Research article
Ερευνητική εργασία

Validity of the Greek Eating Disorder Examination Questionnaire 6.0 (EDE-Q-6.0) among Greek adolescents

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The aim of this study is to examine the validity of the Greek version of the Eating Disorder Examination Questionnaire 6.0 (EDE-Q-6.0) in a sample of adolescent pupils. EDE-Q is a self – report instrument that assesses attitudes and behaviors related to Eating Disorders (EDs). A two-stage identification protocol has been applied to the 16 schools that agreed to participate in the present study. Initially, 2058 adolescents, in class under the supervision of one research assistant and one teacher, completed a Questionnaire on socio-demographic data, the Greek EDE-Q-6.0 and the Greek Eating Attitudes Test (EAT-26) while their weight and height were measured. Six-hundred and twenty six participants, who had scores on EAT-26≥20 and/or were underweight or overweight, were considered as "possible-cases" while the remaining 1432 pupils of the sample were thought as "non-possible cases". At the second stage, parents of 66 of the participants identified as possible-cases as well as parents of 72 participants from 358 controls randomly selected from the sample of "non-possible cases" agreed that their children would be examined by means of Best Estimate Diagnostic Procedure. Participants meeting DSM-IV-TR Eating Disorders criteria were identified. Receiver Operating Characteristics (ROC) analysis was applied to reveal EDE-Q's criterion validity. The kappa statistic test was used as measure of agreement between categorical variables at EDE-Q and at interview (the presence of objective binge eating episode, of self-induced vomiting, the use of laxatives and of excessive exercise). The Discriminant and Convergent validity were assessed using the non-parametric Mann-Whitney U test and by means of the Spearman's correlation coefficient, respectively. Nineteen cases of EDs were identified [one case of Anorexia Nervosa (AN), 13 cases of Eating Disorder Not Otherwise Specified (EDNOS), 5 cases of Binge Eating Disorder (BED)]. At the cut-

off point of 2.6125 on the EDE-Q's global scale the instrument screens with a sensitivity (Se) of 89.5% and a specificity (Sp) of 73.1%, a Positive Predictive Value (PPV) of 34.7% and a Negative Predictive Value (NPV) of 97.8% The same analyses for both sexes revealed a cut-off point of 2.612 for females and of 3.125 for males on the global EDE-Q-6.0 score (Se=84.62%, Sp=73.33% for females and Se= 83.33%, Sp= 84.09% for males), yielding a PPV and a NPV of 35.5% and of 96.5% for females and 41.7% and 97.4% for males, respectively. A very low agreement level, between EDE-Q and interview, was observed regarding the presence of objective bulimic episodes (OBEs) [k=0.191 (SE=0.057)] and the unhealthy weight control behaviors [k=0.295 (SE=0.073)]. Positive correlations were found between EAT-26 and EDE-Q-6.0 for both global scale and subscales (rho=0.50–0.57). The results suggest that EDE-Q-6.0, when using its global score, appears to be a proper screening tool for assessing the core psychopathology of eating disorders in community samples in two-stage screening studies since it distinguishes very well the cases from the non-cases. However, the assessment of the presence and frequency of pathological behaviours which characterize EDs appears to be problematic since adolescents, especially the younger ones, misunderstood terms like large amount of food and loss of control or misinterpret the motivation for excessive exercise. Therefore, marked discrepancies were observed between pathological behaviors self-reported at questionnaire and those detected at interview. We may assume that giving participants more information regarding the definition of these concepts may increase the accuracy with which the participants report these behaviors.

Key words: Eating disorders, Greek Eating Disorder Examination Questionnaire (EDE-Q), validity coefficients, adolescent pupils.

Introduction

According to the Academy for Eating Disorders position paper, eating disorders (EDs) are serious, biologically based mental disorders associated with the highest level of mortality and medical complications of any psychiatric condition, with impairment in emotional and cognitive function and significant worsening in quality of life.[1]

Early detection of EDs, in order to provide appropriate management, is critically important and as an alternative to the clinical interview, which is time-consuming, costly and needs specialized interviewers, two-stage EDs identification protocols have been developed. During the first stage, through screening instruments, individuals who are likely to have significant levels of eating pathology are identified, while, in the second stage, the clinical diagnostic interview is applied only to the proportion of people identified as possible cases during the screening.[2]

The Eating Disorder Examination Questionnaire (EDE-Q) is a self-reported, present-state version of the semi-structured clinical interview Eating Disorder Examination (EDE), and has the advantage to assess not only the eating disorder attitudes but also the specific ED behaviors and their frequency.[3] The psychometric properties of the EDE-Q have been examined in depth and, according to a recent review, the results revealed acceptable internal consistency and test-retest reliability.[4] In Greece, the use of the EDE-Q is limited; up to now there has been published a study regarding the reliability of the EDE-Q,[5] however there are no studies about its validity among adolescents.

The purpose of this study is to examine the validity of the Greek version of the EDE-Q-6.0 in a sample of adolescents (aged between 12–18 years) enrolled in secondary education.

Material and method

Overview

The study was carried out among secondary school adolescents (aged between 12–18 years) who live in northern Evros, a border prefecture of northeastern Greece. The study was reviewed and

approved by both the Pedagogical Institute of the Hellenic Ministry of Education and by the Ethics Committee of the General Hospital of Didymoticho, Greece. Participation involved informed consent from parents and pupils. From the 17 schools which were contacted, 16 agreed to participate in the study and for these schools a two-stage protocol was applied.

At the first stage, the students attending the school on the specific day of the study and who agreed to participate, in a single one-hour session in class, completed the study's questionnaires and had their weight and height measured. The study was presented as a research about the eating behaviors and body image concerns of adolescents. The pupils were informed that their participation was voluntary and they were assured of the confidentiality of their answers. Based on specific criteria pupils were classified as "possible" and "non-possible" cases.

During the second stage of the study, the parents of all possible cases and of a randomly selected sample of non-possible cases were contacted by phone and invited to visit the local Mental Health Center of Orestiada, together with their child, in order to be interviewed. They were kindly requested to bring with them any recent medical records of their child. Two reminder telephone calls were made in order to increase the participation rate.

Measures

During the first stage of the study the following questionnaires were administered:

a. An ad hoc questionnaire on socio-demographic data [age, gender (male-female), place of residence (rural-urban)].

b. The Greek version of EDE-Q-6.0: The current version (EDE-Q-6.0) is comprised of 28 items that focus on the past 28 days and allow assessment of both the core pathology of eating disorders (22 items) and the frequency of disordered eating behaviors (6 items). The 22 items generate four subscales scores (Restraint, Eating Concern, Shape Concern and Weight Concern) as well as a global scale score which is the average of the four subscales.[3] The frequency of the core ED behaviors is assessed in number of episodes occurring in the past four weeks. The Greek version was developed following World Health Organization (WHO) guidelines for translation and cross-cultural adaptation of self-reported measures in order to assure equivalency between the original source and the target version.[6] Both internal consistency and test-retest reliability of the Greek EDE-Q-6.0 were examined in a previous study which involved a sample of 257 adolescents, and both were found adequate (Cronbach's alpha coefficient for each of the EDE-Q subscales as well as for the global score ranged from 0.71 to 0.91, intraclass correlation coefficients and Pearson's correlation coefficients for each subscale and the global score of the questionnaire ranged from 0.55 to 0.70 and from 0.58 to 0.73, respectively while Kendal tau b coefficients indicating the test-retest reliability of items assessing behavioral features ranged from 0.22 to 0.57).[5,6]

c. The Greek version of the EAT-26: EAT-26 is a 26-item questionnaire designed to identify abnormal eating habits and concerns about weight and it is probably the most widely used standardized measure of symptoms and characteristics of ED.[7] A score exactly or above the cut-off score of 20 is considered to be an indicator of a possible eating disorder problem.[8] EAT-26 has been validated for Greek adolescents.[9]

d. Anthropometric measures. All participants had their weight and height measured in order to calculate the body mass index (BMI). The participants were classified as underweight, normal weight, overweight and obese by comparing their BMI with the BMI Percentile Charts of Greek Children and Adolescents[10] as follows: participants that had BMI less than that corresponding to the 3rd percentile for their age and sex on the above mentioned charts were considered as underweight. In addition, as proposed by the Obesity Task Force,[11] pupils were considered overweight or obese when their BMI exceeded the percentile curves that, at the age of 18 years, pass through the BMI of 25 kg/

m^2 and 30 kg/m^2 respectively. The remaining pupils were considered as normal weight.

The adolescents were identified as possible cases if they met at least one of the following three criteria: (a) they had EAT-26 scores of greater than or equal to 20, (b) they were underweight, or (c) they were obese. All other adolescents were considered as "non-possible" cases.

During the second stage of the study the parents of pupils identified as "possible cases" as well as parents of a randomly selected sample from pupils identified as "non-possible" cases were invited, to visit –together with their child– the Mental Health Centre of Orestiada. The pupils which constituted the control sample were selected according to the technique of systematic random sampling. Specifically, during the first stage of the study, when pupils delivered the questionnaires, a researcher wrote a code number on the first page of socio-demographic questionnaire. Two catalogs were developed from all these code numbers for "possible" and "non-possible cases", respectively. From the catalog of "non-possible cases" were selected, every fourth, the pupils who would become the control sample. The Best Estimate Diagnostic Procedure was used as the gold standard in order to identify the cases of EDs. This procedure, apart from the psychiatric interviews, employs all available sources of information (e.g. self-reported data from individuals and also information from family members and medical records) in order to reduce diagnostic errors and its use is particularly common in psychiatry because psychiatric illnesses –unlike their medical counterparts– have no external validators such as laboratory tests or radiological examinations.[12,13] Moreover, individuals with eating disorders, especially adolescents with AN, are less likely to admit the presence of pathology and have the tendency to minimize or deny the presence of symptoms since they may not recognize their eating behaviors as problematic and therefore their reports may not be accurate.[14] It is obvious that parents' reports are especially important as they are interested in eating patterns of their children and may be able to recognize disturbed eating behaviors. Generally, there are two forms of Best-Estimate Diagnostic Procedure. In the first one, two or more clinicians, independently, review the data and derive diagnoses, while in the second one a team of diagnosticians examine and discuss all data and by consensus arrive at best-estimate diagnoses.[15] In the present study we used the second procedure. Specifically, the interviews of participants and their parents were conducted by the first author, and subsequently a meeting took place, which involved another two psychiatrists. All accumulated data were discussed and diagnoses were determined by means of DSM-IV-TR criteria for EDs.

Statistical analysis

Descriptive analysis was done using mean ± Standard Deviation or median (Q1-Q3) for normally or non-normally distributed continuous variables and percentages for categorical variables. T-tests were used to check for differences between continuous normally distributed variables. Chi-square tests were used for the comparison of categorical variables.

Internal consistency of the EDE-Q, total and subscale scores, was tested by Cronbach's alpha coefficient.

To assess convergent validity scatter plots were created to examine first graphically the nature of association between EDE-Q-6.0 total and subscales and EAT-26 (linearity, outliers). After that, Spearman's correlation coefficient was chosen instead of Pearson's, to better describe the above relationships (a linear line could not always be assumed to describe the associations, and outliers were apparent in some cases).

The kappa statistic test was used as a measure of agreement between categorical variables at the EDE-Q-6.0 and at the interview with respect to objective binge-eating episode and unhealthy weight control behaviors. The ability of EDE-Q-6.0 then to discriminate between cases and non-cases (discriminant validity) was assessed using the non-parametric Mann-Whitney U test.

Receiver operating characteristics (ROC) analysis was conducted. Sensitivity, specificity, correct classification and likelihood ratios were calculated for all possible cut-off points of EDE-Q-6.0 global score both for the whole sample and for females and males separately. Finally, the EDE-Q-6.0 global scores which provide the optimal compromise between sensitivity and specificity were determined.

The PPV and NPV of the EDE-Q-6.0 as well as an area under the curve (AUC), at the optimal cut-off point, were also calculated. Results were considered statistically significant for $p < 0.05$ ($\alpha = 5\%$). All analyses were conducted using STATA 9.1.

Results

The sample

Overall, n=2058 pupils participated on the first stage of the study and provided data regarding their eating attitudes and behaviors as like as anthropometric data. From them n=626 and n=1,432 were classified as "possible" cases and "non-possible" cases, respectively. From the 626 participants' parents, who were classified as "possible" cases, only 66 (10.5%) agreed to be interviewed. From the 358 participants' parents, who were randomly selected as controls from the sample of 1432 pupils who were classified as "non-possible" cases, only 72 (20.1%) agreed to be interviewed. So, one hundred and thirty-eight adolescents and their parents took part in the second part of the study.

A description of the sample at the two stages is shown in table 1.

Out of the 2058 participants, 3.3% were classified as underweight, 61.2% as normal weight, 24.4% as overweight and 11% as obese. The EDE-Q-6.0 global score for females was 1.58 (SD=1.28) while for males it was 0.99 (SD=1.03). Regarding the 138 pupils examined at the second stage, 5.3% of them were underweight, 55.6% normal weight, 25.6% overweight and 13.5% obese. Females' EDE-Q-6.0 global score was 1.88 (SD=1.48) and males' 1.73 (SD=1.42).

Considering the second stage interviewed sample (n=138), there were no statistically significant differences between the pupils originally thought as possible cases (n=66) and non-possible ones (n=72), regarding age, sex and place of residence. However, interviewed possible cases compared to non-possible ones presented statistically significant higher BMI [(24.6±6.2) vs (22.2±3.2), t=2.84, p=0.005] and EDE-Q-6.0 global score [(2.65±1.35) vs (1.14±1.16), t=7.08, p<0.000].

Table 1. Description of the sample at the two stages.

		1st stage sample (n=2058)	2nd stage sample (n=138)
Demographics			
Age (mean±SD)		15.3±1.8	14.7±1.9
Sex (n%)	Male	1045 (50.8)	50 (36.2)
	Female	1013 (49.2)	88 (63.8)
Place of residence (n%)	Urban	1459 (70.9)	118 (85.5)
	Rural	599 (29.1)	20 (14.5)
BMI (mean±SD)			
EDE-Q (mean±SD)		23.1±4.5	23.3±5.0
Global scale			
Subscales			
	Restrain	1.28±1.20	1.83±1.46
	Eating concern	0.96±1.17	1.46±1.51
	Weight concern	1.58±1.52	2.17±1.69
	Shape concern	1.77±1.63	2.52±1.92

Internal consistency

Cronbach's alpha coefficients were 0.96 for EDE-Q global scale, 0.84, 0.80, 0.94 and 0.84 for the Restraint, Eating concern, Shape concern and Weight concern subscales respectively, indicating good internal consistency for all EDE-Q global scale and subscales.

Assessment of binge-eating behaviors

On the EDE-Q, 55 participants from the 138 interviewed, reported that they engaged in binge-eating behaviors. However, the interview revealed that only 9 actually presented objective bulimic episodes (OBEs) [k=0.191 (SE=0.057)]. Among these the number of OBEs on the EDE-Q and at the interview ranged from 1 to 28 and from 1 to 20, respectively.

Assessment of weight control behaviors

The use of weight control behaviors was reported by 46 participants on the EDE-Q but confirmed by only 11 (23.91%) participants at the interview [k=0.295 (SE=0.073)].

Sensitivity, specificity, positive and negative predictive value

At the second stage, using DSM-IV-TR diagnostic criteria, we detected 19 cases of EDs, 17 from those originally identified as possible cases and 2 from controls, 13 females and 6 males. One participant (female) met all DSM-IV-TR diagnostic criteria for Anorexia Nervosa (AN) restrictive type. The other 18 participants met the criteria for Eating Disorder not Otherwise Specified (EDNOS) among which five were clinical cases of Binge Eating Disorder (BED). Of the 13 cases diagnosed with EDNOS: 9 were sub-threshold clinical cases of AN restricting type (all criteria met except amenorrhea while body weight was over and below the 85% of EBW in 8 and 1 participants, respectively), 2 were sub-threshold clinical cases of AN binge eating/purging type (all criteria met except amenorrhea and body weight over the 85% of EBW) and 2 were sub-threshold clinical cases for BN purging type (all criteria met but frequency of binge eating and compensative behaviors were lower than required).

The mean age of the cases group was 15.2 years (SD=1.8) while that of non-cases was 14.5 years (SD=1.9) (t=1.93, p=0.056). The mean BMI was 25.84 for the cases group and 21.70 for the non-cases (t= 5.75, p<0.001). From the 19 cases, six (31.5%) were classified as obese (four males and two females) and one (female) as overweight.

Tables 2 and 3 provide an overview of sensitivity, specificity, correct classification and likelihood ratios at the various cut-offs of EDE-Q-6.0 for the whole sample of 138 cases and as well as for females and males separately. The optimal compromise between sensitivity and specificity was achieved at a score of 2.6125 (Se=89.47%,

Table 2. Sensitivity, specificity, correct classification and Likelihood ratios for EDE-Q various cut-off points (n=138).

Cut-off point	Sensitivity	Specificity	Corrected classification	LR$^+$	LR$^-$
2.4	100	70.59	74.6	34.0	0.0
2.6125	89.47	73.11	75.3	33.2	0.14
2.85	84.21	77.31	78.2	37.1	0.20
3.125	73.68	81.51	80.4	39.8	0.32
3.281	73.68	81.51	80.4	39.8	0.32
3.85	42.11	91.60	84.7	50.1	0.63
4.168	36.84	97.48	89.1	146.1	0.64
4.262	26.32	99.16	89.1	313.1	0.74

LR$^+$=Positive likelihood ratio, LR$^-$=Negative Likelihood ratio

Table 3. Sensitivity, Specificity, correct classification and Likelihood ratios for EDE-Q various cut-off points for females (n=88) and males (n=50).

Cut-off point	Sensitivity	Specificity	Corrected classification	LR⁺	LR⁻
Females					
2.4	100.00	72.00	76.14	35.7	0.00
2.612	84.62	73.33	75.00	31.7	0.20
2.875	76.92	76.00	76.14	32.0	0.30
3.137	69.23	81.33	79.55	37.0	0.37
3.5	46.15	86.67	80.68	34.6	0.6
4.243	30.77	97.33	87.50	115.3	0.7
Males					
2.493	100.00	68.18	72.00	31.4	0.00
2.85	100.00	79.55	82.00	48.8	0.00
3.125	83.33	84.09	84.00	52.3	0.19
3.512	50.00	90.91	86.00	55.0	0.55
4.062	33.33	95.45	88.00	73.3	0.69
4.262	16.67	100.00	90.00		0.83

LR⁺=Positive likelihood ratio, LR⁻=Negative Likelihood ratio

Sp=73.11%) yielding a PPV of 34.7%, a NPV of 97.8% and a likelihood ratio for a positive test of 33.2. In addition, ROC analysis demonstrated an AUC of 0.88% (CI={0.82, 0.94}) which, according to Swets, indicates moderate accuracy.[16]

The same analyses for both sexes revealed a cut-off point of 2,612 for females and of 3,125 for males on the global EDE-Q-6.0 score (Se=84.62%, Sp=73.33% for females and Se=83.33%, Sp=84.09% for males), yielding a PPV and a NPV of 35.5% and of 96.5% for females and 41.7% and 97.4% for males as well as a likelihood ratio for positive test of 31.7 and of 52.3 for females and males, respectively.

Discriminative validity

Scores on the EAT-26 and the EDE-Q-6.0 global and subscales, for cases and non-cases are given in table 4. Individuals who were diagnosed as cases had significantly higher scores on both the EAT-26 and the EDE-Q-6.0 global and subscales' scores compared to non-cases.

Table 4. Values of the EDE-Q and the EAT-26 scales by eating disorder caseness.

	Cases (n=19)	Non-cases (n=119)	Mann-Whitney U	
			z	p
EAT-26 (mean±SD)	25.5±8.5	13.0±7.3	6.75	<0.001
EDE-Q (Q1-Q3)				
Global scale	3.28 (3.1–4.26)	1.16 (0.39–3.11)	5.31	<0.001
Subscales				
Restrain	3 (2.4–4.4)	0.6 (0.2–2.2)	5.08	<0.001
Eating concern	2.6 (1.4–3.6)	0.4 (0–1.6)	4.68	<0.001
Weight concern	3.8 (3.4–4.6)	1.6 (0.4–3.4)	4.25	<0.001
Shape concern	4.6 (4.1–5.25)	1.63 (0.5–4)	5.02	<0.001

Convergent validity

Correlations between the EDE-Q-6.0 global and subscale scores with the EAT-26 for the sample of 138 pupils are presented in table 5. The results revealed moderate positive correlations from 0.50 to 0.57. The mean global score of the EDE-Q-6.0 for participants with EAT-26 score of less than 20 and greater than or equal to 20 was 0.95 (0.33–2.4) and 3.23 (2.4–4.14), respectively, and the difference was statistically significant (M-W U test z=5.62, p<0.001).

Discussion

The aim of the present study was to examine the criterion, convergent and discriminative validity of the EDE-Q-6.0 in a sample of Greek adolescents and to establish appropriate cut-off points for use in screening a general population sample. Many studies investigated the psychometric features of the EDE-Q and provided normative data for community samples[17] but, to our knowledge, until today, only two published studies indicated cut-off scores which optimize its sensitivity and specificity. These two studies involved women aged 18–45, were conducted by Mond et al and based on samples of 1,318 and 25 cases[19] respectively, they revealed cut-off scores of 2.3 [Se=0.83, Sp=0.96][18] and 2.80 [Se=0.80, Sp=0.8019 on the global scale of the EDE-Q.

The present study, based on the sample of 19 cases, revealed values of sensitivity and specificity for the EDE-Q-6.0, similar to those reported by Mond

et al.[18,19] In this study we chose a cut-off point which optimizes sensitivity since screening tests – in opposition to diagnostic tests– aim to have high sensitivity in order to include all potential cases, especially if they are used to identify serious diseases that if missed could result in severe harm for the patient.[20] Anderson et al stated that the purpose of screening for the presence of eating disorder is not "necessary to determine an exact diagnosis… but rather to identify individuals who are likely to have significant levels of eating pathology and need further assessment".[2] Taking this into consideration a high sensitive instrument will be more suitable in screening for ED despite the high number of false positives which it yields.

The clinical cut-off score of 2,612 for females falls between the values of 2.3 and 2.8 reported by Mond et al[18,19] in the samples of adult women, whereas for males, as far as we know, the research is limited and until today only normative data regarding EDE-Q scores have been published. In the present study, for male adolescents, the cut-off score which had optimal sensitivity and specificity was higher than that for females, but this finding must be interpreted with caution on account of the small number of male participants and the preponderance of obese individuals, since values of the EDE-Q were found to increase significantly with BMI.[21] However, this high value is in concordance with that reported by Mond et al who found a higher cut-off point which optimized the validity coefficients for overweight participants than for normal weight ones (3.10 vs 1.98).[19]

Related to compensatory behaviors (self-induced vomiting, laxative misuse and excessive exercise) discrepancies were found between questionnaire and those reported at the clinical evaluation. Similar, Mond et al[22] found that about 42% of the participants who reported any self-induced vomiting or laxative misuse on the questionnaire denied these behaviors when they were questioned in a face-to-face interview. Concerning exercise in a compulsive way in order to lose weight or to prevent weight gain, it seems possible that this question on the questionnaire is misunderstood, and it

Table 5. Spearman correlations between EAT-26 & EDE-Q total scale and subscales (n=138).

EDE-Q & EAT-26 correlations	Spearman's rho
EDE-Q global scale	0.569
EDE-Q subscales	
Restraint	0.539
Eating concern	0.510
Shape concern	0.529
Weight concern	0.501

All correlations are significant at the 0.01 level (two tailed)

is mostly perceived that it refers to body building or to additional exercise for physical fitness and sports competition rather than as a compensatory behavior.

Similarly, a significant number of participants reported binge-eating behaviors but the presence of true OBEs was confirmed in only a few of them while the others, in fact, presented episodes of overeating, frequently, during parties, family celebrations, national or religious holidays. It was stated that assessment of self-reported binge-eating in youth is especially problematic due to ambiguity of terms such as "large amount of food" and "loss of control"[23] and that giving participants more information regarding the definition of binge-eating may increase the accuracy with which they report these behaviors on questionnaires like the EDE-Q.[24]

In the present study we identified only one case which completely fulfilled the strict diagnostic criteria of DSM-IV-TR for AN and 18 cases of EDNOS. These results are in concordance with those reported by two-stage epidemiologic studies which revealed that EDNOS is the most frequent diagnosis of EDs in adolescent samples.[25–30] The high frequency of EDNOS-AN which revealed in our study is similar to that reported by Muro-Sans and Amador-Campos who, in a sample of 1,155 adolescents, aged 11–17 years, found 12 cases of EDNOS-AN and 2 cases of EDNOS-BN.[31] However, we have to notice that no case of BN was diagnosed in the present study in opposite with some similar studies who reported, in addition to a significant number of EDNOS, some cases of BN as well.[28–30] Specifically, Pelaez-Fernandez et al in a group of 332 possible cases identified 28 cases of EDNOS, 3 cases of AN and 22 cases of BN.[28] Machado et al in a sample of 2028 female adolescents diagnosed 48 cases of EDNOS, 8 cases of AN and 6 cases of BN.[29] Similar, Vardar and Erzengin, interviewed 238 at risk participants from an initial sample of 2907 adolescents and found 44 cases of EDNOS, 1 case of AN and 23 cases of BN.[30] However, compared with aforementioned studies, participants in the present study recognized as having an ED, were younger (15.2+1.8

vs 16.19+1.33[29] and 17.01+0.86[30]). Pelaez-Fernandez et al do not report mean age of their cases but young adults were included in their sample, and it appears that 64.1% of the cases were over 16 years old.[28] It is well established, first, that the onset of BN, compared to that of AN, occurs at an older age with the majority of cases beginning during late adolescence and, second, the partial syndromes of BN are more prevalent among adolescents than among adults.[32] Younger age of our sample might be an explanation of not identifying any case meeting the strict diagnostic criteria for BN. Similar to our results, Isomma et al, in a sample of adolescents mean age 15.4 years, detected 2 cases of EDNOS-BN but no case of BN.[33] It is very possible the two cases of sub-threshold BN, which were diagnosed in the present study, represent early stages of a later full-blown syndrome. However, we have to notice that if we used the diagnostic criteria of DSM-V[34] which are wider, probably some cases of EDNOS would become full cases of AN or BN.

Moderate positive correlations were found between the EDE-Q-6.0 and the EAT-26 for both global and subscale scores. As far as we know only one study examined the convergent validity of the EDE- Q and the EAT-26 in an adolescent sample and found similar results (r=0.497).[35]

The results of the present study should be interpreted in the context of some limitations. A large number of participants were assessed and more than a quarter were considered as possible cases according to selection criteria, but unfortunately only a small proportion of them were interviewed. In similar studies the number of participants who did not participate in the interview was quite small in comparison to that of the present study (authors reported that they interviewed 69%,[29] 95%,[28] 96.6% 26 and 99.5%[30] of those identified as possible cases). One explanation may be that in these studies interviews were carried out at school, so both children and parents did not have any concern for this. On the contrary, in the present study we chose to interview children and parents at the local Mental health Center and perhaps this was why some of them were reluctant to participate in

the interviews. Another explanation may be that parents did not recognize their children's behaviors as problematic and consequently they did not have any reason for further investigation. Lectures to the Parents and Guardians Association in order to inform parents about the aims of the study as well as about the ED pathology did not increase the rate of participation. As in all studies which use self-reports the results can be affected by denial and social desirability, especially when the study, like the present one, involves individuals with eating disorders psychopathology which, deliberately may omit, conceal or distort their symptoms[36] or due to an impaired insight[37] or delusional body image beliefs,[38] may not be aware of their illness and may not admit that their behaviors are in fact symptoms of a mental disorder. Moreover, since the questionnaires were administrated in school class in the presence of a researcher and a teacher,

the fear of revealing personal information to classmates and teachers might made some participants to minimize or hide their concerns and behaviors.

In addition, the small number of identified cases on which analysis of validity coefficients was based –although similar to those of Mond et al[18,19]– limits the generalization of results.

To our best knowledge, this is the first study which investigated the validity of the EDE-Q-6.0 in a sample of Greek adolescents and provided cut-off scores for both females and males. EDE-Q-6.0 was found to be moderately accurate in discriminating between individuals with eating disorders and those without, and it demonstrates good convergent validity. These results suggest that EDE-Q-6.0, when using its global score, appears to be a proper screening tool for assessing the core psychopathology of eating disorders in community samples in two-stage screening studies.

Εγκυρότητα της Ελληνικής εκδοχής του Eating Disorder Examination Questionnaire (EDE-Q-6.0) σε δείγμα Ελλήνων εφήβων μαθητών

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Σκοπός της μελέτης είναι η διερεύνηση της εγκυρότητας της ελληνικής εκδοχής του ερωτηματολογίου Eating Disorder Examination Questionnaire 6.0 (EDE-Q-6.0) σε δείγμα εφήβων μαθητών. Πρόκειται για ένα αυτοσυμπληρούμενο ερωτηματολόγιο με το οποίο αξιολογούνται στάσεις και συμπεριφορές που σχετίζονται με τις διαταραχές πρόσληψης τροφής. Αποτελείται από 28 ερωτήσεις. Βαθμολογούνται τόσο το συνολικό σκορ και οι 4 υποκλίμακες του ερωτηματολογίου (περιορισμός, ανησυχία για τη διατροφή, ανησυχία για το σχήμα του σώματος, ανησυχία για το βάρος του σώματος) όσο και η συχνότητα εμφάνισης επεισοδίων 6 τύπων διαταραγμένης συμπεριφοράς διατροφής [κατανάλωση ασυνήθιστα μεγάλης ποσότητας τροφής, αντισταθμιστικές συμπεριφορές (αυτοπροκαλούμενος εμετός, καταναγκαστική άσκηση, κατάχρηση καθαρτικών)]. Στα 16 σχολεία δευτεροβάθμιας εκπαίδευσης που δέχτηκαν να συμμετάσχουν στην παρούσα

έρευνα, εφαρμόστηκε ένα πρωτόκολλο δύο φάσεων. Αρχικά, 2.058 μαθητές, στη σχολική τάξη εντός μιας διδακτικής ώρας, παρουσία ενός μέλους της ερευνητικής ομάδας και ενός εκπαιδευτικού, συμπλήρωσαν ένα ερωτηματολόγιο δημογραφικών χαρακτηριστικών καθώς και τις ελληνικές εκδοχές του EDE-Q-6.0 και του EAT-26. Επιπροσθέτως, μετρήθηκε το βάρος και το ύψος τους. Βάσει συγκεκριμένων κριτηρίων οι μαθητές χαρακτηρίστηκαν ως «πιθανές» (n=626) και «μη-πιθανές» (n=1432) περιπτώσεις Διαταραχών Πρόσληψης Τροφής. Συγκεκριμένα, οι μαθητές θεωρήθηκαν «πιθανές» περιπτώσεις εάν παρουσίαζαν στο EAT-26 βαθμολογία ίση ή μεγαλύτερη του 20, εάν ήταν λιποβαρείς η εάν ήταν παχύσαρκοι. Στη δεύτερη φάση, οι γονείς των παιδιών που αναγνωρίστηκαν ως «πιθανές» περιπτώσεις καθώς και οι γονείς των παιδιών που, από το σύνολο των μαθητών που αναγνωρίστηκαν ως «μη-πιθανές» περιπτώσεις, επιλέχτηκαν ως ομάδα ελέγχου, προσκλήθηκαν να επισκεφθούν μαζί με τα παιδιά τους το Κέντρο Ψυχικής Υγείας Ορεστιάδας. Οι μαθητές που αποτέλεσαν την ομάδα ελέγχου επιλέχτηκαν με τη διαδικασία της συστηματικής τυχαίας δειγματοληψίας από το δείγμα των «μη-πιθανών» περιπτώσεων. Οι γονείς 66 μαθητών –από το σύνολο των 626 μαθητών– που χαρακτηρίστηκαν ως «πιθανές περιπτώσεις», καθώς και 72 μαθητών –από το σύνολο των 358 μαθητών– που επιλέχτηκαν ως ομάδα ελέγχου, δέχτηκαν να εξεταστούν τα παιδιά τους. Η διάγνωση τέθηκε χρησιμοποιώντας την Καλύτερη Δυνατή Διαγνωστική Εκτίμηση η οποία, εκτός από την ιατρική συνέντευξη περιλαμβάνει και όλες τις πηγές πληροφοριών (π.χ. πληροφορίες από τα μέλη της οικογένειας, από το οικογενειακό ιστορικό καθώς και από ιατρικές εξετάσεις) με σκοπό την ελαχιστοποίηση των διαγνωστικών λαθών. Εφαρμόστηκε η ανάλυση Receiver Operating Characteristics (ROC) για την εξέταση της Εγκυρότητας Κριτηρίου του EDE-Q-6.0. Η Διακρίνουσα Εγκυρότητα του EDE-Q-6.0 καθώς και η Συντρέχουσα Εγκυρότητα ανάμεσα στις βαθμολογίες του EDE-Q-6.0 και του EAT-26 αξιολογήθηκαν με το μη-παραμετρικό τεστ Mann-Whitney U αφενός, και αφετέρου με τον υπολογισμό του συντελεστή συσχέτισης Spearman. Ο συντελεστής Κάππα του Cohen χρησιμοποιήθηκε προκειμένου να αξιολογηθεί ο βαθμός συμφωνίας των κατηγορικών μεταβλητών στο EDE-Q-6.0 και στη συνέντευξη, σε ό,τι αφορά στην παρουσία των επεισοδίων υπερφαγίας και των αντισταθμιστικών συμπεριφορών. Βάσει των διαγνωστικών κριτηρίων του DSM-IV-TR διαγνώστηκαν 19 περιπτώσεις Διαταραχών Πρόσληψης Τροφής (ΔΠΤ) (μία περίπτωση Ψυχογενούς Ανορεξίας, 13 περιπτώσεις ΔΠΤ Μη Καθοριζόμενη Αλλιώς και 5 περιπτώσεις Διαταραχής Επεισοδιακής Υπερφαγίας). Στο διαγνωστικό όριο 2,6125 της συνολικής βαθμολογίας η ευαισθησία, η ειδικότητα, η θετική προγνωστική αξία και η αρνητική προγνωστική αξία του EDE-Q-6.0 ήταν 89,5%, 73,1%, 34,7% και 97,8%, αντίστοιχα. Η ανάλογη ανάλυση στα δύο φύλα υπέδειξε ως «διαγνωστικό όριο» το 2,612 (για τις θήλεις) (ευαισθησία=84,62%, ειδικότητα=73,3%, θετική προγνωστική αξία=35,5%, αρνητική προγνωστική αξία= 96,5%) και 3,125 (για τους άρρενες) (ευαισθησία=83,33%, ειδικότητα=84,09%, θετική προγνωστική αξία=41,7%, αρνητική προγνωστική αξία=97,4%). Ελάχιστος και μικρός βαθμός συμφωνίας παρατηρήθηκε σε ό,τι αφορά στην παρουσία των επεισοδίων υπερφαγίας [k=0,191 (SE=0,057)] και των αντισταθμιστικών συμπεριφορών [k=0,295 (SE=0,073)]. Τόσο η συνολική βαθμολογία όσο και οι βαθμολογίες στις υποκλίμακες του EDE-Q-6.0 βρέθηκαν να συσχετίζονται θετικά με τη βαθμολογία του EAT (Spearman's rho=0.50–0.57). Τα αποτελέσματα υποδεικνύουν ότι η ελληνική εκδοχή του ερωτηματολογίου EDE-Q -6.0, στη συνολική της βαθμολογία, φαίνεται να αποτελεί ένα έγκυρο εργαλείο για την αξιολόγηση της ψυχοπαθολογίας των ΔΠΤ στους έφηβους μαθητές. Ωστόσο, η αξιολόγηση της παρουσίας και της συχνότητας των διαταραγμένων διατροφικών συμπεριφορών, που χαρακτηρίζουν τις ΔΠΤ, φαίνεται να είναι προβληματική καθώς οι έφηβοι, κυρίως οι νεότεροι, παρανοούν όρους όπως ασυνήθιστα μεγάλη ποσότητα τροφής ή αίσθηση απώλειας ελέγχου και παρερμηνεύουν την έννοια της άσκησης με έναν καταναγκαστικό τρόπο. Ως εκ τούτου, παρατηρήθηκε μεγάλη ασυμφωνία ανάμεσα σε όσα δηλώθηκαν αυτο-αναφορικά και σε όσα διαπιστώθηκαν στη συνέντευξη. Πρόσθετες πληροφορίες που θα αποσαφηνίζουν αυτούς τους όρους είναι ενδεχόμενο να συμβάλουν σε μεγιστοποίηση της ακρίβειας με την οποία οι έφηβοι θα δηλώνουν, αυτο-αναφορικά, τις εν λόγω συμπεριφορές.

Λέξεις ευρετηρίου: Διαταραχές πρόσληψης τροφής, Greek Eating Disorder Examination-Questionnaire-6.0, εγκυρότητα, έφηβοι μαθητές.

References

1. Klump KL, Bulik CM, Kaye WH, Treasure J, Tyson E. Academy for eating disorders position paper: Eating disorders are serious mental illnesses. *Intern J Eat Disord* 2009, 42:97–103

2. Anderson DA, Lundgren JD, Shapiro JR, Paulosky CA. Assessment of Eating Disorders: review and recommendations for clinical use. *Behav Modific* 2004, 28:763–782

3. Fairburn CG, Beglin S. Eating disorder examination questionnaire. In Fairburn CG (ed) *Cognitive behavior therapy and eating disorders*. Guilford Press, New York, 2008:309–313

4. Berg KC, Peterson CB, Frazier P, Crow SC. Psychometric evaluation of the eating disorder examination and eating disorder examination-questionnaire: A systematic review. *Intern J Eat Disord* 2012, 45:428–438

5. Pliatskidou S, Samakouri M, Kalamara E, Goulemtzakis C, Koutrouvi K, Papageorgiou E et al. Reliability of the Greek version of the eating disorder examination questionnaire (EDE-Q) in a sample of adolescent students. *Psychiatriki* 2012, 23:295–303

6. World Health Organization. Process of translation and adaptation of instruments. From: http://www.who.int/substance abuse/research tool/translation/en/index.html2007

7. Mintz LB, O'Halloran S. The Eating Attitudes Test: validation with DSM-IV Eating Disorder criteria. *J Personal Assessm* 2000, 74:489–503

8. Garner DM, Olmsted MP, Bohr Y, Garfinkel PE. The Eating Attitudes Test: psychometric features and clinical correlates. *Psychologic Med* 1982, 12:871–878

9. Simos G. Investigation of the psychogenic disturbances in food intake and of preventive possibilities. Doctoral dissertation. 1996, Aristotle University of Thessaloniki, Faculty of Medicine

10. Chiotis D, Krikos X, Tsiftsis G, Hatzysymeaon M, Maniati-Xristidi M, Dakou-Voutetaki A. Body mass index and prevalence of obesity in subjects of Hellenic origin aged 0-18 years, living in the Athens area. *Ann Clin PediatrUnive Atheniensis* 2004, 51:139–154

11. Dietz WH, Bellizzi MC. Assessment of childhood and adolescent obesity: results from an International Obesity Task Force Workshop, Dublin. *Am J Clin Nutr* 1999, 70:117–175

12. Kosten TA & Rounsaville BJ. Sensitivity of psychiatric diagnosis based on the best estimate procedure. *Am J Psychiatry* 1992, 149:1225–1227

13. Bucholz KK, Nurnberg JI, Kramer JR, Hesselbrock VM, Schuckit MA, Bierut LJ. Comparison of psychiatric diagnoses from interview reports with those from best-estimate procedures. *J Stud. Alcohol* 2006, 67:157–168

14. Couturier JL, Lock J. Denial and minimization in adolescents with anorexia nervosa. *Int J Eat Disord* 2006, 39212–216

15. Klein DN, Ouimette PG, Kelly HS, Ferro T, Riso LP. Test-retest reliability of team consensus Best-Estimate diagnoses of Axis I and II disorders in a family study. *Am J Psychiatry* 1994, 151: 1043–1047

16. Swets JA. Measuring the accuracy of diagnostic systems. *Science* 1988, 240:1285–1293

17. Pelaez-Fernandez MA, Labrador FJ, Raich RM. Validation of eating disorder examination questionnaire (EDE-Q) – Spanish version-for screening eating disorders. *Span J Psychiatry* 2012, 15:817–824

18. Mond JM, Hay PJ, Rodgers B, Owen C, Beaument PJ. Validity of the eating disorder examination questionnaire (EDE-Q) in screening for eating disorders in community samples. *Behav Res Ther* 2004, 42:551–567

19. Mond JM, Myers TC, Crosby RD, Hay PJ, Rodgers B, Morgan JF, Lacey JH, Mitchell JE. Screening for eating disorders in primary care: EDE-Q versus SCOFF. *Behav Res Ther* 2008, 46:612–622

20. Warner J. Clinicians' guide to evaluating diagnostic and screening tests in psychiatry. *Advanc Psychiatr Treatm* 2004, 10:446–454

21. Ro O, Reas DL, Rosenvinge J. The impact of age and BMI on eating disorder examination questionnaire (EDE-Q) in a community sample. *Eat Behav* 2012, 13:158–161

22. Mond JM, Hay PJ, Rodgers B, Owen C. Self-report interview assessment of purging in a community sample of women. *Eur Eat Disord Rev* 2007, 15:403–409

23. Berg KC, Peterson CB, Frazier P, Crow SJ. Convergence of scores on the interview and questionnaire versions of the eating disorders examination: a meta-analytic review. *Psychologic Assessm* 2011, 23:714–724

24. Goldschmidt AB, Doyle AC, Wilfley DE. Assessment of binge eating in overweight youth using a questionnaire version of Child eating disorder examination with instructions. *Intern J Eat Disord* 2007, 40:460–467

25. Nobakht M, Dezhkam M. An epidemiological study of eating disorders in Iran. *Int J Eat Disord* 2000, 28:265–271

26. Rojo L, Livianos L, Cornesa L, Garcia A, Dominguez A, Rodrigo G et al. Epidemiology and risk factors of eating disorders: a two-stage epidemiologic study in a Spanish population aged 12-18 years. *Int J Eat Disord* 2003, 34:281–291

27. Vetrone G, Cuzzolaro M, Antonozzi I, Garfinkel PE. Screening for eating disorders: false negatives and eating disorders not otherwise specified. *Eur J Psychiat* 2006, 20:13–20

28. Pelaez-Fernandez MA, Labrador FJ, Raich RM. Prevalence of eating disorders among adolescent and young adult scholastic population in the region of Madrid. *J Psychosom Res* 2007, 62:681–690

29. Machado PP, Machado BC, Goncalves S, Hoek HW. The prevalence of Eating Disorders Not Otherwise Specified. *Intern J Eat Disord* 2007, 40:212–217

30. Vardar E, Erzengin M. The prevalence of eating disorders and comorbid psychiatric disorders in adolescents: a two-stage community-based study. *Turk Psikyatri Derg* 2011, 22:205–212

31. Muro-Sans P, Amador-Campos JA. Prevalence of eating disorders in a Spanish community adolescent sample. *Eat Weight Disord* 2007, 12:e1–6

32. Le Grange D, Schmidt U. The treatment of adolescents with bulimia nervosa. *J Ment Hlth* 2005, 14:587–597

33. Isomaa R, Isomaa AL, Marttunene M, Kaltiala-Heino R. Capturing clinically significant eating pathology in adolescence. *Eur J Psychiat* 2013, 27:122–128

34. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. Fifth Edition. *Am Psychiatr Publ* 2013:338–354

35. Yucel B, Polat A, Ikiz T, Dusgor BP, Elif Yavuz A, Sertel Berk O. The Turkish version of the eating disorder examination questionnaire: reliability and validity in adolescents. *Eur Eat Disord Rev* 2011, 19:509–511

36. Tury F, Gulec, Kohls E. Assessment methods for Eating Disorders and body image disorders. *J Psychosom Res* 2010, 69:601–611

37. Konstantakopoulos G, Tchanturia K, Surguladze SA, David AS. Insight in eating disorders: clinical and cognitive correlates. *Psychologic Med* 2011, 41:1951–1961

38. Konstantakopoulos G, Varsou E, Dikeos D, Ioannidi N, Gonidakis F, Papadimitriou G et al. Delusionality of body image beliefs in eating disorders. *Psychiatry Res* 2012, 200:482–488

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