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Social functioning and its association with accompanying psychiatric symptoms in adolescents with anorexia nervosa

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ABSTRACT

OBJECTIVE: This study aimed to investigate social functioning and its relation to associated psychiatric symptoms and disorders in adolescent girls with anorexia nervosa.

METHODS: Thirty-two adolescent girls with anorexia nervosa aged between 12 and 18 years were compared to a control group of 30 adolescent girls without any psychiatric disorder. The Schedule for Affective Disorders and Schizophrenia for School-Age Children, Present and Lifetime Version (K-SADS-PL) was applied to determine comorbid psychiatric disorders in the anorexia nervosa group and to rule out any psychiatric disorder in the control group. Submissive Acts Scale, Shyness Scale and Social Comparison Scale were used to assess social functioning.

RESULTS: Submissive behaviours and negative social comparisons were significantly higher in adolescents with anorexia nervosa and were more associated with the comorbid depression and anxiety symptoms, rather than the severity of anorexia nervosa symptoms.

CONCLUSION: The results of this study would guide us to develop more effective treatment strategies for adolescents with anorexia nervosa who have comorbid psychiatric symptoms. Treatment strategies in this age group should consider social functioning and its relation to accompanying psychiatric symptoms and aim to improve social communication and coping skills.

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Adolescent; anorexia nervosa; submissive behaviour; shyness; social comparison; comorbidity

Introduction

Anorexia nervosa (AN) is characterized by deterioration in body perception, excessive fear of weight gain, and refusal to eat. The prevalence of AN, which usually starts in adolescence and young adulthood, is 1.2% in adolescent girls [1]. The age of onset of the disease is between 13 and 20 years [2], but studies in recent years have reported that it has gradually decreased [3]. AN causes severe deteriorations in physical and mental health and is one of the leading psychiatric disorders that severely impairs social functioning [4]. Notably, deterioration in acute episodes of the disease is found to be close to the levels seen in schizophrenia or personality disorders, and even partially or fully improved patients with AN have a limited social network and have reported difficulties in their interpersonal relationships [5,6].

Interpersonal problems such as establishing close relationships with others are characterized by a decrease in social functioning. Patients with AN often manifest some traits leading to problems in relationships, such as increased tendency to submissiveness, shyness and comparison of themselves unfavourably with others [7]. The studies based on experimental data and clinical observations show that these

difficulties in social relationships of patients with AN may be both a cause and a contributing factor in the course of the disease [8–10]. It is reported that patients with AN interpret social stimuli as threats due to their feelings of inadequacy [10–12], increased levels of social anxiety [13,14] and shy temperament characteristics [13] when they compare themselves with other individuals. It was also suggested that temperament characteristics such as shyness, social and communication difficulties might form the basis of AN. These difficulties have adverse effects on social comparison and recognition of social clues, which might be related to the development of the disease. As a result, a vicious cycle leading to the deterioration in social functioning was suggested to occur [10]. Thus, social difficulties and interpersonal problems may be both risk and maintaining factors for AN and are reasonable targets for intervention and treatment.

Several treatment methods used in AN (e.g. interpersonal psychotherapy, cognitive analytic therapy, focal psychodynamic therapy) focus on interpersonal and social difficulties. Recent studies have suggested that interpersonal problems at the beginning of the therapy could influence treatment outcome. Interpersonal difficulties such as the inability of patient to

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engage with the therapist may suppress the treatment process and decrease the treatment efficacy. As such, understanding the problems in social functioning in patients with AN could contribute to the development of interventions to prevent or treat this disorder by improving interpersonal communication and problem-solving skills.

Negative social comparison and a greater tendency to submissive behaviours are also strongly associated with higher levels of affective psychopathologies. Psychiatric comorbidities which impair social adaptation, social functioning and prognosis are common with AN [15]. However, majority of the studies exploring the social functioning in patients with AN ignored the adverse effects of accompanying psychiatric symptoms or disorders. In addition, although it is a disorder that starts during adolescence [2], most studies investigating the social functioning have been carried out in adult patients. Therefore, the objective of this study was to assess social functioning in the areas of submissive behaviours, shyness and social comparison in adolescents with AN, and to investigate the relationship of social functioning with accompanying psychiatric symptoms and disorders. Adolescents with AN were assumed to have more submissive behaviours and shyness when compared to healthy counterparts, as they evaluate themselves more negatively in social comparisons. It was also hypothesized that accompanying depression and anxiety symptoms in adolescents with AN could be related to the assessed areas of social functioning.

Methods

Participants

The research group was recruited from the patients who were diagnosed with AN at the Department of Child and Adolescent Psychiatry, or the Division of Adolescent Medicine at Hacettepe University. The research group consisted of female adolescents between the ages of 12 and 18 years, with normal mental development according to psychiatric evaluation, and without any chronic medical disease. Since the validity and reliability study of the Schedule for Affective Disorders and Schizophrenia for School-Age Children, Present and Lifetime Version (K-SADS-PL) DSM-5 was not completed in the Turkish population, AN and other psychopathologies were diagnosed according to DSM-IV-TR diagnostic criteria by applying K-SADS-PL. Among the 34 participants assessed with the provisional diagnosis of AN, one was excluded from the study due to the presence of accompanying ulcerative colitis, and one as she did not meet the diagnostic criteria of AN. Thirty-two patients in the research group received a restrictive type of AN diagnosis, were in the acute phase of the disorder and medically stable during

the psychiatric evaluation. The patients who required hospitalization for medical stabilization were evaluated within one month after discharge from the hospital.

The control group was created by pairing the adolescents regarding age, gender and socio-economic status with the research group, who were referred to the Division of Adolescent Medicine at Hacettepe University for a general health control, without any complaints and history of psychiatric, neurological or chronic medical diseases. One of the 31 adolescents evaluated was excluded from the study because she did not fill in the measurement inventories entirely and as a result, 30 female adolescents between the ages of 12 to 18 years constituted the control group. The adolescents and their parents who participated in the study gave written informed consent after briefing them with the details of the study. The research protocol was approved by the Ethics Committee of Non-Interventional Clinical Researches of Hacettepe University with the decision number GO 15/355-17.

Socio-demographic and Clinical Information Form. It is the information form prepared by the researchers in order to determine socio-demographic, developmental and medical histories of the participants. This form includes questions on the socio-demographic variables, developmental milestones, clinical course of the symptoms, highest/current/lowest BMI, medical problems, medications, interventions, and family history of psychiatric and medical disorders.

Hollingshead-Redlich Scale. The Turkish translation of the scale which is used to determine the socio-economic level of the families [16]. The scale generates a general measurement that reflects the highest level reached for a period of time, based on the occupation and educational status of the parents.

Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL). The K-SADS-PL is a semi-structured clinical interview form developed by Kaufman et al. [17] to determine the past and present psychopathologies of children and adolescents. The validity and reliability study of the Turkish sample of the scale was conducted [18]. K-SADS-PL is performed by interviewing the parents and children, and at the end of the interview, evaluation is done in line with the information received from all sources. K-SADS-PL was applied to both groups; to confirm the diagnosis of AN and to identify the accompanying psychiatric disorders in the research group, and to exclude those with psychiatric disorders in the control group.

Eating Attitudes Test-40 (EAT-40). The EAT-40 is a self-report scale that assesses changes in eating behaviours in both healthy populations and eating behaviours and attitudes in patients with eating disorders (EDs) [19]. The scale consists of 6-point Likert type 40 items. The Cronbach alpha index of the internal consistency was found as 0.70 in the validity and

reliability study of the Turkish form of the EAT-40 [20].

Submissive Acts Scale (SAS). The SAS is a 5-point Likert-type self-report scale consisting of 16 items developed to measure the level of the submissive social behaviours [21]. The Cronbach alpha internal consistency coefficient, obtained from the original scale, was found to be as 0.89, and as a result of the second application with a four-month interval, the test-retest reliability coefficient was found as 0.84 [21]. The Cronbach alpha value was 0.74 in the validity and reliability study of the Turkish translation of the scale [22].

Shyness Scale (SS). The SS is a 5-point Likert-type self-report scale which aims to measure how much shy the individuals perceive themselves in various situations and consists of 20 items [23]. The scale was adapted to the Turkish society, and the validity and reliability study was conducted [24]. The Cronbach alpha value which was calculated to determine the internal consistency of the scale was found as 0.91.

Social Comparison Scale (SCS). The SCS is a scale intended to determine how the individuals perceive themselves when compared to others in various dimensions. The original scale consists of 11 items and uses a semantic differential approach to determine the social comparisons [25]. In SCS, individuals rate their perceptions of self in relation to others on a 10-point scale, anchored at either end by descriptors such as unattractive vs. attractive, weak vs. strong, etc. Scores of around 60 would indicate that the individual perceived himself/herself as no better or worse than anyone else. Scores below this would indicate an unfavourable comparison and perceived low social rank, while scores above this would indicate a favourable comparison and perceived high social rank. The scale was reported to have high reliability with the Cronbach alpha coefficient calculated as 0.88–0.96 in a clinical sample [25]. The adaptation study of the scale in Turkish was conducted by Şahin and Şahin [26].

Beck Depression Inventory (BDI). Beck and his colleagues developed BDI in 1961 to measure the behavioural symptoms of depression in adolescents and adults [27]. It is used to describe the disease, to measure its severity and to monitor changes with the treatment. The total score of 0–9 is interpreted as minimal symptoms, 10–16 as mild, 17–29 as moderate and 30–63 as severe. The Turkish validity and reliability study of the BDI was conducted by Tegin [28] and Hisli [29] and the cutoff point was determined as 17.

Screen for Child Anxiety and Related Disorders (SCARED). SCARED was developed by Birmaher et al. [30] to screen anxiety disorders during childhood. The Turkish validity and reliability study of the scale was carried out by Çakmakçı [31]. The scale can be used in children and adolescents between the ages of 8 to 18 years and consists of 41 items. Each item is scored between 0 and 2, and the total score of 25 or

more qualifies a warning sign for anxiety disorder. The Cronbach alpha reliability coefficients were reported to vary between 0.74 and 0.93 for the general scale and subscales obtained from the original scale, while test-retest reliability coefficients were reported to be between 0.70 and 0.90 [30]. Cronbach alpha reliability coefficients of the scale for general scale and subscales ranged between 0.88 and 0.91 in the Turkish validity and reliability study [31].

Maudsley Obsessive-Compulsive Inventory (MOCI). The scale which was developed by Hodgson and Rachman in [32] aims to evaluate the type and severity of obsessive-compulsive symptoms. The scale is formed by the subscales of control, cleanliness, slowness, suspicion, and rumination. It can be applied to children aged 9 and over. The score from the scale varies from 0 to 37, and the higher total score indicates an increase in obsessive-compulsive symptoms. In the validity and reliability study, which was conducted by Erol and Savaşır [33], seven new items were added to the scale, and the scale was rearranged as 37 items.

BDI, SCARED, and MOCI were applied to the all adolescents in order to evaluate relationships between the psychiatric symptoms and social functioning and to control the effects of psychiatric symptoms on the assessed areas of social functioning.

Procedure

The details of the study were briefed, and appointments were set for psychiatric evaluation for the adolescents and their families. The patients in the research group were evaluated and underwent physical examinations at the Division of Adolescent Medicine before psychiatric evaluation. The patients who required hospitalization for medical stabilization were evaluated within one month after discharge from the hospital. After obtaining socio-demographic and clinical data from the parents, K-SADS-PL was applied by interviewing adolescents and their parents, separately. The adolescents were informed about the rest of the self-report scales and asked to fill them in.

Data analysis

The Statistical Program for Social Sciences (SPSS) 16.0 was used for the statistical analyses. The statistical analyses of the data indicated by measurements were conducted using the Student's *t*-test or the Mann–Whitney U test according to whether the parametric test assumptions were met or not, respectively. The Chi-square (χ^2) test or Fisher's exact chi-square test was used in the evaluation of the nominal data. Pearson correlation analysis was used to assess the relationship between two continuous variables. The Analysis of Covariance (ANCOVA) was used to statistically control the effects of psychiatric symptoms in the

evaluation of association between the two groups and social functioning. In all analyses, p values less than 0.05 were considered as statistically significant.

Results

Socio-demographic and clinical characteristics

A total of 62 female adolescents between the ages of 12–18 years were included in the study, 32 in the AN group and 30 in the control group. There was no significant difference between the two groups in terms of age, duration of education, socio-economic status, the age of parents, and duration of education of parents (Table 1). The mean age for the onset of the symptoms was 14.0 ± 1.4 years and for the referral to the hospital for the first time was 14.7 ± 1.4 years in the AN group. Eight adolescents (25%) in the AN group had received psychiatric treatment (mean duration 10.4 ± 4.1 months) for AN.

At least one comorbid psychiatric disorder was observed in 19 (59.4%) patients with AN, and more than one comorbid psychiatric disorder in three of the patients (9.4%). Mood disorders were observed in 14 (43.7%), anxiety disorders in six (18.7%), attention deficit hyperactivity disorder (ADHD) in two (6.2%) and enuresis nocturna in one (3.1%) patient. All of the patients with mood disorders had a major depressive disorder; three of the patients with anxiety disorders (50%) had a generalized anxiety disorder, two (33.3%) had social phobia, one (16.7%) had obsessive-compulsive disorder (OCD), and one (16.7%) had separation anxiety disorder. The ratio of adolescents with a lifetime prevalence of having at least one psychiatric disorder was 68.8% in the AN group (22 patients).

In the AN group, the mean scores of EAT, BDI, and SCARED were found to be significantly higher than the control group (Table 1). There was no statistically

significant difference between the mean total scores of MOCI in both groups (Table 1). Fifteen (46.9%) adolescents in the AN group and three (10%) adolescents in the control group were found to have higher BDI scores than the cutoff point of 17 ($\chi^2 = 10.219$, $p = .001$). Nineteen (59.4%) adolescents in the AN group and nine (30%) adolescents in the control group were found to have higher SCARED scores than the cutoff point of 25 ($\chi^2 = 5.395$, $p = .020$). Although the participants in the control group with higher scores than the cutoff points in these scales reported some subthreshold depression or anxiety symptoms, none of them was diagnosed with a psychiatric disorder according to K-SADS-PL.

Scores of submissive behaviors, shyness, and social comparison

The adolescents in the AN group obtained significantly higher submissive behaviours scores than the control group ($t = 3.698$, $p < .000$). It was also found that adolescents in the AN group had higher shyness scores, but the difference between the two groups was not statistically significant ($t = .920$, $p > .05$). Adolescents with AN had significantly lower social comparison scores ($t = -2.986$, $p = .004$) (Table 2).

Relationships between social functioning and socio-demographic and clinical data

It was found that submissive behaviours, shyness, and social comparison scores were not related to the age of the patients, their socio-economic status, BMI/EAT scores, the age at the onset of the disease, duration of the disease and previous psychiatric treatment status in the AN group.

There were moderate positive correlations between the submissive behaviours/shyness scores and the anxiety scores and moderate negative correlations between the social comparison scores and the depression/anxiety scores in the AN group. There were also moderate positive correlations between the submissive behaviours scores and depression/anxiety/OCD scores in the control group (Table 3).

In the AN group, there were no statistically significant differences in submissive behaviours, shyness and social comparison scores when adolescents with accompanying depressive disorders were compared to the

Table 1. Socio-demographic and clinical variables.

| | AN Group (N = 32) | Control Group (N = 30) | Statistics |
|-------------------------------|-------------------|------------------------|-------------------|
| | Mean \pm SD | Mean \pm SD | |
| Age (years) | 15.1 \pm 1.6 | 14.9 \pm 1.9 | $t = 0.420$ |
| Duration of education (years) | 9.8 \pm 1.6 | 9.7 \pm 1.8 | $t = 0.112$ |
| Mother's age | 43.8 \pm 6.2 | 40.5 \pm 4.9 | $t = 2.290$ |
| Father's age | 47.6 \pm 6.5 | 45.3 \pm 4.9 | $t = 1.612$ |
| Education of mother (years) | 10.9 \pm 5.3 | 9.8 \pm 4.5 | $t = 0.886$ |
| Education of father (years) | 11.6 \pm 4.3 | 12.6 \pm 3.5 | $t = -0.942$ |
| BMI | 16.6 \pm 1.4 | 21.3 \pm 1.2 | $t = 13.838^{**}$ |
| EAT | 42.8 \pm 18.1 | 15.3 \pm 5.8 | $t = 7.934^{**}$ |
| BDI | 18.6 \pm 11.6 | 7.9 \pm 5.5 | $t = 4.593^{**}$ |
| SCARED | 29.4 \pm 15.9 | 21.0 \pm 11.2 | $t = 2.383^*$ |
| MOCI | 13.7 \pm 5.9 | 13.3 \pm 6.2 | $t = 0.272$ |

** $p < .000$.

* $p = .02$.

Notes: SD: Standard Deviation, BMI: Body Mass Index, EAT: Eating Attitudes Test, BDI: Beck Depression Inventory, SCARED: Screen for Child Anxiety and Related Disorders, MOCI: Maudsley Obsessive Compulsive Inventory.

Table 2. Scores of submissive behaviours, shyness, and social comparison.

| | AN Group Mean \pm SD | Control Group Mean \pm SD | Statistics |
|-----|------------------------|-----------------------------|-------------------------|
| SAS | 39.1 \pm 11.2 | 29.9 \pm 7.8 | $t = 3.698$ $p < .000$ |
| SS | 53.5 \pm 18.8 | 49.4 \pm 15.7 | $t = .920$ $p = .361$ |
| SCS | 74.8 \pm 17.5 | 86.3 \pm 12.0 | $t = -2.986$ $p = .004$ |

Note: SD: Standard Deviation, SAS: Submissive Acts Scale, SS: Shyness Scale, SCS: Social Comparison Scale.

Table 3. Relationships between social functioning and BDI, SCARED, and MOCI scores.

| | BDI | | SCARED | | MOCI | |
|-----|----------|---------------|----------|---------------|----------|---------------|
| | AN Group | Control Group | AN Group | Control Group | AN Group | Control Group |
| SAS | .389* | .544** | .622** | .618** | .379* | .470** |
| SS | .454** | .256 | .657** | .534** | .405* | .332 |
| SCS | -.513** | .43 | -.621** | .123 | -.290 | .079 |

**p* < .05.

***p* < .01.

Note: Pearson Correlation Analysis, SAS: Submissive Acts Scale, SS: Shyness Scale, SCS: Social Comparison Scale.

adolescents with no accompanying depressive disorder. However, submissive behaviours and shyness scores of the adolescents with any accompanying anxiety disorder were significantly higher than the adolescents with no accompanying anxiety disorder (Table 4).

When the scores of the scales evaluating the social functioning of the adolescents in the study were controlled for depression, anxiety, and OCD symptoms; the difference in the submissive behaviours and social comparison scores between the research and control groups decreased to statistically insignificant levels (Table 5).

Discussion

The results of this study showed that female adolescents with AN had a higher level of submissive behaviours, a sense of inadequacy and negative self-perceptions in their social relationships, however, their level of shyness was not significantly different from the healthy control group. It has been reported that adult patients with AN have more negative cognitions in their social relationships [34], present submissive behaviours [35], find themselves socially less sufficient [36,37], and have a high level of social anxiety [38], similar to the results of this study. These results reveal that such problems in social functions might be important in the development and/or continuity of AN. Shyness has also been identified as a precursor of EDs in clinical and community-based studies [39–41]. Adult patients with EDs have a higher level of shyness than both healthy individuals and those with other psychopathologies [42–44]. The opinion that others have negative thoughts

Table 5. The scale scores evaluating social functioning controlled for depression, anxiety, and OCD symptoms.

| | AN Group | Control Group | Statistics |
|-----|------------|---------------|----------------------------------|
| | Mean ± SD | Mean ± SD | |
| SAS | 37.3 ± 1.5 | 31.9 ± 1.6 | <i>F</i> = 5.016 <i>p</i> = .291 |
| SS | 50.4 ± 2.8 | 52.7 ± 2.9 | <i>F</i> = .264 <i>p</i> = .610 |
| SCS | 79.2 ± 2.5 | 81.6 ± 2.7 | <i>F</i> = .353 <i>p</i> = .555 |

Note: ANCOVA test, SD: Standard Deviation, SAS: Submissive Acts Scale, SS: Shyness Scale, SCS: Social Comparison Scale.

about himself/herself (external shyness) and shy temperament features are reported at a higher rate in patients with EDs when compared to healthy controls [36]. Although the level of shyness was found to be higher in adolescents with AN than in the healthy control group in our study as we hypothesized, the difference between the two groups did not reach a statistically significant level. The sense of shyness is sometimes accepted as a virtue culturally in our society, which could explain why shyness was excessive in healthy individuals.

In this study, depression and anxiety symptoms were shown to be higher in adolescents with AN than in the control group; and submissive behaviours and shyness were found to be positively correlated with depression, anxiety, and obsessive-compulsive symptoms. Accordingly, submissive behaviours and shyness increase in adolescents with AN along with these psychiatric symptoms and these relationships seem to be stronger for the anxiety symptoms. Furthermore, the adolescents with any comorbid anxiety disorder, additional to the AN, had more submissive behaviours and shyness than the adolescents without any anxiety disorder. There were also negative relationships between the social comparison and depression/anxiety symptoms; as depression and anxiety symptoms increase, favourable social comparison and positive self-schema decrease. Positive relationships exist between social self-perception and psycho-social well-being of the person, and the quality of the relationships the person has established with others [45]. Interpersonal problems negatively affect the development and form a basis for psychopathologies [46,47]. However, there is a reciprocal relationship between social functioning and psychopathologies. Psychopathologies are

Table 4. Social functioning scores in AN group with and without depressive and anxiety disorders.

| | With A Major Depressive Disorder (N = 14) | Without A Major Depressive Disorder (N = 18) | Statistics |
|-----|--|--|---------------------------------|
| | Median (Min – Max) Ortanca (Min – Maks) | Median (Min – Max) | |
| SAS | 39.0 (26–61) | 37.5 (20–63) | <i>U</i> = 109.5 <i>p</i> > .05 |
| SS | 56.5 (28–86) | 54.5 (20–80) | <i>U</i> = 91.5 <i>p</i> > .05 |
| SCS | 69.0 (35–94) | 82.0 (30–101) | <i>U</i> = 78 <i>p</i> > .05 |
| | With An Anxiety Disorder (N = 6) | Without An Anxiety Disorder (N = 26) | Statistics |
| | Median (Min – Max) | Median (Min – Max) | |
| SAS | 55.5 (33–63) | 36.0 (20–54) | <i>U</i> = 9.5 <i>p</i> = .001 |
| SS | 69.5 (55–81) | 49.5 (20–86) | <i>U</i> = 23.5 <i>p</i> = .019 |
| SCS | 66.5 (56–92) | 80.0 (30–101) | <i>U</i> = 48 <i>p</i> > .05 |

Note: Mann Whitney *U* test, Min: Minimum, Max: Maximum, SAS: Submissive Acts Scale, SS: Shyness Scale, SCS: Social Comparison Scale.

also known to break social functioning by causing problems with social relations. It has been reported that interpersonal relationship problems are related to many psychopathologies, especially anxiety and mood disorders, besides EDs [14,45,48–50]. In this case, interpersonal relationship problems and deterioration in social functioning in AN patients may also be related to the accompanying depression and anxiety symptoms [15,51]. There are studies reporting that submissive behaviours and negative social comparisons in patients with EDs are positively correlated with the severity of both ED symptoms and depressive symptoms [52–55]. A strong association is also mentioned between shyness and depressive symptoms in patients with EDs [44,56]. However, in a majority of the studies, it has been reported that the relationships between the severity of ED symptoms and the submissive behaviour/negative social comparison were found to be independent of depressive symptoms; and these social problems were suggested to be precursors of EDs [37,53,55,57]. In this study, no relationship was shown between the severity of AN symptoms and submissive behaviours, shyness, and negative social comparison. Furthermore, when the effects of depression, anxiety, and obsessive-compulsive symptoms were controlled, the differences between the AN and control groups lost their significances regarding submissive behaviours and social comparison. These findings suggest that submissive behaviours and negative social comparisons in female adolescents with AN might be associated with accompanying psychiatric symptoms rather than the AN symptoms, different from the results of other studies. Nevertheless, most of the studies evaluating the social functioning in patients with EDs were conducted on adults. Further studies assessing the relationships between deterioration in social functioning and both the severity of ED symptoms and accompanying psychiatric symptoms/disorders in adolescents with AN are needed to shed light on this subject. Even so, the results of this study indicate that clinicians evaluating and treating adolescent patients with AN need to give more attention to the interpersonal and social problems and use social-based interventions even they are the causes or the results of AN.

This study has some strengths and limitations. Including only female adolescents with AN has critical importance in the understanding of the disease that often begins in adolescent girls by increasing the homogeneity of the research group. However, this prevents the generalization of the results to all AN patients. The cross-sectional nature of the study makes it difficult to understand the direction of the relationship between the AN and social functioning. In order to better understand the development and course of the disease, longitudinal cohort studies assessing the social functioning before the onset of AN, during the acute

phase, and after recovery are needed. Also, future research comparing the social functioning in adolescents with AN to those of adolescents with other psychiatric disorders could contribute to our understanding of whether the findings are specific to this disorder.

In conclusion, this study suggests that female adolescents with AN have a negative social self-perception with more submissive behaviours in interpersonal relationships compared to healthy peers. Depression and anxiety symptoms were higher in the AN group. In the assessed fields of social functioning, it was shown that the deterioration is associated with accompanying psychiatric symptoms rather than the AN symptoms. We believe that the findings of this study could contribute to the understanding and treatment of the factors that might be important in the onset or continuity of AN, which is a disorder that occurs mostly in adolescent girls. To better understand the subject, follow-up studies are needed to evaluate the role of social functioning and accompanying psychopathologies in the course of AN in adolescents.

Disclosure statement

No potential conflict of interest was reported by the authors.

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