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Attachment Security and Perceived Expressed Emotion in Adolescents with Anorexia Nervosa

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SUMMARY

Objective: The aim of this study was to compare the attachment security and perceived expressed emotion of female adolescents diagnosed with anorexia nervosa and those without any psychiatric disorder and to compare the expressed emotion of their parents. We also aimed to investigate the relationships between these variables and the effects of depression and anxiety symptoms of the adolescents on attachment security, perceived expressed emotion and expressed emotion of the parents.

Method: The study enrolled 43 female adolescents aged 12-18 years diagnosed with anorexia nervosa and an age and economic statusmatched control group of 37 healthy female adolescents. Both groups completed the Eating Attitudes Test-40 (EAT-40), the Perceived Expressed Emotion Scale (PEES), the Short Form of Inventory of Parentand Peer Attachment (IPPA), the Beck Depression Inventory (BDI) and the Screenfor Child Anxietyand Related Disorders (SCARED). Parents were assessed with the Expressed Emotion Scale (EES).

Results: As compared to the control group, the female adolescents with anorexia nervosa had lower attachment security and higher perception of parental expression of criticism and hostility. Presence of depression and anxiety symptoms did not affect these results. The security of maternal attachment in the adolescents with anorexia nervosa predicted their perception of criticism and hostility in their mothers.

Conclusion: The results of this study indicate the importance of assessing attachment security and perceived expressed emotion in adolescents with anorexia nervosa and the requirement of parental inclusion in the therapeutic process during follow up for implementation of appropriate interventions.

Keywords: Anorexia nervosa, adolescent, attachment, expressed emotion

INTRODUCTION

Anorexia nervosa (AN) is a psychiatric disorder characterized primarily by the excessive limitation of nutritional intake, and also self-induced vomiting, use of laxatives or diuretics, and excessive exercising with the desire to have a thin body. The lifelong prevalence is in the range of 0.5-2% (Weaver and Liebman 2011) and it has the highest mortality rate in psychiatric disorders (Franko et al. 2013).

Familial factors play are thought to play a role in preparing the ground for and accelerating the development of chronic anorexia nervosa (AN) which is believed to present with the complicated interactions of genetic and environmental causes. (Garner 1993, Le Grange et al. 2010). However, the mechanisms underlying the relationship between the symptoms of eating disorder (ED) and the nature of these problems have not been fully explained (Zachrisson and Skarderud 2010, Ringer and Crittenden 2007). Regarding the role of the parent-child relationship in adolescent mental health (Moretti and Pelet 2004), research into familial factors is an important area that will provide enlightening information about the onset, flare-ups and chronicity of adolescent psychopathologies.

Majority of the research in the literature on ED and early-stage family-child relationships investigated the attachment

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styles of individuals diagnosed with with ED (Ward et al. 2000, Zachrisson and Skarderud 2010). Attachment, formed through a positive relationship with the primary caregiver, is an important basic process for interpersonal relationships and emotional sufficiency that continues throughout life (Bowlby 1977). If the child receives the necessary support and positive reactions from the caregiver, they develop the cognitive representation that the connection figure is accessible, reliable, and supportive. If the caregiver is insensitive or inconsistent in reacting to the child's requirements, the child develops the cognitive representation that the attachment figure is rejecting and that the child is not worthy of love and support. Bowlby (1977) has referred to these as the ''internal working models". It is stated that the internal working models developed by the child on the attachment relationships are used as schemas for interpersonal relationships in adulthood and that the individual constructs relationships in line with these schemas (Safran 1990). Moretti and Pelet (2004) emphasized that secure attachment was associated with reduced risky behavior and mental diseases in adolescents, and increased social relationships and coping skills, and that it was necessary to attach more importance to adolescent-parent attachment security. Despite the reports that insecure attachment was observed more among adults with AN compared to healthy control groups (Caglar-Nazali et al. 2014, Keating et al. 2013, Tasca and Balfour 2014), only a few studies have researched attachment security among adolescents with AN (Di Pentima et al. 1998, Balottin et al. 2017).A study on the eating attitudes, attachment styles and problem-solving skills of adolescents attending high school in Turkey reported that disordered eating attitudes and behaviors increased among adolescent females perceiving parental overprotectiveness, and among adolescent males perceiving parental lack of concern, overprotectiveness or prohibitive control of autonomy. It was emphasized that problem-solving skills mediated the relationship between attachment security and eating attitudes (Aytin 2014).

The concept of expressed emotion (EE) reflects the emotional atmosphere within a family (Kazarian 1992) and represents the emotional attitude and behavior of families towards an individual with a psychiatric disorder. EE is an important concept that requires more investigation in relation to mental disorders believed to entail familial factors, because it has the potential to be altered during therapy. EE basically shows how the family copes emotionally with psychiatric disorder by reflecting the number of critical comments, presence or absence of hostile attitudes, emotionally over attentiveness, protectiveness and intervention by family members. EE has the two dimensions of criticism/hostility and over attentiveness/protectiveness –interventionism used to assess the 'high EE' and 'low EE levels of the family members. High EE was argued to be the cause of toxic family stress and a risk factor for the onset, continuation, and flare-up of many psychiatric disorders in adolescents (Peris and Miklowitz 2015). EE level was reported to affect the course and predict the outcome of psychiatric disorders (Simoneau et al. 1998); to be the strongest predictor of flare-up of schizophrenia and depression (Butzlaff and Hooley 1998); to be related to the poor response and abandonment of therapy (Le Grange et al. 1992, Le Grange et al. 2011) Deterioration of ED symptoms in adults patients with ED correlated with excessively critical parental attitudes (Medina-Pradas et al. 2011).

A follow-up study on the effect of parental EE on the treatment response of adolescents with AN reported that paternal critical attitudes predicted whether or not the AN symptoms resolved; and that maternal hostile attitudes predicted family functioning and intrafamily communication. It was emphasized that EE levels could affect the treatment outcomes and also that the maternal and paternal EE levels affected treatment outcomes differently, such that interventions had to be made to reduce the critical and hostile attitudes of both parents (Rienecke et al. 2016).

Another area that may be important for research into the role of familial factors is the concept of 'perceived expressed emotion' (PEE). PEE represents how the individual with psychiatric disorder perceives and evaluates the emotional attitudes and behaviors of the family member in a key relational position. The first study in this area, made on patients with depression, reported a significant correlation between the perceived critical and hostile attitudes of the family and the relapse incidences every nine months, which was emphasized to be more important than the perceived adverse family attitudes. (Hooley and Teasdale 1989).

Comparison of adult patients diagnosed with AN, bulimia nervosa (BN), and binge eating disorder (BED) with a healthy control group indicated that the PEE levels of the three patient groups were higher than that of the control group. There were not significant differences in the PEE levels of the patient groups. The PEE levels were associated with the dysfunctional attitudes toward eating behavior, body weight and body shape (Di Paola et al. 2010). It is being proposed that EE and attachment security are closely related and that understanding the relationship between the levels of EE and attachment security in individuals with psychiatric disorder and their parents may be important (Parker et al. 1989). However, the studies on this subject made among individuals with ED are very limited and have conflicting results (Parker et al. 1989, Hedlund et al. 2003, Duclos et al. 2013). Duclos et al. (2013) did not demonstrate a significant correlation between the attachment security of 60 adolescent girls with AN and the EE levels of their parents. They found

a significant correlation between the attachment security and the EE levels of the mothers, and that mothers with high EE rejected more strongly the psychological autonomy of their daughters. Not evaluating PEE is an important limitation of this study.

In our study, investigation of how parents expressed emotion and how adolescents perceived the expressed emotion by parents provides a balanced assessment of dyadic interactions which is expected to facilitate understanding the role of the family in AN. In the treatment of AN, family relationships were emphasized to be important tools (Stiles-Shields et al. 2012). Studies on patients with ED reported that family-based treatment reduced family EE levels and was found to be associated with improvements of ED symptoms (Le Grange and Eisler 2009, Sepulveda et al. 2008). Since EE is a variable that can be changed during treatment, it is important in developing the treatment of disorders such as AN with a high probability of becoming chronic. Our study has aimed at investigating the attachment security and PEE of the adolescents with AN diagnosis and the EE levels of their parents by controlling the effect of depression and anxiety symptoms of the AN group on these variables, and to assess the relationship between attachment security and EE/PEE. It was hypothesized that parental attachment security would be low in the adolescents with AN diagnosis, and that especially the PEE levels would be high for the criticism/hostility dimension, with a negative correlation between attachment security and the criticism/hostility dimension of EE/PEE.

METHOD

The Participants

The experimental group of this study consisted of female adolescents aged 12-18 years diagnosed on the basis of the DSM-5 criteria (American Psychiatric Association , 2013) with AN in the acute phase after consulting the polyclinics of Hacettepe University Medical School Child and Adolescent Mental Health and Diseases Department and their parents. The inclusion criteria of the study comprised volunteering to participate in this study, not having any psychotic disorder, bipolar disorder, autism spectrum disorders, neurological or chronic diseases, having a clinically normal intelligence level and stable vital signs, and attending follow up control on an outpatient basis. Of the 49 AN participants selected only 43 were included, and 6 were excluded, with 1 having fully recovered, 4 on the basis of having bulimia nervosa (BN), and 1 for having been diagnosed with comorbid medical disease. In the AN group 39 mothers and 21 fathers completed the self-report psychometric scales. For control purposes, the study enrolled 42 female adolescent volunteers matched with the AN patient group on the bases of age, gender and economic status. While 3 were diagnosed with psychiatric disorders, 2 failed to complete the forms, reducing the control group to 37 participants without having eating disorders or any other psychiatric or chronic disease diagnoses. In this group 34 mothers and 20 fathers completed the self-report forms.

After permission was granted by Hacettepe University Non-Interventional Clinical Research Ethics Committee, adolescents and their parents were informed in detail about the study and provided informed consent.

Measurements

The Sociodemographic and Clinical Information Form (SCIF): The socio-demographic, developmental, medical and family histories and clinical information relevant to the disorder were obtained by the SCIF developed by the researchers.

The Hollingshead-Redich Scale: In order to determine a family's socioeconomic-sociocultural level, the Hollingshead-Redich scale (Andreasen 1987) was used after being translated to the Turkish language from CASH (Comprehensive Assessment of Symptoms and History) (Tiryaki 1997). This scale provides an overall rating based on parental occupational and educational status and reflects the highest such level reached for a certain period. The scale, defines five distinct socioeconomic-sociocultural levels including the "family in a wealthy, educated societal layer", coded "1" ; "parents who had higher educa- tion, profession, or higher administrative positions", coded "2" ; parents who were "smaller business owners, government officials or skilled labourers, high school graduates", coded "3"; "parents who were semi-skilled labourers and had educational level below high school education", coded "4"; and "parents who were semi-skilled labourers, not educated or primary school graduates", coded "5". Familial socioeconomic-sociocultural level is determined on the basis of the highest level between two levels. Families with higher education, profession, or higher administrative positions are defined as having a "high SEL"; those who are "smaller business owners, government officials, skilled laborer, or high school graduates" are defined as having an "intermediate SEL"; and those who are "semi-skilled laborers and have an educational level below high school education, or are uneducated or primary school graduates" are defined as having a "low SEL".

The Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL): The K-SADS-PL is a semistructured clinical interview for determining the present and lifetime psychopathologies of

children and adolescents (Kaufman et al. 1997). A reliability and validity study of K-SADS-PL for the Turkish population was conducted by Gökler et al. (2004).

The Eating Attitudes Test-40 (EAT-40): EAT-40 measures AN symptoms and was developed by Garner and Garfinkel (1979). In the validity and reliability study of EAT-40, the alpha coefficient was 0.79 for AN patients and 0.94 for all patient and control groups (Garner and Garfinkel 1979). EAT-40 consists of 40 items with a score range between 0 and 120. The cut-off point for abnormal eating attitudes is 30. Total score for abnormal eating attitudes is calculated by summation of the points given to each item. Translation of EAT-40 to the Turkish language was carried out by Savaşır and Erol (1989) and the internal reliability coefficient was calculated as 0.70.

The Short Form of Inventory of Parent and Peer Attachment (IPPA): The original form of the scale was developed by Armsden and Greenberg (1987) and consisted of 28 items. Raja et al. (1992) developed a shorter version. The IPPA includes "trust", "communication" and "alienation" factors each of which is assessed with four items. Higher total score is related to higher security of attachment. Adaptation to the Turkish language and validity/reliability study of the IPPA was conducted by Günaydın et al. (2005) and the Cronbach's alpha coefficient was found as 0.88 for the mother form and 0.90 for the father form.

The Expressed Emotion Scale (EES): The EES, developed by Berksun (1992) on the basis of the Turkish social and cultural characteristics, has a Cronbach's alpha reliability coefficient of 0.89. This scale comprises 41 questions completed by the family member, regarded as the ''key relation" by the patient, to express how he/she regards the patient and himself /herself. It comprises 29 items with a total score of 29 on the criticism/hostility (CH) subscale and 12 items with a total score of 12 on emotional over-involvement/protection/interventionism (EOI) subscale. High scores indicate elevated expressed emotion.

The Perceived Expressed Emotion Scale (PEES): The PEES is a 41-item scale based on the EES developed by Berksun (1992) with adaptation to the patient of the expressions originally marked by the ''key relation" (Alkar 2006). The scale asks the participating patient to complete the form regarding the most important family member they live with. The PEES comprises 41 items with 29 items with a total score of 29 on the criticism/hostility (CH) subscale and 12 items with a total score of 12 on emotional over-involvement/protection/interventionism (EOI) subscale. The Cronbach's alpha coefficient for the two subscales was found to vary in the 0.93 - 0.79 range; and the internal reliability coefficient for the total PEES was reported to be 0.81 (Alkar 2006). Baştuğ (2008) determined the Cronbach's alpha coefficients for the CH and the EOI subscales as 0.83 and 0.81, respectively. In our study, all participants selected their mothers as the ''key relation".

The Beck Depression Inventory (BDI): The BDI was developed by Beck et al. (1961) and measures vegetative, emotional, cognitive, and motivational symptoms of depression. BDI was adapted to the Turkish language by Hisli (1989) and consists of a 21-item questionnaire with four choices with each item scoring between 0 and 3. The aim of the scale is not to diagnose depression, but to describe the degree of depression symptoms quantitatively. The two half-scale reliability coefficients of the scale tested on 259 university students were found to be 0.74 (Hisli 1989).

The Screen for Child Anxiety and Related Disorders (SCARED): The SCARED was developed in order to screen childhood anxiety disorders between the ages of 8 an18 years (Birmaher et al. 1997). The validity and reliability of the Turkish language version of the scale of was performed by Çakmakçı (2004). The SCARED includes a total of 41 items, which are scored between 0 and 2. A score of 25 or higher is considered as a warning sign for an anxiety disorder.

Implementation

The sociodemographic data, history and family history, medical history and clinical data related to the disorder of the adolescents who volunteered to participate in the study were obtained during clinical interviews using the Socio-demographic and Clinical Information Form (SCIF), developed by the researcher, and the Hollingshead-Redich Scale. After clinical interviews with adolescents and parents, self-report scales were separately completed. The Short Form of the Inventory of Parent and Peer Attachment (IPPA) for the mothers and the fathers (IPPA-M and IPPA-F) were used to assess the attachment security of adolescents with their mothers and fathers. The Perceived Expressed Emotion Scale (PEES) was used to assess how the emotional attitudes and behaviors of the ''key relation"s were perceived. The Beck Depression Inventory (BDI) and the Screen for Child Anxiety and Related Disorders (SCARED) were used to evaluate symptoms of depression and anxiety. With the aim of confirming the diagnosis in adolescents of the AN group and excluding psychiatric disease in the adolescents of the control group, the Kiddie Schedule for Affective Disorders and Schizophrenia – Present and Lifetime version (K-SADS-PL) was applied to the adolescents and the parents. The Expressed Emotion Scale (EES) was completed by the mothers and fathers to assess the emotional attitude and behavior of parents toward the adolescents. Assessment of each participant took about one and a half hours.

Evaluation of the Data and Statistical Analysis

Statistical analysis of the data was performed using the Statistical Package for the Social Sciences, SPSS 21.0 software. The normality of the data was assessed using the Kolmogorov-Smirnov test and Skewness and Kurtosis statistics. Parametric tests were used in the study because all variables were normally distributed. Student's t-test was used for comparing the data obtained by measurements in two independent groups. The comparison of the nominal data between groups was performed using the Chi-square (χ^2) test or the Fisher's exact Chi-square test. Pearson's correlation analysis was performed to investigate the relationships between two continuous variables in the groups. Analysis of covariance (ANCOVA) was performed in order to analyze the main effect of independent variables on a dependent variable under investigation. A linear regression model was used to identify the variables predicting the perceived expressed emotion - criticism/hostility dimension. P values were expected to be less than 0.05 for statistical significance in all analyses.

RESULTS

Socio-demographic and Clinical Characteristics of Participants

The AN group comprised 43 adolescent girls aged 12-18 years, and the control group included 37 adolescent girls aged 12-18 years. Statistically significant intergroup differences were not determined on the bases of age, duration of education of the adolescents and the age, duration of education and the socioeconomic level of the respective mothers and fathers (Table 1). In the AN group, 38 (88.4%) patients had restrictive type AN and 5 (11.6%) patients had binge-eating/purging type AN. The body mass index (BMI) in the AN group was 16.7 ± 1.4. There were statistically significant differences between the scores of the adolescents in these two groups with respect to depression and anxiety symptoms and eating attitudes (Table 1).

Table 1. Sociodemographic and Clinical Characteristics of AN and Control Groups

	AN Group	Control Group	Statistics	p
	N/Mean (%/±SD)	N/Mean (%/±SD)		
Age, year	15.3 ± 1.5	15.4 ± 1.7	t: -0.43	0.66
Education level, year	9.7 ± 1.6	9.9 ± 1.8	t: -0.65	0.52
Mother Age	43.2 ± 5.4	41.0 ± 4.9	t: 1.89	0.06
Maternal education, year	10.6 ± 4.7	9.1 ± 4.4	t: 1.55	0.14
Father Age	46.9 ± 6.2	45.4 ± 4.3	t: 1.21	0.23
Paternal education, year	11.5 ± 3.9	12.1 ± 3.6	t: -0.67 0.67	0.50
Average surveillance period (months)	4.0 ± 3.8			
Family structure				
Nuclear	38 (88.4)	33 (89.2)	χ^2: 1.87	0.59
Other	5 (11.6)	4 (10.8)		
SEL				
High	14 (32.5)	14 (37.8)	χ^2: 0.24	0.64
Moderate	23 (53.5)	17 (43.3)		
Low	6 (14.0)	7 (18.9)		
AN subtype				
Restricting type	38 (88.4)	-	-	-
Binge-eating/ purging type	5 (11.6)			
BMI	16.7 ± 1.4	-	-	-
EAT-40	46.4 ± 18.3	17.1 ± 5.4	t: 9.29	0.000
BDI	19.4 ± 7.1	8.7 ± 4.8	t: 4.69	0.000
SCARED	30.7 ± 16.5	20.4 ± 8.4	t: 3.30	0.002

SEL: Socioeconomic Level; AN: Anorexia Nervosa; BMI: Body Mass Index; EAT-40: Eating Attitudes Test-40; BDI: Beck Depression Inventory; SCARED: Screen for Child Anxiety and Related Disorders

Attachment Security, Perceived Expressed Emotion and Expressed Emotion

On the IPPA-M scale; the mean subscale scores on "trust"[AN group (22.9±5.0), control group (25.5 ± 3.2); t: 2.63, p: 0.01], "communication"[AN group (19.8 ± 5.1), control group (23.7 ± 3.9); t: -3.52, p: 0.001] and "alienation"[AN group (20.7 ± 4.8), control group (24.9 ± 3.9); t: -3.94, p: 0.000] and the total scores[AN group (63.0 ± 12.9), control group (73.8 ± 9.1); t: -4.12, p: 0.000] were observed to be significantly lower in the AN group. Similarly, on the IPPA-F scale, the mean subscale scores on "trust"[AN group (20.7 ± 7.1), control group (24.6 ± 3.7); t: -2.99, p: 0.004], "communication"[AN group (16.8 ± 7.3), control group (20.7 ± 4.1); t: -2.86, p: 0.006], and "alienation"[AN group (19.5 ± 6.4), control group (22.8 ± 4.1); t: -2.65, p: 0.01]subscales and the total scores[AN group (56.0 ± 19.2), control group (69.1 ± 10.3); t: -3.70, p: 0.000]were significantly lower in the AN group.

In the AN group, mean scores on the PEES-CH subscale [AN group (5.6 ± 4.0), control group (2.1 ± 2.0); t: 5.02, p: 0.000] and the EES(father)-CH subscale [AN group (5.0 ± 2.9), control group (2.5 ± 1.5); t: 3.35, p: 0.002] were significantly higher compared to the control group (Table 2). Statistically significant correlations were not found between any of the scale scores and the variables reflecting the severity of AN (EAT-40 and BMI scores) in the AN group.

Table 2. Attachment Security, Perceived Expressed Emotion and Expressed Emotion in AN and Control Groups

	AN Group	Control Group	Statistics	
	Mean±SD	Mean±SD	t	p
IPPA–M-Total	63.0±12.9	73.8 ± 9.1	-4.12	0.000
IPPA–M – Trust	22.9± 5.0	25.5 ± 3.2	-2.63	0.01
IPPA–M-Communication	19.8± 5.1	23.7 ± 3.9	-3.52	0.001
IPPA–M-Alienation	20.7± 4.8	24.9 ± 3.9	-3.94	0.000
IPPA–F –Total	56.0±19.2	69.1± 10.3	-3.70	0.000
IPPA–F –Trust	20.7± 7.1	24.6 ± 3.7	-2.99	0.004
IPPA–F –Communication	16.8± 7.3	20.7 ± 4.1	-2.86	0.006
IPPA–F –Alienation	19.5± 6.4	22.8 ± 4.1	-2.65	0.01
PEES-CH	5.6 ± 4.0	2.1 ± 2.0	5.02	0.000
PEES-EOI	9.1 ± 3.3	8.3 ± 3.6	1.05	0.29
EES(mother)-CH	4.0 ± 2.4	3.0 ± 2.6	1.60	0.11
EES(mother)-EOI	9.1 ± 3.3	8.3 ± 3.6	-0.39	0.69
EES(father)-CH	5.0 ± 2.9	2.5 ± 1.5	3.35	0.002
EES(father)-EOI	7.9 ± 3.4	8.2 ± 2.8	0.19	0.85

AN: Anorexia Nervosa; IPPA–M: Short Form of Inventory of Parent and Peer Attachment- Mother; IPPA–F: Short Form of Inventory of Parent and Peer Attachment-Father; PEES: Perceived Expressed Emotion Scale; EES: Expressed Emotion Scale; CH: Criticism/Hostility; EOI: Emotional Over-Involvement

Correlations Between the Attachment Security, Perceived Expressed Emotion and Expressed Emotion Scale Scores in the AN Group

Positive moderate correlations between the EES (mother)-CH and the EES (mother)-EOI; between the EES (father)-CH and the PEES-CH; a negative moderate correlation between the PEES-CH and the IPPA-M; and a positive strong correlation between the BDI and the SCARED scores were determined (Table 3).

Correction of the EES (father)-CH, PEES-CH, IPPA-M and IPPA-F Scores for the Effect of the Depression and Anxiety Factors

When the EES (father)-CH, PEES-CH and IPPA-M and IPPA-F total scores of the adolescents were corrected for the effect of the depression and anxiety scores, the mean scores of all scales continued to show statistically significant differences between the AN and control groups (Table 4).

Variables Predicting PEES-CH in the AN Group

Linear regression analyses were made to investigate the predictive power for PEES-CH of the variables tested in the participants. Since p values determined in the statistical analyses comparing the variables of age, parental ages, education duration, employment and family socioeconomic status exceeded 0.20, these variables were not incuded in the regression analyses. The total scores of the EES (mother)-CH, IPPA-M, IPPA-F, BDI and the SCARED were used as predictive variables. The model used satisfied all assumptions

Table 3. Correlation Between Scale Scores (EES, PEES, IPPA) in the AN Group

	EES(mother)-CH	EES(mother)-EOI	EES(father)-CH	EES(father)-EOI	PEES-CH	PEES-EOI	IPPA-M	IPPA-F	BDI	SCARED
EES(mother)-CH	1									
EES(mother)-EOI	.617**	1								
EES(father)-CH	.250	-.066	1							
EES(father)-EOI	-.068	.254	.133	1						
PEES-CH	.256	.023	.533*	.267	1					
PEES-EOI	.251	.337	.375	.141	.058	1				
IPPA-M	-.173	.130	-.476*	-.81	-.624**	.062	1			
IPPA-F	.163	.237	-.412	.110	-.274	.000	.448*	1		
BDI	-.202	-.158	.235	.316	.168	.074	-.422*	-.327	1	
SCARED	-.013	.019	.212	.260	.186	.267	-.430*	-.308	.750**	1

Pearson Correlation Analysis, *p<.05, **p<.01, AN: Anorexia Nervosa; IPPA–M: Short Form of Inventory of Parent and Peer Attachment- Mother; IPPA–F: Short Form of Inventory of Parent and Peer Attachment-Father; PEES: Perceived Expressed Emotion Scale; EES: Expressed Emotion Scale; CH: Criticism/Hostility; EOI: Emotional Over-Involvement; BDI: Beck Depression Inventory; SCARED: Screen for Child Anxiety and Related Disorders

Table 4. Total Scores on the EES (Father)-CH, PEES-CH, IPPA-M and IPPA-F After Correction for Depression and Anxiety Scoring

	AN Group Mean ± SD	Control Group Mean ± SD	Statistics	p
EES (father)-CH	6.0 ± 2.8	2.6 ± 1.5	F: 5.9	0.003
PEES-CH	6.1± 4.0	2.2 ± 2.0	F: 10.5	0.000
IPPA-M	61.6 ± 12.7	73.3 ± 9.3	F: 10.1	0.000
IPPA-F	56.0 ± 18.7	68.3 ± 16.7	F: 5.4	0.002

F: Analysis of Covariance (ANCOVA), AN: Anorexia Nervosa; IPPA–M: Short Form of Inventory of Parent and Peer Attachment- Mother; IPPA–F: Short Form of Inventory of Parent and Peer Attachment-Father; PEES: Perceived Expressed Emotion Scale; EES: *Expressed Emotion Scale; CH:* Criticism/Hostility

Table 5. Predictor Factors of PEES-CH in AN Group

Predictors	B	t	95 % Confidence Interval
EES (Mother)-CH	0.24	0.15	-0.14 / 0.63
IPPA-M	-0.166	-3.49**	-0.26 / -0.07
IPPA-F	-0.009	-0.30	-0.06 / 0.05
BDI	0.026	0.43	-0.09 / 0.15
SCARED	0.002	0.04	-0.08 / 0.09

Linear Regression Analysis, **p=.000, AN: Anorexia Nervosa; IPPA–M: Short Form of Inventory of Parent and Peer Attachment- Mother; IPPA–F: Short Form of Inventory of Parent and Peer Attachment-Father; PEES: Perceived Expressed Emotion Scale; EES: Expressed Emotion Scale; CH: Criticism/Hostility; BDI: Beck Depression Inventory; SCARED: Screen for Child Anxiety and Related Disorders

of linear regression analysis and explained 44.3% of the variance of PEES-CH in AN. In stepwise regression analysis with model 1, IPPA-M explained 42.3% of the PEES-CH variance (Nagelkerke R^2=0.423, p<0.000). Results of linear regression analyses demonstrated that security of attachment to the mother was significantly predictive of the PEES-CH in AN (Table 5).

DISCUSSION

The aims of this study were to compare the attachment security, PEE and parental EE of adolescent girls with AN with that of adolescent girls without any psychiatric disorder and to investigate the correlations between these variables. It was aimed to examine the emotional relationships/connections between the adolescent and parents possibly present before AN diagnosis by assessing the attachment security; and to investigate the emotional atmosphere in the family environment by assessing EE/PEE during diagnosing AN. Within the limits of our knowledge, our study is significant in being the first to investigate the relationships between attachment security and EE/PEE in adolescents with AN.

In our study it was aimed to the PEE with the PEES completed by the adolescents to by considering the "key relation" chosen from their family members. In this study, all adolescents chose their mothers as the "key relation". One of the basic findings of this research is that adolescent girls with AN perceived more criticism/hostility in their mothers compared to the healthy control group. However, contrary to our hypothesis, statistically significant differences were not found between the EE levels of the mothers in the two groups. It is reported in the relevant literature that the EE level in the families of patients with AN is lower compared to other clinical groups (Duclos et al. 2012, Szmukler et al. 1985).

Minuchin et al. (1978) argued that mothers and fathers of patients with AN had less expressed emotions, whereas, in agreement with the results of our study, the patients perceived their mothers and fathers as more controlling, conflicting and less intimate. It was reported by another study that adolescents with AN perceived more criticism/hostility from their mothers compared to the control group; but, not evaluating the parental EE was emphasized as an important limitation (Di Paola et al. 2010).

When paternal EE levels were examined in our study, it was found that adolescents with AN reported more criticism/hostility from their fathers compared to the adolescents in the control group. Surprisingly, as the criticism/hostility reported by the fathers increased, the perceived criticism/hostility from the key relations, in this study the mothers, were found to increase among adolescents. Although the PEES was requested to be completed by considering their perceptions on the ''key relation", the choice having been the mother without exceptions, the results may in reality have reflected the emotional atmosphere within the family. In this study, the adolescents with AN were under psychiatric follow-up for four months, and accompanying them in each visit may have caused a reduction in the EE levels of their mothers, while their fathers, with less participation in the follow-up process, may have continued to have higher levels of criticism/hostility. The results of this study suggest the necessity of assessing the EE levels of mothers and fathers of adolescents with AN and how parental emotional attitudes and behaviors are perceived by adolescents, thereby supporting the results of other studies pointing out the importance of participation of both mothers and fathers in the treatment process of adolescents with AN (Rienecke et al. 2016).

In accordance with the hypothesis of this study, adolescents with AN were found to have lower secure attachment to their parents compared to adolescents in the control group. Adolescents with AN reported less trust and communication and more alienation in their attachment relationships with

mothers and fathers. These results support the previous studies reporting that individuals with AN had low attachment security (Di Pentima et al. 1998, Balottin et al. 2017). It was also shown that as the attachment security of adolescents with AN to their mothers decreased, perception of criticism/hostility from mothers increased, which was found to be strongly predicted by the level of attachment security. Importance of secure attachment to the caregiver was emphasized for development of positive internal working models related to self and others (Kobak and Sceery 1988). Observation in this study of higher perception of criticism/hostility from mothers by adolescents with AN may be related to the lack of internal working models of positive and secure perceptions of others in persons without secure attachment relationships. However, Duclos et al. (2013) did not determine a significant correlation between the attachment security of adolescent girls with AN and the EE levels of their parents which was attributed to the differences of the two scales used with respect to time and perspective in evaluating family relationships. Scanning the literature did not reveal another study another study on the subject. Although the cross-sectional nature of our study prevents the formation of cause-result relationship between these variables, assessing attachment security and PEE together allowed us to evaluate the family relationships of adolescent girls with AN more comprehensively. The results show the necessity of paying attention to the attachment security and the PEE in adolescents with AN and that interventions during the treatment process for development of attachment security would contribute to the improvement of family relationships. In our study, statistically significant correlations were not found between the BMI/EAT scores and the EE/PEE and attachment security scores in adolescents with AN. However, depression and anxiety symptoms of the AN group were significantly higher compared to the control group. Hence, the question arises on whether lower attachment security to the parents and higher perceived criticism/hostility from them by adolescents with AN are secondary to the comorbid depression and anxiety symptoms. However, when controlled for the effects of depression and anxiety, adolescents with AN had lower attachment security to their both parents and perceived their mothers as more criticising/hostile. These results show that adolescent girls with AN perceive, independently from depression and anxiety symptoms, more criticism/hostility from their mothers and have less attachment security to their parents compared to adolescents without a psychiatric disorder.

The most important limitations of our study were having a cross-sectional design and having only included patients attending a tertiary psychiatric clinic. These limitations make it difficult to generalize the findings to all adolescents with AN. Furthermore, using self-report scales involve disadvantages such as assuming that patients understand the assessment method, defensive attitudes, bias in the responses and having to remember the given information retrospectively. Hence, the possible effects of the existing psychopathology on the evaluations, perception by the patients of more critical and hostile parental attitudes and behaviors than the actual, and the possibility that mothers and fathers may have reported expressed emotions higher/lower than the actual should not be overlooked. Another limitation of this study was the low number of fathers who volunteered to participate. Future studies including increased number of mothers and fathers would enable better understanding of the relationship between the family environment and AN. This study only assessed the attachment security of adolescents. Considering that the attachment patterns of parents affect the development of secure attachment by the adolescents, assessment of the attachment security of mothers and fathers is also expected to facilitate our understanding of the relationship between the attachment and AN.

In conclusion, it has been found in this study that adolescent girls with AN have lower level of secure attachment to their parents and higher perceived criticism/hostility from mothers when compared to adolescents without a psychiatric disorder. These results did not change when corrected for the effect of comorbid depression and anxiety symptoms Also, attachment security to the mother predicted the perception of criticism/hostility from mothers for the adolescents with AN.

The results of this study support the need for evaluating the attachment security and PEE of adolescents with AN and including the parents in the treatment process for appropriate interventions. Also, there is need for future research on new treatment choices that will help increase attachment security and effectively decrease the criticism/hostility dimension of EE and PEE of adolescents. Also, it is believed that there is need for follow-up studies to investigate the effects of perceived criticism/hostility from parents by adolescents with AN on the course and prognosis of the disorder.

REFERENCES

Alkar YÖ (2006) The relationship of expressed emotion and psychosocial variables with the quality of life of haemodialysis patients: An analysis within the conservation of resources model, Unpublished PhD Thesis, Middle East Technical University, Ankara.

American Psychiatric Association (2013) DSM-5 - Diagnostic and Statistical Manual of Mental Disorders – 5th Ed. American Psychiatric Association, Washington DC.

Andreasen NC, Flaum M, Arndt S (1992) The Comprehensive Assessment of Symptoms and History (CASH). An instrument for assessing diagnosis and psychopathology. Arch Gen Psychiatry 49 :615-23

Armsden GC and Greenberg MT (1987) The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. J Youth Adolesc 16: 427-54.

Aytin N (2014) Ergenlerde Yeme Tutumları ile Sorun Çözme Eğilimleri ve Ebeveyne Bağlanma Arasındaki İlişkinin İncelenmesi, Unpublished Master's Thesis, Adnan Menderes University Institute of Health Sciences, Aydın.

Balottin L, Mannarini S, Rossi M et al (2017) The parental bonding in families of adolescents with anorexia: attachment representations between parents and offspring. Neuropsychiatr Dis Treat 13: 319-27.

Baştuğ G (2008) The roles of perceived expressed emotion of the schizophrenic patients and the expressed emotion of their caregivers on symptom severity and quality of life. Unpublished Specialization Thesis, Middle East Technical University, Ankara.

Beck AT, Ward C et al (1961) Beck depression inventory (BDI). Arch Gen Psychiatry 4: 561-71.

Berksun OE (1992) Şizofrenide aile faktörü: 'Expressed Emotion' ölçek geliştirme ve uyarlama denemesi. Unpublished Specialization Thesis, Ankara University Medical Faculty, Ankara

Birmaher B, Khetarpal S, Brent D et al (1997) The Screen for Child Anxiety Related Emotional Disorders (SCARED): scale construction and psychometric characteristics. J Am Acad Child Adolesc Psychiatry 36: 545-53.

Bowlby J (1977) The Making and Breaking of Affectional Bonds. I. A etiology and psychopathology in the light of attachment theory. Br J Psychiatry 130:201-10.

Butzlaff RL and Hooley JM (1998) Expressed emotion and psychiatric relapse: a meta-analysis' Arch Gen Psychiatry 55: 547-52.

Caglar-Nazali HP, Corfield F, Cardi V et al (2014) A systematic review and meta-analysis of 'Systems for Social Processes' in eating disorders. Neurosci Biobehav Rev 42: 55-92.

Çakmakçı F (2004) Çocuklarda Anksiyete Bozukluklarını Tarama Ölçeği geçerlik ve güvenirlik çalışması. Unpublished Specialization Thesis. Kocaeli University Medical Faculty, Kocaeli.

Di Paola F, Faravelli C and Ricca V (2010) Perceived expressed emotion in anorexia nervosa, bulimia nervosa, and binge-eating disorder. Compr Psychiatry 51: 401-5.

Di Pentima L, Magnani M, Tortolani D et al (1998) Use of the Parental Bonding Instrument to compare interpretations of the parental bond by adolescent girls with restricting and binge/purging anorexia nervosa. Eat Weight Disord 3: 25-31.

Duclos J, Maria AS, Dorard G et al (2013) Bonding and expressed emotion: two interlinked concepts? Psychopathology 46: 404-12.

Duclos J, Vibert S, Matter Let al (2012) Expressed emotion in families of patients with eating disorders: A review of the literature. Curr Psychiatry Rev 8: 183-202.

Franko DL, Keshaviah A, Eddy KT et al (2013) A longitudinal investigation of mortality in anorexia nervosa and bulimia nervosa. Am J Psychiatry 170: 917-25.

Garner DM (1993) Pathogenesis of anorexia nervosa. Lancet, 341: 1631-5.

Garner DM and Garfinkel PE (1979) The Eating Attitudes Test: An index of the symptoms of anorexia nervosa. Psychol Med 9: 273-9.

Gökler B, Ünal F, Pehlivantürk B et al (2004) Okul Çağı Çocuklari İçin Duygulanim Bozukluklari ve Şizofreni Görüşme Çizelgesi-Şimdi ve Yaşam Boyu Şekli-Türkçe Uyarlamasinin Geçerlik ve Güvenirliği. Çocuk ve Gençlik Ruh Sağliği Dergisi.

Günaydın G, Selçuk E, Sümer N et al (2005) Ebeveyn ve arkadaşlara bağlanma envanteri kısa formu'nun psikometrik açıdan değerlendirilmesi. Türk Psikoloji Yazıları, 8: 13-23.

Hedlund S, Fichter MM, Quadflieg N et al (2003) Expressed emotion, family environment, and parental bonding in bulimia nervosa: a 6-year investigation. Eat Weight Disord 8: 26-35.

Hisli N (1989) Beck Depresyon Envanterinin üniversite öğrencileri için geçerliği, güvenirliği. Psikoloji Dergisi 7: 3-13.

Hooley JM ve Teasdale JD (1989) Predictors of relapse in unipolar depressives: Expressed emotion, marital distress, and perceived criticism. J Abnorm Psychol 98: 229.

Kazarian SS (1992) The measurement of expressed emotion: a review. Can J Psychiatry 37: 51-6.

Keating L, Tasca GA and Hill R (2013) Structural relationships among attachment insecurity, alexithymia, and body esteem in women with eating disorders. Eat Behav 14: 366-73.

Kobak RR and Sceery A (1988) Attachment in late adolescence: Working models, affect regulation, and representations of self and others. Child Dev 59: 135-46.

Kumru A (2002) Prosocial behavior within the family context and its correlates among Turkish early adolescents. Unpublished doctoral dissertation, Nebraska University, Nebraska.

Le Grange D and Eisler I (2009) Family interventions in adolescent anorexia nervosa. Child Adolesc Psychiatr Clin N Am 18: 159-73.

Le Grange D, Eisler I, Dare C et al (1992) Evaluation of family treatments in adolescent anorexia nervosa: a pilot study. Int J Eat Disord 12: 347-57.

Le Grange D, Hoste RR, Lock J et al (2011) Parental expressed emotion of adolescents with anorexia nervosa: Outcome in family-based treatment. Int J Eat Disord 44: 731-4.

Le Grange D, Lock J, Loeb K et al (2010) Academy for Eating Disorders position paper: the role of the family in eating disorders. Int J Eat Disord 43: 1-5.

Mancilla-Diaz JM, Franco-Paredes K, Vazquez-arevalo et al (2007) A two-stage epidemiologic study on prevalence of eating disorders in female university students in Mexico. Eur Eat Disord Rev 15: 463-70.

Medina-Pradas C, Navarro JB, López SR et al (2011) Dyadic view of expressed emotion, stress, and eating disorder psychopathology. Appetite, 57: 743-8.

Minuchin S, Rosman BL and Baker L (1978) Psychosomatic families: Anorexia nervosa in context. Cambridge MA: Harvard University Press s. 23-50.

Moretti MM and Peled M (2004) Adolescent-parent attachment: Bonds that support healthy development. Paediatr Child Health 9: 551-55.

Parker G, Hayward L and Johnston P (1989) Factorial validity of the EE scales. Psychol Med 19: 435-46.

Peris TS and Miklowitz DJ (2015) Parental Expressed Emotion and Youth Psychopathology: New Directions for an Old Construct. Child Psychiatry Hum Dev 1-11.

Raja SN, McGee R and Stanton WR (1992) Perceived attachments to parents and peers and psychological well-being in adolescence. J Youth Adolesc, 21: 471-85.

Rienecke RD, Accurso EC, Lock J et al (2016) Expressed Emotion, Family Functioning, and Treatment Outcome for Adolescents with Anorexia Nervosa. Eur Eat Disord Rev 24: 43-51.

Ringer F and Crittenden PM (2007) Eating disorders and attachment: the effects of hidden family processes on eating disorders. Eur Eat Disord Rev 15: 119-30.

Safran JD (1990) Towards a refinement of cognitive therapy in light of interpersonal theory: I. Theory. Clin Psychol Rev 10: 87-105

Savaşır I and Erol N (1989) Yeme tutum testi: anoreksiya nervoza belirtileri indeksi. Psikoloji Dergisi 7: 19-25.

Sepulveda AR, Lopez C, Todd G et al (2008) An examination of the impact of "the Maudsley eating disorder collaborative care skills workshops" on the well being of carers. Soc Psychiatry and Psychiatr Epidemiol 43: 584-91.

Simoneau TL, Miklowitz DJ and Saleem R (1998) Expressed emotion and interactional patterns in the families of bipolar patients. J Abnorm Psychol 107: 497.

Stiles-Shields C, Hoste RR, Doyle PM et al (2012) A review of family-based treatment for adolescents with eating disorders. Rev Recent Clin Trials 7: 133-40.

Szmukler GI, Eisler I, Russell GF et al (1985) Anorexia nervosa, parental 'expressed emotion' and dropping out of treatment. Br J Psychiatry 147: 265-71.

Tasca GA and Balfour L (2014) Attachment and eating disorders: A review of current research', Int J Eat Disord 47: 710-17.

Ward A, Ramsay R and Treasure J (2000) Attachment research in eating disorders. Br J Med Psychol 73 (Pt 1): 35-51.

Weaver L and Liebman R (2011) Assessment of anorexia nervosa in children and adolescents. Curr Psychiatry Rep 13: 93-8.

Zachrisson H and Skarderud F (2010) Feelings of insecurity: review of attachment and eating disorders. Eur Eat Disord Rev 18: 97-106.