Friends	4.99 (1.61)	4.98 (0.92)	Mann-Whitney	0.43
Obese				
Significant others	3.85 (1.4)	5.16 (1.44)	Mann-Whitney	0.02 [a]
Family	2.95 (1.63)	5.69 (1.74)	Mann-Whitney	0.002 [a]
Friends	4 (1.52)	3.86 (0.65)	Mann-Whitney	0.9

[a] All relationships were significant at $P < 0.05$.

Table 5. Logistic Regression Analysis of Various Factors for Being at Risk of EDs

Variables	B	OR	CI 95%	P-Value
Perceived social support	2.70	14.91	3.49 - 63.64	0.000 [a]
Obesity	1.84	6.31	1.75 - 22.68	0.005 [a]
Gender	1.71	5.58	2.13 - 14.62	0.000 [a]
COVID-19-related anxiety	1.85	6.36	2.96 - 13.63	0.000 [a]

[a] Statistical significant relationship.

related to being at risk of EDs. The score of significant others, family, and friends was not different between the two groups with or without EDs. The studies by Birmachu et al. among university students indicated that the PSS of family and friends was negatively related to EDAB, and more significant social support was related to lower EDAB (28, 29). Males with EDs had a significantly lower level of perceived social support in all subscales of the PSS in comparison with women because the studies showed men had a lower level of PSS. Furthermore, obesity was significantly related to a lower score on significant others and family subscales when compared to non-obese individuals because the obese participants had a higher risk of having a low PSS level. Moreover, obese students may prefer to rely more heavily on family and significant others for support rather than friends.

Those with moderate anxiety levels were more likely to tend toward EDs than those with low levels. The recent result is consistent with that of Rodgers et al. (42). In a study of 1st-year students in Ireland, those with higher social support reported lower stress levels (21). Although, the results of the current study showed that the PSS level was not related to COVID-19-related anxiety.

The prevalence of EDs risk was higher in women, and a low level of PSS was higher in men. However, a low level of PSS was related to a higher prevalence of a tendency toward EDs in both genders. Therefore, social support should be considered without a gender lens. The significantly higher frequency of being at risk of EDs and being at a low level of PSS was observed in obese students compared to other groups of BMI. Furthermore, the relationship between a low level of PSS and a higher prevalence rate of

a tendency towards EDs was recognized among the obese group. Therefore, assessing the BMI status before applying interventions to improve PSS among medical students draws more attention. There was also a relationship between the two in preclinical medical students. However, the frequency of being at risk of EDs and being at a low level of PSS did not differ between the two groups of clinical and preclinical students. Students in preclinical settings may be affected by other factors.

The first study to examine the relationship between PSS and the tendency of Iranian medical students to develop EDs was conducted in this study. The results of this study shed light on the research capabilities related to PSS and EDs among medical students.

A few limitations should be considered when reading the current study. The present study was cross-sectional, not allowing for a causal interpretation between PSS and being at risk of EDs. Therefore, other prospective studies are needed to understand the causal pathways. The results of this study provided inadequate information regarding which sources of social support are most crucial to the occurrence of EDs risk in medical students. The authors recommend conducting a more extensive study with a larger sample size. In addition, further research on other sources of anxiety may highlight other factors influencing the relationship between PSS and the tendency of medical students to EDs. Future research should also assess the relationship between PSS and the tendency of medical students to EDs when they have clinical eating disorders.

5.1. Conclusions

Based on the results, the tendency toward EDs is prevalent among medical students at the Alborz Faculty of Medicine, and this condition should be taken seriously. On the other hand, being at risk of EDs is related to medical students' low level of perceived social support. A key priority is implementing comprehensive programs to prevent eating disorders that reduce the symptoms of eating disorders and their eventual onset. Therefore, providing, implementing, and improving university initiatives to screen and enhance medical students' perceived social support in both genders regarding the staging of training and BMI should be given appropriate attention. The results may also aid university counseling centers in recognizing approaches to diminish the high occurrence of EDs.

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Footnotes

Authors' Contribution: M. F. conceived and designed the evaluation, drafted the manuscript, and performed the statistical analysis. M. A. K. participated in designing the assessment. M. N. collected the clinical data and interpreted them.

Conflict of Interests: The authors declare no conflicts of interest.

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