

SCREENING THE RISK FOR EATING DISORDERS AMONG MEDICAL DENTISTRY STUDENTS - A CROSS-SECTIONAL STUDY

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Abstract

The aim of the study is to identify the presence of eating disorders among freshmen dentistry students. Material and methods: a number of 81 students were included in the research. Socio-demographic, anthropometric, health-related and medical data were registered. The eating disorders were evaluated using Eating Disorder Inventory (EDI-3). Statistical analysis was done using SPSS (version 24.0). Results: The scores for the female dentistry students from our sample are higher on four (low self-esteem, personal alienation, interpersonal insecurity, interpersonal alienation) of the 12 subscales of the EDI-3, compared to women from the general population. For male students, six scores were registered to be higher than that of Romanian males: body dissatisfaction, low self-esteem, personal alienation, interpersonal insecurity, interpersonal alienation, and maturity fears. The more hours the students sleep per night, the lower they score on personal alienation. Twenty minutes per day is the time allocated for physical activity by dentistry students. No differences between male and female students on number of sleeping hours per night was identified. EDI-3 subscales are related to eating behaviors. Conclusion: There is a need to investigate the rate of eating disorders among university students in order to adapt therapies.

Keywords: dentistry students, health-related behaviors, dietary habits, eating disorder, EDI-3.

INTRODUCTION

According to the American Psychological Association [1], eating disorders can be defined as abnormal eating habits that can threaten people's physical, psychological and social health. They include anorexia nervosa, bulimia nervosa, and binge eating. A study by [2], comparing rates from European countries, found that over 70% of subjects diagnosed with eating disorders were also diagnosed with a comorbid disorder like anxiety (50%), mood disorder (40%), self-harm behaviors (20%) and substance abuse (10%).

In general, people occasionally worry about their weight. In case of subjects with eating disorders, their concerns go to extremes. Eating disorders have serious health consequences, especially at an age where body image is important for both personal and social reasons. Abnormal weight also affects physical well-being that can impact student's academic results. Psychological and physical weakness are also determined by eating-related problems.

During adolescence the risk for eating disorders is higher than that evaluated for university students. One reason could be the fact that adolescents are more prone to be

unsatisfied with their body image and are more sensitive to criticism related to their body shape compared to students [3, 4].

Some studies conducted on college students described the relationship between eating behaviors and the number of sleeping hours. Healthcare professionals who oversee treating patients with eating disorders should carefully check problems related to night sleep. A study led on college students in the U.S. showed that subjects who sleep less than 8 hours per day presented more negative eating behaviors, poorer internal regulation of food and greater binge eating scores [5, 6].

Other studies have shown that university environment increases the level of stress, due to several reasons like academic tasks, difficulties in finding proper food (like in case of international students), factors related to family distance, academic schedules that make students skip meals etc. [7-10]. Distress increases the risk for eating disorders, especially in students with high level of self-perfectionism or those with a competitive personality. Previous studies conducted on Romanian medical students proved that students enrolled in medical studies experienced high levels of academic distress that impact sleep and eating behaviors. It was also found that the level of academic distress is correlated with a high score of depression [11].

Gender, psychological problems or psychiatric disorders, academic year and type of faculty were among the most studied factors related to a high rate of eating disorders (ED) among students. Gender was found to be associated with ED, but most of the studies were conducted on women [12].

Some studies conducted in different countries screened eating disorders in undergraduate students. The rates ranged from 2.90 to 6.23 in Germany [13], 4.5 to 6.2% in China [14, 15], 5.4% in Japan

[16], 8.9% in Poland [17], 9.6% in Puerto Rico [18], 11.3% in Croatia [19], 12.64% in the United States [20], 20% in Finland [21], 20.8% in Spain [22], 22.7% in Pakistan [23], 22.8% in Turkey [24], 24.6% in the United Arab Emirates [25], 31.8 to 41.8 % in Kuwait [26].

The aims of the present research were:

(1) to examine disordered eating behavior and psychopathological symptoms among medical dentistry students,

(2) to estimate the total prevalence of freshmen dentistry students at high-risk for developing an eating disorder,

(3) to evaluate variables associated with the population at high-risk for an eating disorder by gender.

MATERIAL AND METHODS

Participants

This study was carried out on 81 students enrolled in the first year of study in a medical dentistry faculty and it is a part of a larger research focusing on dentistry students eating behaviors. Before their inclusion in the research, freshman students were informed about the purpose of the study and they were assured about the confidentiality of their data.

The cross-sectional study was conducted between October-December 2017 by the researchers who distributed the questionnaires to students. Initially, 100 students were included in the research; 81 questionnaires were returned fully complete.

Instruments

a) Socio-demographic and medical data

A questionnaire was developed in order to gather socio demographic data (age, gender, environment and religion).

Anthropometric, health-related behavior and medical data (body-mass index, chronic disease, medical treatment,

smoking habits, drinking alcohol behavior, physical activity and self-declared sleeping problems, fasting, dieting in order to reduce weight or eating during nights) were also registered.

Height and weight data were converted into Quetelet's BDI and the value was considered using *World Health Organization* (WHO) standards for European population: a BMI < 18.5 kg/m² was categorized as underweight, 18.5–24.9 kg/m² as the normal range, 25.0–29.9 kg/m² as pre-obese, 30–34.9 kg/m² as obese class I, 35.0–39.9 kg/m² as obese class II, and ≥40 kg/m² as obese Class II [27]. According to DSM-IV [28], a body mass index less than or equal to 17.5 kg/m², is considered as a diagnostic criterion for anorexia nervosa.

b) Psychological data

For the present research The Eating Disorder Inventory (EDI-3) was used, a revised version elaborated by Gardner [29] and adapted for Romanian population (EDI-3, Romanian Version) [30]. The inventory is a screening instrument that detects high-risk population. EDI is not a diagnostic instrument; however, it allows specialists (clinicians or researchers) to estimate the proportion of the population within the spectrum of disordered eating behaviors and psychopathological traits that are closer to the clinical population than the normal population. It is generally easy to use and helps specialists shape personalized psychological treatment for patients based on the results of this instrument.

The psychological instrument was designed for the assessment of attitudinal and behavioral dimensions relevant to anorexia and bulimia nervosa. It consists of ninety-one items rated on a Likert-like scale, from 1 (*never*) to 6 (*always*). Three scales are related specific to eating disorders (drive for thinness—DT, bulimia—B, and body

dissatisfaction—BD) and nine are general psychological scales in strong relationship with eating disorders (low self-esteem—LSE, personal alienation—PA, interpersonal insecurity—II, interpersonal alienation—IA, interoceptive deficits—ID, emotional dysregulation—ED, perfectionism—P, ascetism—AS, and maturity fears—MF).

The answers to the items are recoded as follows: the most extreme response is recoded into 3, the immediately before into 2, and the next response is recoded into 1. The other three responses are recoded into 0. The score for each subscale is obtained by summing up all items of that specific subscale.

No significant differences between male and female participants were registered, a result that is congruent with other studies for most scales, with two exceptions: the scales *drive for thinness* and *body dissatisfaction*, where women scored higher than men.

The version employed for this study was the Romanian version which has also good psychometric properties. Higher scores indicate higher disordered eating attitudes and behaviors.

Statistical analysis

The analysis of data was done using Statistical Package for Social Science (SPSS), version 24.0. Means and standard deviations and frequencies were presented in order to describe the socio-demographic and medical data. For comparative analysis we used the Independent Samples t test and One-Way ANOVA. For correlation analysis we used the Pearson correlation. Some limitations for the statistical analysis were related to the distribution of subjects by gender, meaning that more women were included in the research.

RESULTS

Socio-demographic and medical data

Eighty-one freshmen students aged 18-23 ($M = 19.29 \pm 0.84$) fully filled-in the questionnaires. Most subjects are women ($N = 60, 71\%$), they live mostly in urban areas ($N = 63, 77.8\%$) and most of them declared to be Christian-orthodox ($N = 73, 90.1\%$). The rates for these data are congruent with general statistical data: more women than men are enrolled in medical universities and most of them are coming from highly-rated colleges; also, most of them live in cities. The high rate of Christian-orthodox subjects is due to the fact that this religion represents the majority in the country.

Regarding health-related problem or the existence of a chronic disease, 7 students (8.6%) declared that they have health problems (like gastritis, hypothyroidism, anemia or asthma) and 5 of them claimed that they are under medical treatment.

A rate of 42% of freshmen dentistry students declared that they smoke, half of them smoking daily cigarettes (24% of all questioned participants) and the rest of them occasionally displaying this behavior (weekends, parties, pubs).

Almost $\frac{1}{4}$ of students claimed that they never drank alcohol (24.7%) and 58% of them declared that they occasionally consume alcohol drinks.

The number of night sleeping hours is $M = 6.34 \pm 1.39$ and more than $\frac{1}{3}$ of them (37%) had a short siesta after lunch.

An extremely small part of students practices sport daily (9.9%). The average hours spent per week for sports activities is $M = 3.20 \pm 2.55$ for the entire sample.

The body-mass index (BMI) was measured using self-declared data regarding weight and height. No student was evaluated with obesity.

Table 1. Results for weight and body mass index

Variables	Total subjects	Women	Men
Weight (kg)	60.48 ± 12.26	56.03 ± 8.06	73.19 ± 13.45
BMI	20.96 ± 3.04	20.45 ± 2.87	22.44 ± 3.11
underweight	17 (21%)	16 (26.7%)	1 (4.8%)
normal weight	54 (67.7%)	39 (65%)	15 (71.4%)
pre-obese	10 (12.3%)	5 (8.3)	5 (23.8%)
obese	0	0	0

¹ Number (N) and percent (%), Mean (M) and standard deviation (st.dev).

Eating disorders

The results for the subscales of the EDI-3 are shown in Table 2 (we presented them together with scores for men and women from the general population in Romania). The scores for the female dentistry students from our sample are higher on four (low self-esteem, personal

alienation, interpersonal insecurity, interpersonal alienation) of the 12 subscales of the EDI-3, compared to women from the general population. For male students, six scores were registered to be higher than that of Romanian males: body dissatisfaction, low self-esteem, personal alienation,

interpersonal insecurity, interpersonal alienation, and maturity fears.

Table 2. Comparative results considering medical dentistry students and Romanian general population

EDI-3 subscales	Medical dentistry students Male	Medical dentistry students Female	General population Male	General population Female
Drive for thinness	3.66 ± 2.00	3.55 ± 1.77	2.66 ± 3.66	8.03 ± 7.54
Bulimia	1.14 ± 1.27	1.3 ± 1.43	2.04 ± 2.38	2.00 ± 3.18
Body dissatisfaction	9.52 ± 4.20	9.45 ± 6.48	5.18 ± 6.13	10.29 ± 9.28
Low self-esteem	5.71 ± 3.70	6.35 ± 4.07	3.28 ± 4.85	2.97 ± 3.19
Personal alienation	6.19 ± 3.07	6.78 ± 3.37	3.55 ± 4.12	4.48 ± 3.45
Interpersonal insecurity	9.66 ± 3.02	9.68 ± 4.66	7.07 ± 5.87	6.73 ± 4.95
Interpersonal alienation	10.23 ± 3.87	9.05 ± 3.57	7.04 ± 4.48	7.13 ± 4.06
Interoceptive deficits	4.52 ± 1.91	5.03 ± 2.42	4.79 ± 5.16	6.10 ± 4.34
Emotional dysregulation	2.33 ± 1.77	2.01 ± 1.57	5.36 ± 5.83	6.03 ± 4.60
Perfectionism	1.71 ± 1.34	2.28 ± 1.32	11.79 ± 5.34	10.42 ± 5.42
Ascetism	2.00 ± 1.37	1.88 ± 1.51	6.41 ± 3.66	6.81 ± 3.82
Maturity fears	11.52 ± 2.20	11.80 ± 2.62	10.62 ± 4.07	13.23 5.81

The correlational analysis for our sample (table 3) showed several statistically significant associations. We found a negative correlation between the number of sleeping hours per night and personal alienation ($r = -.271$, $p = .015$). The more hours the students sleep per night, the lower they score on personal alienation. We also found a positive correlation between BMI and *drive for thinness* ($r = .382$, $p < .001$). In this case, the higher the BMI, the higher the students' desire to be thin.

The results of our analysis showed several associations between weight and

three subscales of the EDI-3: a positive correlation between weight and *body dissatisfaction* ($r = .227$, $p = .042$) and negative correlations between weight and *low self-esteem* ($r = -.237$, $p = .033$) and *perfectionism* ($r = -.250$, $p = .025$). More specifically, the higher the weight of the students, the higher their body dissatisfaction (the more they weight, the less satisfied they are with their bodies). Also, the lower they weight, the higher their self-esteem is and the lower their level of perfectionism.

Table 3: Pearson correlations between the subscales of the EDI-3 and some variables

	Sleep	Sports	BMI	Weight
Drive for thinness	-.163	-.124	.081	.063
Bulimia	.093	.053	.124	.00
Body dissatisfaction	-.087	-.066	.382**	.227*
Low self-esteem	-.133	-.066	-.206	-.237*
Personal alienation	-.271*	-.175	.065	-.013

Interpersonal insecurity	-.081	-.129	.026	.039
Interpersonal alienation	-.039	.101	.008	.021
Interoceptive deficits	-.040	-.045	-.019	-.019
Emotional dysregulation	.001	.092	.038	.041
Perfectionism	.127	-.158	-.218	-.250*
Ascetism	.069	-.077	.043	.031
Maturity fears	-.055	.037	-.133	-.068

Note: * $p < .05$; ** $p < .001$.

Using Independent Sample t Test, we found that there was a difference between participants on emotional dysregulation according to their environment: $t(79) = -2.22$, $p = .02$. More specifically, dentistry students from rural areas scored higher on emotional dysregulation ($M = 2.83$) compared to those from urban areas ($M = 1.88$).

Also, we found a statistically significant differences between students who eat during nights and those who don't on body dissatisfaction: $t(79) = -2.57$, $p = .01$. In other words, students who snack during nights have lower scores on body dissatisfaction ($M = 7.48$) compared to those who don't ($M = 10.83$).

The results of the Independent Sample t Test also revealed a significant difference between subjects who fast and those who do not concerning interoceptive deficits ($t(79) = 2.13$, $p = .03$) and perfectionism ($t(79) = 2.22$, $p = .02$). Dentistry students who fast have higher scores on interoceptive deficits ($M = 5.58$) and perfectionism ($M = 2.54$) compared to those who don't ($M = 4.48$ and $M = 1.88$, respectively).

Significant differences were also identified between students who are content and those who are not content with their weight on ascetism ($t(79) = -2.52$, $p = .01$), the former scoring lower on this subscale of the EDI-3 ($M = 1.54$) than the latter ($M = 2.35$). Also, participants who are content

with their weight score lower on body dissatisfaction ($M = 7.36$) than those who are not content ($M = 11.97$): $t(79) = -3.74$, $p < .001$.

Participants who do not carefully choose food products score higher on desire for thinness ($M = 4.17$) compared to those who choose their food carefully ($M = 3.14$): $t(79) = -2.59$, $p = .01$.

We also identified statistically significant differences between dentistry students who dieted for reducing weight and those who didn't on body dissatisfaction ($t(79) = 3.87$, $p < .001$), interpersonal alienation ($t(79) = -2.00$, $p = .04$), and perfectionism $t(79) = -3.06$, $p = .003$. Participants who dieted scored higher on body dissatisfaction ($M = 12.81$) compared to those who declared they didn't diet ($M = 7.79$). The former scored lower on interpersonal alienation ($M = 8.22$) compared to the latter ($M = 9.92$). Finally, participants who dieted scored lower on perfectionism ($M = 1.51$) compared to those who didn't ($M = 2.44$).

We found no differences between male and female students on number of sleeping hours per night ($t(79) = 1.79$, $p = .07$) or any of the EDI-3 subscales ($p > .05$ for all of them).

In order to test whether there are any associations between nutritional status (underweight, normal weight, and pre-obese) and smoking habits (daily, weekly, monthly, occasionally, and no smoking) and

the subscales of the EDI-3, we used One-Way ANOVA analysis. The results revealed significant differences between participants on body dissatisfaction according to their nutritional status: $F(2,78) = 7.37, p = .001$. More concretely, dentistry students who are underweight have lower scores on body dissatisfaction ($M = 5.41$) compared to those who have normal weight ($M = 10.01$) and to those who are pre-obese ($M = 13.40$).

The results also revealed a statistically significant difference between students on perfectionism according to their smoking habits: $F(3,77) = 3.96, p = .01$. More specifically, participants who smoke daily have lower scores on perfectionism ($M = 1.30$) compared to those who claimed that don't smoke ($M = 2.44$).

DISCUSSION

The results of previous studies showed that students have less problems related to weight compared to general population [31]. For the present sample, none of the students had obesity.

With an average time for sport activities of about 3.20 hours per week (approximately 20 minutes per day), this result showed that dentistry students practice sports less than other medical students in the world.

Freshman dentistry students in our sample had an average of 6.34 hours of sleep every night. Sleep has consequences on both physical and psychological health. The American Academy of Sleep Medicine recommends, for this age category, a range of 7–9 hours of sleep per night for optimal health [32]. Comparing our results with those of a previous study led on medical pharmacy students in Romania (with a mean of 7 hours of sleep per night) [7], we can conclude that dentistry students sleep with half an hour less than their colleagues. Some

other studies on medical students showed they sleep 6 to 7 hours a night [33, 34]. A shorter night sleep duration was found to be related to higher physical and psychological distress, lower academic results, risk for suicide, mental and eating disorders [35]. Some studies also revealed that an optimal BMI is related to higher academic results and optimal night sleep [36, 37]. Some other authors showed that sleeping also predicted academic performances. Both short sleeping and going to bed late were found to be related to poor academic scores [38].

The results showed that the prevalence of underweight is higher among women and the prevalence of overweight is higher among men. These results are congruent with other research conducted on students [39].

High scores on body dissatisfaction were associated with diet to reduce their weight and the habit to eat during nights. Subjects who declared that smoke were found to have low scores on perfectionism. Cognitive therapies and internet-based programs were found to be successful for treating eating disorders among college and university students [40].

Strengths and limitations of the study

The strengths of the study include the fact that this is the first one led on dentistry students, presenting the risks for eating disorders. The limitations of the research are related to the small number of male students, so the results cannot be generalized. We also mention that, considering the small number of hours spent on daily physical activities, we did not provide comparative statistical analyses concerning this variable.

CONCLUSION

The results of the study point out the importance of eating habits among medical

students. Factors related to eating disorders are also linked to their habits (sleep, fast, diets, etc) and their academic activities. Concerning the last factors, universities should adjust their schedule in order to assure comfortable breaks for lunches, diverse meals in order to please all

international students and to provide a healthy life style with more physical activity. Also, academics should be aware about the prevalence of eating disorders among medical students and the to provide psychological assistance to those in need.

REFERENCES

1. American Psychological Association. [Last accessed on 2015 Jan 08]. Available from: <http://www.apa.org/topics/eating/index.aspx>
2. Keski-Rahkonen A, Mustelin L. Epidemiology of eating disorders in Europe: prevalence, incidence, comorbidity, course, consequences, and risk factors. *Curr Opin Psychiatry* 2016; 29 (6): 340-345.
3. Musaiger AO, Al-Mannai M, Tayyem R et al. Risk of disordered eating attitudes among adolescents in seven Arab countries by gender and obesity: a cross-cultural study. *Appetite* 2013; 60(1):162-167.
4. Neumark-Sztainer D, Wall M, Guo J et al. Obesity, disordered eating, and eating disorders in a longitudinal study of adolescents: how do dieters fare 5 years later? *J Am Diet Assoc.* 2006; 106(4):559-68.
5. Quick V, Byrd-Bredbenner C, Shoff, S et al. Relationships of sleep duration with weight-related behaviors of US college students. *Behav Sleep Med* 2016; 14(5), 565-580.
6. Allison KC, Spaeth A, Hopkins CM. Sleep and eating disorders. *Curr Psychiatry Rep* 2016; 18(10), 92.
7. Iorga M, Popovici L, Muraru ID et al. Dietary habits and health-related behaviors among medical dentistry students-a cross-sectional study. *Romanian Journal of Oral Rehabilitation* 2018; 10 (3): 32-40.
8. Iorga M, Dondas C, Zugun-Eloae C. Depressed as Freshmen, Stressed as Seniors: The Relationship between Depression, Perceived Stress and Academic Results among Medical Students. *Behav Sci (Basel.)* 2018; 8(8): 70.
9. Socolov S, Iorga M, Munteanu, C, Ioan BG. Acculturation and stress among international students. *Studia UBB Bioethica* 2017; 62 (1-2): 43-53.
10. Socolov S, Munteanu C, Alwan S et al. Socio-demographic characteristics, educational motivation and geo-cultural comfortability related to the process of adaptation of freshman international students in a Romanian university. *The Medical-Surgical Journal* 2017, 121(4), 787-793
11. Iorga M, Manole I, Pop L et al. Eating disorders in relationship with dietary habits among pharmacy students in Romania. *Pharmacy* 2018; 6(3): 97.
12. Striegel-Moore RH, Rosselli F, Perrin N et al. Gender difference in the prevalence of eating disorder symptoms. *Int J Eat Disord* 2009; 42(5), 471-474.
13. Ernst V, Bürger A, Hammerle F. (2017). Prevalence and severity of eating disorders: A comparison of DSM-IV and DSM-5 among German adolescents. *Int J Eat Disord* 2017; 50(11), 1255-1263.
14. Yu J, Lu M, Tian L et al. Prevalence of disordered eating attitudes among university students in Wuhu, China. *Nutr Hosp.* 2015; 32:1752-7.
15. Makino M, Hashizume M, Yasushi M et al. Factors associated with abnormal eating attitudes among female college students in Japan. *Arch Womens Ment Health.* 2006; 9:203-8.
16. Nakamura K, Hoshino Y, Watanabe A et al. Eating problems in female Japanese high school students: a prevalence study. *Int J Eat Disord.* 1999; 26:91-5.
17. Kolarzyk E, Jaglarz M. [Disordered eating attitudes in medical students of Jagiellonian University]. *Przegl Lek.* 2003;60:48-52.

18. Reyes-Rodríguez ML, Franko DL, Matos-Lamour A et al. Eating disorder symptomatology: prevalence among Latino college freshmen students. *J Clin Psychol.* 2010; 66(6):666-79.
19. Ambrosi-Randić N, Pokrajac-Bulian A. Psychometric properties of the eating attitudes test and children's eating attitudes test in Croatia. *Eat Weight Disord.* 2005;10:e76-82.
20. Sira N, Pawlak R. Prevalence of overweight and obesity, and dieting attitudes among Caucasian and African American college students in Eastern North Carolina: a cross-sectional survey. *Nutr Res Pract.* 2010;4:36-42.
21. Isomaa R, Isomaa AL, Marttunen M et al. The prevalence, incidence and development of eating disorders in Finnish adolescents—a two-step 3-year follow-up Study. *European Eating Disorders Review: The Professional Journal of the Eating Disorders Association* 2009, 17(3), 199-207.
22. Sepulveda AR, Carrobes JA, Gandarillas AM. Gender, school and academic year differences among Spanish university students at high-risk for developing an eating disorder: an epidemiologic study. *BMC Public Health.* 2008;8:102.
23. Memon AA, Adil SE, Siddiqui EU et al. Eating disorders in medical students of Karachi, Pakistan—a cross-sectional study. *BMC Res Notes.* 2012;5:84.
24. Şanlıer N, Yabancı N, Alyakut O. An evaluation of eating disorders among a group of Turkish university students. *Appetite.* 2008;51:641-5.
25. Thomas J, Khan S, Abdulrahman AA. Eating attitudes and body image concerns among female university students in the United Arab Emirates. *Appetite.* 2010;54:595-8
26. Musaiger AO, Al-Kandari FI, Al-Mannai M et al. Disordered eating attitudes among university students in Kuwait: the role of gender and obesity. *Int J Prev Med.* 2016 Apr 14;7:67.
27. <http://www.euro.who.int/en/health-topics/disease-prevention/nutrition/a-healthy-lifestyle/body-mass-index-bmi>
28. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders* 4th ed. Washington, DC, APA, 1994.
29. Garner DM, Olmstead MP, Polivy J. Development and validation of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *Intern J. Eat. Dis.* 1983; 2: 15–34.
30. Miclea S, Joja O, Albu M. Studiul de adaptare si standardizare a Inventarului tulburărilor de comportament alimentar (EDI-3) pe populatia din România. In Garner DM *Manualul Inventarului Tulburărilor de Comportament Alimentar EDI-3*; SC Cognitrom SRL: Cluj-Napoca, România, 2011.
31. Joja O, Von Wietersheim J. A cross-cultural comparison between EDI results of Romanian and German students. *Procedia Soc. Behav. Sci.* 2012; 33: 1037–1041.
32. Paruthi S, Brooks LJ, D'Ambrosio C et al. Consensus Statement of the American Academy of Sleep Medicine on the Recommended Amount of Sleep for Healthy Children: Methodology and Discussion. *J. Clin. Sleep Med.* 2016; 12: 1549–1561.
33. Mirghani HO, Mohammed OS, Almutadha YM et al. Good sleep quality is associated with better academic performance among Sudanese medical students. *BMC research notes* 2015; 8(1): 706.
34. Khan HI. Effect of Sleep Pattern on Academic Performance of Medical Students. *Ophthalmology Update* 2018; 16 (2): 691-694.
35. Haile YG, Alemu SM, Habtewold TD. Insomnia and its temporal association with academic performance among university students: a cross-sectional study. *BioMed Research International* 2017; Article ID 2542367, 7 pages.
36. Alswat KA, Al-Shehri AD, Aljuaid TA et al. The association between body mass index and academic performance. *Saudi Med J* 2017; 38(2): 186-191.
37. Alsaggaf MA, Wali SO, Merdad RA et al 2016. Sleep quantity, quality, and insomnia symptoms of medical students during clinical years: relationship with stress and academic performance. *Saudi Med J* 2016; 37(2): 173-82.
38. Urrila AS, Artiges E, Massicotte J et al. Sleep habits, academic performance, and the adolescent brain structure. *Sci Rep* 2017; 7: 41678.

39. Musaiger AO, Al-Mannai M. Role of obesity and media in body weight concern among female university students in Kuwait. *Eat Behav* 2013; 14(2): 229-232.
40. Melioli T, Bauer S, Franko DL et al. Reducing eating disorder symptoms and risk factors using the internet: A meta-analytic review. *Int J Eat Disord*. 2016;49(1):19-31.