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Psychometric Evaluation of the Youth Eating Disorder Examination Questionnaire in Children with Overweight or Obesity

Andrea E. Kass¹, Kelly Theim Hurst², Rachel P. Kolko³, Elizabeth B. Ruzicka⁴, Richard I. Stein⁵, Brian E. Saelens⁶, R. Robinson Welch⁵, Michael G. Perri⁷, Kenneth B. Schechtman⁵, Leonard H. Epstein⁸, and Denise E. Wilfley^{5,*}

¹The University of Chicago, Chicago, IL

²National Center for Weight and Wellness, Washington, DC

³University of Pittsburgh, Pittsburgh, PA

⁴Kent State University, Kent, OH

⁵Washington University School of Medicine, St. Louis, MO

⁶Seattle Children's Hospital, Seattle, WA

⁷University of Florida, Gainesville, FL

⁸University at Buffalo School of Medicine and Biomedical Sciences, Buffalo, NY

Abstract

Objective—This study evaluated the psychometric properties of the Youth Eating Disorder Examination Questionnaire (YEDE-Q) and its utility for detecting loss of control (LOC) eating (i.e., eating episodes, regardless of size, involving a perceived inability to control what or how much one is eating) among school-age children with overweight or obesity. Identifying eating pathology, particularly LOC eating, in this population may facilitate treatment that improves weight outcomes and reduces eating disorder risk.

Methods—Children with overweight or obesity ($N = 241$; 7–11y) completed the YEDE-Q and abbreviated Child EDE (ChEDE) to assess LOC eating, prior to entering a weight management treatment trial. Confirmatory factor analyses (CFA) were conducted on children's YEDE-Q responses and compared to the standard adult EDE-Q factor structure and newer, alternate factor structures.

Results—CFA supported a three-factor structure, which distinguished youth with versus without LOC. The YEDE-Q showed low accuracy for detecting LOC eating as measured by the ChEDE, which served as the gold-standard benchmark (AUC = 0.69). Among children who endorsed LOC eating, more episodes per month were reported on the YEDE-Q than ChEDE ($p < 0.001$).

*Address correspondence to: Denise E. Wilfley, Ph.D., Washington University School of Medicine, Department of Psychiatry, 660 South Euclid, Box 8134, St. Louis, Missouri, USA 63110, wilfleyd@psychiatry.wustl.edu.

Disclosure of Conflicts

The authors report no conflicts of interest.

Conclusions—The YEDE-Q may not have utility as a screener for identifying true cases of LOC eating among school-age children with overweight or obesity. Further evaluation of the YEDE-Q and the alternate three-factor structure is warranted.

Keywords

assessment; eating disorder pathology; loss of control eating; children; overweight

Some children with overweight or obesity experience loss of control (LOC) eating (i.e., eating episodes, regardless of size, involving a perceived inability to control what or how much one is eating).¹ LOC eating is associated with elevated disordered eating attitudes and psychosocial impairment,² predicts excess weight and fat gain over time,^{3, 4} and predicts development of an eating disorder (ED).⁵ Detecting LOC eating during childhood may facilitate tailored intervention to improve weight outcomes and reduce ED risk.

The Child Eating Disorder Examination (ChEDE) is a semi-structured interview adapted from the adult EDE⁶ to assess ED psychopathology, including LOC eating.⁷ The ChEDE relies on clinician administration, which can be burdensome to clinicians and patients, time-consuming, and requires training to administer with fidelity. An efficient self-report screener to detect LOC eating may enhance the feasibility of identifying youth with ED pathology, which can lead to more precise intervention.

The EDE Questionnaire (EDE-Q)^{8, 9}—developed from the adult EDE to be a self-report measure for adults—has been adapted for youth as the Youth EDE-Q (YEDE-Q^a).^{10, 11} Adaptations comprised modified language for children’s comprehension and added vignettes and pictures describing LOC eating. The interview and questionnaire are matched in terms of item content and scoring (i.e., both measures yield information on behavioral features using frequency data and on severity of psychopathology using four subscales and a global score¹²), and thus share a common language for assessing ED psychopathology.^{13, 14} However, meta-analytic results of the adult measures suggest these assessment tools should not be used interchangeably, particularly for assessing binge eating frequency.¹³

Other measures assess eating-related pathology in youth. The Questionnaire on Eating and Weight Patterns—Adolescent version (QEWP-A) was developed to assess for binge eating disorder (BED).¹⁵ However, the QEWP-A has not demonstrated concordance with either the ChEDE among children¹⁶ or the YEDE-Q among adolescents¹⁰ for assessing binge eating. The YEDE-Q also enables assessment of ED psychopathology beyond the criteria to diagnose BED.

YEDE-Q norms are available for adolescent girls,¹⁷ and data from youth 10 years old with overweight or obesity suggest the YEDE-Q may be a useful screener for ED pathology.^{10, 18} However, no study has evaluated the YEDE-Q’s utility for detecting LOC eating among school-aged children as young as 7 years old, despite evidence showing that children experience their first LOC episode, on average, by 8 years old (range=5–13 years).¹⁹ Further, no study has evaluated whether EDE-Q factor structures observed in adults and

^aMeasure available from corresponding author upon request.

adolescents are similar to the YEDE-Q factor structure among school-age children, an examination of which is warranted given that past evaluations have failed to replicate the EDE-Q's standard four-factor structure in adults^{14, 20–25} and adolescents.²⁶ Thus, we examined the YEDE-Q's psychometric properties and use as a screening tool for LOC eating in treatment-seeking children ages 7–11 years old with overweight or obesity. We hypothesized the YEDE-Q would fail to confirm the standard EDE-Q factor structure but support newer, alternative structures, and would have utility for detecting LOC eating in children.

Methods

Participants

Participants were 241 children (63% female; 65% non-Hispanic White/Caucasian; mean age = 9.9 ± 1.3 years) enrolled in a family-based treatment trial for weight management. At entry, children had a body mass index (BMI; kg/m^2) 85th percentile for age and sex ($M = 97.9 \pm 2.5$) and at least one parent with overweight or obesity (BMI ≥ 25). Child BMI percentile and parent BMI were calculated using objectively-measured height and weight.

Children were excluded from the trial if (by self- or parent-report) they had: a) suicidal ideation or a thought disorder, bipolar disorder, substance dependence, or current/past ED; b) an inability to comprehend English 1st-grade level; c) a physical disability or illness that precluded moderate physical activity; or d) been taking weight-affecting medications.

Procedure

Participants were recruited from the St. Louis and Seattle areas via advertisements, physician referrals, and word of mouth. Parents completed a telephone screen to assess family eligibility. Potentially eligible families then attended in-person orientation and baseline assessment visits, during which children completed the YEDE-Q and ChEDE. For additional details, see Best et al.²⁷

The study was approved by each site's Institutional Review Board. Parents and children provided informed consent and assent, respectively.

Measures

The ChEDE⁷ overeating section was administered to identify objective binge episodes (OBES; involving an objectively large amount of food and LOC) and subjective binge episodes (SBES, involving an amount of food not objectively large based on clinical rating but perceived as overeating, accompanied by LOC).

On the same day, children completed the 39-item YEDE-Q.^{10, 11} Response options for most items are on a Likert-type 0–6 scale; higher scores indicate greater pathology. Nine items had response options on a 1–7 scale, which were recoded 0–6 for consistency with the other items. The measure's standard factor structure has four subscales—Restraint (5 items), Eating Concern (5 items), Weight Concern (5 items), and Shape Concern (8 items). Separately, the presence and frequency of OBES and SBES were assessed.

Analytic Plan

For both measures, LOC eating was calculated as OBEs plus SBEs over the past 28 days, given that the small number of youth endorsing OBEs and SBEs on the ChEDE precluded separate analyses of these behaviors. This sum was then log transformed to reduce skew. Outliers (>3 standard deviations above the mean) were observed for LOC episodes on the ChEDE ($n = 4$) and YEDEQ ($n = 1$); however, the presented results include all participants, as the pattern of results was consistent with versus without the outliers.

YEDE-Q internal consistency was calculated using Cronbach's alpha coefficients and average inter-item correlations (AICs). Internal consistency standard is $\alpha = 0.70^{28}$, and AIC values between 0.15–0.50 are considered ideal.²⁹ Confirmatory factor analyses (CFA) were used to test the fit of the standard YEDE-Q four-factor structure, an alternate three-factor structure of the adult EDE-Q identified by Grilo and colleagues among adults with BED or obesity,^{23, 24} and an alternate four-factor structure of the adult EDE-Q identified by White and colleagues among community-based adolescents.²⁶ Goodness of fit was determined by inspecting the overall model chi-square, comparative fit index (CFI) and Tucker-Lewis Fit Index (TLI) = 0.95, and root mean square error of approximation (RMSEA) = 0.60.³⁰

Agreement between the YEDE-Q and the ChEDE for the presence of LOC eating was examined using Pearson chi-square tests, following Goldschmidt and colleagues' approach.¹⁰ Spearman rho correlations and Wilcoxon signed-rank tests were used to examine differences in frequency of LOC episodes assessed by the two measures. Receiver operating characteristic (ROC) analysis was used to test the YEDE-Q compared to ChEDE for detecting cases screening positive for any LOC eating.³¹ Using YEDE-Q subscales from the model with the best fit, convergent validity for differentiating youth with versus without LOC was evaluated using t-tests.

Analyses were conducted using SPSS v.22, except for the CFA, which were conducted using MPlus version 7. Statistical significance was set at $p < .05$; all tests were two-tailed.

Results

There was moderate to good internal consistency of the YEDE-Q subscales based on the standard four factors: Restraint ($\alpha = 0.68$; AIC = 0.29), Eating Concern ($\alpha = 0.74$; AIC = 0.36), Weight Concern ($\alpha = 0.78$; AIC = 0.42), and Shape Concern ($\alpha = 0.90$; AIC = 0.52). However, CFA did not show good fit between the YEDE-Q and the standard four-factor structure ($\chi^2 = 624.43$; $p < .001$; CFI = 0.84; TLI = 0.82; RMSEA = 0.09) or the alternate four-factor structure identified by White and colleagues²⁶ among adolescents ($\chi^2 = 690.66$; $p < .001$; CFI = 0.82; TLI = 0.80; RMSEA = 0.10). The YEDE-Q did show good fit with the alternate three-factor structure identified by Grilo and colleagues^{23, 24} ($\chi^2 = 14.98$; $p = .18$; CFI = 0.99; TLI = 0.99; RMSEA = 0.04).

A higher proportion of children endorsed the presence of LOC eating on the YEDE-Q (48.7%) than on the ChEDE (21.8%), ($\chi^2 = 24.1$; $p < 0.001$). Forty-one children (17.2%) endorsed LOC eating on both assessments. Using the ChEDE as the referent, the YEDE-Q yielded 75 (31.5%) false positives (i.e., children who reported LOC via questionnaire but not

interview) and 11 (4.6%) false negatives (i.e., children who denied LOC via questionnaire but reported LOC on the interview). Children who were false negatives did not differ from the other children in terms of age, sex, BMI z-score, or global YEDE-Q score (p 's > .61). Figure 1 shows results testing the ROC curve; these results suggest the YEDE-Q identifies LOC cases, though with low accuracy.³² Using YEDE-Q subscales from the three-factor structure that had the best fit, youth who endorsed LOC eating on the YEDE-Q had higher subscale scores than did youth who denied LOC eating (Table 1).

Among children who endorsed LOC eating on at least one measure, the mean number of LOC eating episodes was significantly higher on the YEDE-Q versus ChEDE ($z = -8.19$; $p < .001$). Among these children, the number of LOC episodes was not significantly correlated between the YEDE-Q and ChEDE ($\rho = 0.09$; $p = .33$).

Discussion

This study evaluated the psychometric properties of the YEDE-Q and its utility as a screening tool for LOC eating among children ages 7–11y with overweight or obesity. Consistent with hypotheses, results failed to confirm the standard four-factor EDE-Q structure observed in adults and four-factor structure observed in adolescents;²⁶ rather, results supported the alternate three-factor structure observed by Grilo and colleagues,^{23, 24} which has shown good fit among adult samples presenting for bariatric surgery²⁴ or presenting with BED (the latter sample had a mean BMI of 37.9).²³ The alternate factor structure had good convergent validity for differentiating youth with LOC from those without LOC eating, although reliability values for two of the subscales fell outside of the ideal range. Taken together, this alternate structure may be appropriate for children and adults with a higher weight status and be more efficient to deliver, as it is comprised of 7 items instead of 22; however, further evaluation of this three-factor structure is warranted.

In contrast to hypotheses, the YEDE-Q showed low utility for identifying true cases of LOC eating compared to the ChEDE, and participants reported significantly more LOC eating episodes on the YEDE-Q than on the ChEDE, consistent with research among adolescents and adults.^{9, 10, 13, 18, 33, 34} The correlation between these measures for LOC eating frequency was low even when limited to children who indicated any LOC on either measure. This low correlation may have resulted from differences in the format and administration procedure. The interview allows assessors to clarify difficult-to-understand items, such as LOC, and uses a calendar guide, which could affect how accurately youth report frequencies. Alternatively, youth may be more willing to endorse LOC eating via self-report, which is private, than to an assessor. By comparison, in studies of older youth, Goldschmidt and colleagues¹⁰ found a significant correlation between the YEDE-Q and ChEDE for OBEs but not SBEs (and the YEDE-Q yielded significantly greater frequency ratings than the ChEDE for both OBEs and SBEs), Goossens and Braet¹⁸ found no differences between measures in percent endorsing OBEs and SBEs, and Delacuwe and Braet³³ did not find a correlation between measures in OBE frequency. Comparison between the ChEDE and QEWP-A has also shown the QEWP-A is not concordant with the ChEDE for assessing binge eating either: only 4.5% of children reported LOC episodes on both the ChEDE and QEWP-A,¹⁶ whereas agreement was higher in our sample using the YEDE-Q.

The YEDE-Q yielded more false positives than false negatives for detecting LOC eating; however, false positives are preferable to false negatives on a self-report screener to avoid missing cases. Accordingly, if used as a screener, it may be useful to administer the YEDE-Q followed by a diagnostic assessment (e.g., ChEDE) among those who screen positive. Enhancements to the YEDE-Q, such as embedding vignettes regarding LOC within the overeating section rather than in the initial instructions, may also help the YEDE-Q more precisely identify youth with LOC eating. Additionally, it may be helpful to determine factors that predict concordance and discordance, to enhance our understanding of subpopulations for whom the YEDE-Q might be an effective and accurate screener.

To our knowledge, this is the first evaluation of the YEDE-Q in youth as young as 7 years old. However, a study limitation is that the results may not generalize to non-treatment seeking youth or children with full-syndrome EDs. Additionally, although assessments were ordered with the intent of the YEDE-Q being administered prior to the ChEDE, our data are limited as they do not allow us to confirm whether this administration order was consistently accomplished in practice, thus creating a potential limitation of this study.

Taken together, our findings support a three-factor structure and show that the YEDE-Q detects LOC eating but is not concordant with the ChEDE for identifying true cases of LOC eating in school-age children with overweight or obesity. These results suggest the YEDE-Q may have greater utility as a screener, to indicate whether to administer the ChEDE overeating section to evaluate LOC eating. Further evaluation of the YEDE-Q is warranted to validate the alternate structure in a different sample of youth, including among children with known clinical ED pathology.

Acknowledgments

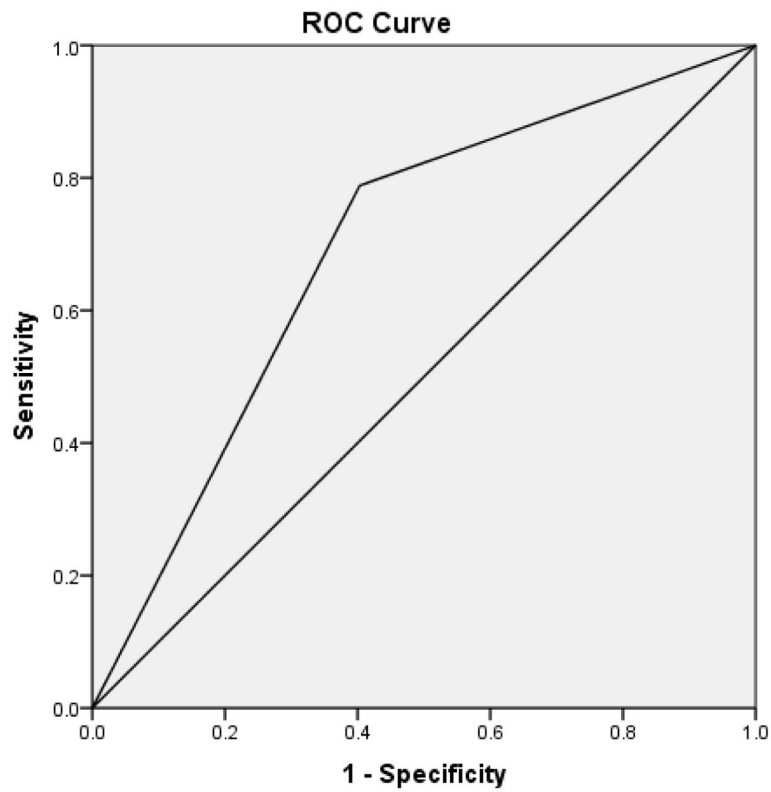
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Diagonal segments are produced by ties.

FIGURE 1.

Receiver operating characteristic analysis for cases screening positive for loss of control eating on the Youth Eating Disorder Examination Questionnaire compared to the Child Eating Disorder Examination.

Area under the curve = 0.69 (SE = 0.04; Asymptotic 95% CI = 0.62 – 0.77); Asymptotic $p < .001$

Differences in eating disorder pathology between youth who did versus did not endorse LOC eating on the YEDE-Q.

TABLE 1

Factor*	Cronbach's α	Average Inter-item Correlation	Full Sample, Mean (SD)	Endorsed LOC, Mean (SD)	Did not Endorse LOC, Mean (SD)	Test Statistic and <i>p</i> -value comparing those who did versus did not endorse LOC
<i>Dietary Restraint</i> (3 items)	0.72	0.46	2.06 (1.54)	2.32 (1.46)	1.80 (1.58)	$t(1, 236) = -2.68; p = .008$
<i>Shape/Weight Overvaluation</i> (2 items)	0.84	0.72	1.92 (1.64)	2.45 (1.56)	1.39 (1.56)	$t(1, 234) = -5.21; p < .001$
<i>Body Dissatisfaction</i> (2 items)	0.87	0.77	2.36 (1.95)	3.09 (1.85)	1.65 (1.78)	$t(1, 236) = -6.12; p < .001$

Note: YEDE-Q = Youth Eating Disorder Examination – Questionnaire; SD = standard deviation.

* Factors are based on the three-factor structure derived by Grilo and colleagues.^{23,24}