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Risk of eating disorders in university students: an international study in Hungary, Poland and Ukraine

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Abstract

Objective: In this international study, the prevalence of Eating disorders (EDs) was determined among university students and identified associated demographic and behavioral factors predicting disorders using data from three European countries.

Methods: The survey was conducted in Hungary, Poland, and Ukraine in 2018. Registered full-time students completed an online anonymous questionnaire. Students provided data about socioeconomic characteristics, body mass index (BMI), EDs, physical fitness and sport practice, psychological distress (stress, anxiety, depression), life orientation, alcohol, tobacco, and cannabis use. Data were analyzed using SPSS 24.0 software.

Results: From the 1965 returned questionnaires 1950 were analyzed, because of the missing data (67.3% female, mean age of the total participant's 21.40 ± 3.83 years old). EDs were observed in 26.3% of students. In logistic regression, EDs were predicted by female sex, higher BMI, single marital status, elevated psychological distress and limited access to health care.

Conclusion: EDs are relatively common in university students especially in females. Students with higher distress and BMI, limited access to health care and living without partner are at risk for EDs. This result highlights the need for a public health approach. Universities are the last chance where students can be screened in an organized setting and offer interventions early when treatment is likely to be most effective.

Keywords: BMI; distress; eating disorders; single; university students.

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Introduction

Eating disorders (EDs) are considered to be serious psychological illnesses with high morbidity and co-morbidity [1–3]. The American Psychiatry Association in its standard medical manuals (diagnostic and statistical manual of mental disorders, fifth edition (DSM-5)) defined EDs as mental disorders with abnormal eating habits that negatively affect a person's physical or mental health [4]. They need to be diagnosed as early as possible and treated like other medical diseases. The most common forms of EDs include anorexia nervosa, bulimia nervosa, and binge eating. Studies highlighted female predominance, but this inadequate or excessive food intake affects both sexes [5]. These conditions can develop during any stage in life but typically appear during adolescence or young adulthood [6]. It increases substantially during the transition from high school to university, so the students of higher education are a population at risk of disturbance in eating [5, 7, 8]. Harrop and Marlatt found that alcohol, cigarette smoking, and other substance abuse disorders are more common in people with EDs than in the general populations [9]. Psychological distress such as depression, anxiety, and stress also frequently co-occurs EDs [1, 10, 11]. The academic or peer pressure of campus life may increase vulnerability to developing clinical symptoms of EDs that can remained under-diagnosed in the university student population. So, early screening of EDs seems to be particularly important

[12]. In addition, it is also important to understand the effect of the university life characteristics such as residence, health care access, job duration during the study, marital status, scholarship, financial difficulties on EDs beyond the BMI status, and other psychopathological and health behavioral problems. To examine pathological eating, a multidimensional approach involving university students from three countries was implemented.

The current study was designed to determine the prevalence of EDs among university students and to identify associated demographic, psychological, and behavioral factors associated with EDS in three countries.

Material and methods

Research design, setting and participants

An international multi-institutional study was conducted on campuses at four universities in Hungary (Miskolc, Budapest), Poland (Biała Podlaska), and Ukraine (Ternopil) in spring of 2018. The original survey (EurECAS: European Evaluation of Comportment and Addiction among Students) was designed at the University of Rouen (INSERM Unit 1073), France in 2017. All the full-time students were invited to take part in this observational study on voluntary nature. Students were reached via student educational administration system. Volunteer participants were asked to complete an online questionnaire which took about 15–20 min. Inclusion criteria: 1) to be registered full-time student at one of the four involved higher educational institutes, 2) full completion of the SCOFF Questionnaire. An introduction text was presented about the purpose of the survey, the voluntary nature of participation and the anonymity of participants. Students gave informed consent about their participation by clicking the consent button.

This study was approved by the local Institutional Ethics Committee in each country.

Outcome measures

Socioeconomic characteristics. Students provided data about their sociodemographic characteristics such as gender, age, marital status (single or living in relationship), job during study (yes/no), financial difficulties (1 = no problem, 5 = real problem), and accommodation (1 = rental/roommate, 2 = with parents, 3 = uni residence, 4 = own flat, 5 = other). Students also gave information, whether they have own general practitioner (GP) and the number of average visits in a year.

Anthropometry. BMI was calculated from self-reported height and weight according to Adolphe Quetelet formula: bodyweight in kilograms divided by the square of the height in meters (kg/m^2). According to the Centers for Disease Control and Prevention, Division of Nutrition, Physical Activity, and Obesity [13] classification the cut-off points were the following: underweight < 18.50, normal range between 18.50 and 24.99, overweight ≥ 25.00, and obese BMI ≥ 30.00

Eating disorders. The SCOFF questionnaire is a 5-item screening tool used to identify possible EDs such as anorexia nervosa, bulimia nervosa, and EDs not otherwise specified in young adults [14, 15]. The questionnaire includes five dichotomous questions, and score of 2/5 indicates possible EDs. S – Do you make yourself sick because you feel uncomfortably full? C – Do you worry you have lost control over how much you eat? O – Have you recently lost more than one stone (6.35 kg) in a 3-month period? F – Do you believe yourself to be fat when others say you are too thin? F – Would you say that food dominates your life? A high correlation has been found between the SCOFF questionnaire and a clinical interview based on DSM-IV criteria [16].

Physical fitness and sports practice. International Fitness Scale (IFIS) gives a measure of fitness based on the answers to five basic questions about fitness with a 5-point Likert-scale. Higher scores indicate better physical fitness [17]. The internal reliability of the scale was good in our sample (Chronbach's $\alpha = 0.833$).

Students additionally reported the length of time per week practicing sports either for leisure or competition reason.

Emotional profile. Depression Anxiety Stress Scales (DASS-21) was used to evaluate the emotional profile of the students. The Dass-21 consists of three 7-item scales that measure depression, anxiety and stress. A respondent indicates on a 4-point scale the extent to which each of 21 statements applied over the previous week with 0 (did not apply at all) to 3 (applied very much, or most of the time). The total sum score denote the general distress of the participants [18]. The internal reliability of the scale was excellent in our sample (Chronbach's $\alpha = 0.943$).

Life orientation. Generalized optimism versus pessimism was measured using the Life Orientation Test–Revised (LOT-R). Of the 10 items, three items measure optimism, three items measure pessimism, and four items serve as fillers. Respondents rate each item on a 4-point scale are (0 = strongly disagree, 4 = strongly agree). There are no cut-off points for optimism or pessimism; higher score implies more optimism [19]. The internal reliability of the scale was adequate in our sample (Chronbach's $\alpha = 0.731$).

Substance use

Alcohol use. Alcohol abuse problems were evaluated using the Alcohol Use Disorders Identification Test (AUDIT). This 10-item test identifies persons with hazardous and harmful drinkers and those with risk of alcohol dependence. Higher scores indicate greater likelihood of hazardous and harmful drinking. A score of 8 or more is considered to indicate hazardous or harmful alcohol use. The internal reliability of the scale was adequate in our sample (Chronbach's $\alpha = 0.751$).

Tobacco and cannabis use. Students reported their tobacco use as current, former, and never smokers. A current smoker smoked at least one cigarette a day. Cannabis user was considered who has consumed cannabis at least once in the previous 30 days.

Data analysis

Descriptive statistics were presented in percentage for qualitative variables, and mean (SD) for quantitative variables. Relationship between categorical variables was tested with Pearson chi-square test, and *t*-test was applied to compare students with positive and negative screen. Cronbach's alphas were calculated to determine internal consistency of scales used in the study. Logistic regression with backward elimination (likelihood ratio) method was fitted to identify independent factors of risk of EDs. Odds Ratio (OR) and their 95% Confidence Intervals (CI) were calculated. A logistic regression was performed to ascertain the effects of age, sex, BMI, marital status, job during study, financial difficulties, accommodation option, access to

health care, life orientation, physical fitness, duration of physical exercise per week, general distress, and substance use (smoking, alcohol and marijuana consumption). The analysis was conducted using SPSS 24.0 statistical software. Significance level was set up at $p \leq 0.05$.

Results

Population description

A total of 1,965 students were included in the study, but 15 questionnaires were incomplete regarding the SCOFF and thus deleted. At last, 1,950 students were analyzed, 531 from Hungary, 698 from Poland and 721 from Ukraine. Table 1 describes characteristics of the participants.

Eating disorders

Globally, the prevalence of EDs was 26.3% (21.8% in Hungary, 20.2% in Poland and 36.9% in Ukraine). According to sex, the prevalence was 30.7% in women and 18.0% in men. From the five items of the SCOFF scales, the most frequently selected ones were "Do you worry you have lost control over how much you eat?" (27.4%) and "Do you believe yourself to be fat when others say you are too thin?" (23.3%). The item least frequently chosen was "Do you make yourself sick because you feel uncomfortably full?" (8.0%).

Table 1: Baseline characteristics of the study participants.

Mean (± SD), frequency	Students
Sample size (Males %)	1950 (32.7)
Ratio by countries (%) HU : PL : UA	27.2 : 35.8 : 37.0
Age categories (%) <20 : 20–25 : >25 y/o : MD	31.5 : 58.9 : 9.1 : 0.4
BMI category (%) UW : Normal : OW : Obese : MD	10.7 : 69.0 : 15.8 : 3.6 : 0.9
Marital status (%) single : in relationship : MD	66.6 : 31.8 :1.6
Job during study (%) yes : no : MD	28.1 : 71.3 : 0.6
Living location during term (%) rental/ roommate : with parents : uni residence : own flat : other : MD	38.5 : 32.7 : 21.5 : 4.6 : 1.9 : 0.8
Financial difficulties (%) 1 no : 2 : 3 : 4 : 5 real financial difficulties : MD	27.0 : 23.5 : 34.6 : 8.5 : 5.1 : 1.4
Health Care access having own GP (%) yes : no : MD	72.0 : 25.7 : 2.3
visiting GP in the previous year (occasion)	2.86 (±3.64)

HU – Hungary, PL – Poland, UA – Ukraine, UW – underweight, OW – overweight, GP – General Practitioner, MD – Missing data.

A positive ED screening had relationship with impaired psychological and physical status as shown in Table 2.

There was no difference in substance use between positive and negative SCOFF scores, however there were significant relationships between positive screen and female sex, younger age, living unattached, having limited access to the health care, and having financial difficulties ($X^2[4] = 15.65$, $p < 0.01$).

Factors associated with eating disorders

The logistic model explained 23.0% (Nagelkerke R^2) of the variance in ED and correctly classified 74.5 of cases. Females were 3.6 times more likely to exhibit ED than males. Students having limited access to health care and living alone were ~ 2.2–2.5 times more likely to have problems than peers living in relationship or having own general practitioner (GP). Increase in general distress and BMI was associated with an increase in the likelihood of exhibiting ED (Table 3).

Table 2: Characteristics of students according to results of SCOFF screening.

Mean (±)SD, frequency	SCOFF +	SCOFF –
Males[a] (%)	22.2	36.5
Age categories[b] (%)		
younger than 20 y/o	32.9	67.1
between 20 and 25 y/o	24.3	75.7
older than 25 y/o	17.0	83.0
Body mass index[c]		
underweight (%)	20.3	79.7
normal (%)	25.9	74.1
overweight (%)	30.4	69.6
obese (%)	37.1	62.9
Physical fitness (score)	19.69 (±4.16)**	20.49 (±3.79)
Duration of physical exercise per week (hours)	4.30 (±3.56)	4.53 (±3.61)
General distress (score)	20.74 (±12.82)**	12.67 (±9.62)
Life orientation (score)	14.09 (±4.71)**	15.14 (±4.33)
Marital status[d]		
single (%)	29.1	70.9
In relationship (%)	20.8	79.2
Health care access		
Having own GP[e] (%)	67.7	75.9
Visiting GP in the previous year (occasion)	2.8 (±2.63)	2.90 (±3.95)

*p < 0.01 **p < 0.001.
[a] $\chi^2[2] = 33.82$; $p = 0.001$
[b] $\chi^2[2] = 23.60$; $p < 0.001$
[c] $\chi^2[3] = 10.82$; $p < 0.05$
[d] $\chi^2[1] = 14.67$; $p < 0.001$
[e] $\chi^2[1] = 12.75$; $p < 0.001$.

Discussion

This international study evaluated the characteristics of EDs in university students using data from three Eastern European countries. Results indicated a high prevalence (~ 26%) of EDs in university students that is in line with other studies conducting in Mexico [20], Pakistan [21], France [8], and Brazil [22]. It should be mentioned that a positive screen suggests the presence of an eating disorder and is not meant to diagnose one. Students of higher education present the highest prevalence rate [23] and increasing over time [24]. The problem is complex and needs multidimensional approach as it frequently co-occurs with other comorbidities, and potentially it is life-threatening condition.

The findings of this survey suggested that the EDs are associated with greater general distress, single marital status, higher BMI, limited access to the health care, and female sex.

Psychological distress was higher among both males and females with positive screen. Psychological distress can be both a cause and consequence of disordered eating. Hay and Williams' findings [25] supported the hypothesis that psychological distress and perceived stress would have the strongest independent association on eating disorder symptoms over time. As previously mentioned, student population had higher psychological distress than the general population, so the university students are at risk population for mental health issues including EDs [26]. The university life is in itself a stressful factor that should be taken into consideration. Living in a relationship gives self-confidence, safety, security for the individual, and helps to develop self-regulation mainly because of the continuous feedback from the partner. This kind of social support is evidently important for the person with ED. This study found higher ratio of positive screen in students living alone. There is lack of studies evaluated this factor in university population. Previous research suggests that as EDs often begin in early adolescence, these young people becoming gradually isolated that make them difficult to establish relationship with others in later life, but drawing conclusions on this result is not warranted until further research is conducted [27].

Body mass index seems also a key component referring to risky eating habits. Similar to the French study, we also found risky individuals in all BMI categories, but the ratio of positive screen was higher in overweight and obese categories [8]. Our result confirms that underweight status is not necessary mean EDs as more students with negative screen were also underweight.

The percentage of students who had own GP differed by positive screen. It seems, students with EDs do not realise they are ill, or if they are aware in it, supposedly the stereotypes about EDs, stigma and shame prevent them to seek for clinical help. This is a problem because it can be extremely difficult to treat without health professional help. Early diagnostic identification and access to specialized health care can greatly improve the chances of physical and emotional recovery.

As it previously documented both men and women can present EDs, and as expected, the proportion of males with possible EDs were smaller than females that is in line with several other studies including an adult population [28] and studies evaluating students of higher education [7, 22, 29].

This study presents some limitations. Questionnaire was chosen because it allowed the participants to be anonymous and this method ensured higher number of participants. All the full-time students were invited; however volunteers to take part may be different from those who choose not to. Nevertheless, we believe that our study provided usable results as we investigated a homogeneous population. EDs were evaluated in general, and there is no information about the type of EDs (anorexia nervosa, bulimia nervosa or binge eating) and subgroups such as dancers, athletes, homo- or bi-sexual within this university population, where there is evidence the higher prevalence of eating disordered attitude and behaviors were not identified [30, 31]. It is also important to emphasize that the students investigated had not been diagnosed with EDs. The SCOFF questionnaire a screening measure that helps to determine if individuals may present an eating disorder that requires professional attention. Because of the cross-sectional design of our study, we cannot establish either the direction or the causality of the effects.

Table 3: Logistic regression predicting likelihood of eating disorders.

Variables	Lower	OR	Upper
sex	0.179	0.274***	0.421
BMI	0.881	0.923**	0.968
marital status	1.699	2.481***	3.622
general distress	0.925	0.939***	0.953
GP	1.177	2.177*	4.021
Constant		45.732	

*p < 0.05, **p < 0.01, ***p < 0.001.

Conclusion

In conclusion, EDs are relatively common in both males and females, however with female predominance. Students with higher BMI are at risk for EDs and those with EDs less often have own medical practitioner. This disorder in

both sexes is strongly correlated with elevated distress. This result highlights need for a public health approach. Universities are the last chance where students can be screened in an organized setting and offer interventions early when treatment is likely to be most effective.

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