

THE HIDDEN PICTURE: UNHEALTHY EATING ATTITUDES AND BEHAVIORS IN A NON-CLINICAL POPULATION FROM BULGARIA

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Abstract

INTRODUCTION: Eating disorders have been intensively researched over recent decades. However, there has been insufficient research into the early assessments for detecting the risk of developing disordered eating. We report preliminary results from a project aiming to assess the prevalence of eating attitudes and behaviors that heighten the risk of eating disorders. The study examines a non-clinical sample of adolescents and adults from two cities of South Bulgaria.

METHODS: In this cross-sectional epidemiological study, a total of 1285 volunteers of 828 females and 453 males, aged 14 to 59 years, were surveyed to assess disordered eating attitudes and behaviors. For this purpose, the study used the 'SCOFF' questionnaire, the Eating Disorder Diagnostic Scale (EDDS), and the Eating Attitudes and Behaviors Questionnaire (EABQ), which was developed for this study.

RESULTS: The proportion of these volunteers underweight (body mass index below 17.5) was 9.8%. Of the total subject, 34.7% provided two or more positive answers for the SCOFF questionnaire (two being the upper threshold for indicating 100% sensitivity to anorexia and bulimia). The results differed between males and females: 21.6% and 42.1%, respectively, in this regard. A factor analysis (oblimin rotation) of EABQ items revealed four main factors: body shape and weight concerns, personal control over eating and calorie intake, dieting, and preoccupation with food and binge eating. A Spearman's correlation analysis showed moderately significant correlations ($p < 0.001$) between the total scores of the SCOFF questionnaire, EABQ, and the scores for three groups of items in the EDDS for assessing eating attitudes and behaviors.

CONCLUSION: We found a greater ED risk in adolescents compared with the older groups and in females compared with males. One fifth of males studied were at high risk of ED and ages between 19 and 39 years also appeared at risk. The EABQ was validated as a sensitive and reliable self-report instrument that can be used for early detection for the risk of ED. Our results could form a basis for developing programs in disordered eating prevention.

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Introduction

Eating disorders (ED) "significantly impairs physical health or psychosocial functioning" (American Psychiatric Association, 2013, p. 329) and have high morbidity and mortality rates (Herpertz-Dahlmann, 2009; Shader, 1994). In the recent decades, research on eating disorders has been intensive (Smolak, Levine, & Striegel-Moore, 1996), whereas the possibilities for early assessment of the risk for the development of disordered eating have been insufficiently studied (Striegel-Moore & Bulik, 2007). Anorexia has been the third most chronic condition for teenage girls (Treasure & Kordy, 1998) and traditionally, gender has been considered one of the most important predictors of the risk for developing an ED (Striegel-Moore & Bulik, 2007; Touchette et al., 2011). Epidemiological data about the prevalence and characteristics of ED in males are lacking, but there are reports about the increasing risk of ED in males (Herzog, Norman, Gordon, & PePOSE, 1984; King, 1990; Pope, Katz, & Hudson, 1993; Striegel-Moore, Silberstein & Rodin, 1986; Thiel, Gottfried, & Hesse, 1993). Early diagnosis of ED improves the prognosis, but individuals with disordered eating frequently do not seek professional

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help in time (Shader, 1994). The difficulties with early detection of ED is also related to the existence of cases with partial syndromes, with prevalence much greater than that of eating disorders (Cotrufo, Barretta, Monteleone, & Maj, 1998; King, 1990, Whitehouse, Cooper, Vize, Hill, & Vogel, 1992). We consider that the study of these conditions of mild eating pathology, characterized by disordered eating attitudes and weight control behaviors (Yannakoulia et al., 2004), could be crucial in helping early diagnostics and effective prevention of ED. The purpose of this study is to assess the prevalence of eating attitudes and behaviors that heighten the risk of eating disorders in a non-clinical sample from South Bulgaria, and to assess the concurrent validity of a new self-report questionnaire for unhealthy eating attitudes and behaviors.

Data and Research Methodology

The study had a cross-sectional design and was conducted in two major cities of South Bulgaria during 2015. We report the preliminary results from a project aiming to organize an epidemiological study of the prevalence of disordered eating attitudes and behaviors in the community and to use the results for preventive programs.

Subjects

We examined 1285 volunteers of 828 females and 453 males, aged 14 to 59 years with mean age of 19.04 (SD = 6.326). The sample included 533 (43.7%) high school students, recruited from four schools; 589 (48.2%) undergraduate university students, from three universities; and 163 (8.1%) volunteers from the general population, all with higher education. According to the self-reported replies, 98.7% of participants were of Bulgarian origin and Caucasian. Of the 1285 subjects, 142 were eliminated from the analysis because they had sought psychiatric help.

Measures

We used three self-report scales, together with additional questions to collect information on body weight and height, such as, the lowest body weight during the last three months and the frequency of measuring body weight. The participants completed:

1. The SCOFF questionnaire, which is a highly effective eating disorder screening questionnaire (Morgan, Reid, & Lacey, 1999), in a Bulgarian version; The SCOFF questionnaire includes five questions with dichotomous “yes” or “no” answers; the questions comprised essential characteristics of anorexia and bulimia nervosa (Garcia et al., 2010).
2. The Eating Attitudes and Behaviors Questionnaire (EABQ), which was developed for this study by a multidisciplinary team to assess unhealthy eating attitudes and behaviors. It was a 25-item questionnaire with a Likert assessment scale (1-always; 2- frequently; 3-sometimes; and 4-no, never).
3. The Eating Disorder Diagnostic Scale (EDDS), which is a self-report diagnostic scale for anorexia, bulimia, and binge eating disorder, using psychiatric disorders criteria from the Diagnostic and Statistical Manual of Mental Disorders (4th ed.; DSM-IV; American Psychiatric Association, 2000) and acceptable psychometric qualities. It was a 22-item questionnaire with varying response scales corresponding to the Likert scale for four items, yes-no answers for nine items, frequency reporting for seven items, and two write-in responses (Stice, Telch, & Rizvi, 2000).

Procedure

The set of items for the EABQ were generated using the core features of ED, as discussed in the literature (Bulik, Reba, Siega-Riz, & Reichborn-Kjennerud, 2005; Herpertz-Dahlmann, 2009; Sepulveda, Carrobbles & Gandarillas, 2008), and which were included in the diagnostic criteria of Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association, 2013) and the International Classification of Diseases (10th revision; ICD-10; World Health Organization, 1990). The EABQ consisted of 25 items that described eating and weight concerns and preoccupations; fears and other feelings relating to body image, self-evaluation, and food consumption; and dietary restraints and behaviors linking to restrictions of food intake, eating rules, purging, and other compensatory activities. The first draft of the EABQ was tested with students from the Medical University in Plovdiv and the feedback received was discussed by our project team before creating the final version of the questionnaire.

We included EDDS in this study, mainly to assess the concurrent validity of our EABQ questionnaire. For this reason, we grouped the items for assessing eating attitudes using a Likert scale format (Group 1); the items concerning eating behaviors by a yes-no approach (Group 2); and items assessing eating behavior by frequency reporting (Group 3). This grouping allowed us to compare the results from the EABQ and the SCOFF questionnaire with the results of the EDDS that were related to disordered eating attitudes and behaviors.

The survey was anonymous. For the statistical analyses, the sample was sub-divided into three age groups: adolescents (14–18 years) representing 68.4% of the sample, young adulthood (19–39 years) 29.1%, and middle adulthood (40–59 years) 2.5%. Processing of the data was done using SPSS 16.0 descriptive statistics, Spearman’s correlation, exploratory factor analysis (Principal Component Analysis) and reliability analysis (Cronbach’s Alpha). Groups were compared with Chi-square test, Mann-Whitney and Kruskal-Wallis test. Our study participants were surveyed after informing their consent.

Results and Discussion

The proportion of the non-clinical sample with body mass index (BMI) below 17.5 was 9.8%, with the percentages for the age groups as follows: adolescents comprised 9.57%; young adulthoods 7.76%, and middle adulthood 0%. The body mass index (BMI) value of 17.5 is the cutoff point for being underweight, according to the ICD-10 criteria. Our findings that adolescents were at the highest risk for disordered eating corresponded to that of other studies (King,1990; Muro-Sans, Amador-Campos, & Morgan, 2007) and thus, individuals aged between 19 and 39 years should be considered in the target group for prevention programs.

There was a significant difference between the BMI of males and females in this study, with smaller mean ranks observed in the females (Mann-Whitney test, $p < 0.001$).

Of the subjects, 34.7% reported that they checked their weight once every few months; 26.0% checked their weight once a month; 19.6% once a week; 11.2% several times a week; 6.00% every day; and 1.7% several times a day. The difference in the frequency of measuring body weight among the three age groups was not statistically significant ($\chi^2 = 4.473$, $df = 2$, $p = 0.107$), but the Kruskal-Wallis test showed significant differences between the total scores of the three questionnaires for the above described groups of respondents, with reported differences of interest in weight control ($p < 0.001$).

The descriptive statistics for the self-reported scales used in this study are shown in Table 1.

Table 1: Total scores from the SCOFF questionnaire, EABQ, and EDDS groups of items						
	Scales	Minimum	Maximum	Mean	Std. deviation	
	SCOFF	5.00	10.00	8.782	1.187	
	EABQ	27.00	98.00	80.853	11.100	
	EDDS group 1	0.00	24.00	8.013	6.736	
	EDDS group 2	6.00	12.00	10.438	1.560	
	EDDS group 3	0.00	77.00	8.349	10.264	
EABQ: Eating Attitudes and Behaviors Questionnaire; EDDS: Eating Disorder Diagnostic Scale						
Source: Authors						

The results from the SCOFF questionnaire showed that “food dominated the life” of 27.2% of subjects; 37.9% “believed themselves to be fat, when others said they are too thin”; 25.3% reported significant weight loss in a 3-month period; 24.8% worried about their control over eating; and 6.4% reported self-induced vomiting. Of the subjects, 34.7% provided two or more positive answers for the SCOFF questionnaire (Table 2). As expected, differences were found between the males and females: 21.6% and 42.1%, respectively, in this regard. We compared the mean results in the two gender groups by Mann-Whitney test and found significant differences ($p < 0.001$). Two “yes” responses from the SCOFF questionnaire defined the threshold for indicating 100% sensitivity to anorexia and bulimia (Garcia et al., 2010; Morgan, Reid, & Lacey, 1999). These results meant that one third of all the respondents could be considered at high risk of having or developing an ED. Garcia et al. (2010) found

54 (13.5%) respondents with two positive answers, using a French version of the SCOFF questionnaire in 400 undergraduate female students. Of these, 35 had typical ED and 19 were false positives. An interesting finding in our study was that one fifth of the males had reported disordered attitudes and behaviors. The sensitivity and specificity of the SCOFF questionnaire were not reported because the study design did not include an objective professional assessment. Our project was aimed at collecting and analyzing data about the incidence of attitudes and behaviors in the non-clinical population that could lead, with a high probability, to clinically significant disordered eating.

Cronbach's Alpha for the SCOFF questionnaire results was 0.479, which was similar to that of other studies (Muro-Sans, Amador-Campos, & Morgan, 2007).

Table 2: Frequency of positive answers from the SCOFF questionnaire

	Number of positive answers	Frequency	Percent (%)
	0	389	35.11
	1	334	30.14
	2	206	18.59
	3	129	11.64
	4	43	3.88
	5	7	0.63

Source: Authors

The 25 items of the EABQ allowed a maximum total score of 100, with a low score meaning a high incidence of disordered attitudes and behaviors. The frequency distribution of the total scores (Figure 1) and the mean value (Table 1) from the EABQ, expected in the non-clinical sample, showed the prevalence of the healthy eating attitudes and behaviors. This indicated the acceptability of the psychometric properties of the EABQ. The mean ranks of the gender groups were significantly different ($p < 0.001$), with smaller values observed in the female group (Mann-Whitney test). This meant a higher prevalence of disordered attitudes and behaviors in females. It also showed a satisfactory sensitivity of the EABQ, which validates the results of the SCOFF questionnaire.

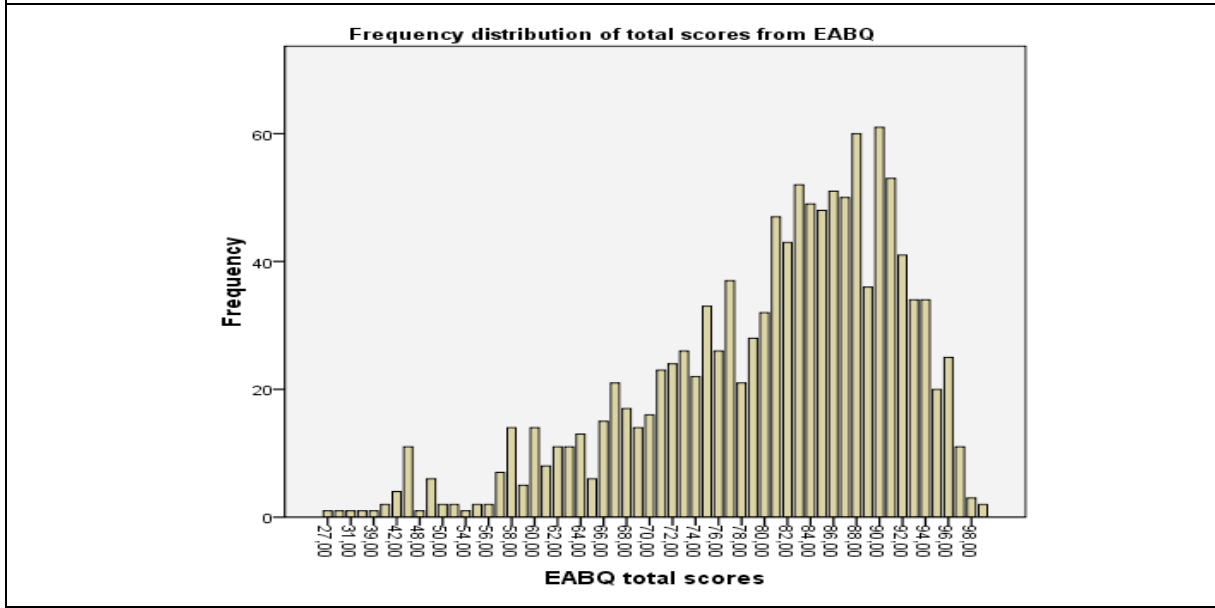
We analyzed the 25 items of the EABQ using an exploratory factor analysis (Principal Component Analysis). The four main factors determined by the PCA represented 31.16% (the first factor), 9.09% (the second factor), 8.41% (the third factor), and 6.06% (the fourth factor) of variation in the data. Assuming these factors were intercorrelated, we used an oblimin rotation to interpret the results (Brown, 2009).

The significant item loadings (higher than 0.30) on the four factors: 'Body shape and weight concerns', 'Personal control over eating and calorie intake', 'Dieting', and 'Preoccupation with food and binge eating', are shown in Table 3. Each of the 25 EABQ items had loads and these were assigned to the four factors identified (Table 3); items 5, 6, 11, 20 and 21 had loads assigned to one other factor (not shown in table) with a lower, but significant value.

The nine items for assessing the first factor (body shape and weight concerns) had content relating to feelings (fears) of becoming fat, dissatisfaction, and significant importance of one's own body shape, and strong feeling of guilt after eating. Six items for avoidance of high calorie food, eating rules, calorie control, and compensating sport activity were loaded on the factor labelled "Personal control over eating and calories intake". Factor 3, labelled "dieting", included six items relating to the will and activity to keep one's stomach empty, including purging. The fourth factor (preoccupation with food and binge eating) included four items that indicated overeating and preoccupation with eating.

The internal consistency of the EABQ questionnaire was high, based on the Cronbach's Alpha value (0.879). As displayed in Table 4, Spearman's correlations show moderately significant correlations ($p < 0.001$) between the total scores of the SCOFF questionnaire, the EABQ, and the scores from three groups of items in the EDDS for assessing eating attitudes and behaviors. These results indicated appropriate concurrent validity of the questionnaire generated in this study.

Figure 1: Frequency of the results from the Eating Attitudes and Behaviors Questionnaire (EABQ)



Source: Authors

Table 3: Eating Attitudes and Behaviors Questionnaire (EABQ) factor structure (Principal Component Analysis, Oblimin Rotation)

Factor	Item numbers	Factor loading
Body shape and weight concerns	EABQ 1	-0.787
	EABQ 2	0.720
	EABQ 3	0.594
	EABQ 14	0.744
	EABQ 16	0.737
	EABQ 19	0.800
	EABQ 20	0.444
	EABQ 25	0.557
Personal control over eating and calories intake	EABQ 4	0.511
	EABQ 5	0.732
	EABQ 6	0.589
	EABQ 7	0.688
	EABQ 11	0.452
	EABQ 12	0.662
Dieting	EABQ 8	0.686
	EABQ 10	0.565

	EABQ 15	0.501
	EABQ 18	0.462
	EABQ 23	0.796
	EABQ 24	0.750
Preoccupation with food and binge eating	EABQ 9	0.793
	EABQ 13	0.749
	EABQ 17	0.704
	EABQ 22	0.445
Source: Authors		

Table 4: Spearman’s correlations between the total scores from the SCOFF questionnaire, EABQ, and EDDS

Scales	SCOFF	EABQ	EDDS group 1	EDDS group 2	EDDS group 3
SCOFF	-	0.566**	-0.517**	0.377**	-0.430**
EABQ	0.566**	-	-0.693**	0.366**	-0.518**
EDDS group 1	-0.517**	-0.693**	-	-0.284**	0.431**
EDDS group 2	0.377**	0.366**	-0.284**	-	-0.429**
EDDS group 3	-0.430**	-0.518**	0.431**	-0.429**	-
EABQ: Eating Attitudes and Behaviors Questionnaire; EDDS: Eating Disorder Diagnostic Scale					
**significant at the 0.001 level (2-tailed)					
Source: Authors					

A serious limitation of this preliminary study was its unbalanced sample, especially with the small number of individuals in the middle adulthood group, with only 28 individuals. For an accurate comparison of the age groups more individuals aged between 40 and 65 years were needed. Further study is in progress.

Conclusion

To the extent of our knowledge, this study is the first Bulgarian epidemiological study, reporting the prevalence of unhealthy eating attitudes and behaviors in a non-clinical sample of adolescents and adults, both male and female. Our results indicate that the attitudes and behaviors, relating to food and eating, should be studied and analyzed to reveal the hidden picture of the risk for ED in the general community. Knowledge about unhealthy eating attitudes can form a fruitful basis for prevention of ED. The hypothesis of a continuum between normal eating and ED, with partial syndromes forming intermediate conditions, and a high risk for clinically significant or full-syndrome ED, is supported in the literature. Prevention could be more effective being directed to individuals of the general population with partial syndromes, i.e., with unhealthy eating attitudes and behaviors. We found a greater ED risk in adolescents compared with the older groups and in females compared with males. That is, our results showed a higher incidence of disordered eating attitudes and behaviors in adolescents and in females. At the same time, we found that one fifth of the males in the study were at high risk of ED, and that young adulthood was also an age period at risk.

We analyzed the relationship between the results of three scales, measuring disordered eating attitudes and behaviors, and confirmed that our questionnaire (EABQ) is a sensitive and reliable self-report instrument that can be used for early detection of ED risk.

This study’s results could form the basis for developing programs for disordered eating prevention in Bulgaria.

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