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Investigating the Factor Structure and Measurement Invariance of the Eating Disorder Examination-Questionnaire (EDE-Q) in a Community Sample of Gender Minority Adults from the United States

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Abstract

Objective: The Eating Disorder Examination-Questionnaire (EDE-Q) is one of the most widely used self-report assessments of eating disorder symptoms. However, evidence indicates potential problems with its original factor structure and associated psychometric properties in a variety of populations, including gender minority populations. The aim of the current investigation was to explore several previously published EDE-Q factor structures and to examine internal consistency and measurement invariance of the best-fitting EDE-Q model in a large community sample of gender minority adults.

Methods: Data were drawn from 1,567 adults (337 transgender men, 180 transgender women, and 1050 gender-expansive individuals) who participated in The PRIDE Study, a large-scale longitudinal cohort study of sexual and gender minorities from the United States. A series of confirmatory factor analyses (CFAs) were conducted to explore the fit of eight proposed EDE-Q models; internal consistency (Cronbach's alphas, Omega coefficients) and measurement invariance (multi-group CFA) were subsequently evaluated.

Results: A brief seven-item, three-factor (dietary restraint, shape/weight overvaluation, body dissatisfaction) model of the EDE-Q consistently evidenced the best fit across gender minority groups (transgender men, transgender women, gender-expansive individuals). The internal consistencies of the three subscales were adequate in all groups, and measurement invariance across the groups was supported.

Discussion: Taken together, these findings support the use of the seven-item, three-factor version of the EDE-Q for assessing eating disorder symptomatology in gender minority populations. Future studies can confirm the current findings in focused examinations of the seven-item, three-factor EDE-Q in diverse gender minority samples across race, ethnicity, socioeconomic status, and age ranges.

Keywords

Eating disorders; assessment; transgender; transmasculine; transfeminine; non-binary; gender minority; sexual and gender minority; LGBTQ+; Eating Disorder Examination-Questionnaire

Introduction

A growing body of evidence suggests that gender minority people (i.e., individuals whose gender does not align with their sex assigned at birth) are at increased risk for eating disorders and disordered eating behaviors relative to cisgender people (Diemer et al., 2015; Guss et al., 2017; Simone et al., 2020). Theoretical explanations for this apparent disparity have often been grounded in the gender minority stress framework (Hendricks & Testa, 2012; Testa et al., 2015), which posits that social and structural factors (e.g., transphobic laws and policies) disproportionately expose gender minority people to proximal (i.e., internalized transphobia) and distal (i.e., discrimination) stressors that may influence the development of eating-related pathology. Importantly, emerging research indicates that the severity of eating disorder symptoms may differ across gender minority subgroups. For instance, a recent extension of the gender minority stress framework found that, relative to transgender men and women, gender-expansive individuals reported greater experiences of social stressors and eating concerns (Lefevor et al., 2019), while another study found that transgender women reported greater eating restraint and body shape concerns compared to gender-expansive people (Nagata et al., 2020). As such, ensuring the adequacy of eating disorder screening and diagnostic measures for use among gender minority people, including across specific subgroups, is critical for properly assessing the nature and severity of eating disorder symptoms in both research and clinical contexts.

The Eating Disorder Examination-Questionnaire (EDE-Q; Fairburn & Beglin, 1994) is among the most common self-report eating disorder measures used in research and clinical practice. While originally developed with a four-factor structure (Restraint, Eating Concern, Weight Concern, and Shape Concern), the lack of empirical support for this structure has led to the promulgation of multiple alternative factor structures (Becker et al., 2010; Byrne et al., 2010; de Oliveira Júnior et al., 2022; Friborg et al., 2013; Grilo et al., 2015; Machado et al., 2020; Pennings & Wojciechowski, 2004; C. B. Peterson et al., 2007). Although these alternative versions of the EDE-Q have been investigated in a variety of distinct populations, it remains unclear which factor structure, if any, is most appropriate for assessing the severity of eating disorder symptoms among gender minority adults.

With a sample of US adult women with bulimia symptoms, Peterson and colleagues (2007) found support for the internal consistency of each subscale in the original four-factor model, while exploratory analyses identified a three-factor structure in which most items from Weight Concern and Shape Concern subscales loaded onto a single factor. In a Fijian translation administered to Fijian adolescent girls, Becker and colleagues (2010) found acceptable internal consistency for the global and subscale scores and identified a modified two-factor structure which combined most items from Shape Concern, Weight Concern, and Eating Concern subscales in one factor with the Restraint items loading to a second factor (Becker et al., 2010). Additionally, Friborg and colleagues (2013) proposed an alternative four-factor structure in a representative community sample of Norwegian adult women. Here, the first factor primarily consisted of Weight Concern and Shape Concern items, the second factor had a mix of Restraint and Eating Concern items, the third factor had only Eating Concern items, and the fourth factor had only Restraint items (Friborg et al., 2013).

In a sample of treatment-seeking bariatric surgery candidates, Grilo and colleagues (2013) found support for a three-factor structure wherein each factor represented Dietary Restraint, Shape/Weight Overvaluation, and Body Dissatisfaction. Single-factor structures have also found support in prior research (Grilo et al., 2013). These include a full 22-item model identified by Pennings and colleagues (2004) (Pennings & Wojciechowski, 2004) with a sample of Dutch women with anorexia nervosa and a brief eight-item model consisting of Weight Concern and Shape Concern items using samples of US adolescent girls (Wade et al., 2008) and eating disorder treatment-seeking US adult women (Byrne et al., 2010).

To our knowledge, only one prior investigation has evaluated the factor structure of the EDE-Q in gender minority samples. A study of transgender youth seeking gender-affirming healthcare (C. M. Peterson et al., 2020) found support for a unidimensional model with the EDE-Q total score as a valid, global measure of eating pathology. However, given potential differences between youth and adults and between treatment-seeking and non-treatment-seeking populations, this finding may not generalize to gender minority adults from the general community. Although prior work has established measurement invariance across females and males (Klimek, Convertino, Pennesi, et al., 2021; Rand-Giovannetti et al., 2020), no prior study has investigated measurement invariance of the EDE-Q across gender minority subgroups (e.g., transgender men vs. transgender women vs. gender expansive individuals). Given evidence suggesting that eating disorder symptom severity may vary by gender minority subgroup (Diemer et al., 2018; Lefevor et al., 2019; Nagata et al., 2020), establishing measurement invariance is important to ensure the validity of comparing scores across groups.

To address an existing gap in the literature, the current study reports on transgender men (i.e., men who were assigned female sex at birth), transgender women (i.e., women who were assigned male sex at birth), and gender-expansive individuals (i.e., those with genders outside the woman-man binary) were recruited from The PRIDE Study (a large-scale longitudinal cohort study of sexual and gender minority adults from the United States). Given the wide variety of EDE-Q factor structures that have received empirical support across prior studies with diverse samples, we used a *comparative* confirmatory factor analysis (CFA) approach to evaluate the generalizability of these factor structures to the current study sample. Notably, this comparative approach is consistent with prior studies examining the factor structure and psychometrics of the EDE-Q (Allen et al., 2011; Compte et al., 2019; Klimek, Convertino, Pennesi, et al., 2021; Machado et al., 2020), as well as research evaluating measures of other psychological and health-related constructs (Goldstein et al., 2021; Manzar et al., 2016; Peralta & Cuesta, 1995; Serretti & Olgiati, 2004). As such, we aimed to (1) evaluate several previously investigated EDE-Q factor structures and identify the best-fitting model in separate samples of transgender men, transgender women, and gender-expansive people; and (2) for the best-fitting model, evaluate internal consistency and measurement invariance across gender minority subgroups.

Method

Procedure and participants

The Population Research in Identity and Disparities for Equality (PRIDE) Study is a national (US), longitudinal, cohort study of sexual and/or gender minority (SGM) adults, including individuals who identify as lesbian, gay, bisexual, transgender, and/or queer (LGBTQ), or another sexual and/or gender minority identity. Specific inclusion criteria include: identification as an SGM person, living in the US or its territories, adult (18 years or older), and the ability to read and respond to a questionnaire written in English. Data are collected on a secure, web-responsive, cloud-based platform accessible from any computer, tablet, or smartphone. Participants in The PRIDE Study are recruited through PRIDEnet (a national network of organizations and individuals to engage SGM/LGBTQ communities in health research), newsletters and blog posts, distribution of promotional items, outreach at conferences and events, social media advertising, and word-of-mouth. Additional details about The PRIDE Study research recruitment, platform, and design have been previously described (Lunn, Capriotti, et al., 2019; Lunn, Lubensky, et al., 2019).

A total of 4285 participants in The PRIDE Study completed the "Eating and Body Image" survey; however, only transgender or gender-expansive participants (n=1809) were included in the present investigation. Participants in the current study were classified as either a: (1) transgender man (man/transgender man/transmasculine [write-in] gender identity and female sex assigned at birth); (2) transgender woman (woman/transgender woman/transfeminine [write-in] gender identity and male sex assigned at birth); or (3) gender-expansive person including genderqueer, multiple gender identities, another gender identity, non-binary, nonconforming, genderfluid, intersex, two-spirit, agender, and bigender (anyone not classified as a cisgender man, cisgender woman, transgender man, or transgender woman). Further details describing the classification rules for gender minority categories are shown in Appendix A.

Participants with more than 50% of missing values on EDE-Q items were excluded from the analyses given that the validity of data when over 50% are missing may be questionable (Heymans & Twisk, 2022): (i) 15 of 352 (4.3%) transgender men, leaving a final sample of 337; (ii) 1 of 181 (0.6%) transgender women, leaving a final sample of 180; and (iii) 70 of 1120 (6.3%) gender-expansive participants, leaving a final sample of 1050. In all cases, the pattern of missing data was consistent with missing completely at random according to the non-parametric test of homoscedasticity ($p > .050$) as described by Jamshidian et al. (2014). As such, data imputation was performed using multivariate imputation by chained equations.

Analyses

Descriptive statistics were calculated for demographic characteristics. Continuous variables were reported as mean ± SD and categorical variables as percentages. A series of CFAs were conducted using eight existing models of the EDE-Q. Given that the assumption of multivariate normality was not fulfilled (Mardia's test kurtosis = 70.27, $p < .001$) and the ordinal nature of the data, the CFAs were based on diagonally weighted least squares (WLSMV) estimation method, as it is less biased and more accurate than other

robust methods (Li, 2016). To evaluate model fit, the following statistics were considered: Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA) and its 90% confidence interval, and the Standardized Root Mean Square Residual (SRMR). Following Hu and Bentler (1999) (Hu & Bentler, 1999), model fit was determined via consensus among these three indices: CFI values ≥ .95, SRMR values ≤ .08, and RMSEA values ≤ .06 suggest a good fit, whereas CFI values .90–.94, SRMR values .09–.10, and RMSEA values .07–.10 suggest an acceptable fit.

The EDE-Q models under investigation were as follows: Model 1: The original 22-item, four-factor model (Restraint, Eating Concern, Weight Concern, Shape Concern) described by Fairburn and Beglin (1994, 2008); Model 2: A three-factor model that retains two EDE-Q subscales (Restraint, Eating Concern) but collapses Weight and Shape Concern items (C. B. Peterson et al., 2007); Model 3: A two-factor model that retains one EDE-Q subscale (Restraint) and collapses Eating, Weight, and Shape Concern items (Becker et al., 2010); Model 4: A one-factor model that includes all 22 items from the original four-factor model (Pennings & Wojciechowski, 2004); Model 5: A brief one-factor eight-item model consisting of Weight and Shape Concern items (Byrne et al., 2010; Wade et al., 2008); Model 6: an alternative 22-item four-factor model described by Friborg et al. (2013); Model 7: a bi-factor model based on Friborg et al.'s (2013) 22-item four-factor model that also includes a general latent 'g' factor accounting for the variance in all items (Friborg et al., 2013); and Model 8: a brief seven-item, three-factor model (Dietary Restraint, Shape/Weight Overvaluation, Body Dissatisfaction) described by Grilo and colleagues (Grilo et al., 2013). The Expected Cross Validation Index (ECVI) was considered for model comparison as chi-square difference tests are not appropriate for non-nested models. Lower values of ECVI are preferable as they represent some degree of combination between better fit and greater parsimony. The ECVI index is preferred over other non-nested model comparison indexes (e.g., the Akaike Information Criterion (AIC) (Akaike, 1987) as it "also incorporates sample size—specifically, a greater penalty function for fitting a non-parsimonious model in a smaller sample" (Brown, 2006). For the retained model, internal consistency was assessed through Cronbach's alpha and the Omega coefficient (Dunn et al., 2014; Nunnally, 1978); however, following recommendation by Eisinga et al. (2012), internal consistency for two-item factors was assessed using the Spearman-Brown reliability coefficient. Internal consistency values > .80 were considered adequate (Nájera Catalán, 2019; Nunnally, 1978). Finally, a multi-group CFA/measurement invariance analysis (Chen, 2007) for the retained model was conducted to assess configural, metric, and scalar invariance across gender minorities (i.e., transgender men, transgender women, and gender-expansive participants). Briefly, configural invariance assumes that the hypothesized factor structure is the same across groups (if data does not fit at this level, then invariance does not hold at any level), metric invariance implies that factor loadings magnitudes are equal, and scalar invariance denotes that item loadings and item intercepts are similar. ΔCFI < 0.01 was considered as an indicator of metric invariance (non-significant $\Delta\chi^2$ were also expected for metric invariance, as it implies that the invariance model is a better representation of the data), and scalar invariance supported when ΔCFI < 0.01 and ΔRMSEA < 0.015 (Chen, 2007; Cheung & Rensvold, 2009). We also conducted sensitivity analyses among the gender-expansive group by female and male sex assigned at birth.

R software (version 3.4.4) and the following packages were used: *WebPower* (Zhang & Yuan, 2018) for sample size estimation, *Psych* (Revelle, 2018) for descriptive statistics, *MissMech* (Jamshidian et al., 2014) for the assessment of the underlying missing mechanism, *mice* (van Buuren & Groothuis-Oudshoorn, 2011) for missing values imputation, *MNV* (Korkmaz et al., 2014) for assessment of multivariate normality, *MBESS* (Kelley & Lai, 2012) for assessment of internal consistency through the Omega coefficient, *Lavaan* (Gana & Broc, 2019) for CFAs, *semPlot* (Epskamp et al., 2022) for graphical representation of the retained model, and *semTools* (Jorgensen et al., 2018) for measurement invariance analysis (multi-group CFA).

Results

Transgender men

Transgender men (n = 337) had a mean age of 30.9 years (SD = 9.8, range = 18 – 67) and a mean self-reported BMI of 28.8 kg/m^2 (SD = 7.4, range = 16.1 – 58.5). A total of 78.9% of transgender men identified as White, 2.6% as Black, 0.3% as Asian, 0.3% as Native American, 6.0% as another race, 0.5% as multi-race; 11.4% did not provide data on race. In addition, 5.0% of the sample identified as Hispanic, Latino, or Spanish in origin. A majority of transgender men (56.8%) had college education or higher, 98.1% were born in the U.S.A., and 10.2% reported having ever been told by a healthcare provider that they had an eating disorder.

Transgender women

Transgender women (n = 180) had a mean age of 41.2 years (SD = 15.0, range = 20 – 74) and a mean BMI of 28.0 kg/m^2 (SD = 6.4, range = 17.3 – 55.5). A total of 85.6% identified as White, 0.6% as Asian, 6.1% as another race, 5.0% as multi-race; 4.4% did not provide data on race. In addition, 4.0% of the participants identified as Hispanic, Latino, or Spanish in origin. A majority of transgender women (55.8%) had college education or higher, 95.3% were born in the U.S.A., and 8.1% reported having ever been told by a healthcare professional that they had an eating disorder.

Gender-expansive participants

Gender-expansive participants (n = 1050) had a mean age of 30.0 years (SD = 9.9, range = 18 – 74) and a mean self-reported BMI of 28.7 kg/m^2 (SD = 8.5 range = 12.9 – 70.8). A total of 72.3% identified as White, 1.0% as Black, 2.6% as Asian, 0.3% as Native American, 11.0% as another race, 6.0% as multi-race; 10.4% did not provide data on race. In addition, 6.0% of the sample identified as Hispanic, Latino, or Spanish in origin. A majority of gender-expansive participants (58.1%) had college education or higher, 96.8% were born in the U.S.A., and 13.9% reported having ever been told by a healthcare provider that they had an eating disorder.

Confirmatory factor analyses

A series of CFAs were conducted to evaluate the previously described models among gender minority participants (see Table 1). Transgender women showed adequate fit indices in models 2, 6, 7 and 8; however, fit indices were better in Model 8, and ECVI values

were lower in this model. Overall, the brief seven-item, three-factor model (Model 8) showed good fit for CFI and RMSEA in all gender minority populations. SRMR values suggested a good fit in transgender women and acceptable fit for transgender men and gender-expansive people. Model 8 showed the lowest respective ECVI values across all models, indicating a combination of best fit and greatest parsimony. Thus, Model 8 was retained for all gender minority samples (Figure 1). Sensitivity analyses supported Model 8 among gender-expansive participants who were assigned female and male sex at birth.

Table 2 shows results from a multi-group CFA that was conducted to evaluate measurement invariance of the retained seven-item, three-factor model (Model 8; Grilo et al., 2013). Measurement invariance among transgender men, transgender women, and gender expansive participants was supported at the configural level, indicating that the number of latent factors and the pattern of item loadings were similar across subsets of gender minority participants. In addition, metric invariance was also observed (ΔCFI = .008), suggesting that the magnitude of the loadings was similar across groups. Consistently, the non-significant $\Delta\chi^2$ also supported metric invariance. Further, scalar invariance was observed (ΔCFI = −0.001 and ΔRMSEA = −0.004), indicating that item loadings and item intercepts were similar across groups. Consistently, a CFA of the retained seven-item, three-factor model (Model 8; Grilo et al., 2013) including all gender minorities participants (N = 1567) resulted in adequate fit to the data (CFI = 0.98, RMSEA = 0.09 [90% CI = 0.08, 0.10], SRMR = 0.03). Sensitivity analyses supported that Model 8 was invariant across gender-expansive participants who were assigned female and male sex at birth.

Internal consistency

Internal consistency for the retained model (Model 8) showed adequate values. For the three-item Dietary Restraint factor, Cronbach's alpha values were 0.82 for transgender men, 0.88 for transgender women, and 0.86 for gender expansive participants. Similarly, the Omega coefficient for the Dietary Restraint factor was 0.83 (95% CI = 0.78, 0.86) for transgender men, 0.81 (95% CI = 0.75, 0.87) for transgender women, and 0.86 (95% CI = 0.84, 0.88). For the two-item Shape/Weight Overvaluation factor, the Spearman-Brown coefficient was 0.89 for transgender men, 0.88 for transgender women, and 0.89 for gender expansive participants. Finally, for the two-item Body Dissatisfaction factor, the Spearman-Brown coefficient was 0.84 for transgender men, 0.85 for transgender women, and 0.85 for gender expansive participants.

Discussion

Although research suggests that gender minority populations are at risk for elevated eating disorder symptomatology (Diemer et al., 2015; Guss et al., 2017; Simone et al., 2020), the present study represents the first psychometric evaluation of one of the most widely used self-report eating disorder measures (i.e., the EDE-Q) in transgender men, transgender women, and gender expansive individuals. Our goal was to identify the best-fitting factor structure for the EDE-Q and explore measurement invariance across gender minority adults to guide future investigations and support appropriate use of the measure with gender minority individuals in clinical and research contexts. Given concerns regarding

the replicability and validity of the original four-factor structure of the EDE-Q, as well as the number of alternative models that have been empirically supported in prior studies with diverse samples, we used a comparative CFA approach to explore eight distinct EDE-Q models. Results provided the strongest support for a brief seven-item, three-factor model described by Grilo et al. (2013), with the three subscales (dietary restraint, shape/weight overvaluation, and body dissatisfaction) demonstrating adequate internal consistency in all gender minority groups and measurement invariance of the three-factor model was supported across transgender men, transgender women, and gender expansive adults.

The overvaluation of shape/weight, body dissatisfaction, and dietary restraint subscales reflected in the three-factor model are consistent with the transdiagnostic cognitive behavioral theory of eating disorders (Cooper & Grave, 2017; Fairburn et al., 2003), which highlights the common features across eating disorders. Specifically, within this framework, weight/shape overvaluation is conceptualized as a core underlying cognitive feature of eating disorders that fosters both body image concerns and efforts to restrict eating. As such, the factors reflected in this briefer model focus on what are arguably the most central factors within the transdiagnostic theory. Moreover, for gender minority populations in particular, gender minority stress theory (Hendricks & Testa, 2012; Lefevor et al., 2019; Testa et al., 2015) posits that social stressors (e.g., transphobia, discrimination, sexual objectification) can trigger a cascade of stress responses, which among other negative outcomes may promote thinness-oriented eating disorder symptoms (such as restriction/restraint) and body image disturbances (Cusack et al., 2021; Muratore et al., 2022). Notably, items from the Weight Concern, Shape Concern, and Dietary Restraint subscales of the original EDE-Q are retained in this brief version, but no items from the Eating Concern scale are included. The advantages of a shorter form include practical application (less time needed in a busy clinical environment) and the removal of redundant items, as model fit may be improved without redundancy. While these results are consistent with prior work in a sample of 962 sexual minority adult men and women (Klimek, Convertino, Gonzales, et al., 2021), they are inconsistent with prior work in a sample of 249 transgender youth seeking medical treatment at a transgender clinic and met criteria for gender dysphoria (Peterson et al., 2020). However, like both studies, the original four-factor structure of the EDE-Q was not supported in the present investigation, adding to extensive evidence indicating that the original factor structure may not be appropriate for application with gender minority individuals. In the only prior study examining the psychometric properties of the EDE-Q among gender minorities, Peterson and colleagues (2020) used an exploratory factor analysis approach in a sample of 11–24-year-olds seeking gender-affirming hormone replacement therapy recruited from the Midwestern United States. In contrast, the present study used a CFA approach to explore the fit of eight models using data from a community sample of 2,638 gender minority adults recruited from across the US. Thus, differences in sampling and statistical methodology may explain the disparate pattern of results, and future research may benefit from testing the fit of the brief seven-item, three-factor model in community samples of transgender youth.

We also found support for measurement invariance across gender minorities within the present sample, suggesting that the three-factor EDE-Q model is measuring the same eating disorder constructs across transgender men, transgender women, and gender expansive

individuals. Importantly, these findings support using this three-factor version of the EDE-Q in future studies to compare mean scores across the gender minority subgroups examined here. Given prior research suggesting that eating disorder symptom severity may vary across gender minority subgroups (Diemer et al., 2018; Lefevor et al., 2019; Nagata et al., 2020), empirical support for this brief version of the EDE-Q will aid future research on potential differences in the nature and severity of disordered eating between transgender men, transgender women, and gender expansive individuals.

Strengths and limitations

A notable strength of this investigation is the focus on gender minority populations that, until recently, have received limited attention within the eating disorders field and literature. Additional strengths included the large sample sizes for each of the gender minority groups, the comparative CFA approach that evaluated numerous previously supported EDE-Q models, and the examination of measurement invariance across the groups. However, certain limitations should also be addressed. First, the gender-expansive group included individuals with a variety of distinct gender identities. This was necessitated by sample size considerations, but the heterogeneity of the group should be considered when interpreting the findings. Second, although there was variability in the racial demographics of the gender minority groups, participants across all groups were predominantly White and highly educated, thus findings may not generalize to more socio-demographically diverse gender minority populations. Moreover, the current study focused on adults with a wide age range, and future studies could benefit from including adolescents or focusing on gender-minority people within narrower age ranges (e.g., young adults). The extent to which individuals in the current sample had access to or engaged in gender-affirming healthcare was unknown. Future studies should examine how gender-affirming healthcare may impact findings, alongside the intersections of race, ethnicity, gender, and socioeconomic status. Testing multiple CFAs may increase the chance of overfit for any one of the CFAs. The use of a short form (e.g., a seven-item, three-factor measure) may introduce problems in measurement. For instance, a factor structure with 2–3 items on average per subscale could create unreliable reporting in small samples. Future research in a different sample of gender minority people testing only the brief seven-item EDE-Q would be useful for further confirming the three-factor structure and measurement invariance findings of this study. Furthermore, we did not evaluate test-retest reliability and convergent or divergent validity, which could be addressed in future research.

Conclusions

The current study of gender minority individuals indicated support for a seven-item, three-factor version of the EDE-Q (Grilo et al., 2013), which has also been supported in prior investigations with other populations. Specifically, the present findings supported the factor structure, internal consistency, and measurement invariance of this three-factor version of the measure across transgender men, transgender women, and gender-expansive people. Notably, the especially brief nature of this version of the EDE-Q is beneficial, given the reduced participant/patient burden associated with completing fewer items on self-report assessments in research or clinical settings. Future studies will be needed to evaluate additional psychometric properties of this version of the EDE-Q that were not

examined in the current investigation, including test-retest reliability, construct validity, and predictive validity. Additional psychometric research with gender minority individuals reflecting greater racial, ethnic, and socioeconomic diversity will also be needed to bolster the generalizability of the present findings. Finally, there is a need for future research to establish empirically derived clinical cut-off scores for this version of the EDE-Q among gender minority samples.

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Appendix

Appendix

Appendix A.

Explanation of Classification of Participants

Population	Gender identity	Sex assigned at birth
Cisgender man	man (exclusively)	male
Cisgender woman	woman (exclusively)	female
Transgender man	man, transgender man, or transmasculine (write-in) [a]	female
Transgender woman	woman, transgender woman, or transfeminine (write-in) [b]	male
Gender-expansive person	Included: genderqueer, multiple gender identities, another gender identity, non-binary, nonconforming, genderfluid, intersex, two-spirit, agender, bigender, or other write-ins. This category included anyone not classified as cisgender man, cisgender woman, transgender man, or transgender woman.	

[a] Includes any combination of man, transgender man, and/or transmasculine, but not other gender identities.

[b] Includes any combination of woman, transgender woman, and/or transfeminine, but not other gender identities.

Availability of Data, Materials and Code

Availability of data and materials: Data from The PRIDE Study may be accessed through an Ancillary Study application (details at pridestudy.org/collaborate).

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Public Significance statement:

Although transgender individuals have greater risk of developing an eating disorder, the factor structure of the Eating Disorder Examination-Questionnaire, one of the most widely used eating disorder assessment measures, has not been explored in transgender adults. We found that a seven-item model including three factors of dietary restraint, shape and weight overvaluation, and body dissatisfaction had the best fit among transgender and non-binary adults.

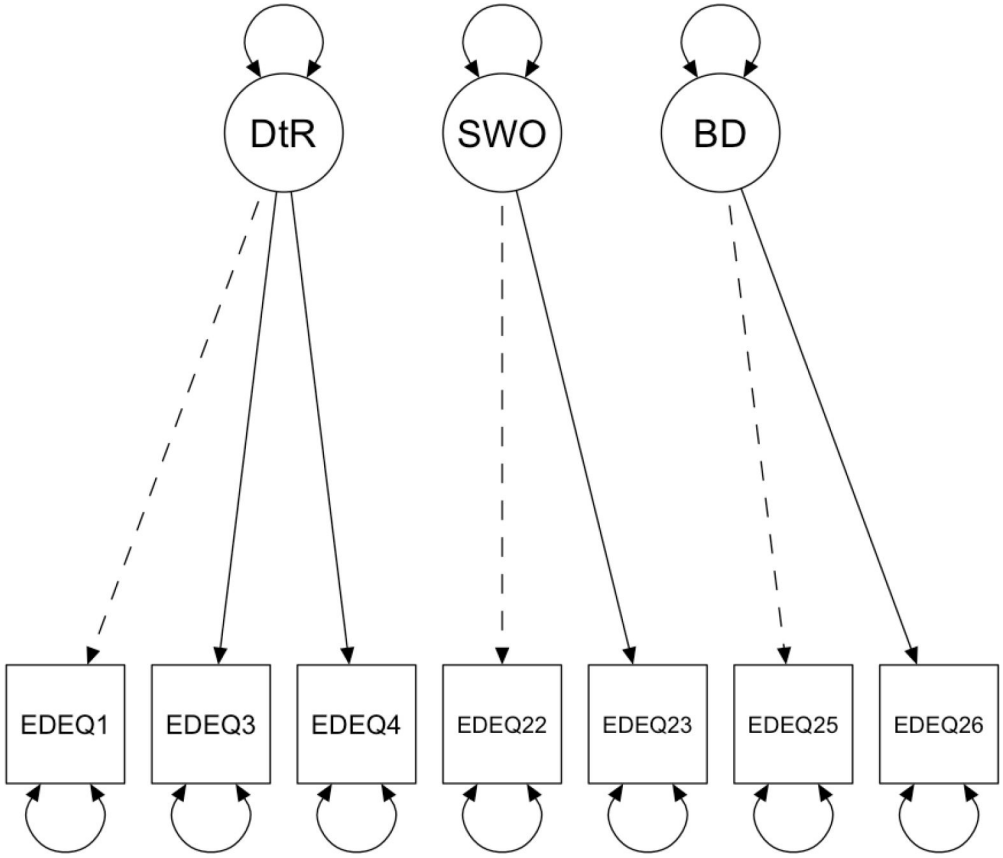

Figure 1.

Grilo et al., 2013's seven-item, three-factor model

DtR = Dietary Restraint; SWO = Shape/Weight Overvaluation, BD = Body Dissatisfaction

Table 1.

Confirmatory Factor Analyses in Gender Minority Groups (N = 1567).

	Fit Indices & Model Comparison Index			
EDE-Q models	**CFI**	**RMSEA (CI 90%)**	**SRMR**	**ECVI**
Model 2. Three-factor model				
Transgender men (n = 337)	0.83	0.08 (0.07, 0.09)	0.07	1.20
Transgender women (n = 180)	0.98	0.06 (0.05, 0.07)	0.08	1.71
Gender-expansive people (n = 1050)	0.81	0.09 (0.08, 0.09)	0.07	0.93
Model 3. Two-factor model				
Transgender men (n = 337)	0.81	0.09 (0.08, 0.09)	0.08	1.34
Transgender women (n = 180)	0.89	0.07 (0.06, 0.08)	0.09	1.77
Gender-expansive people (n = 1050)	0.78	0.09 (0.09, 0.10)	0.08	1.08
Model 4. Full one-factor model				
Transgender men (n = 337)	0.75	0.10 (0.09, 0.10)	0.09	5.05
Transgender women (n = 180)	0.85	0.08 (0.07, 0.09)	0.09	2.07
Gender-expansive people (n = 1050)	0.72	0.11 (0.10, 0.11)	0.09	1.40
Model 5. Brief eight-item model				
Transgender men (n = 337)	0.92	0.14 (0.11, 16)	0.05	0.22
Transgender women (n = 180)	0.92	0.13 (0.10, 0.16)	0.06	0.32
Gender-expansive people (n = 1050)	0.94	0.12 (0.11, 0.13)	0.04	0.11
Model 6. Alternative four-factor model				
Transgender men (n = 337)	0.86	0.07 (0.06, 0.08)	0.06	1.03
Transgender women (n = 180)	0.91	0.06 (0.05, 0.07)	0.07	1.55
Gender-expansive people (n = 1050)	0.84	0.08 (0.08, 0.09)	0.06	0.75
Model 7. Bi-factor model (four factors and a latent '*g*' factor)				
Transgender men (n = 337)	0.87	0.07 (0.06, 0.08)	0.06	1.03
Transgender women (n = 180)	0.92	0.06 (0.05, 0.07)	0.07	1.55
Gender-expansive people (n = 1050)	0.84	0.08 (0.08, 0.09)	0.06	0.79
Model 8. Brief seven-item, three-factor model				
Transgender men (n = 337)	0.96	0.09 (0.07, 0.12)	0.04	0.15
Transgender women (n = 180)	0.99	0.06 (0.01, 10)	0.03	0.22
Gender-expansive people (n = 1050)	0.96	0.09 (0.08, 0.10)	0.03	0.06

Table 2.

Measurement invariance between subset samples of transgender men (n = 337), transgender women (n = 180), and gender-expansive people (n = 1050) from The PRIDE Study.

Fit indices	χ^2	*df*	CFI	RMSEA	SRMR	Model Comparison	$\Delta\chi^2$	ΔCFI	ΔRMSEA	ΔSRMR	Δ*df*	*p*
Configural	165.939	33	0.971	0.088	0.030	-	-	-	-	-	-	
Metric	137.789	41	0.979	0.067	0.031	Configural versus Metric	−28.150	0.008	−0.021	0.001	8	0.734
Scalar	149.995	49	0.978	0.063	0.032	Metric versus Scalar	12.206	−0.001	−0.004	0.001	8	0.355

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.