



Clinical Characteristics and Factors Associated with Duration of Inpatient Treatment in Female Adolescents with Eating Disorders

Yeme Bozukluğu Tanılı Kız Ergenlerde Klinik Özellikler ve Yatarak Tedavi Süresiyle İlişkili Faktörler

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ABSTRACT

Objective: This study examined the sociodemographic and clinical characteristics of female adolescents with eating disorders receiving inpatient treatment, compared anorexia nervosa (AN) and non-AN eating disorder groups, evaluated changes in depressive symptoms, and identified factors associated with the duration of inpatient treatment.

Method: This single-center retrospective study reviewed the records of 45 female adolescents with eating disorders treated in a child and adolescent psychiatry inpatient unit between July 2021 and May 2026. Patients were categorized into AN and non-AN eating disorder groups. Sociodemographic data, psychiatric comorbidities, risk behaviors, indications of hospitalization, comorbid medical conditions, pharmacological treatment, depressive symptom severity and duration of inpatient treatment were analyzed.

Results: The mean age of the patients was 15.13±1.71 years, and 48.9% had AN. The AN group had lower body mass index and higher rates of amenorrhea/menstrual irregularity, comorbid medical conditions, need for nutritional support, and hospitalization due to weight loss or medical instability. The non-AN group had higher rates of psychiatric comorbidities, cigarette and alcohol use, non-suicidal self-injury, suicide attempts, and hospitalization due to suicidality or non-adherence to treatment. Depressive symptom severity decreased from admission to discharge in both groups. In an exploratory hierarchical regression analysis, depressive symptom severity at admission and indication for hospitalization were associated with the duration of inpatient treatment, whereas diagnostic group was not.

Conclusion: Female adolescents receiving inpatient treatment for eating disorders presented with substantial clinical complexity. Duration of treatment was associated with severity of depressive symptoms and the indication for hospitalization rather than with diagnostic category. These findings provide real-world data from Türkiye and underscore the need for larger-scale prospective studies examining factors associated with treatment course and prognosis.

Keywords: Eating disorders, adolescents, inpatient treatment, anorexia nervosa, hospitalization duration

ÖZ

Amaç: Bu çalışmada, yatarak tedavi gören yeme bozukluğu tanılı kız ergenlerin sosyodemografik ve klinik özelliklerinin incelenmesi, anoreksiya nervoza (AN) ve AN dışı yeme bozukluğu gruplarının karşılaştırılması, depresif belirtilerdeki değişimin değerlendirilmesi ve yatarak tedavi süresiyle ilişkili faktörlerin belirlenmesi amaçlanmıştır.

Yöntem: Bu tek merkezli, retrospektif çalışmada, Temmuz 2021 ile Mayıs 2026 tarihleri arasında bir çocuk ve ergen psikiyatrisi yataklı servisinde yeme bozukluğu nedeniyle tedavi edilen 45 kız ergenin dosya kayıtları incelenmiştir. Hastalar AN ve AN dışı yeme bozukluğu grupları olarak sınıflandırılmıştır. Sosyodemografik veriler, psikiyatrik eş tanımlar, riskli davranışlar, yatış endikasyonları, komorbid tıbbi durumlar, farmakolojik tedaviler, çocuklar için depresyon derecelendirme ölçeği puanları ve yatarak tedavi süresi analiz edilmiştir.

Bulgular: Hastaların yaş ortalaması 15,13±1,71 yıl olup, %48,9'u AN tanısına sahipti. AN grubunda beden kitle indeksi daha düşük; amenore/menstrüel düzensizlik, komorbid tıbbi durumlar, beslenme desteği gereksinimi ve kilo kaybı ya da tıbbi instabilite nedeniyle yatış daha sık saptandı. AN dışı grupta ise psikiyatrik eş tanı, sigara ve alkol kullanımı, kendine zarar verme davranışı, intihar girişimi, suisidalite ya

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da tedavi uyumsuzluğu nedeniyle yatış daha sık görüldü. İki grupta da depresif belirtiler yatış süresince azalma gösterdi. Keşifsel hiyerarşik regresyon analizinde, yatış sırasındaki depresif belirti şiddeti ve yatış başlangıcındaki depresif belirti şiddeti ve yatış endikasyonu yatarak tedavi süresiyle ilişkili bulunurken, yeme bozukluğu tanı grubu ile ilişki saptanmadı.

Sonuç: Yatarak tedavi gören yeme bozukluğu tanılı kız ergenler klinik açıdan karmaşık özellikler göstermektedir. Tedavi süresi, tanı grubundan ziyade depresif belirti şiddeti ve yatış endikasyonu ile ilişkili bulunmuştur. Bu bulgular, Türkiye’den gerçek yaşam verileri sunmakta ve tedavi süreci ile prognozla ilişkili faktörlere yönelik daha geniş örneklemli prospektif çalışmalara duyulan gereksinimi desteklemektedir.

Anahtar kelimeler: Yeme bozuklukları, ergenler, yatarak tedavi, anoreksiya nervoza, yatış süresi

INTRODUCTION

Eating disorders are severe psychiatric conditions that commonly emerge during adolescence and are associated with substantial medical and psychiatric morbidities, impaired psychosocial functioning, reduced quality of life, and elevated risk of mortality^(1,2). According to the diagnostic and statistical manual of mental disorders-fifth edition, feeding and eating disorders include several diagnostic categories, such as anorexia nervosa (AN), bulimia nervosa (BN), binge-eating disorder (BED), avoidant/restrictive food intake disorder, pica, rumination disorder, other specified feeding or eating disorder (OSFED), and unspecified feeding or eating disorder (UFED)⁽³⁾.

A systematic review of prevalence studies published between 2000 and 2018 reported weighted mean lifetime prevalence estimates of feeding and eating disorders as 8.4% in women and 2.2% in men⁽⁴⁾. However, prevalence estimates vary by age group, diagnostic approach, and time frame. A recent systematic review and meta-analysis focusing specifically on children and young people reported a pooled global point prevalence of 5.23% for any eating disorder, with OSFED identified as the most common diagnostic category⁽⁵⁾. Although adolescence is a critical developmental period for the onset and detection of eating disorders, recent evidence also indicates that eating disorders and associated psychiatric comorbid disorders may be observed in younger children⁽⁶⁾.

Eating disorders in young people are rarely limited to eating-related symptoms or weight disturbance alone. Psychiatric and medical comorbidities are common and may increase their clinical severity, impair functioning, and complicate treatment planning^(7,8). Common psychiatric comorbidities and risk-related clinical features include anxiety and mood disorders, trauma-related symptoms, substance use disorders, non-suicidal self-injury (NSSI), and suicide-related behaviors⁽⁹⁻¹¹⁾. Medical complications of eating disorders are often multisystemic, affecting the cardiovascular, gastrointestinal, metabolic, and reproductive systems⁽⁷⁾. Therefore, clinical assessment in adolescents with eating disorders should not be restricted

to evaluation of body weight, body mass index (BMI), or medical stability, but should also include psychiatric comorbidity, self-harm, risk of suicide, and adherence to treatment. Accordingly, treatment planning should be holistic and individualized, integrating medical stability, psychiatric risk, severity of symptoms, and response to treatment⁽¹²⁾.

Many children and adolescents with eating disorders may be managed in outpatient or less intensive treatment settings when they are medically stable and psychiatric risks can be safely contained. However, inpatient treatment may be necessary in the presence of severe nutritional compromise, rapid weight loss, refusal of oral intake, cardiovascular or metabolic instability, severe psychiatric comorbidity, suicidality, family conflict, or failure of outpatient treatment⁽¹³⁻¹⁵⁾. Inpatient care provides an intensive setting for medical stabilization, nutritional rehabilitation, psychiatric assessment, symptom management, and maintenance of patient safety.

Adolescents requiring inpatient treatment may represent a more severely affected clinical subgroup of patients with eating disorders⁽¹⁶⁾. In Türkiye, a recent study described a multidisciplinary outpatient follow-up model for pediatric eating disorders and reported improvements in body mass indices and global clinical severity during follow-up⁽¹⁷⁾. In addition, a retrospective study from Türkiye involving adolescent girls diagnosed with AN found that more than one-third had a history of suicide attempts and approximately 40% had engaged in NSSI⁽¹⁸⁾. However, real-world data focusing specifically on adolescents requiring inpatient treatment remain scarce.

Therefore, the present study aimed to retrospectively examine the sociodemographic and clinical characteristics, diagnostic distribution of eating disorders, psychiatric comorbidities, indications for hospitalization, and changes in depressive symptom severity in adolescents with eating disorders admitted to a child and adolescent psychiatry inpatient unit in Türkiye. Secondary aims were to compare patients with AN and non-AN eating disorders and to identify factors associated with duration of hospitalization.

MATERIALS and METHODS

Study Design and Setting

This was a single-center retrospective observational study conducted in the Child and Adolescent Psychiatry Inpatient Unit of Dokuz Eylül University. Clinical records of patients hospitalized with a diagnosis of an eating disorder between July 2021 and May 2026 were retrospectively reviewed. To reduce the potential confounding effect of the acute coronavirus disease-2019 pandemic period on hospitalization patterns and clinical characteristics, the study period was restricted to admissions from July 2021 onward.

Participants

The inclusion criteria were hospitalization in the child and adolescent psychiatry inpatient unit during the study period and a documented clinical diagnosis of AN, BN, OSFED/UFED, or BED. The exclusion criterion was discharge at the patient's own request before termination of treatment. The study sample consisted of 45 adolescents who met these criteria and were hospitalized with a diagnosis of an eating disorder during the study period. For patients with more than one hospitalization during the study period, only data from the most recent hospitalization were included in the analyses. All eligible inpatients identified in the records were female. Ages of the study population were recorded in months, and the age range of the patients varied between 134 and 214 months. Diagnoses of eating disorder and comorbid psychiatric conditions were established by child and adolescent psychiatrists based on routine clinical interviews and documented in the medical records.

Since BN, BED and OSFED/UFED subgroups were too small to allow meaningful diagnosis-specific comparisons, patients were classified into AN and non-AN groups for exploratory analyses. The non-AN group comprised patients with BN, BED, or OSFED/UFED. The groups were then compared with respect to their clinical characteristics, psychiatric comorbidities, indications for hospitalization, and duration of inpatient treatment.

Data Sources and Study Variables

Data were obtained through retrospective review of the hospital information management system and medical records of the patients. For each patient, data relevant to sociodemographic characteristics, clinical features, eating disorder diagnosis, psychiatric comorbidities, indications for hospitalization, results of medical consultations,

pharmacological treatment, severity of depressive symptoms, and duration of inpatient treatment were recorded.

Sociodemographic variables included the ages of the patients and their parents. Clinical variables included eating disorder diagnosis number of comorbid psychiatric diagnoses, specific psychiatric comorbidities, including major depressive disorder, anxiety disorders, attention-deficit/hyperactivity disorder (ADHD), post-traumatic stress disorder, borderline personality traits, conduct disorder, obsessive-compulsive disorder, and intellectual disability, as well as NSSI, history of suicide attempt, cigarette, alcohol, and substance use, amenorrhea or menstrual irregularity, presence of compensatory behaviors, need for nutritional support during hospitalization, and pre-admission BMI.

The primary indications for hospitalization were classified into four clinical categories as weight loss, medical instability, suicidality, and non-adherence to treatment. Given the limited sample size, these categories were collapsed into a binary variable as weight loss and/or medical instability versus suicidality and/or non-adherence to treatment. Additional medical conditions identified through consultations during hospitalization were also recorded which included electrolyte or acid-base disturbances, endocrine-metabolic conditions, cardiac problems, severe or treatment-resistant malnutrition, and gastrointestinal conditions.

Regarding pharmacological treatment, antidepressant and antipsychotic use during hospitalization were recorded. Antidepressant doses were calculated as fluoxetine-equivalent doses, and antipsychotic doses were calculated as chlorpromazine-equivalent doses.

Assessment of Depressive Symptoms

Severity of depressive symptoms was assessed using admission and discharge scores recorded on the children's depression rating scale-revised (CDRS-R)⁽¹⁹⁾. Both raw CDRS-R and CDRS-R T-scores were included in the analyses. Changes in depressive symptoms from admission to discharge were examined in the total sample and separately according to diagnostic groups. In addition, the association between changes in depressive symptoms and the duration of hospitalization was evaluated. Change in CDRS-R scores was calculated as admission score minus discharge score; therefore, higher change scores indicated greater reductions in the severity of depressive symptoms during inpatient treatment.

Outcome Measures

Study measures included sociodemographic and clinical characteristics, indications for hospitalization, changes in depressive symptoms, and duration of inpatient treatment. Exploratory analyses compared the AN and non-AN groups and examined factors associated with the duration of inpatient treatment. For this purpose, diagnostic groups, number of comorbid psychiatric diagnoses, indications for hospitalization, and admission CDRS-R raw scores were included in the regression analysis model.

Statistical Analysis

Continuous variables were presented as mean $\pm$ standard deviation, and categorical variables as numbers and percentages. Comparisons between the AN and non-AN eating disorder groups were performed using independent-samples t-tests for continuous variables, and chi-square test or Fisher's exact test for categorical variables as appropriate. Non-normally distributed continuous variables and ordinal/count variables were presented as median [interquartile range (IQR)] and compared between groups using the Mann-Whitney U test.

Changes in CDRS-R raw scores and CDRS-R T-scores between admission and discharge were evaluated using paired-samples t-tests. A 2 $\times$ 2 mixed-design analysis of variance was conducted to examine whether changes in depressive symptoms differed according to diagnostic groups. The association between change in CDRS-R scores and duration of the hospitalization was assessed using Pearson correlation analysis.

Hierarchical multiple linear regression analysis was performed to identify factors associated with the duration of inpatient treatment. Diagnostic group and number of comorbid psychiatric diagnoses were entered in the first step, indication for hospitalization in the second step, and admission CDRS-R raw scores in the third step. Due to missing data, the regression analysis was conducted with 43 participants. The level of statistical significance was set at $p < 0.05$. Given the exploratory nature of the analyses, p-values were not adjusted for multiple comparisons and should be interpreted cautiously. Effect sizes were reported where appropriate using Cohen's d, partial eta squared and explained variance. Regression assumptions, including multicollinearity, linearity, and residual distribution, were examined before interpreting the final model.

A post-hoc power analysis was conducted for the final multiple regression model using Cohen's f^2 , calculated

from the model's R^2 . In addition, a sensitivity analysis was performed to estimate the minimum detectable effect size for 80% power, given the available sample size, α level, and number of predictors.

Ethical Considerations

This study was conducted as a retrospective chart review. Ethical approval was obtained from the Dokuz Eylül University Non-Interventional Research Ethics Committee (approval number: 2026/08-01, dated: 23.02.2026). Patient data were retrospectively reviewed and anonymized before analysis. The study was conducted in accordance with the principles of the World Medical Association Declaration of Helsinki Ethical Principles for Medical Research Involving Human Subjects.

RESULTS

Sample Characteristics

A total of 45 female adolescents hospitalized with a diagnosis of an eating disorder were included in the study. The mean age of the participants was 15.13 ± 1.71 years, with an age range of 11.17-17.83 years. The mean maternal age was 44.54 ± 6.36 years, and the mean paternal age was 49.24 ± 5.49 years.

Regarding diagnostic distribution, 22 participants were diagnosed with AN, 6 with BN, 16 with OSFED/UFED, and 1 with BED. Accordingly, 22 patients were classified into the AN group, whereas 23 patients into the non-AN eating disorder group.

Additional medical conditions identified through consultations performed during hospitalization were present in 14 patients (31.1%). The most common of them were electrolyte or acid-base disturbances ($n=5$), endocrine-metabolic disorders ($n=4$), and cardiac problems ($n=3$). Other conditions included severe or treatment-resistant malnutrition ($n=2$) and gastrointestinal conditions ($n=1$). The demographic and diagnostic characteristics of the total sample are summarized in Table 1.

Comparisons According to Diagnostic Groups

When the AN and non-AN eating disorder groups were compared, no significant difference was found in terms of age. The number of comorbid psychiatric diagnoses was significantly higher in the non-AN eating disorder group than in the AN group [median (IQR): 2.0 (1.0) vs. 0.5 (1.0); Mann-Whitney $U=93.00$, $z=-3.816$, $p < 0.001$]. The mean pre-admission BMI was significantly lower in the AN group than in the non-AN eating disorder group, 16.42 ± 2.48 versus 26.19 ± 5.00 , respectively ($t(27.85)=-7.83$, $p < 0.001$).

Table 1. Demographic and diagnostic characteristics of the total sample

Variables	Total sample (n=45)
Sex, female, n (%)	45 (100.0)
Age, years, mean $\pm$ SD	15.13 $\pm$ 1.71
Maternal age, years, mean $\pm$ SD	44.54 $\pm$ 6.36 ^a
Paternal age, years, mean $\pm$ SD	49.24 $\pm$ 5.49 ^a
Family structure, n (%)	
Intact family	29 (64.4)
Separated/divorced parents	11 (24.4)
Parental loss	3 (6.7)
Unknown	2 (4.4)
Maternal education, n (%)	
Primary/secondary school	7 (15.6)
High school	12 (26.7)
University degree or higher	15 (33.3)
Unknown	11 (24.4)
Paternal education, n (%)	
Primary/secondary school	6 (13.3)
High school	10 (22.2)
University degree or higher	18 (40.0)
Unknown	11 (24.4)
Family history of eating disorders, n (%)	2 (4.4)
Types of eating disorders, n (%)	
AN	22 (48.9)
BN	6 (13.3)
OSFED/UFED	16 (35.6)
BED	1 (2.2)
Indications for hospitalizations, n (%)	
Medical instability	2 (4.4)
Weight loss	16 (35.6)
Suicidality	18 (40.0)
Non-adherence to treatment	9 (20.0)
Additional medical conditions identified during hospitalizations, n (%)	14 (31.1)
Electrolyte/acid-base imbalance	5 (11.1)
Endocrine-metabolic conditions	4 (8.9)
Cardiac problems	3 (6.7)
Severe/treatment-resistant malnutrition	2 (4.4)
Gastrointestinal conditions (gastritis etc.)	1 (2.2)
Data are presented as n (%) or mean $\pm$ standard deviation. Percentages were calculated based on the total sample. ^a : Data were available for 41 patients. Because more than one additional medical condition could be present in the same patient, the sum of the subcategories may exceed the total number of patients with additional medical conditions. AN: Anorexia nervosa, BN: Bulimia nervosa, BED: Binge-eating disorder, OSFED/UFED: Other specified or unspecified feeding or eating disorder	

Amenorrhea or menstrual irregularity, pre-admission compensatory behaviors, additional medical conditions identified during hospitalization, and the need for nutritional support during hospitalization were also significantly more frequently detected in the AN group

Use of cigarette and alcohol use cigarette and alcohol use NSSI, and a history of suicide attempts were significantly more common in the non-AN group. Substance use did not differ significantly between the groups. Indications of hospitalizations differed significantly between the groups. In the AN group, hospitalization was more commonly due to weight loss and/or medical instability, whereas in the non-AN eating disorder group, suicidality and/or non-adherence to treatment was the predominant indication for hospitalization. Among comorbid psychiatric diagnoses, major depressive disorder, ADHD, and borderline personality traits were significantly more common in the non-AN eating disorder group than in the AN group. No significant intergroup differences were found for anxiety disorders, post-traumatic stress disorder, conduct disorder, obsessive-compulsive disorder, or intellectual disability.

No significant differences were observed between the groups regarding duration of symptoms, age at treatment initiation, time to hospitalization, number of hospitalizations, admission CDRS-R raw scores, or admission CDRS-R T-scores. Similarly, fluoxetine-equivalent antidepressant doses and chlorpromazine-equivalent antipsychotic doses, and duration of inpatient treatment did not differ significantly between the diagnostic groups. Clinical and treatment characteristics according to diagnostic groups are summarized in Table 2.

Changes in Depressive Symptoms from Admission to Discharge

At admission, CDRS-R raw scores were comparable in the AN and non-AN eating disorder groups (54.33 $\pm$ 15.73 and 52.55 $\pm$ 14.25, respectively). At discharge, mean CDRS-R raw scores decreased to 39.50 $\pm$ 14.02 in the AN group and 37.14 $\pm$ 13.81 in the non-AN eating disorder group. Similarly, CDRS-R T-scores decreased from 71.05 $\pm$ 11.81 to 59.65 $\pm$ 12.23 in the AN group and from 70.09 $\pm$ 11.25 to 56.73 $\pm$ 12.46 in the non-AN eating disorder group.

Among participants with both admission and discharge CDRS-R data (n=42), CDRS-R raw scores decreased significantly from admission to discharge, $t(41)=8.46$, $p<0.001$, Cohen's $d=1.31$. CDRS-R T-scores showed a comparable and significant decrease, $t(41)=8.59$,

Table 2. Clinical and treatment characteristics by eating disorder group

Variables	Total (n=45)	AN (n=22)	Non-AN ED (n=23)	p-value
Clinical characteristics				
Age, years, mean $\pm$ SD	15.13 $\pm$ 1.71	14.75 $\pm$ 1.55	15.49 $\pm$ 1.81	0.151
Number of comorbid psychiatric diagnoses, median (IQR)	1 (2.0)	0.5 (1.0)	2.0 (1.0)	<0.001
Pre-admission BMI, mean $\pm$ SD	21.30 $\pm$ 6.29	16.42 $\pm$ 2.48	26.19 $\pm$ 5.00	<0.001
Amenorrhea/menstrual irregularity, n/N (%)	16/44 (36.4)	13/21 (61.9)	3/23 (13.0)	0.001
Pre-admission compensatory behaviors, n/N (%)	27/41 (65.9)	17/20 (85.0)	10/21 (47.6)	0.020
Additional medical condition identified during hospitalization, n (%)	14 (31.1)	11 (50.0)	3 (13.0)	0.011
Need for nutritional support during hospitalization, n (%)	15 (33.3)	15 (68.2)	0 (0.0)	<0.001
Risk behaviors and substance use				
Cigarette use, n (%)	5 (11.1)	0 (0.0)	5 (21.7)	0.049
Alcohol use, n (%)	6 (13.3)	0 (0.0)	6 (26.1)	0.022
Substance use, n (%)	1 (2.2)	0 (0.0)	1 (4.3)	1.000
Non-suicidal self-injury, n (%)	25 (55.6)	8 (36.4)	17 (73.9)	0.017
History of suicide attempt, n (%)	23 (51.1)	5 (22.7)	18 (78.3)	<0.001
Indications for hospitalizations				<0.001
Weight loss/medical instability, n (%)	18 (40.0)	17 (77.3)	1 (4.3)	
Suicidality/treatment non-adherence, n (%)	27 (60.0)	5 (22.7)	22 (95.7)	
Comorbid psychiatric diagnoses				
Major depressive disorder, n (%)	26 (57.8)	9 (40.9)	17 (73.9)	0.036
Anxiety disorders, n (%)	10 (22.2)	3 (13.6)	7 (30.4)	0.284
Attention-deficit/hyperactivity disorder, n (%)	6 (13.3)	0 (0.0)	6 (26.1)	0.022
Post-traumatic stress disorder, n (%)	3 (6.7)	1 (4.5)	2 (8.7)	1.000
Borderline personality traits, n (%)	5 (11.1)	0 (0.0)	5 (21.7)	0.049
Conduct disorder, n (%)	3 (6.7)	0 (0.0)	3 (13.0)	0.233
Obsessive-compulsive disorder, n (%)	1 (2.2)	1 (4.5)	0 (0.0)	0.489
Intellectual disability, n (%)	1 (2.2)	1 (4.5)	0 (0.0)	0.489
Illness course and treatment characteristics				
Symptom duration, months, mean $\pm$ SD	16.72 $\pm$ 12.55 ^b	14.41 $\pm$ 13.09	19.56 $\pm$ 11.57	0.201
Age at treatment initiation, years, mean $\pm$ SD	13.78 $\pm$ 1.77	13.62 $\pm$ 1.56	13.94 $\pm$ 1.98	0.571
Time to hospitalization, months, mean $\pm$ SD	12.62 $\pm$ 10.99 ^c	10.00 $\pm$ 9.31	15.67 $\pm$ 12.23	0.109
Number of hospitalizations, median (IQR)	1 (0.0)	1.0 (1.0)	1.0 (0.0)	0.521
Admission CDRS-R raw score, mean $\pm$ SD	53.42 $\pm$ 14.85	54.33 $\pm$ 15.73	52.55 $\pm$ 14.25	0.698
Admission CDRS-R T-score, mean $\pm$ SD	70.56 $\pm$ 11.41	71.05 $\pm$ 11.81	70.09 $\pm$ 11.25	0.787
Fluoxetine-equivalent dose, mg/day, mean $\pm$ SD (N=42)	42.76 $\pm$ 20.63	42.33 $\pm$ 19.98	43.24 $\pm$ 21.84	0.888
Chlorpromazine-equivalent dose, mg/day, mean $\pm$ SD (n=44)	249.98 $\pm$ 179.48	238.31 $\pm$ 173.91	260.63 $\pm$ 187.67	0.685
Inpatient treatment duration, days, mean $\pm$ SD	23.33 $\pm$ 7.76	24.73 $\pm$ 7.42	22.00 $\pm$ 8.00	0.243
Data are presented as n (%), n/N (%), mean $\pm$ standard deviation (SD), or median [interquartile range (IQR)], unless otherwise indicated. Independent-samples t-tests or Welch's t-tests were used for normally distributed continuous variables, Mann-Whitney U tests were used for non-normally distributed/count variables. Chi-square tests or Fisher's exact tests were used for categorical variables, as appropriate. The p-value for indication for hospitalization refers to the overall comparison of the two collapsed indication categories. Data were missing for 1 patient for amenorrhea/menstrual irregularity and for 4 patients for pre-admission compensatory behaviors. ^b : Data were available for 40 patients. ^c : Data were available for 39 patients. AN: Anorexia nervosa, non-AN ED: Eating disorders other than anorexia nervosa, BMI: Body mass index, CDRS-R: Children's depression rating scale-revised, ADHD: Attention-deficit/hyperactivity disorder, NSSI: Non-suicidal self-injury, PTSD: Post-traumatic stress disorder, OCD: Obsessive-compulsive disorder				

$p < 0.001$, Cohen's $d = 1.33$. A 2×2 mixed-design analysis of variance was conducted to determine whether changes in depressive symptoms differed by diagnostic groups. For CDRS-R raw scores, the main effect of time was significant, $F(1,40) = 69.56$, $p < 0.001$, $\eta^2 = 0.64$; however, the interaction between time and diagnostic group was not significant, $F(1,40) = 0.007$, $p = 0.933$. Similarly, for CDRS-R T-scores, the main effect of time was significant, $F(1,40) = 72.02$, $p < 0.001$, $\eta^2 = 0.64$, whereas the interaction between time and diagnostic group was not significant $F(1,40) = 0.36$, $p = 0.552$. These findings indicate that depressive symptoms decreased significantly, and comparably during inpatient treatment of both the AN and non-AN eating disorder groups. Change in CDRS-R raw scores was calculated as admission scores minus discharge scores; thus, higher values indicated greater symptom reduction. A moderate positive Pearson correlation was found between reduction in CDRS-R raw scores and the duration of hospitalization, $r = 0.413$, $p = 0.007$.

Factors Associated with Duration of Inpatient Treatment

Hierarchical multiple linear regression analysis was conducted to identify factors associated with the duration of inpatient treatment. Diagnostic group and the number of comorbid psychiatric diagnoses were entered in the first step, indication for hospitalization in the second step, and admission CDRS-R raw score in the third step. Due to missing data, the analysis was conducted with 43 participants.

The first model, which included the diagnostic groups and number of comorbid psychiatric diagnoses, did not significantly predict the duration of inpatient treatment, $F(2,40) = 0.76$, $p = 0.476$, $R^2 = 0.036$. After indication for hospitalization was included in the model in the second step, the total explained variance increased to 10.4%; however, this increase was not statistically significant, $\Delta R^2 = 0.068$, $p = 0.094$. In contrast, the inclusion of admission CDRS-R raw scores in the third step made a significant contribution to the model, $\Delta R^2 = 0.181$, $p = 0.004$. The final model explained statistically significant variance of 28.6% in the duration of inpatient treatment, $F(4,38) = 3.80$, $p = 0.011$, $R^2 = 0.286$.

In the final model, admission CDRS-R raw scores were positively associated with the duration of inpatient treatment, $B = 0.205$, standard error (SE) $= 0.066$, 95% confidence interval (CI) (0.07, 0.34), $\beta = 0.429$, $p = 0.004$. Indication for hospitalization was also significantly associated with the duration of inpatient treatment, B

$= -6.98$, SE $= 3.16$, 95% CI (-13.37, -0.59), $\beta = -0.492$, $p = 0.033$. Since the indication for hospitalization was coded as 0 = weight loss/medical instability and 1 = suicidality/treatment non-adherence, the negative B coefficient indicated that hospitalization due to suicidality and/or non-adherence to treatment was associated with a shorter duration of inpatient treatment than hospitalization due to weight loss and/or medical instability. No evidence of problematic multicollinearity was observed in the final regression model, with variance inflation factor values ranging from 1.015 to 2.768.

Based on the final model R^2 of .286, the observed effect size was Cohen's $f^2 = 0.40$. With 43 participants, four predictors, and $\alpha = 0.05$, the post-hoc power analysis indicated adequate power to detect the observed large overall model effect. However, sensitivity analysis showed that the available sample size provided 80% power only for relatively large effects, indicating that smaller but clinically meaningful associations may not have been detected.

The results of the hierarchical regression analysis are summarized in Table 3.

DISCUSSION

The present study characterized a clinically severe and heterogeneous sample of female adolescents with eating disorders admitted to a child and adolescent psychiatry inpatient unit. Patterns of clinical complexity differed across diagnostic presentations. Patients with AN showed greater nutritional and medical compromise, including lower pre-admission BMIs, higher rates of menstrual irregularity and medical comorbidities, and a greater need for nutritional support. In contrast, the heterogeneous non-AN group showed a greater burden of psychiatric comorbidity and higher rates of smoking, alcohol use, NSSI, and previous suicide attempts. Despite these differences, the groups did not differ significantly in terms of admission CDRS-R scores or duration of inpatient treatment. In the exploratory regression model, duration of inpatient treatment was associated with severity of depressive symptoms at admission and indication for hospitalization, but not with diagnostic group or number of comorbid psychiatric diagnoses.

The contrast between the groups may reflect both differences in diagnostic phenotypes and diagnosis-specific pathways leading to psychiatric hospitalization. In AN, low body weight, recent weight loss, nutritional compromise, and physiological abnormalities may make the need for hospitalization more apparent.

Table 3. Hierarchical regression analysis of factors associated with duration of inpatient treatment								
Model/variable	R ²	ΔR ²	F	B	SE	95% CI	β	p-value
Model 1	0.036	0.036	F(2,40)=0.76					0.476
Diagnostic group				-0.88	2.69	(-6.32, 4.57)	-0.063	0.745
Number of comorbid psychiatric diagnoses				-1.10	1.44	(-4.00, 1.81)	-0.147	0.450
Model 2	0.104	0.068	F(3,39)=1.51					0.226
Diagnostic group				3.11	3.51	(-3.98, 10.20)	0.222	0.381
Number of comorbid psychiatric diagnoses				-0.58	1.43	(-3.49, 2.32)	-0.078	0.686
Indication for hospitalization				-5.96	3.47	(-12.98, 1.05)	-0.421	0.094
Model 3	0.286	0.181	F(4,38)=3.80					0.011
Diagnostic group				4.19	3.19	(-2.27, 10.65)	0.300	0.197
Number of comorbid psychiatric diagnoses				-0.53	1.30	(-3.16, 2.10)	-0.071	0.685
Indication for hospitalization				-6.98	3.16	(-13.37, -0.59)	-0.492	0.033
Admission CDRS-R raw score				0.205	0.066	(0.07, 0.34)	0.429	0.004
The dependent variable was the duration of the hospitalization. The analysis was conducted with 43 participants. Diagnostic group and number of comorbid psychiatric diagnoses were entered in Model 1; hospitalization indication was added in Model 2; and admission CDRS-R raw score was added in Model 3. Diagnostic group was coded as 1= AN and 2= non-AN eating disorder. Hospitalization indication was coded as 0= weight loss/medical instability and 1= suicidality/treatment non-adherence. In Model 2, the addition of hospitalization indication resulted in a non-significant increase in explained variance, ΔR ² =0.068, p=0.094. In Model 3, the addition of admission CDRS-R raw score resulted in a significant increase in explained variance, ΔR ² =0.181, p=0.004. According to the direction of coding, hospitalization due to suicidality and/or treatment non-adherence was associated with a shorter inpatient treatment duration compared with hospitalization due to weight loss and/or medical instability. AN: Anorexia nervosa, CDRS-R: Children's depression rating scale-revised, SE: Standard error, CI: Confidence interval								

Adolescents with non-AN eating disorders, however, may not be underweight and may be hospitalized primarily for indications such as severe depression NSSI, suicide attempts, alcohol or cigarette use, behavioral dysregulation, or non-adherence to treatment. The non-AN inpatient group may therefore represent a particularly high-risk inpatient subgroup rather than the broader population of adolescents with non-AN eating disorders.

Consistent with this interpretation, the non-AN group had higher rates of major depressive disorder, ADHD, borderline personality traits, NSSI, and previous suicide attempts. Previous research has similarly linked ADHD and borderline personality pathology to bulimic and binge-eating presentations⁽²⁰⁻²²⁾. However, since the study did not include a comparison group of psychiatric inpatients without an eating disorder, the additional contribution of eating disorder pathology to the need for inpatient treatment could not be determined.

Eating disorders are not clinically homogeneous, and transitions between diagnostic categories may occur over time⁽²³⁾. Although previous studies have examined shared and diagnosis-specific clinical patterns, their findings have not yielded a consistent account of transdiagnostic similarities and differences^(24,25). OSFED represents the most frequently reported diagnostic group of eating disorders in children and adolescents, also evidenced

by recent data from Türkiye^(5,26). Consistent with these reports, OSFED/UFED accounted for most of the non-AN group in the present study (16/23, 69.6%). However, combining BN, BED, and OSFED/UFED into a single group may have concealed clinically relevant differences among these diagnostic groups.

The findings have implications for assessment in general psychiatric settings. Symptoms of eating disorders may be overlooked when adolescents present with depression, anxiety, self-harm, or other psychiatric concerns, particularly in the absence of marked weight loss. Pehlivanurk-Kizilkan et al.⁽²⁷⁾ found that approximately two-thirds of eating disorder cases among adolescent psychiatric inpatients were not identified during routine clinical interviews and were detected only through systematic screening. Clinicians should therefore assess restrictive eating, binge eating, compensatory behaviors, body-image concerns, and recent weight changes regardless of BMI or presenting complaint.

Duration of inpatient treatment did not differ significantly between the AN and non-AN groups, but this finding should not be interpreted as evidence of equivalent treatment needs. In AN, inpatient care may focus primarily on nutritional rehabilitation, weight restoration, monitoring for refeeding-related complications, and physiological stabilization. In non-AN presentations, greater attention

maybe required for NSSI, suicidality, psychiatric comorbidity, behavioral dysregulation, treatment engagement, and planning of safe discharge. Similar periods of inpatient treatment may therefore reflect different forms of clinical complexity rather than comparable treatment content or resource use.

In the final regression model, the duration of hospitalization for suicidality and/or non-adherence to treatment was approximately seven days shorter than that for weight loss and/or medical instability. One possible explanation is that admissions for nutritional compromise or medical instability may require a longer period of time for physiological stabilization and nutritional rehabilitation, whereas some admissions for the management of acute psychiatric risk may focus on crisis containment, safety planning, and transition to outpatient care. This result should nevertheless be considered exploratory. The CI was relatively wide, and clinically distinct indications were combined because of the limited sample size. In addition, indication of hospitalization was not statistically significant before admission CDRS-R score was entered into the model and became significant only in the final step. The estimate may therefore have been influenced by overlap or suppression effects involving severity of depression and indication for admission, as well as instability arising from the modest sample size. Replication in larger samples using more specific hospitalization categories is needed.

Depressive symptom scores were lower at discharge than at admission, with similar levels of improvement in the AN and non-AN groups. This may reflect the combined effects of crisis stabilization, nutritional and psychiatric treatment, and the structured inpatient environment. However, without a comparison group, the improvement cannot be attributed directly to hospitalization or any specific intervention. Higher admission CDRS-R raw scores were associated with longer duration of inpatient treatment, possibly reflecting greater need for psychiatric stabilization among adolescents with more severe depressive symptoms. However, this association may also reflect unmeasured dimensions of clinical severity and therefore should not be interpreted causally.

Eating disorders manifesting firstly in childhood or adolescence may follow persistent or relapsing courses. A recent meta-analysis has reported that approximately 40% of eating disorders identified during adolescence persisted into early adulthood and that relapses occurred in approximately one-quarter of cases⁽²⁸⁾. Early recognition and timely treatment may reduce the duration of untreated illness and improve the likelihood of recovery⁽²⁹⁾.

Longitudinal and transdiagnostic research is needed to identify the clinical, psychiatric, and treatment-related factors associated with prognosis.

Several strengths of the study should be noted. It provides real-world data from a child and adolescent psychiatric inpatient setting in Türkiye, incorporates both medical and psychiatric dimensions of clinical severity, and examines an understudied population requiring intensive treatment. The availability of admission and discharge CDRS-R assessments allowed evaluation of within-admission changes in depressive symptoms. In addition, duration of inpatient treatment was examined using a model that incorporated diagnosis, psychiatric comorbidity, indication for hospitalization, and severity of depressive symptoms rather than relying solely on diagnostic comparisons.

Study Limitations

However, this study has several limitations. The retrospective, single-center design limited control over the completeness and consistency of routine clinical documentation and precluded causal inference. The sample included only female adolescents receiving psychiatric inpatient care, limiting generalizability of the results to male and gender-diverse adolescents, outpatients, and less severely affected clinical populations. Since each the BN, BED, OSFED, and UFED subgroups consisted of small number of patients, they were combined into a heterogeneous non-AN group. Although this strategy enabled us to conduct planned analyses, it may have obscured diagnosis-specific differences. The modest sample size also limited statistical power; therefore, non-significant findings should not be interpreted as evidence of equivalence. BMI-for-age Z-scores or percentiles and standardized measures of symptom severity of eating disorders were not available. Symptoms and risk-related characteristics may have been underdocumented or inconsistently recorded, and duration of inpatient treatment may have been influenced by bed availability, discharge procedures, family circumstances, and access to post-discharge care.

CONCLUSION

In conclusion, medical and psychiatric severity took different forms across eating disorder presentations in this inpatient sample. AN was more strongly associated with nutritional and medical compromise, whereas the non-AN group showed higher rates of psychiatric comorbidity, self-injury, previous suicide attempts, cigarette and alcohol use. Assessment and treatment planning should

therefore integrate nutritional status, medical stability, depressive symptoms, suicidality, self-injury, psychiatric comorbidity, and treatment engagement rather than relying primarily on diagnosis or body weight. Greater attention to non-AN presentations in psychiatric settings may facilitate earlier recognition and more appropriately tailored care for high-risk adolescents.

Ethics

Ethics Committee Approval: This study was conducted as a retrospective chart review. Ethical approval was obtained from the Dokuz Eylül University Non-Interventional Research Ethics Committee (approval number: 2026/08-01, dated: 23.02.2026).

Informed Consent: Retrospective study.

Declaration of AI Use: An AI-assisted tool was used only for English language editing. The authors reviewed and approved the final manuscript and are responsible for its content.

Footnotes

Author Contributions

Surgical and Medical Practices: E.S., M.T.Ö., S.A.G., H.B.B., R.O.Ç., Concept: E.S., S.A.G., H.B.B., R.O.Ç., Design: E.S., S.A.G., H.B.B., R.O.Ç., Data Collection or Processing: E.S., M.T.Ö., R.O.Ç., Analysis or Interpretation: E.S., M.T.Ö., R.O.Ç., Literature Search: E.S., R.O.Ç., Writing: E.S., S.A.G., H.B.B., R.O.Ç.

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