

The Turkish Version of the Munich Eating and Feeding Disorder Questionnaire: factor structure, validity, and reliability

Hande ÖNGÜN YILMAZ¹

ABSTRACT

Objective: This research aims to examine the factor structure, validity, and reliability of the Munich Eating and Feeding Disorder Questionnaire (Munich ED-Quest) in Turkish, which is a new detailed self-rating scale developed for the assessment of eating and feeding disorders. **Methods:** The English version of the Munich ED-Quest was translated into Turkish using the back-translation technique. Five hundred thirty-four (461 females, 73 males) students studying at the Faculty of Health Sciences in a Turkish university whose age average was 23.0 ± 3.0 years completed the Munich ED-Quest and the Eating Attitude Test (EAT). One hundred seventy-four of the participants completed the questionnaire again for the test-retest reliability within one week following the first conduct. **Results:** Factor analysis supported the three-factor structure of the Munich ED-Quest. The total Cronbach's alpha value was 0.940 (95% CI: 0.753-0.936 for the three subscales), and the test-retest reliability was 0.923 (95% CI: 0.755-0.906 for the three subscales) (all $p < 0.001$) for the present time. The positive directional moderate correlation amongst the total points of Munich ED-Quest and EAT points supports the concurrent validity. **Conclusion:** This research reveals that the Turkish version of Munich ED-Quest is an acceptable, valid, and reliable scale for the investigation of eating disorders among the young Turkish population. (*Anatolian Journal of Psychiatry* 2020; 21(Suppl.2): 29-36)

Keywords: eating disorders, factor structure, reliability, validity

Münih Yeme ve Beslenme Bozuklukları Anketinin Türkçe Sürümü: Faktör yapısı, geçerlilik ve güvenilirliği

ÖZ

Amaç: Bu araştırma, yeme ve beslenme bozukluklarının değerlendirilmesi için geliştirilen yeni bir detaylı öz değerlendirme ölçeği olan Münih Yeme ve Beslenme Bozuklukları Anketi'nin (Münih YB Anketi) Türkçe faktör yapısını, geçerliliğini ve güvenilirliğini incelemeyi amaçlamaktadır. **Yöntem:** Münih YB Anketinin İngilizce sürümü geri çeviri tekniği kullanılarak Türkçeye çevrildi. Türkiye'de bir üniversitenin Sağlık Bilimleri Fakültesi'nde öğrenim gören, yaş ortalaması 23.0 ± 3.0 yıl olan 534 katılımcı (461 kadın, 73 erkek) Münih YB Anketi'ni ve Yeme Tutum Testini (YTT) tamamladı. Test-tekrar test güvenilirliği için katılımcıların 174'ü ilk uygulamadan sonraki bir hafta içinde Münih YB Anketi'ni tekrar doldurdu. **Bulgular:** Faktör analizi Münih YB Anketinin üç faktörlü yapısını doğruladı. Şimdiki zaman için toplam Cronbach alfa değeri 0,940 (üç alt ölçek için %95 CI: 0.753-0.936) ve test-tekrar test güvenilirliği 0.923 (üç alt ölçek için %95 CI: 0.755-0.906) bulunmuştur (tümü için $p < 0.001$). Münih YB Anketinin toplam puanları ile YTT puanları arasındaki pozitif yönlü orta kuvvetli korelasyon eş zamanlı geçerliliği destekledi. **Tartışma:** Bu araştırma, Münih YB Anketinin Türkçe sürümünün, genç Türk popülasyonunda yeme bozukluklarının araştırılması için kabul edilebilir, geçerli ve güvenilir bir ölçek olduğunu göstermiştir. (*Anadolu Psikiyatri Derg* 2020; 21(Ek sayı.2): 29-36)

Anahtar sözcükler: Yeme bozuklukları, faktör yapısı, güvenilirlik, geçerlilik

¹ Assist. Prof., PhD, Department of Nutrition and Dietetics, Faculty of Health Sciences, İstanbul Okan University, İstanbul, Turkey
Correspondence address / Yazışma adresi:

Dr. Öğr. Üyesi Hande ÖNGÜN YILMAZ, İstanbul Okan Üniversitesi, Sağlık Bilimleri Fakültesi Beslenme ve Diyetetik Bölümü
Tepeören Mahallesi, 34959 Akfırat-Tuzla/İstanbul, Turkey
E-mail: hande.ongun@okan.edu.tr

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INTRODUCTION

Eating and feeding disorders and their precise definitions and diagnostic criteria have changed significantly over time. The Diagnostic and Statistical Manual of Mental Disorders (DSM-5), combines eating and feeding disorders assessed in two separate sections in previous versions and presents them in a single section. This was reported as an important change that led to the development of new scales in diagnostic criteria to assess the eating and feeding disorders seen in adolescents and/or adults.¹⁻³

Inventories have been developed aimed at investigating ED. The Eating Attitude Test (EAT),^{4,5} and the Eating Disorder Examination Questionnaire (EDE-Q)^{6,7} are the most commonly used in research. EAT focuses on the symptoms of anorexia nervosa,⁴ and the EDE-Q assesses the main properties of eating psychopathology over the last 28 days.⁸ In addition to EAT and the EDE-Q, the Eating Disorder Inventory (EDI)⁹ and the revised forms of EDI-2¹⁰ and EDI-3,¹¹ and the SCOFF Questionnaire (an acronym of Sick, Control, One stone, Fat, and Food)¹² are other inventories used for ED. Assessing diagnostic criteria is not the subject of any EDI version.⁹⁻¹¹ The SCOFF questionnaire, on the other hand, is a short screening scale based on self-reporting, which includes five questions about the existence of ED prior to clinical assessment.¹² Before the DSM-5 criteria were published, the Eating Disorder Diagnostic Scale (EDDS) was used to diagnose EDs. EDDS provides an overall severity rating with respect to EDs.^{13,14} However, it does not make a distinction with respect to specific symptoms such as bulimic attitudes.¹⁵

Although the existing inventories related to EDs cover symptoms rather well, they were reported not to be capable of considering the new developments regarding ED studies and definitions. The existing ED inventories did not fully meet the updated diagnosis criteria in DSM-5 because they were developed before its publication. Therefore, the existing inventories were reported to remain insufficient for assessment.¹

The Munich Eating and Feeding Disorder Questionnaire (Munich ED-Quest), which is based upon the changes in DSM-5 diagnosis criteria, includes all the items needed to evaluate the symptoms of eating and feeding disorders and other potential items that indicate the future developments. Therefore, the questionnaire includes a wider symptom spectrum in comparison

with other scales that measure ED attitudes. The questionnaire was developed to help identify the EDs described in DSM-IV, as well as EDs such as night eating syndrome, rumination disorder, and preventive/limiting food intake disorder included in DSM-5. It also includes additional attitudes and cognitive states of persons with EDs that are not specified in the diagnostic criteria such as characteristic anxieties and some obsessive-compulsive behaviors. Apart from the current state (last quarter), it also includes the worst case in the past. The scale measures eating and feeding disorders at two time periods. The first measurement is the last three months, the second is three months in the past after adolescence.¹

Munich ED-Quest is a scale that inclusively assesses the symptoms of ED in individuals aged between 12-65 years, it was developed in accordance with the DSM-5 and ICD-10 criteria, and recommended to be used in clinical and community studies. This study aims to analyze the factor structure of the Munich ED-Quest by conducting its validity and reliability study in Turkish, and bringing in a new measurement scale to the literature that can be used in studies made to determine risky situations in terms of eating and feeding disorders.

METHODS

Participants

Five hundred thirty-four (461 females, 73 males) students studying at the Faculty of Health Sciences in a Turkish university participated in the research. The students were selected using the simple random sampling method and invited to participate voluntarily. The criteria to be included in the research were determined as not having a known mental or physical illness that required treatment.

Test-retest method was used to analyze the reliability coefficients. The questionnaire was administered to the 174 participants again within a week following the first conduct.

Measures

The participants completed the Munich ED-Quest and EAT questionnaires to evaluate the validity and reliability of the Munich ED-Quest questionnaire.

The original version of the Munich ED-Quest is a scale that extensively assesses ED symptoms in individuals aged between 12 and 65 years.¹ The

original version, the use of which was found to be suitable for clinical and community research, was developed based on the DSM-5 and ICD-10 criteria and published in German and English.

Munich ED-Quest, which covers a wide variety of symptoms related to EDs and enables evaluation of the symptoms for the past and the present consists of 65 items. These items are divided into a couple of subitems. For most items, the results are coded on a five-point scale from 0 (no symptom) to 4 (symptoms are serious/frequently present). Additional questions ask about binge eating and inappropriate compensatory behaviors. The questionnaire enables the diagnosis of anorexia nervosa, bulimia nervosa, binge eating syndrome and night eating syndrome and their subtypes in accordance with DSM-5 criteria.¹

Munich ED-Quest makes measurements at two different times; the assessment of the symptoms in the last three months (current) prior to the assessment and the worst case in the past. Three subscales were determined in the factor analysis of the original version as 'preoccupation with figure and weight,' 'bingeing and vomiting,' and 'inappropriate compensatory behavior.' The same subscales are used for the current and past situations and the total score is obtained from the items of the three subscales. High scores reflect more severe symptoms.¹

EAT,⁴ which was used for concurrent validity, is a scale that was originally developed as a self-assessment tool composed of 40 questions to objectively measure the symptoms of anorexia nervosa and bulimia nervosa. EAT was adapted to Turkish by Savaşır and Erol⁵ and the validity and reliability study has been conducted.

Procedure

Ethical approval (Dated:16.04.2018, No:93) was attained from the Ethics Committee of İstanbul Okan University in compliance with the Helsinki Declaration. Approval was attained from the Administrative Committee of the University to conduct the research.

The necessary permission was obtained from the owner of the questionnaire via e-mail to translate Munich ED-Quest into Turkish and to test its reliability. For the translation of Munich ED-Quest into Turkish, the first step was to study the language equivalence. Initially, the Munich ED-Quest was translated into Turkish by two independent translators who were fluent in German and English, these translations were merged by an academic with full command of English and it was turned into the agreed-on

translation. The combined advanced translation was translated back into English by a translator who has native fluency in Turkish and English. The questionnaire was translated back into English and compared with its English original, a discussion was made on its Turkish version, and the necessary corrections were made on the Turkish questionnaire. The final Turkish version of Munich ED-Quest and its original form were assessed by nine experts in nutrition and dietetics, and psychology for the accuracy of the translation. The Turkish version of Munich ED-Quest was finalized in line with the opinions of the experts.

Students were invited to complete the Turkish version of the Munich ED-Quest and EAT on a voluntary basis. The questionnaires were completed by the participants under the supervision of the researcher. The participants who accepted to determine the assessment protocols with a code to facilitate the repetition of the questionnaire for test-retest analysis within one week, completed the Turkish version of Munich ED-Quest one week after the first conduct of the questionnaire.

Statistical analysis

Kaiser-Maier-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were performed to see if the scale was suitable for factor analysis.¹⁶ Exploratory factor analysis (EFA) was used for the questions answered concerning the current status of the scale to determine the construct validity of the scale. The factor structure determined with EFA was examined using confirmatory factor analysis (CFA). To examine CFA, Chi-square goodness (χ^2 /sd), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), comparative fit index (CFI), root mean square error (RMSE), and root mean square error of approximation (RMSEA) were used.¹⁷

Cronbach's alpha coefficient was calculated to investigate the internal consistency. Test-retest reliability was determined by calculating the intraclass correlation coefficients (ICCs). The concurrent validity and the correlation between the current and past status mean scores were analyzed using Pearson's correlations (r) analysis. The characteristics of the sample and mean scores were determined using descriptive statistics.

Statistical analysis of the data was made using the IBM® SPSS® Statistics 23 program and the confidence level was 95%. For CFA, the IBM®

Table 1. Factor structure and reliability analysis of the Turkish Version of Munich ED-Quest (n=534)

Item	Factor loading	Item removed Cronbach's alpha	Total Cronbach's alpha	Explained variance ratio
Factor 1. Bingeing and vomiting			0.936	22.445
12a	0.695	0.933		
12b	0.708	0.933		
13	0.743	0.932		
14	0.731	0.932		
15	0.750	0.933		
16	0.652	0.933		
17a	0.640	0.933		
18	0.593	0.935		
19a	0.672	0.934		
20	0.498	0.936		
21	0.619	0.933		
22	0.469	0.935		
23	0.434	0.935		
24	0.658	0.932		
25	0.582	0.933		
27	0.534	0.934		
28	0.623	0.933		
29	0.586	0.933		
30	0.616	0.932		
37	0.543	0.934		
38	0.513	0.933		
39	0.506	0.933		
40	0.477	0.934		
47	0.578	0.934		
50	0.551	0.934		
Factor 2. Preoccupation with figure and weight			0.896	13.342
03	0.773	0.878		
04	0.802	0.881		
05	0.601	0.889		
06	0.784	0.883		
07	0.741	0.888		
09	0.737	0.877		
10	0.700	0.881		
48	0.514	0.897		
49	0.631	0.886		
59a	0.446	0.899		
Factor 3. Inappropriate compensatory behavior			0.753	9.282
52a	0.389	0.756		
53a	0.631	0.722		
54a	0.824	0.713		
55a	0.688	0.705		
56a	0.632	0.728		
60a	0.583	0.734		
61a	0.815	0.716		
64	0.478	0.744		
65	0.400	0.762		

KMO=0.924; $\chi^2=16576.68$, $p<0.05$

Total Cronbach's alpha=0.940; Total explained variance=45.070%

SPSS® Amos™ 21.0 program was used.

RESULTS

Five hundred thirty-four (461 females, 73 males) students studying at the Faculty of Health Sci-

ences in a Turkish university whose age average was 23.0 ± 3.0 years, and average BMI was 21.8 ± 3.4 kg/m² participated in the research. According to the analysis, the KMO value was >0.50 and Bartlett χ^2 test was significant ($p < 0.05$). Accordingly, the scale was found suitable for factor analysis (Table 1).

Exploratory factor analysis (EFA)

Table 1 presents an overview of EFA and reliability analysis for the Turkish version of Munich ED-Quest. According to EFA results, it was determined that the items of the scale were grouped in three dimensions. Items 2, 11, 26, 31, 32, 33, 34, 35, 36, 45, 46, 51, 57, and 58 were remove because they were not included in any dimension at the end of the analysis.

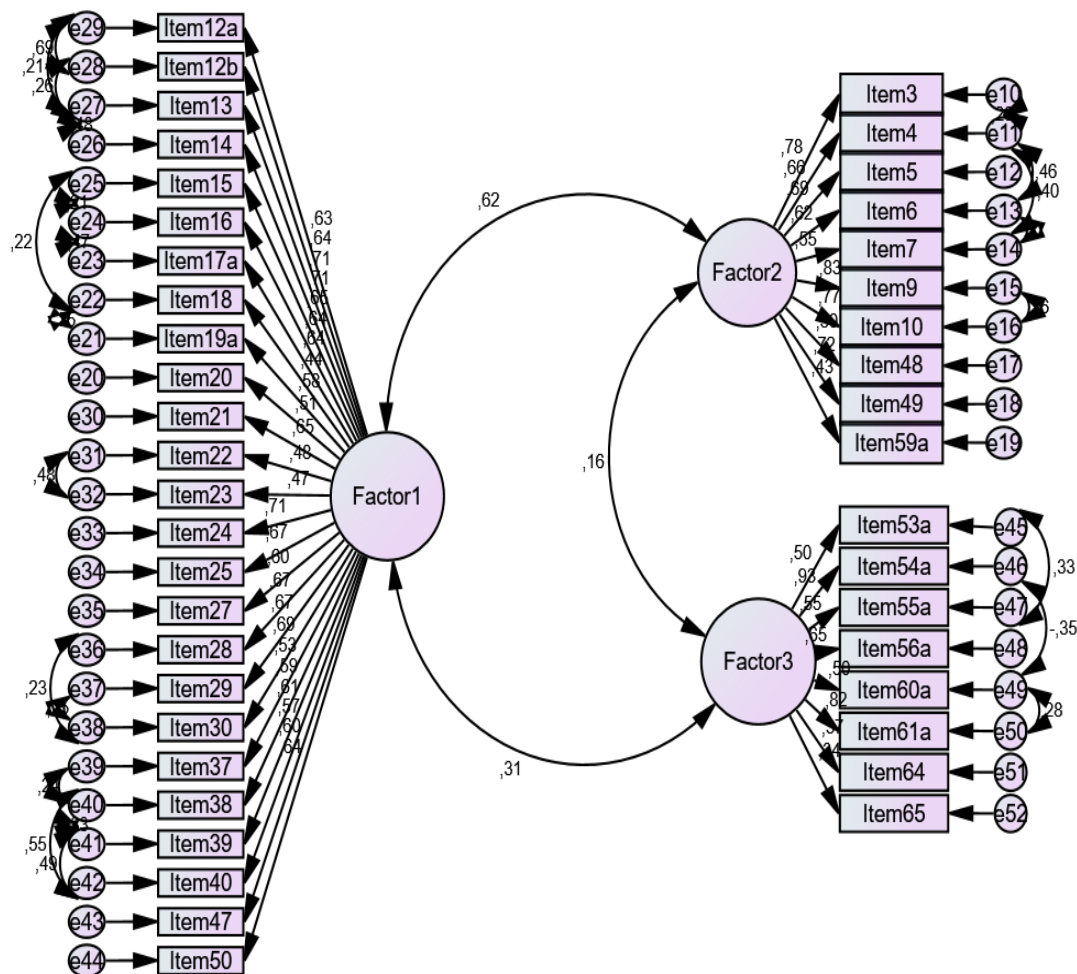


Figure 1. Path diagram of the confirmatory factor analysis of the Turkish Version of Munich ED-Quest

Factor 1 (bingeing and vomiting) is composed of 25 items, the factor loads of which varied between 0.750-0.434. Factor 2 (preoccupation with figure and weight) is composed of 10 items, the factor loads of which varied between 0.802-0.446. Factor 3 (inappropriate compensatory behavior) is composed of 9 items, its factor loads varied between 0.824-0.389. The total variance explanation ratio of Factor 1 was 22.445%, Factor 2 was 13.342%, and Factor 3 was 9.282%.

The subscales of the Turkish version of Munich ED-Quest explained 45.070% of the total variance.

For Factor 1 Cronbach's alpha value is found as 0.936, 0.896 for Factor 2, 0.753 for Factor 3, and 0.940 for the total (Table 1).

Confirmatory factor analysis (CFA)

According to the result of CFA performed for

verifying the factor structure obtained with EFA, the Turkish version of the Munich ED-Quest provided χ^2/sd (2.965), RMSE (0.067), RMSEA (0.061), and AGFI (0.804) indices with full compliance, and it was partly compatible with GFI (0.854) and CFI (0.889) indices. The path diagram of the CFA of the Turkish Version of Munich ED-Quest is given in Figure 1.

Test-retest reliability

ICCs were calculated for test-retest reliability of

Table 2. Test-retest reliability analysis of the Turkish Version of Munich ED-Quest (n=174)

Factor	ICCs	p
Factor 1	0.902	<0.001
Factor 2	0.906	<0.001
Factor 3	0.755	<0.001
Total score	0.923	<0.001
Factor 1 (past)	0.897	<0.001
Factor 2 (past)	0.925	<0.001
Factor 3 (past)	0.845	<0.001
Total Score (past)	0.930	<0.001

ICCs: Intra-class coefficients

mean scores (Table 2). It was found as 0.902 and 0.897 (past) for Factor 1, 0.906 and 0.925 (past) for Factor 2, 0.755 and 0.845 (past) for Factor 3, and the total score of the Turkish version of Munich ED-Quest was found as 0.923 and 0.930 (past).

Mean scores

The mean score of Factor 1 was 19.45±16.99 and 19.50±17.18 (past), the mean score of Factor 2 was 10.12±8.63 and 9.34±8.46 (past), and the mean score of Factor 3 was 0.37±1.56 and 0.30±1.39. The total mean score of the scale was 29.94±23.40 and 28.88±23.72 (past). Total mean score of EAT was found as 17.91±11.30, and it was determined that 72.5% (n=387) of the participants had low risk, 17.4% (n=93) had moderate risk, and 10.1% (n=54) had high risk in terms of eating attitudes.

A positive and strong correlation was found between the total scores of the current and past status of Factor 1 and of Factor 2. A positive and very strong correlation was found between the current and past status scores of Factor 3, and the total scores of the current and past status scores of the Turkish version of Munich ED-Quest (Table 3).

Table 3. Pearson's correlations between Turkish versions of Munich ED-Quest and EAT (n=534)

Factor	Factor 1	Factor 2	Factor 3	Total score	Factor 1 (past)	Factor 2 (past)	Factor 3 (past)	Total score (past)	EAT
Factor 1	1	0.531*	0.380*	0.947*	0.840*	0.479*	0.326*	0.791*	0.380*
Factor 2		1	0.223*	0.769*	0.530*	0.779*	0.194*	0.668*	0.398*
Factor 3			1	0.425*	0.356*	0.246*	0.834*	0.396*	0.176*
Total score				1	0.829*	0.651*	0.364*	0.846*	0.435*
Factor 1 (past)					1	0.601*	0.355*	0.955*	0.383*
Factor 2 (past)						1	0.247*	0.800*	0.326*
Factor 3 (past)							1	0.403*	0.176*
Total score (past)								1	0.401*
EAT									1

*: $p < 0.001$, Pearson's correlations; EAT: Eating Attitude Test

Concurrent validity

For determining the concurrent validity of the Turkish version of Munich ED-Quest, the mean scores were correlated with the scores of EAT (Table 3). A positive and moderate correlation was found between the scores of current and past status of Factor 1, and the scores of current and the past status scores of Factor 2 and EAT. A positive and weak correlation was found between the scores of current and past status of

Factor 3 and EAT. A positive and moderate correlation was found between the total scores of current and past status of the Turkish version of Munich ED-Quest and EAT (all $p < 0.01$).

DISCUSSION

The aim of this study was to prove the validity and reliability of the Turkish version of Munich ED-Quest for the young Turkish population by

verifying its factor structure. This is the first study to test the validity and reliability of the original version of the Munich ED-Quest by adapting it to another language. Also, in this study, the concurrent validity of the Turkish version of Munich ED-Quest was tested with EAT.

The original version of the Munich ED-Quest was drawn up with the intent of developing a scale to measure the symptoms of eating and feeding disorders basing on DSM-5 criteria, which merge eating and feeding disorders.¹ Compared with other scales related to EDs, Munich ED-Quest includes a wider symptom, syndrome, and diagnosis range in adolescence and adulthood.^{1,4,6,9-11,13,14}

The original version of Munich ED-Quest defines an importance level composed of total score, sub-factors, and items.¹ According to the EFA performed for the Turkish version of Munich ED-Quest, three sub-factors were identified as in the original version. The CFA result of the scale confirms the three-dimensional structure in the original version. However, not all of the compatibility indices used for CFA yielded the expected results. According to the CFA result; while the Turkish version of Munich ED-Quest χ^2/sd (<5) provides the RMR (<0.08), RMSEA (<0.08) and AGFI (>0.75) indices with full compliance, it did not fully comply with GFI (<0.90) and CFI (<0.90) the indices. As seen in the EFA given in Table 1 and the Path diagram given in Figure 1, some items were not included in the same sub-factors as the original scale.

In the Turkish version of Munich ED-Quest, the total Cronbach's alpha value was found 0.940 (Table 1). The internal consistency coefficients of the original version was 0.940 for the total score.¹ The internal consistency coefficients of the original and Turkish versions of valid and reliable scales used for EDs in Turkey are 0.83⁹ for EAT, 0.70,⁵ 0.93-0.95 for EDE-Q,¹⁸ 0.93,⁷ 0.82 for SCOFF,¹⁹ 0.74.²⁰ The results of this research revealed that the Turkish version of Munich ED-Quest had excellent internal consistency and supported its reliability. The internal consistency coefficients of this study and the original study¹ reveal that Munich ED-Quest is a reliable measurement scale that can be used in clinical and social studies.

The ICC analysis made for both measurements for current and past status with respect to sub-factors and total scores to measure the reliability of test-retest were found as acceptable (Table 2). It is considered appropriate to make the test-

retest measurements within the shortest time period possible so that the changes over time would not influence the measurements because the scale reveals the status in the last three months. High levels of reliability show the stability of Munich ED-Quest over time.

The correlations between the current and past status of the Turkish version of Munich ED-Quest (Table 3) support the fact that the Turkish version of Munich ED-Quest can be used for the diagnosis of present EDs, as well as for any time in the past (adolescence period).

For concurrent validity, it was found that the Turkish version of Munich ED-Quest had a significant positive correlation with EAT (Table 3). The non-existence of a strong correlation might be associated with the self-report-based data of the research and noninclusion of a clinical sample in the research, but it may also be associated with the rarely seen symptoms of Munich ED-Quest.

The results of this study contain some constraints. An important limitation of the study is that CFA results do not show the factor validity results as much as expected. The data of the research are based on self-reports. The sample of the study involves a healthy and young population and the majority are females. Therefore, the results may not apply to the general public and cannot be generalized for males. Another constraint is the absence of a clinical sample diagnosed as having EDs. Therefore, studies conducted with a clinical sample are needed for the use of the scale for individuals with EDs.

Despite the constraints, the study has strengths. One of the strengths of this research is the large sample size and predominance of young females who are frequently diagnosed as having EDs. The Turkish version of Munich ED Quest has excellent reliability and internal consistency, as well as positive psychometric properties related to test-retest reliability and concurrent validity.

Overall, the Turkish version of Munich ED-Quest is an acceptable, valid, and reliable scale for identification of EDs based on DSM-5 criteria. The scale meets epidemiologic research requirements for lifelong assessment of eating and feeding disorders because it evaluates current status as well as past status after adolescence. This research is important in terms of introducing a new measurement tool to the literature for the detection of risky conditions for EDs.

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