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Validation of the Lithuanian eating disorder examination-questionnaire (EDE-Q) in a community sample of young adults

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Abstract

Objective The Eating Disorder Examination Questionnaire (EDE-Q), originally validated in English-speaking women, has become a widely used tool for assessing eating pathology. However, its original factor structure has often failed to replicate in diverse populations. This study aimed to examine the factor structure and assess the measurement invariance of the EDE-Q 6.0 in a representative sample of young men and women in Lithuania.

Method The study included 800 participants aged 18–30 years, representing a demographically diverse sample of young adults in Lithuania. Confirmatory factor analysis (CFA) was conducted to validate the structure of the Eating Disorder Examination Questionnaire (EDE-Q 6.0) and establish a configural model. Measurement invariance was assessed across sexes. Convergent validity was evaluated using the Level of Personality Functioning Scale—Brief Form 2.0 and the Patient Health Questionnaire-4.

Results The original four-factor structure of the EDE-Q 6.0 was not supported. Instead, CFA indicated that a three-factor, seven-item model provided the best fit to the data (EDE-Q 7). The identified factors were *Dietary Restraint*, *Shape/Weight Overvaluation*, and *Body Dissatisfaction*. This model demonstrated excellent fit indices and measurement invariance across sexes. However, women reported significantly higher scores on all subscales compared to men. EDE-Q 7 exhibited adequate convergent validity, correlating with measures of personality functioning, anxiety, and depression.

Discussion The three-factor, 7-item measure is a brief, valid, and reliable measure of eating disorder psychopathology for Lithuanian young adults.

Plain English summary

The study tested how well the Eating Disorder Examination Questionnaire (EDE-Q 6.0) works for young adults in Lithuania. The questionnaire was originally developed in English, but past studies have shown that its structure doesn't always fit well in different populations.

The study included 800 men and women aged 18–30 from the community. Using statistical analyses, the researchers found that the original four-part structure of the questionnaire did not fit the Lithuanian data. Instead, a shorter version with seven questions grouped into three factors—Dietary Restraint, Shape/Weight Overvaluation, and Body Dissatisfaction—worked best. This new version, called EDE-Q 7, was consistent for both men and women, though women tended to score higher on all scales.

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The shorter questionnaire also showed good validity, meaning that higher scores were linked with more difficulties in personality functioning, anxiety, and depression. To conclude: EDE-Q 7 is a brief, reliable, and valid tool for measuring eating disorder symptoms in Lithuanian young adults.

Keywords EDE-Q, Psychometric validation, CFA, Measurement invariance, Convergent validity, Young adults

Introduction

Eating disorders (EDs) are complex neuropsychiatric conditions from which recovery is achievable. However, their detection and assessment have remained persistently challenging. Disordered eating often begins during adolescence, persists into young adulthood, and frequently remains undetected. Insufficient screening practices and the lack of effective tools in healthcare and broader community settings are frequently identified as major barriers to early intervention for individuals affected by EDs [6]. The availability of contextually appropriate data—tailored to specific countries and/or cultures—is essential for the accurate interpretation of such assessments [7].

The Eating Disorder Examination—Questionnaire 6.0 (EDE-Q 6.0; [11]) is a 28-item self-report measure to assess eating-disordered behaviors and attitudes. It was originally derived from the Eating Disorder Examination (EDE) interview, which is considered to be the golden standard in clinical EDs assessment [15]. The EDE-Q versions are widely recognized and commonly used in both clinical and non-clinical populations to evaluate EDs psychopathology [7, 38]. The EDE-Q 6.0 provides four rationally derived subscale scores—Restraint, Eating Concern, Weight Concern, and Shape Concern—as well as a global score, which is calculated as the mean of the subscale scores. These scores are designed to measure the presence and severity of eating disorder features.

A substantial body of research supports the internal consistency and temporal stability of the EDE-Q 6.0 [5, 28]. The original version of the EDE-Q 6.0 psychometric properties has been extensively studied across diverse cultural and linguistic contexts, including French [8], Portuguese [26], Spanish [33], Japanese [27], Farsi [42] and Mexican [47], Finish [18] populations. However, a review by Rand-Giovannetti and colleagues (2020) of over 20 empirical studies concluded that the subscale structure of 28 item EDE-Q lacks consistent empirical support. To date, most research has not validated the original factor structure of the EDE-Q 6.0, with only a few exceptions [12, 48]. Additionally, some authors [16] highlighted that many items from the Shape and Weight Concern subscales frequently load together onto a single factor. To address these inconsistencies, researchers have refined the factor structure of the original EDE-Q by removing items that failed to load distinctly onto any one factor [21]. Studies have proposed various alternative

models, including one-factor [9], two-factor [2], three-factor [35, 51], and four-factor models [13, 35]. Notably, Grilo et al. [14] identified a best-fitting model of the EDE-Q consisting of only seven items (EDE-Q 7). Various studies [4, 25] have demonstrated the superior performance of the EDE-Q 7 when compared to other versions of the EDE-Q.

Given that this measure was originally developed using female populations, the utility of the EDE-Q 6.0 measuring male eating disorder symptomatology must be further considered. Previous studies employed various community and clinical samples where the female proportion usually considerably prevailed [38]. Therefore, the new research ought to be directed to assess and validate the newly proposed factor structures within wider nonclinical and general population samples for both females and males. Thus, examining representative samples may valuably contribute to such research.

Moreover, few studies have investigated the measurement invariance of the versions of EDE-Q, which refers to its ability to measure the same construct consistently across sexes, and findings have been inconsistent. Exploratory factor analyses (EFAs) with male and female athletes and non-athletes, finding that factor loadings for male non-athletes diverged from the other groups [10]. Other studies supported measurement invariance across sexes using a Spanish translation of the EDE-Q in Mexican adolescents [34]. Grilo et al. [14] and Kliem et al. [21] similarly reported invariance in reduced-item models for American and German adult samples, respectively. While some studies found measurement invariance for the EDE-Q [38], others identified invariance using a brief three-factor, seven-item structure [14, 19]. These findings underscore the need for additional research across diverse populations and sexes to clarify the EDE-Q's measurement properties considering the newly derived models representing its better structure, e.g., 7 items as proposed by Grilo with colleagues [14].

In Lithuania, the EDE-Q 6.0 has been translated and validated in a student sample [3]. The Lithuanian version demonstrated acceptable internal consistency across the four subscales and the global score, with test–retest reliability ranging from good to excellent. Furthermore, the LT-EDE-Q 6.0 showed adequate concurrent validity. However, confirmatory factor analysis (CFA) failed to replicate the original four-factor structure of the EDE-Q

[3]. These results indicate the need for further analysis of the EDE-Q in a representative sample of Lithuanian young adults to determine the most appropriate structural model for eating disorder screening. Additionally, it is important to evaluate the convergent validity of the best-fitting models by comparing them with other variables that have been shown to have significant associations in previous research. One such variable could be depression and/or anxiety, which, while distinct, are often associated with eating disorders [43] as well as personality functioning [45].

Given the inconsistencies across various studies and the limited research on the EDE-Q 6.0 in Lithuania, the primary objective of the current study was to assess the factor structure of the Eating Disorder Examination Questionnaire (EDE-Q 6.0) and to compare different proposed models of its factor structure within a single sample. Based on findings of previous research, it was hypothesized that the CFA would not support the original factor structure of the EDE-Q, necessitating the exploration of alternative models to represent the data more accurately.

Therefore, the second aim was to investigate the alternative models described in the literature and to determine which one of them is the most appropriate the Lithuanian sample.

The third aim of this study was to assess measurement invariance by sex, examining whether the EDE-Q demonstrates comparable psychometric properties in men and women. In addition to evaluating internal consistency and structural validity, it is essential to determine whether the EDE-Q functions equivalently between men and women, to ensure that any observed differences reflect true variation in eating pathology rather than measurement bias. Measurement invariance testing provides a statistical framework for evaluating whether a scale assesses the same latent constructs across groups, and is a critical foundation for meaningful group comparisons [37]. By testing configural, metric, and scalar invariance, we aimed to establish whether the EDE-Q's structure, factor loadings, and item thresholds operate equivalently across sexes, supporting the validity of sex-based comparisons in both research and clinical settings.

Given the limited and inconsistent data on this topic, no specific hypothesis was formulated regarding the results of measurement invariance by sex. However, it was anticipated that women will exhibit significantly higher scores for eating disorder symptoms compared to men.

Finally, the study also aimed to evaluate the convergent validity of the EDE-Q best-fitting model by examining its associations with other measures, including anxiety, depression, and personality functioning.

Methods

Sampling procedure

The current study used a nationally representative sample of the Lithuanian young adult population, which was recruited by an independent agency specializing in social survey research (RAIT GROUP a market research company operating in the Baltic countries). A total sample was selected through multistage probability sampling, with the primary sampling unit being the main regions of Lithuania, followed by stratification by sex and age groups. Survey weights were calculated based on the national data for the year 2023 provided by the Lithuanian Official Statistics (*Rodiklių Duomenų Bazė—Oficialiosios Statistikos Portalas*, [41]). The sample size was determined based on the estimated population of Lithuanians aged 18–30 (~360,000), with calculations targeting a 95% confidence level and a 5% margin of error for detecting proportions (e.g., prevalence of eating disorder symptoms). Using the standard formula for proportions (with an assumed maximum variance of $p = 0.5$), the minimum required sample size was 384. To allow for potential subgroup analyses of measurement invariance across sexes and to account for non-response, the final sample was expanded to 800 respondents.

The population was accessed via the Intra Research online panel (www.manonuomone.lt). Invitations to participate in the survey were distributed according to predefined quotas, and participants completed self-report questionnaires. Once the quota for a specific group was filled, additional respondents from that group were not permitted to complete the questionnaire.

Participants

The sample was nationally representative of the Lithuanian young adult population ($N = 800$), drawn from 10 districts of Lithuania based on predefined quotas. Of the total sample, 390 participants (48.75%) were female, and 410 participants (51.25%) were male. Participants ranged in age from 18 to 30 years, with a mean age of 24.46 years ($SD = 3.77$). The mean age of men was 24.46 years ($SD = 3.69$), while the mean age of women was 24.51 years ($SD = 3.82$), respectively. 60% of the total sample had completed higher education or were students at the time of the study, while 40% reported other levels of education. 42% ($n = 336$) of respondents indicated that they reside in a metropolitan area, 26.3% ($n = 210$) in a large city, 18.1% ($n = 145$) in another type of city, and 13.6% ($n = 109$) in a small town.

Measures

The EDE-Q 6.0 [3, 11] is a self-report measure consisting of 28 items derived from EDE interview assessing core features of eating disorder symptomatology and

focusing on the past 28 days. The EDE-Q produces two types of data: severity and frequency. Twenty-two items assessing severity are rated on a 7 point (0–6) forced-choice scale, with higher scores indicating greater severity. In the original model, these items are used to generate a global score and four subscale scores: Restraint (five items), Eating Concern (five items), Shape Concern (eight items) and Weight Concern (five items). Six additional items assess the frequency of key behavioral features of eating disorders such as binge eating, self-induced vomiting, laxative misuse, diuretic misuse, and excessive exercise. The behavioral frequency items do not contribute to the subscale scores but provide clinically useful information that may inform diagnostic and treatment decisions. All models tested in these analyses included only the subscale items. The Cronbach's alpha for the overall EDE-Q 6.0 scale was 0.933, indicating excellent reliability. For the different subscales, the coefficients were as follows: Restraint (0.821), Eating Concern (0.819), Shape Concern (0.878), and Weight Concern (0.787), reflecting acceptable to excellent reliability across subscales.

Personality Functioning Scale—Brief Form 2.0, [50]. The LPFS-BF 2.0 is a 12-item measure comprising two six-item factors that assess intrapersonal (identity, self-direction) and interpersonal (empathy, intimacy) features of personality functioning. Each item is rated on a 4-point Likert scale, where 1 reflects low or no levels of personality dysfunction (i.e., better functioning), and 4 indicates high, disordered levels of personality dysfunction (i.e., poorer functioning). Research suggests that scores between 2 and 3 on most LPFS-BF 2.0 items may be indicative of personality pathology [50].

The Cronbach's alpha for the overall LPFS-BF 2.0 scale was 0.910, indicating excellent reliability. For the individual subscales, the coefficients were as follows: Self-Functioning (0.888) and Interpersonal Functioning (0.821), demonstrating acceptable reliability across.

Patient Health Questionnaire-4, [20, 24]. The Patient Health Questionnaire (PHQ-4) was used to measure mental distress. The PHQ-4 is a widely utilized tool that assesses symptoms of anxiety and depression by combining two screening instruments: the Generalized Anxiety Disorder 2-item (GAD-2) and the PHQ-2, which measures major depressive symptoms. It is frequently used in general population studies. Participants were asked to indicate how often they had been bothered by the respective symptoms over the past two weeks, using a scale ranging from 0 ("not at all") to 3 ("nearly every day"). The Cronbach's alpha for the total PHQ-4 scale was 0.827, indicating good reliability. For the individual subscales, the coefficients were as follows: Depression (0.795) and Anxiety (0.705), demonstrating acceptable reliability across subscales.

Data analyses strategy

Confirmatory factor analyses comparison of model fit

First, we examined the factor structure of 9 EDE-Q models, each incorporating all subscale items. Models were selected based on the analysis conducted by Rand-Giovannetti and colleagues [38], prioritizing those with a unique, fully developed, and published factor structure and adding some newer published models that included all items in the final model.

1. One-factor model [9],
2. Two-factor model [2],
3. Three-factor model [2],
4. Three-factor model [35],
5. Three-factor model [51],
6. Original four-factor model [11],
7. Four-factor model [13]
8. Original four-factor model [11], with added residual errors correlations)
9. Testing subscales of the original model individually [36].

Next, additional analyses were conducted to evaluate the fit indices of reduced-item models, as several of these models have demonstrated good fit in previous research. Seven models, representing various factor structures and including different numbers of items, were analyzed:

1. Three-factor model (7 items) [14],
2. Four-factor model (8 items) [21],
3. One-factor model (8 items) [21],
4. Brief weight and Shape concern (8 items) [2],
5. One-factor model (8 items) [49],
6. Four-factor model (14 items) [32],
7. Five-factor model (17 items) [23].

All model fitting was completed with *Mplus* 6.0 software (Muthén, L. K and Muthén, B. O., 1998–2012 [30]). Models were specified with unweighted least square mean and variance adjusted estimation and the "categorical" option in *Mplus*. Three fit statistics were used to determine whether the models fit the data well: root mean square error of approximation (RMSEA) < 0.08, comparative fit index (CFA) > 0.95, and Tucker-Lewis index (TLI) > 0.95 [17]. Additionally, fit statistics were calculated for seven reduced item models. The same fit statistics were used to determine the models fit the data well. Two well-fitting models were compared with a Satorra-Bentler χ^2 (SB χ^2) difference test [44] and the best fitting model for the Lithuanian representative sample of young adults was chosen.

Measurement invariance between sexes

The second goal of the current research was to examine the measurement invariance of the best fitting model of EDE-Q in men and women. Models were specified with unweighted least square mean and variance adjusted estimation and the “categorical” option in *Mplus*. The data were fitted to three different measurement invariance models: configural, metric, and scalar. Configural invariance measures whether there is the same pattern of factor loadings between groups. Metric invariance indicates whether the factor loadings are equivalent among groups. Scalar invariance refers to the equivalence of the intercepts between groups [38].

Mean comparisons between men and women and correlations with other variables (personality functioning, depression, and anxiety) were run in SPSS 23.0 using Student t test and Spearman correlations.

Results

Full measure model fit comparisons

None of the full measure models met criteria for good fit according to the statistics reported in Table 1.

Reduced-item model analyses

The analysis of the fit statistics for the reduced item sets, as indicated in Table 2, revealed that two models fit the data well: three factor model [14] and four factor model [32]. Using the criteria of fit statistics [17] Grilo's three factors model is the best-fitting model in the total sample. According to SB χ^2 test, the difference in χ^2 between Grilo's and Parker's models was 403.475 with 60 degrees

Table 2 Fit statistics for EDE-Q (reduced-items) data

Model	χ^2	Df	RMSEA	CFI	TLI
Grilo's 3-factors (7 items)	23.846	11	0.038	0.999	0.997
Kleim's 4 factors (8 items)	214.404	14	0.133	0.978	0.956
Kleim's 1 factors (8 items)	596.650	20	0.189	0.932	0.905
Allens' Brief Weight and Shape Concern (8 items)	567.263	20	0.184	0.967	0.953
Wade's 1 factor (8 items)	264.422	20	0.123	0.982	0.975
Laskowski's 5 factors (17 items)	1089.064	109	0.106	0.960	0.950
Parker's 4 factors (14 items)	427.325	71	0.079	0.982	0.976

of freedom. This difference was statistically significant, indicating that the second model provided a significantly worse fit to the data compared to the first model. Accordingly, Grilo et al.' three factor model is being used in further analyses as well as its internal consistency coefficient is provided in Table 3.

Measurement invariance between sexes

Measurement invariance analyses were conducted using Grilo's three-factor model (see Table 4).

The configural model, in which the factor loadings and intercepts were free to vary between sexes, fit the data well. The factor loadings were similar in both men and women. The metric invariance model, in which the factor loadings were constrained to be equal in men and women, also fit the data well (Table 4). The factor loadings were similar in both men and women (Table 5). In the scalar invariance model, the factor loadings and intercepts were constrained to be equal between sexes. This model also fits the data well (Table 4). The results demonstrate strong measurement invariance for the EDE-Q data across males and females. The 3-factor model has consistent factor structure (configural invariance), factor loadings (metric invariance), and thresholds/intercepts (scalar invariance). Configural, metric, and scalar invariance are all supported for the 3-factor model, indicating that the measurement properties are equivalent across males and females. Since scalar invariance is established, it is valid to compare latent factor means between males and females.

Mean comparisons between men and women

Means were compared for each individual item and for factor scores (Tables 5 and 6) for both men and women. As we can see from Table 5, women had higher scores on 5 of the 7 analyzed items. Two items on which women and men did not differ significantly were on food avoidance and dietary rules. A comparison of the observed means of the factor scores (see Table 6) indicated that women had higher scores than men on two factors

Table 1 Fit statistics for EDE-Q (All items Model) data

Model	χ^2	Df	RMSEA	CFI	TLI
One factor	4877.984	209	0.166	0.838	0.820
Allen's 2-factors	4100.179	208	0.152	0.865	0.850
Allen's 3-factors	3759.524	206	0.146	0.876	0.861
Peterson 3-factors	2943.821	206	0.128	0.905	0.893
White's 3 factors	3034.568	206	0.130	0.902	0.890
Fairburn's 4-factors (original)	3039.915	202	0.132	0.901	0.887
Friborg's 4-factors	2874.555	203	0.128	0.907	0.894
Fairburn's 4-factors (original, with residual errors correlations) *	1596.151	189	0.096	0.951	0.940
EDE-Q Restraint**	154.391	5	0.192	0.966	0.931
EDE-Q Eating Concern**	85.127	5	0.141	0.979	0.957
EDE-Q Shape Concern**	561.374	20	0.183	0.955	0.936
EDE-Q Weight Concern**	71.882	5	0.129	0.974	0.949

* Item25 with Item26, Item22 with Item23, Item9 with Item10, Item 8 with Item7, Item11 with Item12; Item26 with Item27, Item 26 with Item28, Item25 with Item27, Item1 with Item3, Item 25 with Item28; Item 3 with Item4; Item1 with Item4. ** Testing subscales individually according to Prnjak and Jukic (2000)

Table 3 Reliability analysis of Grilo 3-factors (EDE-Q 7) model (Cronbach's alpha (α))

	Total (N—800)	Females (N—390)	Males (n—410)
EDE-Q-7 Global	0.837	0.846	0.821
EDE-Q-7 Dietary restraint	0.829	0.858	0.801
EDE-Q-7 Shape/weight overvaluation	0.879	0.912	0.834
EDE-Q-7 Body dissatisfaction	0.818	0.838	0.780

Table 4 Measurement invariance statistics for 3-factor models of EDE-Q 7 data

	χ^2	Df	RMSEA	TLI	CFI	p
Configural	132.325	58	0.057	0.993	0.995	< 0.001
Metric	132.326	58	0.057	0.993	0.995	< 0.001
Scalar	124.700	54	0.057	0.993	0.995	< 0.001

Table 5 Factor loadings of the configural model, Mean (SD), and Mean Comparisons among Female and Male

Item	Factor loadings		M (SD)		Test statistics	
	Females	Males	Females	Males	t	P
<i>Factor 1. Dietary restraint</i>						
1 Restraint over eating	0.867	0.838	1.84 (1.92)	1.40 (1.80)	3.38	0.001
3 Food avoidance	0.873	0.842	1.82 (1.97)	1.60 (1.91)	1.55	0.121
4 Dietary Rules	0.841	0.789	1.42 (1.83)	1.50 (1.88)	−0.61	0.546
<i>Factor 2. Shape/weight overvaluation</i>						
22 Importance of weight	0.930	0.879	2.89 (2.02)	2.19 (1.90)	5.08	< 0.001
23 Importance of shape	0.946	0.882	3.02 (2.01)	2.40 (1.95)	4.42	< 0.001
<i>Factor 3. Body dissatisfaction</i>						
25 Dissatisfaction with weight	0.797	0.818	2.98 (2.07)	2.22 (1.91)	5.42	< 0.001
26 Dissatisfaction with shape	0.970	0.866	3.13 (2.01)	2.35 (2.04)	5.47	< 0.001

Table 6 Sex differences in EDE-Q 7

Scale	Total (N—800) Mean (SD)	Females (N—390) Mean (SD)	Males (N—410)	T	P
EDE-Q 7 global	2.18 (1.40)	2.44 (1.42)	1.95 (1.33)	5.05	< 0.001
Dietary restraint	1.59 (1.63)	1.69 (1.68)	1.50 (1.58)	1.67	0.095
Shape/weight overvaluation	2.61 (1.89)	2.96 (1.93)	2.29 (1.78)	5.03	< 0.001
Body dissatisfaction	2.65 (1.89)	3.06 (1.90)	2.29 (1.79)	5.94	< 0.001

(Shape/Weight overvaluation and Body dissatisfaction). The only factor on which women and men did not differ was on Dietary restraint. The global score of all 7 analyzed items was higher in women as well.

Relation between EDE-Q construct validity

The concurrent and discriminant validity of EDE-Q-7 was assessed by testing the correlations with other

constructs of psychopathology (Table 7): the level of personality functioning, depression, and anxiety scores. The global score of the 7 analyzed items was positively associated with the level of personality functioning, indicating that a higher score for eating disorder symptoms corresponded to a lower level of personality functioning. As expected, the scores of EDE-Q-7 were positively related to depression and anxiety scores.

Table 7 Correlations among EDE-Q-7, LPFT, PHO

	1	2	3	4	5	6	7	8	9	10	11	12	13
EDE GI (1)	–												
EDE DR (2)	0.76**	–											
EDE SW (3)	0.82**	0.40**	–										
EDE BD (4)	0.81**	0.37**	0.67**	–									
LPFT GI (5)	0.33**	0.19**	0.36**	0.30**	–								
LPFT SF (6)	0.34**	0.19**	0.37**	0.32**	0.94**	–							
LPFT IF (7)	0.27**	0.17**	0.28**	0.23**	0.90**	0.70**	–						
PHO Dep (12)	0.32**	0.19**	0.34**	0.31**	0.51**	0.50**	0.43**	–0.41	0.07*	–0.31**	0.04	–	
PHO An (13)	0.29**	0.19**	0.30**	0.26**	0.49**	0.48**	0.42**	–0.01	0.09**	–0.34**	0.11**	0.63**	–
PHO GI (14)	0.33**	0.21**	0.36**	0.31**	0.55**	0.55**	0.47**	–0.04	0.08*	–0.36**	0.08*	0.90**	0.90**

EDE GI EDE-Q 7 Global; EDE DR EDE-Q 7 Dietary Restraint; EDE SW EDE-Q 7 Shape/Weight Overvaluation; EDE BD EDE-Q 7 Body Dissatisfaction; LPFT GI LPFT (The Level of Personality Functioning Scale- Brief Form 2.0) Global; LPFT SF LPFT Self-functioning; LPFT IF LPFT Inter-relational functioning; PHO Dep PHO Depression; PHO An PHO Anxiety; PHO GI PHO Global, * $p < 0.05$, ** $p < 0.001$

Sex differences in correlations between EDE-Q and validity measures

Table 8 demonstrates the strength of associations between eating disorder symptoms (EDE-Q 7) and related validity measures differed by sex, Fisher's r -to- z transformation was applied to compare correlation coefficients between women ($n = 390$) and men ($n = 410$). The results revealed several statistically significant sex differences. Notably, the association between EDE-Q 7 Body dissatisfaction and personality functioning was significantly stronger in men than in women. Similarly, stronger associations in men were observed between EDE-Q 7 Body dissatisfaction, anxiety, depression and the global score of mental distress. Conversely, the association between EDE-Q 7 Dietary restraint and depression was significantly stronger in women than in men, suggesting a closer link between restrictive eating and depressive symptoms in women. No significant sex differences were observed for associations between the global score of EDE-Q 7 Global or Shape/Weight Overvaluation subscale and any of the validity measures (all $ps > 0.05$).

Discussion

To the best of our knowledge, this is the first study to comprehensively investigate the psychometric properties of the EDE-Q 6.0 in Lithuania using a demographically representative sample of young adults. Confirmatory factor analysis was employed to evaluate the factor structure, comparing nine models previously supported by research. Additionally, further analyses were conducted to assess the goodness-of-fit for seven reduced-item models. The best-fitting model was subsequently evaluated for evidence of measurement invariance by sex and its associations with other variables, including

Table 8 Sex differences in correlations between EDE-Q 7, LPFT, PHO

Variable 1	Variable 2	Females ($n = 390$)	Males ($n = 410$)	Fisher's z	p
EDE GI	LPFT GI	0.31	0.33	–0.314	0.377
EDE GI	LPFT SF	0.33	0.32	0.157	0.437
EDE GI	LPFT IF	0.22	0.30	–1.209	0.113
EDE GI	PHO Dep	0.36	0.27	1.409	0.079
EDE GI	PHO An	0.23	0.31	–1.216	0.112
EDE GI	PHO GI	0.32	0.32	0	0.5
EDE DR	LPFT GI	0.18	0.19	–0.146	0.442
EDE DR	LPFT SF	0.18	0.19	–0.146	0.442
EDE DR	LPFT IF	0.15	0.18	–0.434	0.332
EDE DR	PHO Dep	0.27	0.11	2.344	0.011
EDE DR	PHO An	0.21	0.17	0.585	0.239
EDE DR	PHO GI	0.26	0.15	1.619	0.053
EDE SW	LPFT GI	0.36	0.36	0	0.5
EDE SW	LPFT SF	0.38	0.32	0.964	0.168
EDE SW	LPFT IF	0.27	0.30	–0.46	0.323
EDE SW	PHO Dep	0.36	0.31	0.794	0.214
EDE SW	PHO An	0.24	0.32	–1.224	0.111
EDE SW	PHO GI	0.33	0.34	–0.159	0.437
EDE BD	LPFT GI	0.21	0.36	–2.306	0.011
EDE BD	LPFT SF	0.25	0.36	–1.711	0.044
EDE BD	LPFT IF	0.12	0.33	–3.13	0.001
EDE BD	PHO Dep	0.26	0.35	–1.399	0.081
EDE BD	PHO An	0.13	0.34	–3.146	0.001
EDE BD	PHO GI	0.21	0.38	–2.632	0.004

Boldface denotes statistically significant effects ($p < 0.05$)

EDE GI EDE-Q 7 Global; EDE DR EDE-Q 7 Dietary Restraint; EDE SW EDE-Q 7 Shape/Weight Overvaluation; EDE BD EDE-Q 7 Body Dissatisfaction; LPFT GI LPFT (The Level of Personality Functioning Scale- Brief Form 2.0) Global; LPFT SF LPFT Self-functioning; LPFT IF LPFT Inter-relational functioning; PHO Dep PHO Depression; PHO An PHO Anxiety; PHO GI PHO Global

personality functioning, depression, and anxiety were examined to assess convergent validity.

Consistent with the majority of previous research [1, 3, 22, 38] on this topic, neither the original factor structure nor alternative models of the EDE-Q 6.0 questionnaire received empirical support in our study. Only two reduced-item models demonstrated sufficient statistical indices for model fit: Grilo's three-factor, seven-item model and Parker's four-factor, fourteen-item. Among these, Grilo's model, consistent with findings from most other studies [4, 22, 25, 38], demonstrated the best indications of model fit. Consequently, this model was selected for further analysis. This model comprises the following components: Dietary Restraint, including three items—Item 1 (restraining overeating), Item 3 (food avoidance), and Item 4 (adherence to dietary rules); Shape/Weight Overvaluation, encompassing Item 22 (importance of weight) and Item 23 (importance of shape); and Body Dissatisfaction, which includes Item 25 (dissatisfaction with weight) and Item 26 (dissatisfaction with shape).

The results of measurement invariance evaluation indicate that the model achieves configural, metric, and scalar invariance, as evidenced by consistent fit indices (RMSEA, TLI, CFI) across all levels of testing. This suggests that the 3-factor model is robust and operates equivalently across females and males. Since scalar invariance is established, meaningful comparisons of latent factor means between females and males can be made, as it ensures that any differences in latent factor means truly reflect actual differences in the construct, not just measurement bias. The data show that the groups interpret the factors similarly and respond to the items in comparable ways.

Across all subscales of the Grilo's three-factor 7-item EDE-Q, women exhibited significantly higher scores compared to men. These results align with findings from other studies indicating that women tend to score higher on the EDE-Q [38, 40]. This could indicate that the reduced-item scale is more sensitive in detecting eating disorder symptoms among women, potentially resulting in higher scores. However, cultural, and linguistic factors may also play a role. In Lithuania, contemporary beauty standards for women are heavily shaped by media-driven ideals that prioritize slimness, creating tension between natural body diversity and the pressure to conform to a narrow, often unattainable image of perfection [39]. In contrast, post-Soviet Lithuanian men internalize ideals of strength and breadwinning, yet economic marginalization and social exclusion often result in embodied shame, powerlessness, and self-destructive coping strategies [46]. Nevertheless, this interpretation should be approached with caution, as recent research highlights the underrepresentation of male eating disorders in clinical practice,

particularly with the growing recognition of muscularity-oriented disordered eating as a distinct male phenotype [29].

The global score and subscales of the EDE-Q short version were significantly associated with impairments in personality functioning. Notably, the correlations between eating disorder symptoms—particularly those reflected in the Body Dissatisfaction subscale—and dysfunction in the Self domain of personality functioning were of moderate strength. In contrast, the correlation between Body Dissatisfaction and dysfunction in the Interpersonal domain was small, indicating a weaker association between these constructs. These findings suggest that eating disorder symptoms tend to be more closely linked to challenges in identity, and self-direction, although difficulties within interpersonal relationships may be also reported. These results are in line with the other studies indicating correlation between eating disorder symptoms and personality dysfunction.

The Patient Health Questionnaire (PHQ-4), a tool used to measure global mental distress, showed a significant correlation with eating disorder symptoms. While all depression and anxiety scores were significantly associated with the EDE-Q short form factors (Dietary Restraint, Shape/Weight Overvaluation, and Body Dissatisfaction), the strongest relationship was observed between depressive symptoms and Body Dissatisfaction. It goes in line with other studies which demonstrate the important relations between ED symptoms and depression/anxiety [19, 43]. These previously mentioned significant correlation indicates the adequate convergent validity of the EDE-7 in the Lithuanian sample of young adults. Interestingly, that while body dissatisfaction is more prevalent in women's sample, among men EDE-Q Body Dissatisfaction showed stronger associations with both personality functioning impairments and internalizing symptoms (depression, anxiety, and global score of mental distress). Specifically, this pattern may reflect the less socially normalized experience and relatively atypical body image distress in men, where such concerns may signal deep self-worth and emotion regulation difficulties [31]. In contrast, although body dissatisfaction is more prevalent among women, it may not always relate to broader dysfunction to the same extent, possibly due to greater cultural or social normalization of such concerns in women.

A key limitation of this study lies in its sample composition. While the use of a demographically representative community sample enhances the generalizability of the findings to the broader young adult population in Lithuania, it does not account for the specific characteristics and symptomatology of individuals diagnosed with clinical eating disorders. The absence of a clinical sample limits the

study's ability to assess the psychometric properties of the EDE-Q short version of 7 items in populations with diverse and clinically significant eating disorder presentations. This may limit the generalizability of the findings to clinical settings, where the prevalence and severity of eating disorder symptoms are likely to differ substantially from those observed in a general community sample. Therefore, future research should prioritize the inclusion of clinical populations to enhance the applicability of the results. Another limitation of the present study is that test–retest reliability was not assessed, as data were collected anonymously, and participants could not be re-identified for follow-up assessment. This limits the ability to draw conclusions about the temporal stability of the measures used. Additionally, the study did not include an instrument alternatively assessing eating disorders, which may limit the comprehensiveness of the validity evaluation.

Despite these limitations, the findings suggest that the EDE-Q demonstrates promise as a screening tool within the general population. Its ability to identify patterns of disordered eating and related concerns highlights its potential utility for early detection in non-clinical settings. Future research should incorporate clinical populations to evaluate the scale's sensitivity and validity across the spectrum of eating disorder diagnoses and explore cross-cultural differences, ensuring a more comprehensive understanding of its utility for screening and clinical assessment.

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Author contributions

A.A.—Conceptualization, writing the main manuscript text, funding administration; R.Br.—Conceptualization, statistical result analysis and writing, paper review; D.Č.—Paper discussions and review; R.Ba.—Supervision of the process, paper review. All authors approved of the final version for publication.

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Data availability

No datasets were generated or analysed during the current study.

Declarations

Competing interests

The authors declare no competing interests.

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