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Eating Disorders and Body Image Perception among University Students

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Abstract: This study aimed to determine the prevalence of eating disorders and body image among university students undertaking nutrition education. Subjects included 577 students from Gazi University, Faculty of Vocational Education, Department of Food and Nutrition Education (Group 1 n = 299) and other departments (Group 2 n = 278) which did not involve nutrition education. The Eating Attitudes Test (EAT-40), body cathexis index and anthropometric measurements were used to assess eating attitudes. The results showed that 75.9% of nutrition educated students and 83.5% of others had normal BMI (18.5-24.9 kg/m^2). Thirty-four of the 577 students had an EAT-40 score over the cut-off level of 30. Thus, 14% of the nutrition educated were at high risk and 9.7% at moderate risk. Among others, 7.2% were at high risk and 13.3% at moderate risk. It was also seen that 30.1% of the nutrition educated and 29.5% of others were dissatisfied with their bodies. The mean EAT-40 score of all participants was 15.1±10.68; body cathexis score was 147.9±21.48. The difference between the two index means was not significant ($p>0.05$). A weak negative relationship was found between BMI, EAT-40 and the body image perception score. The results indicated that the prevalence of abnormal eating attitudes and behaviors was 5.9% among students. Nutrition education was found to have no effect on the occurrence of abnormal eating attitudes and behaviors.

Key words: Nutrition education, EAT-40, anthropometric measurements, body cathexis

INTRODUCTION

The changing social, economic, cultural and traditional structure of a society may also affect the bodily perceptions of individuals. In Western societies where the concept of beauty is based on body weight and shape, having a "thin" body is considered beautiful and consequently, eating disorders are on the rise. Print and visual media throughout the world encourage people to stay thin and they often publish special "recipes" for this purpose. As a result, many people follow special diets and exercises in order to lose weight. Seen almost exclusively among white middle class women until recently, eating disorders are now more common across all social classes and in all countries (Basterzi *et al*., 2003). Having both physical and psychosocial dimensions, eating disorders reveal themselves in one's thoughts about food and body weight and image, as well as in their eating behaviors (Becker *et al*., 1999). This study examined the relationship among anthropometric measurements, eating disorders and body cathexis in Turkish university students who were and were not undertaking education in nutrition science.

MATERIALS AND METHODS

Participants: Subjects consisted of 577 students enrolled in Gazi University, Faculty of Vocational Education, Department of Food and Nutrition Education (Group 1 n = 299) and other departments (Group 2 n = 278) which do not offer nutrition education. Gazi University is located in the capital city of Turkey, Ankara. The main goal of the Department of Food and Nutrition Education is to offer undergraduate and graduate programs to equip individuals with technical knowledge and skills in the fields of hygiene in mass nutrition systems, quality (HACCP), preparation of food in experimental practices, cooking and preserving principles, mother and child nutrition, nutrition during diseases, Turkish cuisine and upholstery and scientific subjects.

Among the students, 51.8% were in their 3rd and 4th year of university undertaking nutrition education and the remaining 48.2% were undertaking other classes. As for accommodation, 53.6% were living in dormitories whereas the remaining 46.4% were living in off-campus housing. The mean age of study population was 21.4±2.18 years (range 18-30 years). Data was collected by face to face interviews that took place for 6 months between January and June 2008.

The questionnaire: The questionnaire contained demographic items including sex, age, smoking and alcohol intake.

The eating attitudes test (EAT-40): The risk estimations were obtained from the criteria used by Garner and Garfinkel (1979) and later addressed by Savasir and Erol (1989). The questionnaire contained 40 questions related to eating habits, which were graded as follows: always, very often, often, sometimes, rarely, never. Answers marked as never, rarely and sometimes

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carried zero points whilst often = 1, usually = 2 and always = 3 points (Garner *et al*., 1982). In our study, the reliability (Cronbach's alpha) of the EAT-40 was found to be 0.814. In the scale, the scores were classified as follows: a score of 30 and above indicated high risk (abnormal eating behavior), between 21 and 30 indicated moderate risk and below 21 indicated low risk.

Body cathexis: Developed in 1953 by Secord and Jourard, the scale was tested for validity and reliability and adapted to the Turkish society in 1989 by Hovardaoglu (Hovardaoglu, 1990). The scale contains 40 items, each of which is related to an organ, a part of the body (such as arms, legs, or the face) or a function (such as sexual activity level). For each item, scores range between 1 to 5 across the alternatives "Don't like it at all", "Don't like it", "Undecided", "Like it" and "Like it a lot". The total score ranges between 40 and 200, with a higher score indicating a higher level of satisfaction. In our study, the reliability (Cronbach's alpha) of the test was found to be 0.929 and the mean score of the scale was 147.95±21.48. The resulting grouping indicated that a value within ±1/2SD to the mean (137.21-158.69) showed moderate risk, below 137.21 indicated high risk and over 158.69 represented low risk.

Anthropometric measurements: All anthropometric measurements were conducted according to the World Health Organization standards and made in triplicate by nutritionists. Body Mass Index (BMI) was calculated from measurements of height and weight. Participants were classified according to BMI and a value between 18.5-24.9 kg/m^2 was classified as normal weight while 25 or greater was considered overweight (WHO, 1987). Fat mass was determined by bioelectrical impedance analysis with a TBF-300 Body Composition Analyzer (TANITA, Tokyo, Japan) according to the manufacturer's internal algorithm.

Statistics: Chi Square test was used to determine the difference between female participants' age, BMI, cigarette and alcohol intake, physical activity level, EAT-40 and body cathexis index distributions with respect to taking nutrition education. Student's t-test was utilized to test the difference between body fat mass, BMI, EAT-40 and body cathexis index scores of those who did and did not undertake nutrition education. Multiple regression analysis (stepwise) was used to identify how well cathexis index score is predicted by body fat mass and EAT-40 scores. The data was analyzed by using "Statistical Package for Social Sciences" (SPSS for Windows 15.0).

RESULTS

As shown in Table 1, 65.0% of participants were between 18-21 years old and the BMI of 79.5% was found to be within normal limits (18.5-24.9 kg/m^2). The prevalence of current smoking was 11.1% and 4.5% of participants were alcohol users. The level of physical activity was low (%16.6) in all groups. Overall, the EAT-40 scores of 5.9% of participants suggested high risk. The body cathexis scores also indicated high risk for 29.8% of participants in all groups.

Table 1: Baseline characteristics of respondents (n = 577)

	Group 1 (n = 299)		Group 2 (n = 278)		Total (n = 577)			
Age (Years)	n	%	n	%	n	%	χ^2	p-value
18-21	193	64.5	182	65.5	375	65.0	0.258	0.879
22-25	94	31.4	87	31.3	181	31.4		
26-29	12	4.0	9	3.2	21	3.6		
BMI (kg/m^2)								
<18.5	42	14.0	33	11.9	75	13.0	7.101	0.029
18.5-24.9	227	75.9	232	83.5	459	79.5		
>25	30	10.0	13	4.7	43	7.5		
Cigarette smoking								
Smokers	27	9.0	37	13.3	64	11.1	2.675	0.102
None-smokers	272	91.0	241	86.7	513	88.9		
Alcohol intake								
User	12	4.0	14	5.0	26	4.5	0.350	0.554
Non-user	287	96.0	264	95.0	551	95.5		
Physical activity								
Yes	55	18.4	41	14.7	96	16.6	1.381	0.240
No	244	81.6	237	85.3	481	83.4		
EAT-40 score								
Low risk (<21)	256	85.6	221	79.5	477	82.7	3.837	0.147
Moderate risk (21-30)	29	9.7	37	13.3	66	11.4		
High risk (>30)	14	4.7	20	7.2	34	5.9		
Body cathexis score								
High risk (<137)	90	30.1	82	29.5	172	29.8	0.989	0.610
Moderate risk (137-159)	119	39.8	121	43.5	240	41.6		
Low risk (>159)	90	30.1	75	27.0	165	28.6		

Table 2: Mean anthropometric measurement, EAT-40 and body perception scores with respect to undertaking nutrition education

	Group 1 (n = 299)	Group 2 (n = 278)	Total (n = 577)	t-score	p-value
Anthropometric measurements					
Fat (%)	21.4±6.89	21.2±6.36	21.3±6.64	0.444	0.658
BMI (kg/m^2)	21.5±2.97	21.0±2.81	21.2±2.90	2.142	0.033
EAT-40	14.4±10.01	15.9±11.32	15.1±10.68	-1.648	0.100
Body cathexis	148.4±21.36	147.5±21.64	147.9±21.48	0.492	0.623

Table 3: Regression analysis results for the dependent variable, i.e. body cathexis and the independent variables, i.e. BMI and EAT-40 test scores

Model summary[c]

					Change statistics				
Model	R	R^2	Adjusted R^2	Std. error of the estimate	R^2 change	F change	df 1	df 2	Sig. F change
1	0.114[a]	0.013	0.011	21.36216	0.013	7.615	1	575	0.006
2	0.144[a]	0.021	0.017	21.29907	0.008	4.412	1	574	0.036

[a]Predictors: (Constant), BMI
[b]Predictors: (Constant), BMI, tope EAT40
[c]Dependent variable: Body cathexis

Coefficients[a]

							Correlations			Collinearty statistics	
Model		Unstand. coeff. (B)	Std. error	Stand. coeff. (Beta)	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	165.901	6.564	-	25.273	0.000	-	-	-	-	-
	BMI	-0.845	0.306	-0.114	-2.760	0.006	-0.114	-0.114	-0.114	1.000	1.000
2	(Constant)	169.630	6.781	-	25.014	0.000	-	-	-	-	-
	BMI	-0.896	0.306	-0.121	-2.925	0.004	-0.114	-0.121	-0.121	0.994	1.006
	Tope EAT40	-0.175	0.083	-0.087	-2.100	0.036	-0.077	-0.087	-0.087	0.994	1.006

[a]Dependent variable: Body cathexis, Unstand. = Unstandardized, Stand. = Standardized, Coeff. = Coefficients

Table 2 shows that the BMI of participants who were undertaking nutrition education (Group 1) (21.5±2.97 kg/m^2) was higher than those who were not (21.0±2.81 kg/m^2) ($p<0.05$). The difference between the body fat (%), EAT-40 and body cathexis scores of those who were (Group 1) and were not undertaking nutrition (Group 2) education was insignificant ($p>0.05$).

Multiple regression analysis was conducted by using the body image perception scale as the dependent variable and the EAT-40 score and BMI as independent variables. Variables were selected with the stepwise method. Among independent variables, BMI and EAT-40 scale seemed to be the most important ones predicting the body image perception score. Anthropometric measurements did not meet the variable selection criteria and were consequently excluded. BMI accounted for 1.3% of the total variance in body image perception scale scores and the EAT-40 test scores accounted for 0.8% ($p<0.05$). The regression coefficient showed that a negative relationship existed between the body image perception scale score and the variables of BMI and EAT-40.

DISCUSSION

School-based nutrition education programs and services can offer a systematic and efficient venue for promoting health-enhancing eating behaviors among youth. These behaviors constitute a complex phenomenon occurring as a result of arranging motor, cognitive, social and emotional developments with the help of central and peripheral factors. People do not eat only for biological development and physiological functions. On the contrary, eating is related to the development of all social relations ever after the mother-baby relationship. It is indeed associated with many satisfying and painful experiences (Saygili, 1999). A great majority of people with eating disorders find themselves overweight even though they are not (Borgen, 2001). A high score on the EAT-40 scale shows increased negative eating behaviors. The mean EAT-40 score was found to be 15.1±10.68 in this study and no meaningful difference was found between the EAT-40 mean scores of students who were (Group 1) and were not undertaking nutrition (Group 2) education ($p<0.05$). In previous studies conducted with university students in Turkey, the following mean EAT-40 scores were reported: 14.66±8.98 (Asçi *et al*., 2006), 16.74±10.45 (Oral, 2006), 20.3±14.3 (Sanlier *et al*., 2008), 20.7±10.5 (Uzun *et al*., 2006), 14.4±7.27 and 20.07±13.80 (Ilhan *et al*., 2006). Our finding was similar to these studies. In our sample, 5.9% of students were at a high risk of eating disorders. However, in other studies on young people in Turkey, the rate of disordered eating attitudes varied between 2.2 and 22.8% (Altug *et al*., 2000; Uzun *et al*., 2006; Asci *et al*., 2006; Kugu *et al*., 2002; Ilhan *et al*., 2006; Sanlier *et al*., 2008; Bas *et al*., 2004; Bas *et al*., 2006). Even among students who received nutrition education professionally, the rate of abnormal eating

attitudes and behaviors was 9.4% (Odabasi *et al*., 2007). In the present study, we found eating disorders in 4.7% of nutrition educated students (Group 1). The results of studies conducted in Western societies show the prevalence of disordered eating attitudes to be between 9.5 and 24.6% among students (Janout and Janoutova, 2004; Toro *et al*., 2006, O'dea and Abraham, 2001).

Designed to measure how satisfied people are with the different parts and functions of their bodies, the body image scale implies a higher rate of satisfaction as the score increases (Secord and Jourard, 1953). In the present study, the mean body cathexis score was found to be 147.9±21.48. The mean body cathexis score did not differ between students who were educated in nutrition (Group 1) and who were not ($p>0.05$). In other studies, the mean scores were 84.9±19.9 (Sanlier *et al*., 2008) and 135.81± 27.26 (Pinar, 2002). The rate of poor body image was 29.8% among all students who participated in this study. Özmen *et al*. (2007) reported that 56.7% of the females in his study were not satisfied with their bodies. In the present study, the percentage of participants dissatisfied with their bodies was found to be lower than the studies conducted by Sanlier *et al*. (2008) and Özmen *et al*. (2007). In yet another study conducted by Odabasi *et al*. (2007), self-evaluation score was found to be 148 (83-200) among students undertaking professional nutrition and dietetic education. In a study (Espina *et al*., 2002) conducted on 11 to 18-year-old children, the results showed that 32% of females were concerned over their body shape, which increased even more with age. On the other hand, the rate of dissatisfaction among males was much lower at 8.9%. However, there is a positive relationship between body shape concern and body weight, irrespective of gender.

The changes in body image and the increased tendency for eating disorders have been associated with social structure changes. Globalization is a comprehensive process which also includes nutrition. The rapid spread of globalization and its influence on societies bring changes in nutrition-related areas (Aslan, 2004). The present study found no difference between the EAT-40 test and body image scores of either group (Group 1, Group 2).

In a study on the relationship between BMI and possible eating disorders (Ilhan *et al*., 2006), 85,1% of participants with eating disorders were observed to actually be within normal body weight limits. This has implications for the relationship between eating disorders and body image perception. Altug *et al*. (2000) reported that eating behavior disorders were correlated with body shape and body weight. BMI has a significant correlation with body image (Hrabosky and Grilo, 2007). However, in our study, BMI accounted for only 1.3% of the total variance related to body image perception score and the EAT-40 scores accounted for 0.8% ($p<0.05$). The relationship between BMI and EAT-40 and body image perception scale score was weak and negative in this study. High BMI and EAT-40 scores reveal less satisfaction with the various parts and functions of the body. Similarly, Erol *et al*. (2000) and Maor *et al*. (2006) found no significant correlation between BMI and eating attitude scale. Furthermore, nutrition knowledge was found to have no effect on the occurrence of abnormal eating attitudes and behaviors in another study conducted by Odabasi *et al*. (2007).

REFERENCES

Altug, A., G. Elal, P. Slade and A. Tekcan, 2000. The Eating Attitudes Test (EAT) in Turkish university students: Relationship with sociodemographic, social and individual variables. Eating Weight Disorders, 5: 152-160.

Aslan, D., 2004. Nutrition problems caused by body image perception problems. Sted., 13: 326-329.

Asci, F.H., M. Tüzün and C. Koca, 2006. An examination of eating attitudes and physical activity levels of Turkish university students with regard to self-presentational concern. Eating Behaviours, 7: 362-367.

Bas, M., F.H. Asci, E. Karabudak and G. Kiziltan, 2004. Eating attitudes and their psychological correlates among Turkish adolescents. Adolescence, 39: 593-599.

Bas, M., E. Karabudak, N. Karaagaoglu and N. Cigerim, 2006. Association between eating attitudes and dietary intake of adolescents living in the Black Sea Region. 5th International Nutrition and Dietetics Congress, Antalya.

Basterzi, A.D., V. Tüzer, M.S. Alagöz, C. Uysal and E. Göka, 2003. Eating attitude and body image in plastic surgery patients. New Symposium, 41: 3-6.

Becker, A., S. Grinspoon, A. Klibanski and D. Herzog, 1999. Current concepts: eating disorders. N Engl. J. Med., 340: 1092-1098.

Borgen, J.S., 2001. Eating Disorders in Athletes. In R.J. Maughan (Ed.), Nutrition in sport (pp: 510-522). Blackwell Science.

Erol, A., G. Toprak, F. Yazici and S. Erol, 2000. A comparison of locus of control and self-esteem as predictors of eating disorders among university students. Clin. Psychiatry, 3: 147-152.

Espina, A., M.A. Ortego, I.O. Alda, A. Aleman and M. Juaniz, 2002. Body shape and eating disorders in a sample of students in the Basque country: A pilot study. Psychology Spain, 6: 3-11.

Garner, D.M. and P.E. Garfinkel, 1979. The Eating attitudes test: An index of the symptoms of anorexia nervosa. Physchol Med., 9: 273-279.

Garner, D.M., M.P. Olmsted, Y. Bohr and P.E. Garfinkel, 1982. The Eating Attitudes Test: Psychometric features and clinical correlates. Psychol. Med., 12: 871-878.

Hovardaoglu, S., 1990. A study on the reliability and validity of the body perception scale. In Y.D. Özdemir, Body image satisfaction levels of schizophrenic and major depression patients. Unpublished master's thesis, Ankara University, School of Social Sciences.

Hrabosky, J.I. and C.M. Grilo, 2007. Body image and eating disordered behavior in a community sample of Black and Hispanic women. Eating Behaviours, 8: 106-114.

Ilhan, M.N., S. Özkan, F.N. Aksakal, S. Aslan, E. Durukan and I. Maral, 2006. Frequency of possible eating disorders among medical school students. Psychiatry in Turkey, 8 (3).

Janout, V. and G. Janoutova, 2004. Eating disorders risk groups in the Czech republic-cross-sectional epidemiologic pilot study. Biomed. Papers, 148: 189-193.

Kugu, N., G. Akyüz and O. Dogan *et al*., 2002. Prevalence of eating disorders among university students and self-esteem, family functions, childhood abuse and neglect in the eating disordered. 3P J., 10: 255-266.

Maor, N.G., S. Sayag, R. Dahan and D. Hermoni, 2006. Eating attitudes of adolescents. IMAJ, 8: 627-629.

O'dea, J. and S. Abraham, 2001. Knowledge, beliefs, attitudes and behaviors related to weight control, eating disorders and body image in Australian trainee home economics and physical education teachers. JNE, 33: 332-340.

Odabasi, E., B. Ersan, A. Hasbay and N.B. Tosun, 2007. Eating disorders evaluation among nutrition and dietetics students at Hacettepe University, Turkey. Thematic Network for Dietetics, Issue 2.

Oral, N., 2006. A study on the relationships between eating attitude disorder and interpersonal schemas, bonding styles, interpersonal relationship styles and anger. Doctoral dissertation, Ankara University, School of Social Sciences.

Ozmen, D., E. Ozmen, D. Ergin, A.C. Cetinkaya, N. Sen and P.E. Dundar, 2007. The association of self-esteem, depression and body satisfaction with obesity among Turkish adolescents. BMC Public Health, pp: 16-80.

Pinar, R., 2002. Depression, self-esteem and body image among the obese: A comparative study. C.U. School Nursing J., 6: 30-41.

Savasir, I. and N. Erol, 1989. Eating Attitude Test: The Index for Anorexia Nervosa Symptoms. Psychology J., 7: 19-25.

Saygili, F., 1999. Complications of Obesity. In C. Yilmaz (Ed.), Obesity and Treatment (41-57). Istanbul: Mart Printing House.

Secord, P.F. and S.M. Jourard, 1953. The appraisal of body-cathexis: Body-cathexis and the self. J. Consulting Psychol., 15: 443-347.

Sanlier, N., N. Yabanci and O. Alyakut, 2008. An evaluation of eating disorders among a group of Turkish university students. Appetite, 51: 641-645.

Toro, J., G. Gomez-Peresmitre, J. Sentis, A. Valles, V. Casula, J. Castro, G. Pineda, R. Leon, S. Platas and R. Rodriguez, 2006. Eating disorders and body image in Spanish and Mexican female adolescents. Social Psychiatry Psychiatric Epidemiol., 41: 556-565.

Uzun, O., N. Güleç, A. Özsahin, A. Doruk, B. Özdemir and U. Caliskan, 2006. Screening disordered eating attitudes and eating disorders in a sample of Turkish female college students. Comprehensive Psychiatry, 47: 123-126.

World Health Organization, 1987. Measuring obesity classification and description of anthropometric data. Report on WHO consultation on the epidemiology of obesity, Geneva.