Predictors of Anorectic and Bulimic Symptoms in Adolescent Girls

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ÖZET:

Adolesan kızlarda anorektik ve bulimik semptomların belirleyicileri

Amaç: Bu çalışmada, ergenlerde yeme bozukluklarının gelişiminde etkili kabul edilen değişkenlerden aile işlevselliği, benlik saygısı, obsesif kompulsif (OK) belirtiler, depresif belirtiler, vücut algısı ve beden kitle indeksinin bulimik ve anorektik belirtileri belirleyici etkilerini karşılaştırmayı amaçladık.

Yöntem: Lise birinci sınıf öğrencisi 1201 kız öğrenciye Edinburg Bulimiya Araştırma Testi (EBAT), Yeme Tutum Testi (YTT), Rosenberg Benlik Saygısı Ölçeği (RBSÖ), Belirti Tarama Listesi (SCL-90-R), Aile Değerlendirme Ölçeği (ADÖ), Vücut Algısı Ölçeği (VAÖ) ve Beck Depresyon Ölçeği (BDÖ) uygulandı, ayrıca boy ve kiloları ölçüldü. Regresyon analizinde bağımlı değişken olarak EBAT semptom puanı; bağımsız değişken olarak RBSÖ'nin benlik saygısı alt ölçeği, SCL-90-R'ın OK belirti alt ölçeği, ADÖ alt ölçekleri, VAÖ, BDÖ puanları ve beden kitle indeksi (BKİ) alındı. Aynı bağımsız değişkenler YTT puanını belirlemek için kullanıldı.

Bulgular: Bulimik davranışları en çok OK belirtilerinin belirlediği ve varyansın %11,6'sını karşıladığı saptandı. Diğer belirleyici değişkenler; depresyon, BKİ ve aile işlevlerinden gereken ilgiyi gösterme olarak saptandı. YTT puanlarını güçlü biçimde belirleyen değişkenler sırasıyla depresyon, aile işlevselliği, BKİ ve OK belirtiler olarak saptandı. Anorektik belirtileri en güçlü belirleyen değişken, depresif belirtilerdi.

Tartışma ve Sonuç: Orta ergenlik dönemindeki kızlarda bulimik ve anorektik patolojiye benzer değişkenler farklı ölçülerde katkıda bulunmaktadır. Bulimik belirtileri OK belirtiler, anorektik belirtileri ise depresif belirtiler daha güçlü belirlemektedir.

Anahtar sözcükler: bulimiya, anoreksiya, adolesan, belirleyici

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ABSTRACT:

Predictors of anorectic and bulimic symptoms in adolescent girls

Objective: In this study, we aimed to compare the predictive effects of variables such as family functioning, self-esteem, obsessive-compulsive (OC) symptoms, depressive symptoms, body perception, and body mass index of anorectic and bulimic symptoms in adolescent female students.

Methods: Bulimia Inventory Test of Edinburgh (BITE), Eating Attitudes Test (EAT), Rosenberg Self Esteem Scale (RSES), Symptom Check List (SCL-90-R), Family Assessment Device (FAD), Body Perception Scale (BPS), and Beck Depression Inventory (BDI) were administered to 1201 female students attending the first year in high school, and their heights and weights were measured. In regression analysis, BITE symptom scores were taken as the dependent variable and self esteem subscale of RSES, obsessive-compulsive symptom subscale of SCL-90-R, FAD subscales, BPS, and BDI scores and body mass index were taken as independent variables. The same independent variables were used to predict the EAT scores.

Results: Obsessive-compulsive symptoms were found to be the most predictive variable for bulimic behavior, accounting for 11.6% of the variance. Other predictor variables were depression, body mass index, and affective involvement as a part of family functioning. The most predictive variables for EAT scores were found to be depression, family functioning, body mass index, and obsessive-compulsive symptoms. Depression score was the most predictive variable for anorectic symptoms.

Conclusion: Similar variables contribute to bulimic and anorectic pathology in varying degrees. The strongest predictor of bulimic pathology in mid-adolescent girls was found to be obsessive-compulsive symptoms, while depressive symptoms were most predictive variable for anorectic symptoms.

Key words: Bulimia, anorexia, adolescence, predictor

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INTRODUCTION

Towards the end of the twentieth century, Bulimia nervosa (BN) has emerged in Western countries parallel with the tendency of the population to have a slimmer body (1). The appearance of this disorder has reminded investigators of a cultural effect on its etiology (1).When compared to anorexia nervosa (AN), the prevalence of BN is strikingly higher. Also in Eastern populations, the prevalence of BN tends to increase with the trend towards Westernization (2). It has been accepted that BN and AN have similar etiologies, both being multifactorial disorders caused by a combination of biological, social, and psychological influential factors (3). It has been stated that, while genetic factors predominated in AN, cultural factors were more important in BN (1). Despite the fact that their

etiologies are not fully established, the effects of these factors on both disorders have been investigated heavily.

Impairment in family functioning has been detected as an important factor in the appearance and prognosis of both pathologies (4,5,6). Different impairments in family functioning have been described for AN and BN. When compared with control families; hostility, chaos, sense of isolation, and impairment in empathy were shown to be higher in BN families (7,8). Furthermore, interventions from the family and especially the mother, jealousy, competitiveness, sexual abuse of the father have also been reported in BN families (9). Similarly, presence and avoidance of conflicts, rigid attitudes, and excessive protection have been observed in AN families (10).

Depressive disorders are more prevalent in AN and BN patients when compared to the normal population (11). Studies involving normal adolescent population have suggested that there was a relationship between mood disorders and both eating disorders and weight concerns (12). Negative affect model accepts that depressive individuals have binge eating in order to achieve relaxation and to get rid of negative feelings. On the other hand, compensatory behaviors like vomiting are also used for decreasing the anxiety induced by weight gain (13). There is still a controversy on the causative relation of eating disorders (ED) and depression. While some of the studies have suggested that ED was a result of depression, others suggested the opposite (13,14,15). Nowadays, it is widely accepted that there is a relationship between ED and depression, but its nature is yet to be revealed (16).

Low self-esteem has been shown to be related to bulimic psychopathology (17). The fact that it has been reported in non-depressive AN and BN patients indicates that it is independent of depression (18). Increase in self-esteem has been documented in women who have recovered from BN. It has been demonstrated that perfectionist women, who feel themselves as obese, would have bulimic symptoms only if they had low self-esteem (19).

It has been stated that the major psychopathology in BN was the extreme importance that the patients attribute to their appearance and weight (20). This feature was adopted as diagnostic criteria In DSM-IV (21).

Comorbidity and resemblance of OCD and ED to each other have been mentioned in literature (22,23). Higher prevalence of ED has been shown in patients with a diagnosis of OCD (24). On the other hand, more obsessive compulsive symptoms and more obsessive personality traits have been detected in ED patients (25). Rothenberg has defined ED as a modern version of OCD with a theme of losing weight and fear of eating with a fear of gaining weight, dieting, counting calories, exercising, controlling of weight, binge eating, and vomiting and stated that all of these behaviors had obsessive compulsive content as a core (26). Rothenberg's view supports the phenomenological resemblance of OCD to ED. In addition to the thoughts of diet and weight, there are compulsive behaviors like binge eating and vomiting in BN patients (27,28). In support of this phenomenon, OC symptoms have been found to be the most predicting variable for ED in a Turkish female college student sample (29).

In this current study, we aimed to investigate whether these aforementioned variables would predict anorectic or bulimic symptoms or not.

MATERIAL AND METHODS

Participants

All first grade female students (n = 1201) from four high schools in different socio-economical regions of Eskisehir city were included in the study. Permission for the study was granted from Provincial National Education Directorate. Sociodemographic information of the subjects including age, place of birth, and whether they were receiving any psychiatric help or not, were recorded on a general information form.

Scales

Eating Attitudes Test (EAT). EAT measures eating behavior and attitude of AN patients as well as possible abnormalities in eating attitudes of normal individuals. EAT is considered as a good screening instrument for eating disorders. It has been developed by Garner and Garfinkel (30). The total score is directly related with the level of psychopathology. In addition to its capability of detecting clinically "sick" individuals, EAT may also be an indicator of the tendency of the individual for this disorder. It contains 40 items with six possible answers for each statement ranging from 'never' (0) to 'always' (3). Validity and reliability of its Turkish version has been demonstrated

by Savasir and Erol (31). Factorial validity was shown in population sample and reliability coefficients of the Turkish version of the test were found to be high (31).

Bulimic Investigatory Test, Edinburgh (BITE). BITE is a self-reported questionnaire including 33 items on eating habits and concerns about eating, shape and weight as found in BN (32). Validity and reliability of its Turkish version has been done by Kıran et al. (33). BITE consists of two subscales both including symptom and severity subscales. Symptom subscale provides information about the sum of symptoms, while severity subscale provides information about the frequency of the symptoms that are present. EAT has been criticized because the range of symptoms that are being questioned does not include all eating disorders. Although it is a valid and reliable scale, EAT is not designed for binge eating. EAT items focus specifically on behaviors and emotions accompanying AN (32). Due to their critics about EAT, Henderson and Freeman developed BITE aiming to detect bulimic symptoms (32). In this study, EAT scores and BITE symptom subscale scores were considered as anorectic and bulimic symptom scores, respectively.

Beck Depression Inventory (BDI). The aim of the scale is to measure depression symptoms on a self-report basis. It has been developed by Beck et al. (34).Validity and reliability of its Turkish version has been demonstrated by Tegin (35) and Hisli (36,37).

Rosenberg Self-Esteem Scale (RSES). It has been developed by Rosenberg (38). Validity and reliability of its Turkish version has been performed by Cuhadaroglu (39). It contains 10items scored on a 4-point likert scale that is anchored by "strongly agree" and "strongly disagree". The scale results in a score between 0 and 6, with lower scores indicative of higher self-esteem.

The Symptom Checklist-90-R (SCL-90-R). The Symptom Checklist-90-R (SCL-90-R) List is a self-rated psychiatric symptom screening tool. It has been structured in order to assess 9 different symptom dimensions with 90 items consisting of psychiatric symptoms and complaints. The score is positively correlated with psychiatric symptom level. It has been developed by Derogatis (40). Validity and reliability study has been performed by Dag in a Turkis sample (41).

Family Assessment Device (FAD). The aim of this device is to assess the constitutional and organizational qualities of family functioning as well as determining relationships and interactions within the family as healthy and unhealthy. It has been developed by Ebstein et al. and includes 60 items and 7 subscales in total:

(1) Problem solving (FADPRS); (2) communication (FADCOM); (3) roles (FADROL); (4) affective responsiveness (FADAFR); (5) affective involvement (FADAFI); (6) behavior control (FADBHC); (7) general functions (FADGNF) (42). The scores range between 1 (healthy) and 4 (unhealthy). Authors have suggested that mean scores greater than 2 was a marker for tendency to unhealthiness in family functioning and thus theoretically have accepted 2 as a cut-off value. Validity and reliability study was performed by Bulut in a Turkish sample (43).

Body Perception Scale (BPS). This scale measures the satisfaction level that is experienced about different parts of the body. The target population is young/ adult males and females. It is a self-rated, verbal personality scale with individual and group applications. It contains 40 items scored on a 5-point likert scale with a total score between 40 and 200. Higher scores reflect an increase in the positivity of assessment. It is more appropriate to be used especially in depression research. It has been developed by Secord and Jourard (44). Validity and reliability study has been performed by Hovardaoglu in a Turkish sample (45).

Procedure. General Information form, BDI, RSES, FAD, SCL-90-R, BITE, EAT, and BPS were administered to all participants. No inclusion criteria were used and we accepted all students without questioning past history or current psychiatric diagnosis. The order, in which the scales were administered, was changed in every school in order to control for the "order effect". General information form and the scales were administered to the students in the classroom under the supervision of the primary investigator. Then height and weight measurements were made by using a standard balance beam scale. Body mass index (BMI) was then calculated as kg/m^2.

Statistical Analyses. Multiple regression analysis was performed to detect the power of variables in predicting bulimic pathology symptoms (BITE scores) and anorectic symptoms (EAT scores). Pearson's product-moment correlation coefficient was used to measure correlation between the variables. Statistical analyses were performed using SPSS Version 10.0 for Windows (SPSS Inc, Chicago, IL)

RESULTS

Mean age of the study population (n = 1201) was 15.19 years (SD = 0.42), mean weight was 52.26 kg (SD = 9.15), mean height was 159.5 cm (SD = 5.90), and mean BMI was 20.4 (SD = 3.23). Mean and standard deviations of the study variables are shown in Table 1. Correlation matrix for the study variables is presented in Table 2.

Multiple regression analysis was performed where BITE symptom total score was used as the dependent variable and self esteem subscale of RSES, OC subscale of SCL-90-R, FAD subscales, BDI total score, BMI and BPS total score were used as the independent variables. Selection of the variables was determined stepwise by using pin = 0.05 and pout = 0.1 criteria. Among the independent variables, OC subscale of SCL-90-R was the most significant contributor to the prediction of bulimic pathology symptoms (F = 153.05; p<0.001). Other predictors in descending order of power were BDI total score, BMI, and FAD affective involvement score. While OC symptom subscale of SCL-90-R explained 11.6% of the total variance associated with BITE symptom total score, and this figure was increased to 15.5% after other variables were added to the model. While affective responsiveness, behavior control, communication, roles, problem solving and general functions subscales of FAD, self-esteem subscale of RSES and BPS total scores were significantly correlated with BITE symptom total scores, they did not contribute significantly to the prediction of bulimic pathology symptoms. Results of the multiple regression analysis are shown in Table 3. Distribution of the subjects according to bulimic pathology severity score was as follows: 0 (n = 1038), 1 (n = 82), 2 (n = 29), 3 (n = 29), 4 (n = 19), 5 (n = 1), 6 (n = 2), 8 (n = 1). Depressive symptoms were found to be the strongest predictor of EAT scores, explaining 16% of the variance (F = 221.8; p<0.001). Other predictors in descending order of power were FAD affective involvement, BMI, OC symptoms, FAD problem solving, and FAD roles (Table 4).

Table 1: Mean values and standard deviations (SD) of the study variables

Study variable	Mean	SD
Age (years)	15.19	0.42
Body weight (kg)	52.26	9.15
Ideal weight that the subjects wish to achieve	47.88	5,61
Height (cm)	159.5	5,90
BMI (kg/m^2)	20.4	3.23
Bulimic pathology symptom	10.50	3.30
Bulimic pathology severity	0.27	0.83
Depression	11.51	7.98
Self-esteem	1.18	1.16
OC symptom	1.21	0.65
General symptom level	0.99	0.61
FAD Problem solving	2.02	0.64
FAD Communication	1.98	0.53
FAD Roles	1.85	0.46
FAD Affective responsiveness	1.91	0.62
FAD Affective involvement	1.96	0.47
FAD Behavior control	1.80	0.39
FAD General functions	1.75	0.58
Body Perception Scale	135.90	23.34

FAD: Family Assessment Device

Table 2: Correlation matrix of the variables in the study population

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
BITE	1													
EAT	0.209**	1												
BDI	0.301**	0.404**	1											
BMI	0.127**	0.213**	.118**	1										
RSES	0.238**	0.286**	.556**	.0116**	1									
SCLOC	0.340**	0.321**	.0561**	.0057	.0392**	1								
FADPRS	0.171**	0.075**	.0332**	.0056	.0310**	.0282**	1							
FADCOM	0.162**	0.148**	.0379**	.0036	.0323**	.0356**	.0607**	1						
FADROL	0.236**	0.245**	.0438**	.0062*	.0413**	.0364**	.0540**	.0611**	1					
FADAFR	0.177**	.0207**	.0423**	.0050	.0369**	.0361**	.0544**	.0631**	.0627**	1				
FADAFI	0.225**	.0275**	.0326**	.0066*	.0299**	.0322**	.0199**	.0375**	.0500**	.0465**	1			
FADBHC	0.165**	.0184**	.0336**	.0034	.0274**	.0288**	.0363**	.0431**	.0534**	.0425**	.0385*	1		
FADGENF	0.215**	.0241**	.0476**	.0073*	.0429**	.0406**	.0663**	.0694**	.0715**	.0740**	.0527**	.0483**	1	
BPS	-0.206**	-.0227**	-.0442**	-.0161**	-.0471**	-.0381**	-.0319**	-.0339**	-.0367**	-.0334**	-.0218**	-.0274**	-.0370**	1

**≤ 0.01 *≤0.05
BITE: Bulimia Inventory Test of Edinburgh; EAT: Eating Attitudes Test; BDI: Beck Depression Inventory; BMI: Body Mass Index; RSES: Rosenberg Self Esteem Scale; SCLOC: Obsessive symptoms; FADPRS: Problem
Solving; FADCOM: Communication; FADROL: Roles; FADAFR: Affective Responsiveness; FADAFI: Affective Involvement; FADBHC: Behavior Control; FADGENF: General Functions. BPS: Body Perception Scale

Table 3: Regression analysis results of the study population where BITE symptom total score is the dependent variable

Predictive variable	R	R2	R2 change	F change	P	Beta
OC Symptom	0.341	0.116	0.116	153.05	.000	0.341
Depression	0.367	0.134	0.018	23.98	.000	0.162
BMI	0.382	0.146	0.011	15.19	.000	0.106
FADAFI	0.394	0.155	0.009	12.87	.000	0.104

FADAFI: Affective involvement

Table 4: Regression analysis results of the study population where EAT symptom total score is the dependent variable.

Predictive variable	R	R2	R2 change	F change	P	Beta
FADAFI	0.435	0.189	0.028	134.8	0.000	0.135
BMI	0.463	0.214	0.025	104.8	0.000	0.163
OC Symptom	0.473	0.224	0.010	83.1	0.000	0.129
Depression	0.401	0.161	0.161	221.8	0.000	0.277
FADPRS	0.482	0.233	0.009	70.0	0.000	-0.134
FADROL	0.486	0.236	0.003	59.3	0.000	0.078

FADAFI: Affective involvement; FADPRS: Problem Solving; FADROL: Roles

DISCUSSION

Statistically significant correlation was found between bulimic symptoms and OC symptoms. This relationship was reflected in the regression analysis as OC symptoms being the strongest predictor. OC symptoms constituted the biggest (11.6%) portion of the total variance of 15.5% which was explained by four variables in the regression model. OCD has been shown to be a precursor for the eating disorder in AN and BN patients and has been suggested that it could be a risk factor in the development of ED (46). OC symptoms have been found to be the best predictor of bulimic symptoms in adolescent girls in this study, as well. Additionally, our results strongly support that bulimic eating behavior has an obsessive compulsive nature, which is an important finding shown in a different culture.

Six variables were found to predict anorectic symptoms and these explained 23.6% of the total variance. The strongest predictor of anorectic symptoms was the presence of depressive symptoms (explaining 16.1% of the variance). These results suggest that depressive symptoms were in stronger correlation with anorectic symptoms while OC symptoms were in stronger correlation with bulimic symptoms. This relationship deserves further investigation since OC and depressive symptoms are essentially known to be very closely related with eating disorders in terms of comorbidity and similarity of clinical symptoms.

Depression was found to be correlated with bulimic pathology and was found to be the second best predictor of bulimic pathology in adolescent girls; however, was not as strong as OC symptoms. In parallel with these findings, depression has been reported to be a significant predictor for binge eating among female college students (47). In a prospective study, depressive symptoms have been found to predict the beginning of binge eating in adolescent girls (47). Other studies reported that bulimic symptoms lead to depression as well (14,15).

It has been found in our study that BMI was positively correlated with bulimic and anorectic symptoms, and predicted anorectic and bulimic pathology. Increased body mass has been reported to predict the beginning of binge eating. As being overweight is not approved socially, increased body mass results in body dissatisfaction. Family demands towards losing weight, when combined with pressure from friends and the media, lead to modeling of various eating disorders and increase in weight control behavior (48). In contradiction, it has been found in some studies that BMI did not predict body dissatisfaction (15). Although self-esteem and body perception correlated with bulimic and anorectic symptoms in our study, the predictive power of these variables was not statistically significant.

Among FAD subscales; impairment of affective involvement was found to predict bulimic pathology. This subscale, in addition to roles and problem solving subscales also predicted anorectic symptoms. When compared with normal women in various studies, bulimics have been found to be less capable of expressing themselves, their family and their emotions, to have poorer communication skills, to perceive their family as more closed, less interconnected (in terms of interest and support), less nourishing, and more distant (6,8). Different functioning characteristics have been reported for family members of bulimic and anorectic patients (49). In a study involving female college students, impairment of family functioning has been reported to be correlated with bulimic pathology (50).

Anorexia is clinically characterized by deficit symptoms which are somewhat similar to depression. On the contrary, bulimic symptoms rather resemble obsessive compulsive picture which acts by undoing mechanism in terms of binge eating and inappropriate compensation behavior; our findings do support this phenomenon.

Its cross-sectional nature and utilization of self-rated scales are among the main limitations of our study. Eating disorder symptoms in adolescents, in some cases may show discontinuity, because of this, being a cross sectional study done in adolescent population, we can not generalize our results to all eating disorder patients. Another limitation of our study is that we accepted all students regardless of their psychiatric diagnosis and treatments. This may also have an effect on our results.

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