

Psychometric Properties of the Eating Disorder Examination-Questionnaire: Factor Structure and Internal Consistency

Carol B. Peterson, PhD^{1*}
 Ross D. Crosby, PhD^{2,3}
 Stephen A. Wonderlich, PhD^{2,3}
 Thomas Joiner, PhD⁴
 Scott J. Crow, MD¹
 James E. Mitchell, MD^{2,3}
 Anna M. Bardone-Cone, PhD⁵
 Marjorie Klein, PhD⁶
 Daniel le Grange, PhD⁷

ABSTRACT

Objective: The purpose of this investigation was to evaluate the factor structure and the internal consistency of the Eating Disorder Examination-Questionnaire (EDE-Q).

Method: The EDE-Q was administered to 203 women with bulimic symptoms, who were recruited from five Midwestern communities.

Results: Acceptable levels of internal consistency were observed for the EDE-Q total score ($\alpha = .90$) and subscales: Restraint ($\alpha = .70$), Eating Concern ($\alpha = 0.73$), Shape Concern ($\alpha = 0.83$) and Weight Concern ($\alpha = 0.72$). Exploratory factor loadings using Principal Axis Analysis supported the Eating Concern and

Restraint subscales. Most of the Shape Concern and Weight Concern items loaded on one factor, with the exception of the items focusing on the importance of weight and shape in self-evaluation and preoccupation with shape and weight.

Conclusion: The results of this study provide support for the internal consistency of the EDE-Q and indicate a need for further examination of the factor structure of this instrument. © 2007 by Wiley Periodicals, Inc.

Keywords: bulimia nervosa; assessment; eating disorders

(*Int J Eat Disord* 2007; 40:386–389)

Introduction

The Eating Disorder Examination (EDE)¹ is an interview-based instrument, which is one of the most widely used measures in the field of eating

disorders. The EDE has extensive reliability and validity data supporting its use¹ and has been described as the most accurate measure of binge eating.² A questionnaire version of the EDE (EDE-Q)³ has been used with increasing frequency in clinical and community investigations of eating disorder symptoms.⁴

Studies that have evaluated the correspondence between the EDE and the EDE-Q have yielded inconsistent findings.^{5–12} Because of the inconsistencies that have been observed between the questionnaire and interview versions of the EDE, evaluating the psychometric properties of the EDE-Q is imperative. However, few studies have examined its reliability and validity. Luce and Crowther¹³ observed Cronbach α coefficients of 0.78 and higher for the EDE-Q subscales, as well as good two-week test-retest reliability in a sample of undergraduate women. Similarly, Mond et al.,¹⁴ found internal consistency coefficients that ranged from .73 to .93, and more variable temporal consistency over several months in a community sample.

Although the EDE-Q was designed to assess eating disorders, the internal consistency of the EDE-Q has not been reported for samples of symptomatic participants. Previous research has not investigated the factor structure of the EDE-Q, and only

Accepted 3 January 2007

Portions of this manuscript were presented at the 2005 International Conference on Eating Disorders in Montreal, Quebec, April 2005.

Supported by 1 R01-MH/DK58820 from NIH, R01-DK61912 from NIH, 1 R01-DK61973 from NIH, 1 R01-MH59100 from NIH, 1 R01-MH66287 from NIH, P30-DK50456 from NIH, R01-DK 60432 from NIH, R01-MH 59234 from NIH, K02-MH65919 from NIH, the University of Missouri Research Council, Walden W. and Jean Young Shaw Foundation, and the Neuropsychiatric Research Institute

*Correspondence to: Carol B. Peterson, PhD, Eating Disorders Research, Department of Psychiatry, University of Minnesota, 606 24th Avenue South, Suite 602, Minneapolis, MN 55454.

E-mail: peter161@umn.edu

¹ Department of Psychiatry, University of Minnesota, Minneapolis, Minnesota

² Neuropsychiatric Research Institute, Fargo, North Dakota

³ Department of Neuroscience, University of North Dakota School of Medicine, Fargo, North Dakota

⁴ Department of Psychology, Florida State University, Tallahassee, Florida

⁵ Department of Psychological Sciences, University of Missouri-Columbia, Columbia, Missouri

⁶ Department of Psychiatry, University of Wisconsin, Madison, Wisconsin

⁷ Department of Psychiatry, University of Chicago, Chicago, Illinois

Published online 15 February 2007 in Wiley InterScience (www.interscience.wiley.com). DOI: 10.1002/eat.20373

© 2007 Wiley Periodicals, Inc.

one study has evaluated the factor structure of the interview version of the EDE.¹⁵ The purpose of this investigation was to examine the internal consistency and the factor structure of the EDE-Q in a multisite sample of women with bulimic symptoms.

Method

Participants

Female participants ($N = 203$) were recruited from five Midwestern communities. Among the participants, the average age was 25.7 ($SD = 8.9$; range = 18–57) and average body mass index was 23.0 ($SD = 5.3$; range = 16.2–53.4). The majority of participants were Caucasian ($n = 184$; 90.6%; Asian: $n = 7$; 3.4%; Black: $n = 5$; 2.5%; Hispanic: $n = 3$; 1.5%; Other: $n = 4$; 2.0%), unmarried ($n = 151$; 74.4%; married: $n = 24$; 11.8%; other: $n = 28$; 13.8%) and had at least some college education ($n = 131$; 64.5%; high school or less: $n = 14$; 6.9%; college degree: $n = 29$; 14.3%; graduate education: $n = 25$; 12.3%; other: $n = 4$; 2.0%).

Of the 203 participants, 144 (70.9%) met full criteria for bulimia nervosa (BN) as assessed by the Structured Clinical Interview for DSM-IV.¹⁶ The remainder ($n = 59$; 29.1%) met criteria for subthreshold BN, which was defined as binge eating and compensatory behavior occurring at least once per week for the past three months or compensatory behaviors occurring at least once per week accompanied by subjective binge eating episodes that were not objectively large.¹

Measures

Eating Disorder Examination-Questionnaire (EDE-Q). The EDE-Q³ is a 36-item self-report questionnaire that focuses on symptom occurrence for the past 28 days and includes four subscales: Restraint, Eating Concern, Weight Concern, and Shape Concern.

Structured Clinical Interview for DSM-IV (SCID). The SCID¹⁶ is a semi-structured interview for establishing DSM-IV diagnosis and has well-documented reliability and validity.¹⁷ For this investigation, the eating disorders module of the SCID was administered to determine current eating disorder diagnosis.

Procedure

This study was reviewed and approved by the institutional review board at each site. Potential participants were first screened by phone for eligibility. Phone screening included the administration of the eating disorders

module of the SCID to determine current eating disorder diagnosis. Eligible participants were invited to the research clinic, where they completed informed consent procedures and the EDE-Q, which was administered on scannable forms as part of a larger battery of self-report questionnaires.¹⁸

Statistical Analyses

Cronbach α coefficients were calculated for the global score and subscales. Exploratory factor analysis was performed using principal axis analysis (PAA) with nonorthogonal Promax rotation in order to allow for the anticipated correlation between factors. Four factors were extracted to attempt to replicate the EDE subscales.

Results

Cronbach α coefficients for the global score and subscales were acceptable, at 0.70 or greater: Global score: $\alpha = .90$; Restraint: $\alpha = .70$; Eating Concern: $\alpha = .73$; Shape Concern: $\alpha = .83$; Weight Concern: $\alpha = .72$.

Factor loadings provided some support for the EDE-Q subscales (see **Table 1**). Factor 1 included eight items from the Shape Concern and Weight Concern subscales, with content that focused on body dissatisfaction, discomfort with body exposure, and a desire to change body shape and weight. Factor 2 contained seven items, five of which were from the Eating Concern subscale. The two exceptions were the preoccupation with weight and shape item from the Weight Concern and the Shape Concern subscales and the empty stomach item from the Restraint subscale. Factor 3 consisted of five items from the Restraint subscale as well as the fear of weight gain item from the Shape Concern subscale. Factor 4 included the importance of weight item from the Weight Concern subscale and the importance of shape item from the Shape Concern subscale. In summary, exploratory factors from the PAA largely supported the Eating Concern and Restraint subscales. Most items from the Weight Concern and Shape Concern subscales combined into one factor, with the exception of the two items pertaining to the impact of weight and shape on self-evaluation, which were included in a separate factor, as well as the preoccupation with weight and shape item, which was included with the Eating Concern subscale factor. Correlations among the factors (shown in **Table 2**) were generally modest, ranging from 0.077 to 0.498.

TABLE 1. Principal axis analysis of EDE-Q items

Item	EDE-Q Subscale	Factor 1	Factor 2	Factor 3	Factor 4
Dissatisfaction with weight	Weight Concern	1.032	-.156	-.008	-.169
Dissatisfaction with shape	Shape Concern	.857	-.095	-.049	-.013
Desire to lose weight	Weight Concern	.840	-.138	.191	-.033
Feelings of fatness	Shape Concern	.742	-.027	.052	.092
Discomfort seeing body	Shape Concern	.611	.269	-.264	.071
Discomfort about exposure	Shape Concern	.451	.229	-.198	.135
Reaction to weighing	Weight Concern	.310	.112	-.102	.176
Flat stomach	Shape Concern	.289	.198	.134	-.027
Preoccupation with food	Eating Concern	-.177	.980	-.014	-.058
Preoccupation with weight and shape	Weight Concern/ Shape Concern	.031	.777	-.026	-.055
Eating in secret	Eating Concern	-.111	.582	.099	-.028
Social eating	Eating Concern	.034	.430	.085	.083
Fear of losing control	Eating Concern	.119	.401	.183	-.039
Guilt about eating	Eating Concern	.321	.394	.025	-.023
Empty Stomach	Restraint	.109	.388	.229	-.067
Avoidance of eating	Restraint	-.086	-.009	.815	-.060
Dietary rules	Restraint	-.098	.071	.752	.037
Restraint over eating	Restraint	.066	.027	.557	.068
Fear of weight gain	Shape Concern	.312	.122	.322	.152
Food avoidance	Restraint	.114	.190	.272	.023
Importance of weight	Weight Concern	-.043	-.105	.096	1.032
Importance of shape	Shape Concern	.021	.020	-.053	.793
Eigenvalue		7.17	2.44	1.68	1.31
Percent variance		30.54	9.06	5.70	4.66

TABLE 2. Factor intercorrelations

	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	1.000	.430	.498	.197
Factor 2	.430	1.000	.344	.319
Factor 3	.498	.344	1.000	.077
Factor 4	.197	.319	.077	1.000

Because of the lack of fit with four factors, post hoc analyses were conducted to extract three factors. Factor 1, 11 items, included all of the items from the Shape Concern and Weight Concern subscales except for preoccupation with weight and shape. Factor 2, seven items, included all of the Eating Concern subscale items along with preoccupation with weight and shape (Weight and Shape Concern subscales) and empty stomach from the Restraint subscale. Factor 3, four items, included all items from the Restraint subscale except for empty stomach.

Conclusion

Consistent with previous findings using different samples,^{13,14} this investigation provides support for the internal consistency of the EDE-Q in a sample of women with bulimic symptoms. The four factors extracted using PAA did not replicate the EDE-Q subscales. Although two of the factors resembled the Eating Concern and the Restraint subscales, the

empty stomach item appeared to be more related to concerns about eating than to dietary restraint. In addition, the fear of weight gain item from the Shape Concern subscale loaded with the Restraint subscale items. Most of the items from Shape Concern and Weight Concern loaded on one factor, with the exception of the two items related to the impact of weight and shape on self-evaluation which formed a separate factor, and the preoccupation with weight and shape item, which appeared to be more closely related to the Eating Concern subscale. These findings suggest that the self-evaluation and preoccupation with weight and shape items may be independent from other aspects of weight and shape concerns. Post hoc analyses in which three factors were extracted indicated that most of the items from the Shape Concern and Weight Concern subscales loaded on the first factor, Eating Concern items on factor two, and Restraint items on factor three.

The results of this study provide preliminary evidence that a three-factor solution may be a better fit for the EDE-Q than a four-factor solution. In particular, the Weight Concern and Shape Concern items appear to combine in one factor rather than in two separate ones. A one or two factor solution to the EDE-Q was not supported by the observed Eigenvalues. In contrast, the only study that has been published on the factor structure of the interview version of the EDE¹⁵ did obtain a two-factor solution in a sample of obese patients without binge eating disorder: the items from the Restraint

subscale formed one factor, and the items from the other three subscales formed the second factor. The contrast between these two sets of findings may be due to the fact that participants respond to items differently when they are administered in a questionnaire rather than an interview format. Because the EDE is a clinician-based interview, participant misinterpretation of the items can be clarified by the examiner. Another possible explanation is that factor analysis results may vary among different types of eating and weight disorder samples.

Although the use of a relatively large sample of women with bulimic symptoms from five different sites is one strength of this study, the sample size is nonetheless a limitation of this investigation because it was not sufficiently large to conduct confirmatory factor analysis. In addition, participants were primarily Caucasian and well-educated, which may limit the generalizability of these findings. A strength of this investigation was the use of the SCID rather than self-report questionnaire to establish eating disorder diagnosis; however, it is unclear whether the administration of the SCID by phone rather than in person may have enhanced or detracted from the reliability of the instrument,^{19,20} particularly in an eating disorder sample.²¹

This study is the first to examine the factor structure of the EDE-Q. Future investigations are needed to examine the factor structure of both the EDE and the EDE-Q in clinical as well as community samples. In addition, further reliability and validity data are needed to understand the psychometric properties of the EDE-Q, particularly its factor structure.

The authors thank Molly Gill Willer, Beth Mullen, Kamila Cass, Christoph Schulz, Jessica Syverson, and Erin Venegoni for their assistance with this investigation.

References

1. Fairburn CG, Cooper Z. The Eating Disorder Examination. In: Fairburn CG, Wilson GT, editors. *Binge Eating: Nature, Assessment, and Treatment*, 12th ed. New York: The Guilford Press, 1993, pp. 317–360.
2. Wilson GT. Assessment of binge eating. In: Fairburn CG, Wilson GT, editors. *Binge Eating: Nature, Assessment, and Treatment*. New York: The Guilford Press; 1993, pp. 227–249.
3. Fairburn CG, Beglin SJ. Assessment of eating disorders: Interview or self-report questionnaire? *Int J Eat Disord* 1994;16:363–370.
4. Anderson DA, Williamson DA. Outcome measurement in eating disorders. In: Ishak WW, Burt T, Sederer LI, editors. *Outcome Measurement in Psychiatry: A Critical Review*. Washington, DC: American Psychiatric Press; 2002, pp. 289–301.
5. Binford R, le Grange D, Jellar C. Eating Disorder Examination versus Eating Disorder Examination-Questionnaire in adolescents with full and partial-syndrome bulimia nervosa and anorexia nervosa. *Int J Eat Disord* 2005;37:44–49.
6. Black CMD, Wilson GT. Assessment of eating disorders: Interview versus questionnaire. *Int J Eat Disord* 1996;20:43–50.
7. Carter JC, Aime AA, Mills JS. Assessment of bulimia nervosa: A comparison of interview and self-report questionnaire methods. *Int J Eat Disord* 2001;30:187–192.
8. Grilo CM, Masheb RM, Wilson GT. A comparison of different methods for assessing the features of eating disorders in patients with binge eating disorder. *J Consult Clin Psychol* 2001;69:317–322.
9. Grilo CM, Masheb RM, Wilson GT. Different methods for assessing features of eating disorders in patients with binge eating disorder: A replication. *Obes Res* 2001;9:418–422.
10. Passi VA, Bryson SW, Lock J. Assessment of eating disorders in adolescents with anorexia nervosa: Self-report questionnaire versus interview. *Int J Eat Disord* 2002;33:45–54.
11. Wilfley DE, Schwartz MB, Spurrell EB, Fairburn CG. Assessing the specific psychopathology of binge eating disorder patients: Interview or self-report? *Behav Res Ther* 1997;35:1151–1159.
12. Wolk SL, Loeb KL, Walsh BT. Assessment of patients with anorexia nervosa: Interview versus self-report. *Int J Eat Disord* 2005;37:92–99.
13. Luce KH, Crowther JH. The reliability of the Eating Disorder Examination-self-report questionnaire version (EDE-Q). *Int J Eat Disord* 1999;25:349–351.
14. Mond JM, Hay PJ, Rodgers B, Owen C, Beumont PJV. Temporal stability of the Eating Disorder Examination Questionnaire. *Int J Eat Disord* 2004;36:195–203.
15. Mannucci E, Ricca V, Di Bernardo M, Moretti S, Cabras PL, Rotella CM. Psychometric properties of the EDE 12.0D in obese adult patients without binge eating disorder. *Eat Weight Disord* 1997;2:144–149.
16. First MN, Spitzer RL, Gibbon W, Williams JB. *Structured Clinical Interview for DSM-IV Axis I Disorders-Patient edition, Version 2.0*. New York: Biometrics Research Department, 1995.
17. Segal DL, Hersen M, Van Hasselt VB. Reliability of the Structured Clinical Interview for DSM-III-R: An evaluative review. *Comp Psychiatry* 1994;35:316–327.
18. Wonderlich SA, Crosby RD, Joiner T, Peterson CB, Bardone-Cone A, Klein M, et al. Personality subtyping and bulimia nervosa: Psychopathological and genetic correlates. *Psychol Med* 2005;35:649–657.
19. Allen K, Cull A, Sharpe A. Diagnosing major depression in medical outpatients: Acceptability of telephone interviews. *J Psychosom Res* 2003;55:385–387.
20. Cacciola JS, Alterman AI, Rutherford MJ, McKay JR, May DJ. Comparability of telephone and in-person Structured Clinical Interview for DSM-III-R (SCID) diagnoses. *Assessment* 1999;6:235–242.
21. Keel PK, Crow S, Davis TL, Mitchell JE. Assessment of eating disorders: Comparison of interview and questionnaire data from a long-term follow-up study of bulimia nervosa. *J Psychosom Res* 2002;53:1043–1047.