RESEARCH ARTICLE Turkish Journal of Psychiatry 2023;34(1):31–38
https://doi.org/10.5080/u27103

Eating Disorder-15: Factor Structure, Psychometric Properties, Validity, and Reliability of the Turkish Version for Clinical and Non-Clinical Samples

Hande ÖNGÜN YILMAZ[1], Aslıhan POLAT[2], Gizem KÖSE[3], Sibel BALCI[4], Ahmet Murat GÜNAL[5]

ABSTRACT

Objective: Eating Disorder-15 (ED-15) is a self-report scale recommended for use to evaluate weekly progress and treatment results in eating disorders. This research aims to examine the factor structure, psychometric properties, validity, and reliability of the Turkish version of ED-15 (ED-15-TR) for clinical and non-clinical samples.

Methods: Translation-back translation method was used for language equivalence of ED-15-TR. The research was conducted with a total of 1049 volunteers, with two sample groups as non-clinical (n=978) and clinical (n=71). The participants completed an information form, ED-15-TR, Eating Disorder Examination Scale (EDE-Q), and Beck Depression Inventory (BDI). Three hundred fifty-two participants from the non-clinical group and 18 from the clinical group completed ED-15-TR again within a week.

Results: Factor analysis confirmed the two-factor structure of ED-15-TR. Cronbach's alpha value was 0.911 (0.773, and 0.904 for the two subscales respectively), the intraclass correlation coefficient for test-retest reliability was 0.943 in the clinical group (0.906, and 0.942 for the two subscales respectively); 0.777 (0.699, and 0.776 for the two subscales respectively) in the non-clinical group (for all p<0.001). The high level of a positive correlation between ED-15-TR and EDE-Q supported concurrent validity.

Conclusion: This research indicates that ED-15-TR is an acceptable, valid, and reliable self-report scale for Turkish society.

Keywords: Eating disorders, factor analysis, validity, reliability, scale

INTRODUCTION

Eating disorders (ED) are a group of psychiatric diseases with chronic progress that significantly affect physical and psychological health and have a poor prognosis. The normalization of eating behavior, its complications, and concomitant diagnoses are studied during the treatment process (Bachner-Melman et al. 2018, Öngün-Yılmaz 2019). Treatment approaches are to ensure individuals' achievement and maintenance of their optimal body weight, to stop food restriction or inappropriate compensatory behavior, and to follow up to prevent relapses after acute recovery (Öngün-Yılmaz 2019).

The lack of a clear definition and method to measure recovery in individuals with ED makes it difficult to measure recovery rates (Bachner-Melman et al. 2018). There is a movement towards the basis of measuring symptoms during a session while evaluating the treatment of psychiatric disorders (Tatham et al. 2015). There is evidence that sudden gains, defined as changes in symptomology between two consecutive treatment sessions, explain the rate of improvement in the treatment of psychiatric disorders (Aderka et al. 2012, Dalle-Grave et al. 2019). However, very few research has been done on the impact of immediate gains on treatment outcomes in ED. It has been reported that the main challenge researchers face while trying to assess immediate gains is the selection of

Received: 10.02.2022, **Accepted:** 24.05.2022, **Available Online Date:** 02.03.2023

[1]Assoc. Prof., [5]Assis. Prof., İstanbul Okan University, Department of Nutrition and Dietetics, İstanbul, [2]Prof., Kocaeli University Faculty of Medicine, Department of Psychiatry, Kocaeli, [3]Assis. Prof., Acıbadem Mehmet Ali Aydınlar University, Department of Nutrition and Dietetics, İstanbul, [4]Assis. Prof., Kocaeli University Faculty of Medicine, Department of Biostatistics and Medical Informatics, Kocaeli, Turkey.

e-mail: dythandeongun@gmail.com

an appropriate tool to assess weekly changes in individuals with ED (Cartwright et al. 2017, Cavallini and Spangler 2013, Dalle Grave et al. 2019, Utzinger et al. 2016).

Routine assessment of irregular eating symptoms during treatment provides clinicians and patients with evidence-based data on the process and outcome of treatment, so, it is important to evaluate the treatment of ED on a session-by-session basis (Rodrigues et al. 2019). There is a clear need for standard definition and self-report tools to assess the disease and recovery processes of eating disorders (Bachner-Melman et al. 2018).

The majority of the inventories developed to investigate ED (Fairburn and Beglin 1994, Fichter et al. 2015, Garner and Garfinkel 1979, Garner et al. 1982) and validated in Turkish (Ergüney-Okumuş and Sertel-Berk 2019, Öngün-Yılmaz 2020, Savaşır and Erol 1989, Yucel et al. 2011) have been used for the diagnosis of ED and are not designed to assess weekly changes. Most of the existing self-report scales are long and take time to apply, so they are not practical for session-based assessments (Tatham et al. 2015).

There are three scales that are known to have been developed to date to evaluate changes in eating disorder symptoms on a session-by-session basis and have not yet been adapted into Turkish. (Dalle Grave et al. 2019, Spangler 2010, Tatham et al. 2015). Eating Disorder-15 Scale (ED-15), one of these scales, is a short, reliable, and valid self-report scale developed by Tatham et al. (2015) to evaluate weekly changes in eating disorder symptoms. It is designed to assess eating attitudes and irregular eating behaviors in the last one-week period. It has the potential to inform clinicians about cognitive and behavioral symptom changes associated with eating. Although it is not recommended as an alternative to current pre-, and post-treatment scales, it is recommended as a complementary tool for measuring the effect of treatment on a session basis for ED (Tatham et al. 2015).

There is a lack of a valid and reliable measurement tools to be used to evaluate weekly changes in eating disorder symptoms in our country. This study aimed to introduce a new measurement tool by examining the factor structure and psychometric properties of the Turkish version of the ED-15 (ED-15-TR) by conducting a Turkish validity and reliability study for clinical and non-clinical samples. For this purpose, the research hypotheses are ED-15-TR factor structure of the scale to be similar to the factor structure of the original, ED-15-TR's internal consistency coefficient and test-retest reliability to be found high enough to be acceptable, there to be a positive correlation between ED-15-TR and Eating Disorders Examination-Questionnaire (EDE-Q), and Beck Depression Inventory (BDI), and lastly the ED-15-TR, EDE-Q and BDI scores of the individuals in the clinical sample who have been diagnosed with an ED to be found to be higher than those in the non-clinical sample who have not been diagnosed with an ED.

METHODS

Participants

A total of 1049 (637 females, 412 males) volunteer adults participated in the research. The research has two samples: a clinical sample that has been diagnosed with an ED and a non-clinical sample that has not been diagnosed with an ED. The non-clinical sample consisted of 978 volunteer adults (596 female, 382 male) participants, consisting of students and employees of Istanbul Okan University, who had not been diagnosed with an eating disorder according to the information they provided in their statements. The clinical sample consisted of 71 voluntary adult participants (41 female, 30 male) who applied to the Department of Psychiatry outpatient clinic of Kocaeli University Faculty of Medicine and were diagnosed with an eating disorder by a psychiatrist according to the criteria of the DSM-5.

Measures

The data of the research were collected with the information form developed by the researchers, the Eating Disorder-15 Scale (ED-15-TR), Eating Disorders Examination-Questionnaire (EDE-Q), and Beck Depression Inventory (BDI).

Information Form: The information form developed by the researchers following the literature consists of questions including age, gender, the status of being diagnosed with an eating disorder, weight, and height information.

Eating Disorder-15 Scale (ED-15-TR): ED-15, a valid and reliable scale developed as a complementary tool to measure the effect of treatment for eating disorders on a session-by-session basis, consists of 15 items that evaluate eating attitudes and disordered eating behaviors in the last week. Five more behavioral items reflecting the symptoms of eating psychopathology were added to the two attitude subscales consisting of ten items (binge eating, vomiting, laxative use, eating restriction, and excessive exercise). It includes two attitude subscales: "Weight and Shape Concerns" (items 2, 4, 5, 6, 9, and 10) and "Eating Concerns" (items 1, 3, 7, and 8). Scale items are positively scored between 0-6. For scoring, the scores obtained from the subscale items are summed and divided by the number of items. The overall attitude score is the average of the scores in all ten items. The height of the scores obtained from the scale reflects the severity of the symptoms. Internal consistency values were 0.938 for the "Weight and Shape Concerns" subscale and 0.802 for the "Eating Concerns" subscale (Tatham et al. 2015). The

internal consistency coefficients obtained in this study were 0.911, 0.904, and 0.773 for the total score, "Weight and Shape Concerns" and "Eating Concerns" sub-dimensions respectively in the entire sample, 0.943, 0.940, 0.817 for the clinical sample, and 0.903, 0.895, and 0.761 for the non-clinical sample, respectively.

Eating Disorders Examination-Questionnaire (EDE-Q): It is a self-report scale consisting of 28 items that evaluate the main characteristics of eating psychopathology in the last 28 days (Fairburn and Beglin 1994), being adapted into Turkish by Yücel et al. (2011). EDE-Q includes four subscales that reflect the severity of the psychopathology such as restriction and concerns about eating, body shape, and weight. For subscale scores, relevant items are averaged; and for the total score, the scores of the subscales are averaged (Fairburn and Beglin 1994, Yücel et al. 2011). In the Turkish adaptation study conducted by Yücel et al. (2011), the Cronbach's alpha coefficient of the EDE-Q was reported as 0.93. The internal consistency coefficients obtained in this study were 0.919 for the entire sample, 0.937 for the clinical sample, and 0.913 for the non-clinical sample.

Beck Depression Inventory (BDI): It is a self-report scale designed to include the symptoms seen in depression (Beck et al. 1961). Adapted into Turkish by Hisli (1989). A score of 17 and above on the scale consisting of 21 symptom categories suggests that the individual is at risk of depression. The higher the total score the higher the severity of depression. In the Turkish adaptation study conducted by Hisli (1989), Cronbach's alpha coefficient of BDI was reported as 0.80. The internal consistency coefficients obtained in this study were 0.895 for the entire sample, 0.895 for the clinical sample, and 0.890 for the non-clinical sample.

Procedure

The necessary permission was obtained from the owner of the scale via e-mail to test the validity and reliability by translating the ED-15 into Turkish. In the first phase, language equivalence was studied. ED-15 was translated into Turkish by two independent translators and then combined by two academics who have a good command of English to reach a final tool agreed upon. The combined advanced translation was then back-translated into English, compared with the English original, and feedback from the developer of the original scale was received via e-mail. The Turkish scale was amended in line with the feedback of the scale owner. The final Turkish version and original form of ED-15 were evaluated by 12 experts in nutrition and dietetics, and psychiatry in terms of the appropriateness of the translation. In line with experts' feedback, the final version of the ED-15-TR was created.

Ethical approval was obtained from the Ethics Committee of Istanbul Okan University (Date: 11.12.2019, Number: 116/12) under the Helsinki Declaration. Permission was obtained from the Administrative Board (Date: 04.11.2020, Number: 40/6) of Istanbul Okan University, where the research was conducted. The research was conducted with adults who volunteered to participate in the research following the approval of the ethics committee and the permission of the institution. The researchers shared the web page of the questionnaire by calling the university students and employees who made up the non-clinical sample via the e-mail system to fill in the questionnaire prepared on an online questionnaire portal. To facilitate the repetition of the questionnaire after one week for the test-retest analysis, the participants were asked to share their e-mail addresses. The responding individuals were contacted again by e-mail one week after the first application, and 352 people filled out the ED-15-TR again.

The individuals who made up the clinical sample completed the data collection tools under the supervision of the researchers. Eighteen people from the clinical sample refilled ED-15-TR for test-retest analysis one week after the first administration.

Statistical Analyses

Statistical analysis was performed with IBM SPSS 20.0 (IBM Corp., Armonk, NY, USA) and MedCalc 14 programs. To determine the suitability of the scale for factor analysis, the Kaiser-Meyer-Olkin (KMO) coefficient was calculated and the Bartlett Sphericity Test was performed. The validity of the scale was examined by exploratory factor analysis (EFA). Receiver Operating Characteristic (ROC) analysis was used to determine the cutoff points. In the reliability analysis, Cronbach's Alpha (α) reliability coefficient was calculated for internal consistency, and intraclass correlation coefficients (ICCs) were calculated for reliability analysis with test-retest. Conformity to normal distribution was examined by the Kolmogorov-Smirnov test. Since the assumption of normal distribution was not provided, the variables were given as median (25th-75th percentile). Mann-Whitney U test was used to determine the differences between the groups and Spearman correlation analysis was used to determine the relationships between the variables. All statistical analyzes were performed with 5% significance and $p<0.05$ was considered sufficient for statistical significance.

RESULTS

A total of 978 adult participants with an average age of 26.87±10.37, an average body mass index (BMI) of 23.24±4.17 kg/m^2, 596 of whom were women (60.9%)

Table 1. Factor structure of the ED-15-TR (n=1049)		
Item	**Factor 1 Weight and shape concerns**	**Factor 2 Eating concerns**
ED 1	0.272	0.757
ED 2	0.828	0.188
ED 3	0.183	0.742
ED 4	0.701	0.481
ED 5	0.770	0.356
ED 6	0.576	0.622
ED 7	0.243	0.725
ED 8	0.271	0.646
ED 9	0.603	0.588
ED 10	0.822	0.211
Explained variance (%)	33.81	32.37

Total explained variance (%) 66.18
KMO=0.923; Bartlett 5973.30 (p<0.001)

and 382 of whom were men (39.1%) took part in the non-clinical sample of the study. The clinical sample consisted of 71 adult participants with an average age of 27.63±10.64, and an average BMI of 25.79±6.23 kg/m^2, 41 of whom were women (57.7%) and 30 of whom were men (42.3%). Thirteen of the participants constituting the clinical sample (18.3%) were diagnosed with anorexia nervosa, 12 (16.9%) were diagnosed with bulimia nervosa, 16 (22.5%) were diagnosed with binge eating disorder, and 30 (42.3%) were diagnosed with night eating syndrome. Since the Kaiser-Meyer-Olkin (KMO) value was found to be 0.923 and the Bartlett Sphericity Test statistic was significant (χ^2 = 5973.30; p<0.001), it was concluded that the scale was suitable for factor analysis (Table 1).

Validity

Exploratory factor analysis (EFA)

According to the results of the exploratory factor analysis (EFA), which was used to determine the construct validity of the scale, it was determined that the items of the ED-15-TR were collected in 2 dimensions. Factor 1 (Weight and shape concerns) consists of 6 items with factor loads between 0.576-0.828. The ratio of factor 1 to explain the total variance is 33.81%. Factor 2 (Eating concerns) consists of 4 items with factor loads between 0.646- 0.757. The ratio of factor 2 to explain the total variance is 32.37%. Together, the ED-15-TR sub-dimensions explained 66.18% of the total variance (Table 1).

Concurrent Validity

Correlation analysis of ED-15-TR and EDE-Q scores, which were applied to determine their concurrent validity, is given in Table 2. A moderate and high positive correlation was found between ED-15-TR subscales and EDE-Q subscales and the total score for CS, NCS, and the entire sample (all p<0.001). A moderate positive correlation was found between BDI and ED-15-TR subscales (all p<0.001).

Discriminant Validity

Cutoff points were determined for the diagnosis of ED in ED-15-TR using Receiver Operating Characteristic (ROC) analysis. The cutoff point for ED-15-TR was 2.5, the sensitivity value was 38.0 (95% CI: 26.8-50.3), and the specificity value was 87.4 (95% CI: 85.2-89.4). For the "Weight and Shape Concerns" sub-dimension, the cutoff point was 1.67, the sensitivity value was 47.89 (95% CI: 35.9-60.1), and the specificity value was 78.12 (95% CI: 75.4-80.7). For the "Eating Concerns" sub-dimension of the scale, the cutoff point was 2.25, the sensitivity value was

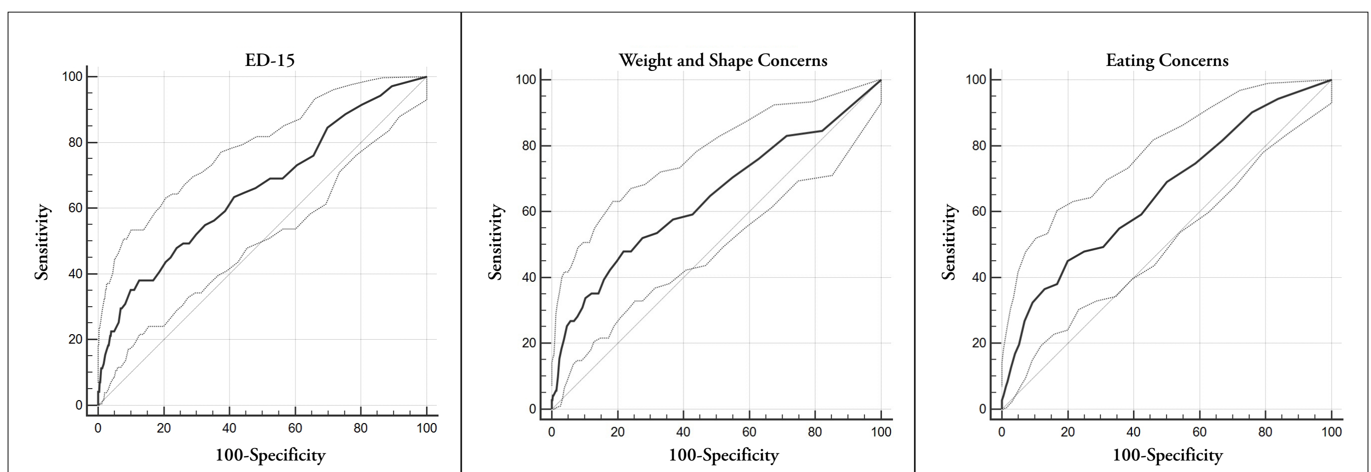

Figure 1. ROC curves for the ED-15-TR and its subscales.

45.07 (95% CI: 33.2-57.3), and the specificity value was 80.06 (95% CI: 77.4-82.5).

As a result of the ROC analysis, the value of area under the curve (AUC) for ED-15-TR was calculated as 0.658 (p<0.001). The AUC values for the "Weight and Shape Concerns" and "Eating Concerns" sub-dimensions of the scale were 0.642 (p<0.001) and 0.655 (p<0.001), respectively (Figure 1).

Reliability

Internal Consistency

Cronbach's alpha values were calculated to determine internal consistency in the reliability analysis of ED-15-TR. The Cronbach's alpha coefficients calculated for the entire sample were found to be 0.911 for the ED-15-TR, 0.904 for the "Weight and Shape Concerns" sub-dimension, and 0.773 for the "Eating Concerns" sub-dimension.

The Cronbach's alpha coefficients calculated separately for the clinical and non-clinical samples were found to be 0.943 and 0.903 for the ED-15-TR, 0.940 and 0.895 for the "Weight and Shape Concerns" sub-dimension, and 0.817 and 0.761 for the "Eating Concerns" sub-dimension, respectively.

Test-Retest Reliability

The intraclass correlation coefficients (ICCs) calculated for the test-retest reliability of the ED-15-TR are given in Table 3. The ICCs values calculated for the entire sample were 0.795 for the ED-15-TR, 0.793 for the "Weight and Shape Concerns" sub-dimension, and 0.719 for the "Eating Concerns" sub-dimension (all p<0.001).

Table 2. Correlations between ED-15-TR, EDE-Q, and BDI

	Clinical Sample (n=71)			**Nonclinical Sample (n=978)**			**Total (n=1049)**		
	ED-15-TR			**ED-15-TR**			**ED-15-TR**		
Scale	**Weight and shape concerns**	**Eating concerns**	**Total**	**Weight and shape concerns**	**Eating concerns**	**Total**	**Weight and shape concerns**	**Eating concerns**	**Total**
ED-15-TR									
Weight and shape concerns	1.000	0.808*	0.964*	1.000	0.720*	0.933*	1.000	0.728*	0.936*
Eating concerns	0.808*	1.000	0.927*	0.720*	1.000	0.912*	0.728*	1.000	0.914*
EDE-Q									
Restraint	0.526*	0.657*	0.613*	0.570*	0.638*	0.649*	0.575*	0.646*	0.655*
Eating concern	0.596*	0.674*	0.660*	0.647*	0.670*	0.707*	0.647*	0.677*	0.709*
Weight concern	0.677*	0.597*	0.673*	0.734*	0.651*	0.749*	0.734*	0.652*	0.749*
Shape concern	0.735*	0.638*	0.725*	0.789*	0.682*	0.797*	0.788*	0.683*	0.796*
Global	0.723*	0.719*	0.757*	0.772*	0.731*	0.813*	0.771*	0.734*	0.812*
BDI									
Total score	0.439*	0.426*	0.440*	0.412*	0.358*	0.422*	0.424*	0.375*	0.435*

*p<0.001; Spearman's rho correlations
ED-15-TR: Eating Disorder-15; EDE-Q: Eating Disorders Examination-Questionnaire; BDI: Beck Depression Inventory

Table 3. Test-retest reliability analysis of the ED-15-TR

ED-15-TR	**Clinical Sample (n=18)**		**Nonclinical Sample (n=352)**		**Total (n=370)**	
	ICCs	**95% CI**	**ICCs**	**95% CI**	**ICCs**	**95% CI**
Weight and shape concerns	0.906*	0.767-0.964	0.776*	0.731-0.815	0.793*	0.751-0.828
Eating concerns	0.942*	0.853-0.978	0.699*	0.642-0.749	0.719*	0.666-0.765
Total	0.943*	0.855-0.978	0.777*	0.732-0.815	0.795*	0.755-0.830

*p<0.001, ICCs: Intra-class Correlation Coefficients, CI: Confidence Interval

Table 4. Comparison of ED-15 TR, EDE-Q, and BDI Scores Between Clinical and Non-Clinical Groups

	Clinical Sample (n=71)		Nonclinical Sample (n=978)		p
	Mean ± SD	Median (Q1-Q3)	Mean ± SD	Median (Q1-Q3)	
ED-15-TR attitudinal scales					
Weight and shape concerns	1.95 ± 1.70	1.50 (0.50-3.67)	1.08 ± 1.14	0.67 (0.17-1.50)	<0.001**
Eating concerns	2.18 ± 1.52	1.75 (0.75-3.50)	1.38 ± 1.18	1.13 (0.50-2.25)	<0.001**
Total Score	2.04 ± 1.56	1.60 (0.60-3.30)	1.19 ± 1.07	0.90 (0.40-1.80)	<0.001**
ED-15-TR behavioral items					
Bingeing (times)	1.28 ± 1.43	1.00 (0.00-2.00)	1.06 ± 1.47	0.00 (0.00-2.00)	0.022*
Vomiting (times)	0.87 ± 1.76	0.00 (0.00-1.00)	0.08 ± 0.43	0.00 (0.00-0.00)	0.022*
Using laxatives (days)	0.78 ± 1.65	0.00 (0.00-1.00)	0.14 ± 0.63	0.00 (0.00-0.00)	0.002*
Restricting or dieting (days)	2.42 ± 2.64	1.00 (0.00-5.00)	1.12 ± 1.72	0.00 (0.00-2.00)	0.477
Exercising hard (days)	1.59 ± 2.19	0.00 (0.00-3.00)	0.75 ± 1.49	0.00 (0.00-1.00)	0.014*
EDE-Q					
Restraint	1.77 ± 1.57	1.60 (0.40-2.80)	0.84 ± 1.07	0.60 (0.00-1.20)	<0.001**
Eating concern	1.33 ± 1.45	0.80 (0.20-2.20)	0.55 ± 0.80	0.20 (0.00-0.80)	<0.001**
Weight concern	1.99 ± 1.59	1.80 (0.60-3.00)	1.10 ± 1.17	0.80 (0.20-1.80)	<0.001**
Shape concern	2.10 ± 1.79	1.50 (0.63-3.75)	1.29 ± 1.34	0.88 (0.13-2.00)	<0.001**
Global	1.79 ± 1.45	1.26 (0.61-2.68)	0.95 ± 0.97	0.62 (0.18-1.45)	<0.001**
BDI					
Total score	17.27 ± 10.82	17.00 (9.00-23.00)	9.50 ± 8.41	8.00 (3.00-14.00)	<0.001**

**p<0.001; *p<0.05; Mann-Whitney U Test; Q1-Q3: 25th-75th percentile
ED-15-TR: Eating Disorder-15; EDE-Q: Eating Disorders Examination-Questionnaire; BDI: Beck Depression Inventory

ICCs values calculated separately for clinical and non-clinical samples were 0.943 and 0.777 for ED-15-TR, 0.906 and 0.776 for the "Weight and Shape Concerns" sub-dimension, and 0.942 and 0.699 for the "Eating Concerns" sub-dimension, respectively (all p<0.001).

Comparison of ED-15-TR, EDE-Q, and BDI Scores of Clinical and Non-Clinical Samples

Comparison of the scores of ED-15-TR and attitude scales and additional questions about behavior, scores of EDE-Q and subscales, and BDI scores for clinical and non-clinical samples are given in Table 4. The clinical sample's ED-15-TR and attitude scale scores, EDE-Q and subscales scores, and BDI scores were significantly higher than the non-clinical sample (all p<0.001).

DISCUSSION

Evaluation of sudden gains in the treatment of eating disorders provides evidence-based data on the progress of treatment. Therefore, a standard definition is needed to evaluate the disease and recovery processes in the treatment of individuals with eating disorders (Bachner-Melman et al. 2018; Rodrigues et al. 2019). ED-15, a short self-report scale developed to evaluate the progress and outcomes of the treatment of eating disorders on a session-by-session basis, has the potential to inform clinicians about the cognitive and behavioral symptom changes associated with eating. The ED-15 allows to evaluate eating attitudes and disordered eating behaviors in the last week and to measure sudden gains between two consecutive treatment sessions (Tatham et al. 2015). This research aimed to verify the factor structure of the ED-15 scale by translating it into Turkish and prove its validity and reliability for the Turkish population in two sample groups consisting of clinical and non-clinical adults. As a result of the research, data supporting the validity and reliability of ED-15-TR were obtained.

As a result of the EFA conducted for ED-15-TR, two attitude subscales, "Weight and Shape Concerns" and "Eating Concerns", were defined as in the original version, and all

items took place in the same subscale. The factor loads of item-6 gave close results for both subscales, and it was deemed appropriate to be in the original subscale. ED-15-TR, together with the subscales explained 66.178% of the total variance.

The fact that there was a high positive correlation between ED-15 and an existing validated inventory known to measure similar constructs, the EDE-Q (Yucel et al. 2011), shows that ED-15-TR has concurrent validity. Besides that, the moderate positive correlation between ED-15-TR and BDI is important in terms of supporting the presence of comorbid conditions accompanying ED.

Cutoff points were determined for ED-15-TR and its sub-dimensions using ROC analysis, and the area under the curve (AUC) was calculated. As a result of the ROC analysis, the area under the curve should be above 0.50, and the discriminating power increases as it gets closer to 1 (Kılıç 2013). The fact that the AUC value of the ED-15-TR, which was calculated as 0.658 ($p<0.001$), is close to 0.50 and the sensitivity values are low, shows that the discriminative validity of the scale is not sufficient and it is not suitable for diagnostic use.

To determine the level of internal consistency in the reliability analysis of the ED-15-TR, the Cronbach's alpha coefficients were calculated separately for the entire sample and clinical and non-clinical samples, as in previous studies (Tatham et al. 2015; Rodrigues et al. 2019), for ED-15-TR and its sub-dimensions showed they had a high degree of internal consistency. In test-retest reliability, intraclass correlation coefficients calculated separately for ED-15-TR and its sub-dimensions in the entire sample and clinical and non-clinical samples were found to be at an acceptable level. Since the scale evaluates the status for the last week, the test-retest measurements were repeated in one week so that changes over time did not affect the measurements. High test-retest reliability levels indicated the stability of ED-15-TR over time. The results of this research indicate that ED-15-TR has excellent internal consistency and is a reliable measurement tool.

When the ED-15-TR, EDE-Q, and BDI scores of clinical and non-clinical samples were compared, the clinical sample scores were statistically significantly higher (all $p<0.001$), similar to previous studies (Tatham et al. 2015; Rodrigues et al. 2019). ED-15-TR scores for additional behavioral items other than restricting or dieting were also higher in the clinical sample than the non-clinical sample (all $p<0.05$). These results are an important indicator of the appropriateness of using ED-15-TR in individuals with eating disorders.

The fact that the data is based on self-report and the low number of people in the clinical sample are important limitations of the study. Another limitation is the fact that no repeated weekly follow-ups were made with the individuals constituting the clinical sample since the study aimed to prove the validity and reliability of ED-15-TR for the Turkish population. Using ED-15-TR in the follow-up of the treatment of eating disorders, conducting studies that evaluate the treatment results weekly in future studies will be useful to test the sensitivity of the scale to change. The research is a pioneer for future studies to evaluate the course of eating disorders treatment. Despite its limitations, the presence of two sample groups, clinical and non-clinical, and the high total sample size are the strengths of the study. The ED-15-TR has high internal consistency and test-retest reliability. It also has positive psychometric properties related to concurrent validity and exploratory factor analysis was found to be compatible with the original scale.

According to the results of the research, it can be said that ED-15-TR is an acceptable, valid, and reliable self-report scale for Turkish society. This research is important in terms of introducing a new measurement tool that can be used in research on eating disorders to the Turkish literature.

REFERENCES

Aderka IM, Nickerson A, Boe HJ et al (2012) Sudden gains during psychological treatments of anxiety and depression: A meta-analysis. J Consult Clin Psychol 80: 93-101.

Bachner-Melman R, Lev-Ari L, Zohar AH et al (2018) Can recovery from an eating disorder be measured? Toward a standardized questionnaire. Front Psychol 9: 2456.

Beck AT, Ward CH, Mendelson M et al (1961) An inventory for measuring depression. Arch Gen Psychiatry 4: 561-71.

Cartwright A, Cheng YP, Schmidt U et al (2017) Sudden gains in the outpatient treatment of anorexia nervosa: A process-outcome study. Int J Eat Disord 50: 1162-71.

Dalle-Grave R, Sartirana M, Milanese C et al (2019) Validity and reliability of the Eating Problem Checklist. Eat Disord 27: 384-99.

Ergüney-Okumuş FE, Sertel-Berk HÖ (2019) Yeme Tutum Testi Kısa Formunun (YTT-26) Üniversite Örnekleminde Türkçeye Uyarlanması ve Psikometrik Özelliklerinin Değerlendirilmesi. Psikoloji Çalışmaları 40: 57-78.

Fairburn CG, Beglin SJ (1994) Assessment of eating disorders: Interview or self-report questionnaire? Int J Eat Disord 16: 363-70.

Fichter MM, Quadflieg N, Gierk B et al (2015) The Munich eating and feeding disorder questionnaire (Munich ED-quest) DSM-5/ICD-10: Validity, reliability, sensitivity to change and norms. Eur Eat Disord Rev 23 (Suppl. 3): 229-40.

Garner DM, Garfinkel PE (1979) The Eating Attitudes Test: An index of the symptoms of anorexia nervosa. Psychol Med 9 (Suppl. 2): 273-9.

Garner DM, Olmsted MP, Bohr Y et al (1982) The eating attitudes test: psychometric features and clinical correlates. Psychol Med 12: 871-8.

Hisli N (1989) Beck depresyon envanterinin üniversite öğrencileri icin geçerliliği, güvenilirliği. (A reliability and validity study of Beck Depression Inventory in a university student sample). J Psychol 7: 3-13.

Kılıç S (2013) ROC analysis in clinical decision making. Journal of Mood Disorders 3: 135-40.

Öngün Yılmaz H (2019) Yeme ve Beslenme Bozuklukları. Beslenme Obezite ve Toplum Sağlığı, 1st Edition, Ç Yaman, N Erenoğlu-Son (Eds), İstanbul, Güven Plus Grup A.Ş. Yayınları, p. 35-60.

Öngün Yılmaz H (2020) The Turkish Version of the Munich Eating and Feeding Disorder Questionnaire: factor structure, validity, and reliability. Anatolian Journal of Psychiatry 21 (Suppl. 2): 29-36.

Rodrigues T, Vaz AR, Silva C et al (2019) Eating Disorder-15 (ED-15): Factor structure, psychometric properties, and clinical validation. Eur Eat Disord Rev 27: 682-91.

Savaşır I, Erol N (1989) Eating attitude test: anorexia nervosa symptoms index. J Psychol 7 (Suppl. 23): 19-25.

Spangler DL (2010) The Change in Eating Disorder Symptoms scale: Scale development and psychometric properties. Eat Behav 11: 131-7.

Tatham M, Turner H, Mountford VA et al (2015) Development, psychometric properties and preliminary clinical validation of a brief, session-by-session measure of eating disorder cognitions and behaviors: The ED-15. Int J Eat Disord 48 : 1005-15.

Utzinger LM, Goldschmidt AB, Crosby RD et al (2016) Are sudden gains important in the treatment of eating disorders? Int J Eat Disord 49 : 32-5.

Yucel B, Polat A, Ikiz T et al (2011) The Turkish version of the eating disorder examination questionnaire: reliability and validity in adolescents. Eur Eat Disord Rev 19 (Suppl. 6): 509-11.