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Psychometric Evaluation of the Eating Disorder Examination-Questionnaire for Bariatric Surgery Candidates

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Abstract

Objective—Despite increasing use of the Eating Disorder Examination-Questionnaire (EDE-Q) in bariatric surgery patients, little is known about the utility and psychometric performance of this self-report measure in this clinical group. The primary purpose of the current study was to evaluate the factor structure and construct validity of the EDE-Q in a large series of bariatric surgery candidates.

Methods and Procedures—Participants were 337 obese bariatric surgery candidates. Participants completed the EDE-Q and a battery of behavioral and psychological measures.

Results—Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) produced a 12-item, 4-factor structure of the EDE-Q. The four factors, interpreted as Dietary Restraint, Eating Disturbance, Appearance Concerns, and Shape/Weight Overvaluation, were found to be internally consistent and converged with other relevant measures of psychopathology.

Discussion—Factor analysis of the EDE-Q in bariatric surgery candidates did not replicate the original subscales but revealed an alternative factor structure. Future research must further evaluate the psychometric properties, including the factor structure, of the EDE-Q in this and other diverse populations and consider means of improving this measure's ability to best assess eating-related pathology in bariatric surgery patients.

INTRODUCTION

Bariatric surgery has received continued support as the treatment of choice for producing substantial and sustained weight loss in severely obese persons (1,2). Despite dramatic weight loss following bariatric surgery, follow-up studies have found patterns of weight regain or plateau within the first (3) and second (2) years following surgery. In fact, Sjöström *et al.* (3) found percent weight loss decreased from 38% 1 year post-surgery to 25% 10 years post-surgery in patients who received Roux-en-Y gastric bypass surgery and from 21 to 13%, respectively, in patients who underwent gastric banding. Multiple studies have found similar long-term results in weight change (4–7). Accordingly, researchers have begun to work toward identifying predictors of postoperative weight regain. Based on the putative link between energy intake and weight change, preoperative and postoperative

eating behaviors have been hypothesized as potential predictors of surgical outcome (8). Eating-related psychopathology (e.g., binge eating, disinhibition, and eating concerns), for example, has been the focus of emerging prospective research on factors potentially associated with postoperative weight changes (see refs. 8 and 9 for reviews).

Self-report questionnaires initially developed for and validated with eating disordered patients have been increasingly used to identify eating-related psychopathology in obese bariatric surgery patients. To date, one of the most commonly used instruments is the Eating Disorder Examination-Questionnaire (EDE-Q) (10), a self-report measure of features of eating disorders, including the frequency of various forms of overeating and binge eating, as well as dimensional aspects of eating-related psychopathology.

The EDE-Q has generally received support as an adequately reliable and valid measure of eating-related pathology and specific disordered eating behaviors, although its performance varies somewhat across eating disorder (11–14) and normative (15–17) samples. Like many self-report instruments, the EDE-Q generally results in higher subscale scores than the interview version of the EDE (13,14,16,18). Given the widespread use of the EDE-Q, the dearth of basic psychometric evaluation studies is cause for concern, since such analyses are essential for improving assessment methods. To our knowledge, only one study has investigated the factor structure of the EDE-Q (19). Peterson *et al.* (19) performed an exploratory factor analysis (EFA) using data from a sample of women with bulimic symptoms and discovered a factor structure that did not replicate the original four factors of the EDE-Q.

Initial studies of the EDE-Q with obese bariatric patients have generally provided preliminary support for the adequacy of the EDE-Q. Although some studies have reported only modest convergence with the interview method for this instrument (20,21), these reports and others (22) have noted the utility of the EDE-Q for screening and identifying heightened risk for disordered eating and associated psychological problems. Given the widespread use of the EDE-Q in research with bariatric samples (23–27), the primary purpose of this study was to evaluate the factor structure and construct validity of the EDE-Q in a large sample of bariatric surgery candidates.

METHODS AND PROCEDURES

Participants

The participants were 337 (281 women and 56 men) obese bariatric surgery candidates from a general medical center. The age of participants ranged from 18 to 71 years (mean = 43.2, s.d. = 10.5). Of the 337 participants, 69% ($n = 233$) were white, 16.5% ($n = 56$) were black, 12% ($n = 41$) were Hispanic, 0.5% ($n = 1$) was Asian, and 2% ($n = 7$) were of an unspecified race. The majority of participants ($n = 207$, 61.5%) had received at least some college education, while an additional 30% ($n = 102$) had completed high school. BMI of participants ranged from 33.8 to 84.9 (mean = 51.4, s.d. = 9.2). Sixty-three percent ($n = 213$) of the candidates went on to receive surgery, while 37% ($n = 124$) did not have the surgery, or the surgery was pending at the time of data analysis. Patients who underwent surgery did not statistically differ from candidates who did not receive surgery on any demographic or clinical variables.

Procedures and assessment measures

The current study comprises a consecutive sample of participants who were recruited by clinical staff members at the time of a routine evaluation for surgical candidacy. A human subjects committee approved the study protocol, and written informed consent was obtained from each participant. Participants were informed that their participation would not

influence the type of care provided by the surgical team. Participants completed a battery of self-report measures as part of the preoperative evaluation process with a multidisciplinary team. There were no exclusion criteria for participation (other than those that previously identified a patient as unsuitable for surgery, thus obviating the evaluation process), including the presence and frequency of binge eating. The following measures were administered to participants before surgery.

EDE-Q—The EDE-Q (10) is a 32-item self-report measure of eating disordered attitudes and behavior based on the investigator-based EDE interview (28). The EDE-Q assesses the frequency of different forms of overeating, including *objective bulimic episodes* (i.e., binge eating defined as unusually large quantities of food with a subjective sense of loss of control), *subjective bulimic episodes* (i.e., subjective sense of loss of control while eating a quantity of food not regarded to be large given the context), and *objective overeating episodes* (i.e., eating defined as unusually large quantities of food without a subjective sense of loss of control). The EDE-Q also comprises four subscales: Dietary Restraint, Eating Concern, Weight Concern, and Shape Concern. EDE-Q sub-scale items are rated on a seven-point forced-choice format (0–6), with higher scores reflecting greater severity or frequency.

Validation measures—The *Emotional Overeating Questionnaire* (EOQ) (29) is a 6-item self-report measure of the frequency of overeating in response to specific emotions (anxiety, sadness, loneliness, tiredness, anger, and happiness). Items and response formats parallel the language of the EDE-Q. The EOQ has demonstrated adequate internal consistency, test-retest reliability, and convergence with measures of psychopathology (29). The *Body Shape Questionnaire* (BSQ) (30) is a 34-item measure of preoccupation with, and distress about, one's body shape. The BSQ has demonstrated good concurrent and discriminant validity, in addition to good reliability (30,31). The *Beck Depression Inventory* (BDI) (32) is a widely used 21-item measure of depressive symptoms and is a useful marker for broad psychosocial distress and psychopathology (33). The BDI has demonstrated adequate internal consistency, test-retest reliability, and construct validity with clinician ratings of depression (34). The *Rosenberg Self-Esteem Scale* (RSES) (35) is a widely used 10-item measure of global self-esteem, which consists of cognitive-evaluative and affective elements. This scale has received considerable support in its validity and reliability, including adequate internal consistency and test-retest reliability (36,37). The BSQ, BDI, and RSES are widely used measures of body image dissatisfaction and general psychosocial functioning in diverse clinical samples of obese patients (38–42), including bariatric surgery patients (43–47), and have been found to be associated with eating-related pathology within this latter group (25,26,48,49). The EOQ was included as an additional exploratory measure since eating (or overeating) in response to emotions is not uncommon for individuals who struggle with their eating behavior. Obese individuals with disordered eating behaviors often eat in response to intense affective stimuli (50), and recent research has found emotional overeating to be common in prebariatric surgery candidates (51,52).

RESULTS

Factor structure of the EDE-Q

EFA—Data from approximately one-half of the sample ($n = 167$) were randomly selected via computer-generated random seed and used to conduct an EFA using principal axis factoring and oblique (Direct Oblimin) rotation of the correlation matrices. Of the 32 items in the EDE-Q, 26 were entered into the EFA. The 26 items entered into the EFA consisted of all subscale items and the objective overeating episode, objective bulimic episode, and subjective bulimic episode frequency items. Although not part of the subscales, the eating frequency items were included in the factor analysis, as they are fundamental to the

diagnostic criteria of specific eating disorders and are indicative of general eating pathology. To prevent the possibility of the eating frequency items naturally loading together on the same factor due to the unique (and larger) range of values (e.g., objective bulimic episode range = 0–28) relative to all other items of the EDE-Q (range = 0–6), the scaling of the 3 frequency items was recoded to parallel all other EDE-Q items (e.g., 0 = no episodes, 1 = 1–5 episodes, etc.). (An EFA performed with the 3 eating frequency items based on their original scale of measurement revealed the same factor loadings and structure.) Of the six omitted items, four were items assessing the frequency of compensatory behaviors (e.g., vomiting, laxative misuse)—which were rarely reported in the current sample—and 2 were dichotomous (yes/no) items assessing the presence of objective overeating episodes and subjective bulimic episodes and were therefore inappropriate for factor analysis.

The Kaiser–Meyer–Olkin measure of sampling adequacy and the Bartlett's test of sphericity were calculated to assess the appropriateness of the data for factor analysis. The Kaiser–Meyer–Olkin index was 0.77 and the Bartlett's test was significant ($\chi^2(325) = 1,607.9, P < 0.001$), indicating that the data were appropriate for analysis (53). Items were retained if they had a factor loading of .50 or higher, and if they loaded on one factor. Factors were retained if they had an eigenvalue .100 and accounted for at least 5% of the total variance. Based on these criteria, as Table 1 shows, four factors were identified, consisting of 12 items, accounting for 52.9% of the total variance. The first factor, labeled *eating disturbance*, consisted of two items assessing overeating and binge eating, anchored as “an unusually large amount of food,” and a third item (“Self-defined binge eating”) allowing for the individual's interpretation of “binge episodes.” The second factor, labeled *appearance concern*, consisted of four items that assess evaluative, emotional, and behavioral aspects of body image. The third factor, labeled *dietary restraint*, consisted of three items assessing attempts to restrict food intake. The fourth factor, labeled *shape/weight overvaluation*, consisted of two items that assess degree of importance placed on shape and weight for self-worth. Whereas the Appearance Concern factor measures the degree of dissatisfaction with body shape, weight, and other aspects of physical appearance, the Shape/Weight Overvaluation factor measures the extent to which an individual places undue emphasis on body shape and weight in self-evaluation. (The following 10 items did not load on any factor: fear of losing control, avoidance of eating, empty stomach, eating in secret, flat stomach, fear of weight gain, guilt about eating, subjective bulimic episode frequency, reaction to weighing, and social eating. The following four items loaded on factors that were not retained: preoccupation with food, eating, or calories; preoccupation with shape or weight; feelings of fatness; and desire to lose weight.)

Confirmatory factor analysis—A confirmatory factor analysis (CFA; using LISREL 8) was performed using the data of the remaining half of the sample ($n = 170$). The CFA indicated that the original 4-factor model produced an acceptable fit based on recommended standards (54,55). Specifically, the root mean square error of approximation was 0.10 (confidence interval = 0.08–0.12), the comparative fit index was 0.93, and the standardized root mean square residual was 0.075. Factor loadings of the EFA and the CFA (in italics) appear in Table 1.

Descriptive characteristics and psychometric analyses

Based on the scoring method of the original EDE-Q subscales, scores for the four newly created factors were calculated by computing the average of responses to the items loading on their respective factors. Because there are an unequal number of items across the factors, it allows for direct comparison of factor scores, with each score potentially ranging from 0 to 6. Table 2 displays the internal consistency (Cronbach's alphas), means, and s.d. of the four factors comprising the revised version of the EDE-Q, as well as the subscales of the

original EDE-Q. Based on the overall sample ($N = 337$), reliability analyses indicated improved internal consistency of the four newly constructed factors in comparison to the subscales of the original EDE-Q.

To assess the construct validity of the revised EDE-Q subscales, Pearson's correlations were first calculated among the newly constructed factors and the original EDE-Q subscales. As displayed in Table 2, the revised Dietary Restraint subscale did not correlate with all other factors of the newly conceived factor structure, while the original Restraint subscale correlated significantly but minimally with other subscales of the original EDE-Q. Also of interest was the inverse correlation between the Eating Disturbance and revised Dietary Restraint subscales.

The Shape/Weight Overvaluation and Appearance Concern subscales were moderately correlated, while the original Shape and Weight Concern subscales were strongly correlated.

To further compare the construct validity of the revised and original EDE-Q subscales, Pearson's correlations were calculated between the EDE-Q subscales and the EOQ, BSQ, BDI, and RSES. As Table 3 displays, analyses revealed a similar correlational pattern among the original EDE-Q subscales and the revised factors. Both the revised Dietary Restraint factor and the original Restraint subscale did not correlate, or were minimally correlated, with the included validation measures. All other subscales of the original and revised scales had medium-to-high correlations with the validation measures. Like the original Shape Concern and Weight Concern subscales, the Appearance Concern and Shape/Weight Overvaluation sub-scales were strongly correlated with the BSQ. Interestingly, the Shape/Weight Overvaluation factor correlated more strongly with the BDI ($z = 2.83$, $P < 0.01$) and RSES ($z = -3.84$, $P < 0.001$) than the Appearance Concerns factor.

DISCUSSION

The primary purpose of the current study was to examine the psychometric properties of the EDE-Q by assessing its factor structure and construct validity in a series of preoperative bariatric surgery candidates. The EFA and CFA with the EDE-Q items revealed a 12-item, 4-factor structure that did not replicate the original EDE-Q subscales. In fact, the four extracted factors were more comparable to those found by Peterson *et al.* (19) with data from a community sample of women with bulimic symptoms. Both the current authors and Peterson *et al.* (19) identified a similar body dissatisfaction/discomfort factor (which consisted of both Shape Concern and Weight Concern items), while both studies found that overvaluation of shape and weight loaded separately rather than with appearance concern-related items. Interestingly, however, while the Appearance Concern and Shape/Weight Overvaluation factors correlated strongly ($r = 0.53$) in the current study, Peterson and colleagues' (19) two similar factors were modestly correlated ($r = 0.20$). Both studies also revealed a reduced version of the original Restraint subscale. (Although Peterson *et al.* (19) concluded that all five items of the Restraint scale significantly loaded together, the loadings of two of these items were considerably lower (i.e., empty stomach = 0.23; food avoidance = 0.27) than those of the other three items.) Although the restraint factors of the two factor analyses were not identical—which may be indicative of the distinct populations represented in the two studies—they both suggest that improvement of the Restraint subscale can be achieved by item reduction. Finally, the two studies revealed distinct eating pathology factors, with the current study's EFA/CFA producing a factor consisting of items assessing specific disordered eating behaviors (i.e., Eating Disturbance factor) and Peterson *et al.*'s (19) EFA producing a scale that more closely resembled the original Eating Concern scale. It should be noted, however, that unlike in the current study, Peterson *et al.* (19) did not

include the eating behavior frequency items (i.e., objective binge episodes, subjective binge episodes, and objective overeating episodes) in their factor analysis.

Initial psychometric evaluations of the newly constructed factors revealed both improvements and departures from the original EDE-Q subscales. Overall, the internal consistencies of the revised factors were strong, if not improved from the original subscales (e.g., original Restraint = 0.69, revised Dietary Restraint = 0.81). Correlational analyses among the original EDE-Q subscales, the current study's factors, and measures of emotional overeating, body image dissatisfaction, and general psychopathology were performed to assess the construct validity of both the original EDE-Q subscales and the revised factors. Overall, the newly constructed factors correlated as well with other measures of psychopathology compared to the original EDE-Q subscales. Interestingly, however, the correlational pattern among the revised Dietary Restraint and Eating Disturbance factors, and EOQ, suggests that dietary restraint in obese individuals seeking bariatric surgery may not be interpreted as maladaptive. That is, greater dietary restraint was associated with less disturbed eating and less frequent emotional eating, suggesting that this revised factor appears to measure an adaptive form of restraint.

In the initial development of the EDE subscales, Cooper *et al.* (56) argued for the conceptual distinction between the Shape Concern and Weight Concern subscales despite their close association. In the current study, obese candidates responded similarly to questions about body shape and weight, suggesting that a psychometric distinction is unnecessary in this population. Further, the results of the current study suggest that a more important distinction is between body image dissatisfaction/discomfort and overvaluation of shape and weight. Overvaluation of shape and weight, or the “undue influence of body weight or shape on self-evaluation,” (57) appears to be a related, but distinct, construct from body dissatisfaction. That is, although an individual may be dissatisfied with her or his physical appearance, defining one's self-worth primarily on the basis of her or his shape or weight is considered more pathological. In fact, shape/weight over-valuation better differentiates patients with eating disorders from normal controls than body dissatisfaction (58) and is more closely associated with general psychopathology in bariatric surgery patients (48). The significantly larger correlation between Shape/Weight Overvaluation and the BDI relative to the correlation between Appearance Concern and the BDI in the current study supports this latter finding. Therefore, measuring general appearance-related concerns (i.e., body image dissatisfaction/discomfort) and shape/weight overvaluation as separate, but related, constructs may be clinically useful. Hrabosky *et al.* (43) found that global appearance-related concerns are not predictive of weight loss outcomes following bariatric surgery, but they do substantially improve over time, despite the fact that patients frequently still remain obese 1 year postsurgery. However, it is unknown whether shape/weight overvaluation would be a better indicator of postoperative change in weight, eating behavior, and general psychopathology.

The resulting different factor structures—based on EFA and CFA methods—compared to the original EDE-Q subscales raises questions regarding the potentially limited utility of the original instrument for assessing eating-related attitudes and behaviors in bariatric surgery candidates. For example, “avoidance of eating for eight or more hours” and “desire for empty stomach,” two items that previously loaded on the original Restraint subscale of the EDE (56) (and subsequently included on the EDE-Q) based on self-reports from eating disorder and normal controls, did not significantly load with other dietary restraint items in the bariatric candidate sample. The fact that these two items, which measure maladaptive restriction, did not load onto the revised Dietary Restraint factor further supports this subscale as a measure of adaptive restraint in this clinical population. Furthermore, items assessing the desire for a flat stomach, fear of weight gain, fear of losing control over one's

eating, and guilt about eating—items included in the Eating Concern subscale—did not load well with any one factor. Our findings suggest that such items are not pertinent to preoperative bariatric surgery candidates. On the other hand, it is possible that these items might be important to assess postoperatively in order to comprehensively measure eating- and appearance-related concerns. Clinicians or researchers interested in assessing such issues may be advised to regard these as separate constructs, rather than connected by a larger, latent construct (e.g., “eating concerns”).

A strength of this study was the large sample size, allowing for both EFA and CFA. Our study, however, involved analyses of preoperative data only. Thus, the generalizability of the newly constructed 4-factor scale to the postoperative period is uncertain. Moreover, different or additional items that may be relevant to the postoperative period, such as vomiting, chewing and spitting out food, grazing, dumping, food craving, and emotional eating, should be evaluated in future studies. Additionally, individuals who experience objective binge episodes before bariatric surgery may experience loss of control without the ability to objectively overeat postoperatively. Such an instance may suggest the utility of items assessing loss of control, in general, and subjective binge episodes in particular. For example, in assessing postoperative binge eating, Kalarchian *et al.* (23) defined binge eating as the presence of either objective or subjective binge episodes. Further research should examine the impact of both preoperative and postoperative loss of control on weight outcome. A different factor structure that may include previously omitted items should be evaluated at postsurgery to see whether it reveals a better fit, and consequently, perhaps is a better postoperative outcome measure of eating-related pathology in bariatric surgery patients. Overall, however, the continued development and refinement of psychometrically sound measures of eating-related pathology (e.g., binge eating, general loss of control, overeating) in the bariatric surgery population is critical in identifying both preoperative and postoperative indicators of weight and behavioral outcomes, as such disturbances have been found to persist postsurgically (59), potentially hindering weight loss (23,60–62).

It should be emphasized that the results of this study cannot be generalized to the factor structure of the EDE interview, as previous studies comparing the interview and self-report versions of the EDE in obese individuals with binge eating disorder (13,14,18) and preoperative (20) and postoperative (21) bariatric surgery patients have found discrepancies between the two measures, with the subscales of the EDE-Q yielding reliably higher scores. In addition, the results of recent studies have raised concerns about the accuracy of the EDE-Q in assessing objective binge episodes relative to the EDE interview in bariatric surgery candidates and postsurgical patients (20,21).

To our knowledge, this study was the first attempt to evaluate the psychometric properties of the EDE-Q in bariatric surgery candidates, a population in which this scale has been repeatedly used to assess eating-related pathology (23–26). The EDE and EDE-Q are often considered the sine qua non in the assessment of eating-related pathology and are often the standard in characterizing eating disorder-related behaviors and attitudes across populations in both clinical and research settings. Assumptions have been made that a single measure, such as the EDE or EDE-Q, can be applied to various clinical populations (e.g., bulimia nervosa, binge eating disorder, obesity, bariatric surgery patients) and community samples to effectively assess symptoms of pathology. This approach has two benefits. First, it allows clinicians and researchers to rely on one measure across populations. Second, it allows for comparisons between groups of interest, especially those that appear to share similar traits, as well as between clinical and community samples. Nonetheless, the use of a single measure across populations limits our understanding of the eating-related pathology of each group, potentially overlooking distinct pathological traits, such as emotional overeating. Collectively, our findings and those reported by Peterson *et al.* (19) suggest the need to (i)

further evaluate the psychometric properties, including the factor structure, of these measures in diverse populations and (ii) consider how to assess eating-related pathology in various clinical and community samples through the use of population-specific instruments rather than relying solely on a single, global approach. Such research may lead to the expansion of the EDE and EDE-Q, with the possible goal of maintaining the core attributes of these measures and including items and factors applicable to the population being assessed.

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Exploratory and confirmatory factor analysis of the Eating Disorder Examination-Questionnaire subscale and eating items

Table 1

Item	Factor loading ^a			
	Eating Disturbance	Appearance Concern	Dietary Restraint	Shape/Weight Overvaluation
17. Overeating frequency	0.86	0.77		
18. Objective binge episode frequency	0.80	0.89		
8. Self-defined binge eating	0.57	0.58		
29. Dissatisfaction with shape		0.77	0.92	
28. Dissatisfaction with weight		0.77	0.88	
32. Avoidance of exposure		0.69	0.61	
31. Discomfort seeing body		0.68	0.61	
1. Restraint over eating			0.84	0.76
3. Food avoidance			0.82	0.64
4. Dietary rules			0.73	0.78
25. Importance of weight				0.95
26. Importance of shape				0.89
				0.96

^a Only loadings > 0.50 are displayed. No items loaded on more than one factor. The left column for each factor displays the factor loadings of the exploratory factor analysis. Italic type denotes the factor loadings from the confirmatory factor analysis.

Table 2
Psychometric, descriptive, and correlational characteristics of the revised and original EDE-Q factors

Factor	α	Mean \pm s.d.	Correlations		
			1	2	3
Revised EDE-Q					
1. Dietary Restraint	0.81	3.77 \pm 1.80			
2. Eating Disturbance	0.72	0.79 \pm 0.97	-0.19**		
3. Appearance Concern	0.83	5.17 \pm 1.16	-0.03	0.22***	
4. Shape/Weight Overvaluation	0.95	3.46 \pm 1.99	0.02	0.27***	0.53***
Factor	α	Mean \pm s.d.	Correlations		
			5	6	7
Original EDE-Q					
5. Restraint	0.69	2.74 \pm 1.37			
6. Eating Concern	0.74	2.04 \pm 1.42	0.21***		
7. Shape Concern	0.78	4.28 \pm 1.19	0.19***	0.64***	
8. Weight Concern	0.61	3.51 \pm 1.12	0.15**	0.67***	0.79***

EDE-Q, Eating Disorder Examination-Questionnaire.

**
 $P < 0.01$

 $P < 0.001$.

Table 3

Correlational analyses among revised and original EDE-Q factors and measures of emotional overeating, body image dissatisfaction, and general psychopathology

Scale	EDE-Q revised				Original EDE-Q			
	Dietary Restraint	Eating Disturbance	Appearance Concern	Shape/Weight Overvaluation	Restraint	Eating Concern	Shape Concern	Weight Concern
Emotional Overeating Questionnaire	−0.12 [*]	0.48 ^{***}	0.30 ^{***}	0.37 ^{***}	0.02	0.48 ^{***}	0.43 ^{***}	0.44 ^{***}
Body Shape Questionnaire	0.02	0.34 ^{***}	0.67 ^{***}	0.64 ^{***}	0.16 ^{***}	0.66 ^{***}	0.80 ^{***}	0.72 ^{***}
Beck Depression Inventory	0.03	0.31 ^{***}	0.29 ^{***}	0.48 ^{***}	0.10	0.46 ^{***}	0.45 ^{***}	0.45 ^{***}
Rosenberg Self-Esteem Scale	−0.01	−0.24 ^{***}	−0.30 ^{***}	−0.54 ^{***}	−0.10	−0.49 ^{***}	−0.45 ^{***}	−0.46 ^{***}

EDE-Q, Eating Disorder Examination-Questionnaire.

^{*} $P < 0.05$

^{**} $P < 0.01$

^{***} $P < 0.001$.