Eating Disorder Examination Questionnaire (EDE-Q-13): Expanding on The Short Form

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Abstract

Objective: The Eating Disorders Examination–Questionnaire (EDE-Q) is widely used but is time-consuming to complete. In recent years, the advantages and disadvantages of several brief versions have therefore been investigated. A seven-item scale (EDE-Q-7) has excellent psychometric properties but excludes items on bingeing and purging. This study aimed to evaluate a thirteen-item scale (EDE-Q-13) including items on bingeing and purging.

Method: Participants were 1,160 (188; 11.4% males) community volunteers aged 28.79±9.92. They completed the full EDE-Q and measures of positive body experience, social and emotional connection, life satisfaction, positive and negative affect and positive eating. The six EDE-Q items about bingeing and purging, recoded to correspond to the response categories of the other EDE-Q questions, were added to the EDE-Q-7, resulting in the EDE-Q-13.

Results: Confirmatory factor analysis confirmed the hypothesized EDE-Q-13 structure, including the bingeing and purging subscales. Strong positive correlations were found between the EDE-Q-13 and the original EDE-Q scores. The EDE-Q-13 showed convergent validity with related measures.

Conclusions: The EDE-Q-13 is a brief version of the EDE-Q that includes bingeing and purging subscales and has satisfactory psychometric properties. Its use in clinical and research contexts is encouraged.

Plain English Summary

The Eating Disorders Examination–Questionnaire (EDE-Q) is a widely used questionnaire that assesses eating disorder symptoms, however its 28 items take time to complete. In this study we examined a 13-item version of the EDE-Q, consisting of a seven-item version shown to have good properties and six EDE-Q items assessing binge eating and purging. The full EDE-Q and measures of positive body experience, social and emotional connection, life satisfaction, positive and negative affect and positive eating were completed online by 1,160 community volunteers (11.4% males) between 18 and 76 years of age. The expected structure of the EDE-Q-13 was confirmed. EDE-Q-13 and the original EDE-Q scores were highly correlated, and the EDE-Q-13 was associated with questionnaires that are associated with the EDE-Q. The EDE-Q-13 is a brief version of the EDE-Q that includes bingeing and purging subscales. It can be used as a screening instrument to identify high risk for an eating disorder in research and clinical practice.

Introduction

The EDE-Q has been in use for over quarter of a century (Fairburn and Beglin, 1994) and has been translated into many languages, including Hebrew (Zohar et al., 2017). This widely used self-report questionnaire discriminates between disordered eating and eating disorders in screening community samples (Mond et al., 2006), in primary care (Mond et al., 2008) and supports the clinical diagnosis of eating disorders (Schaefer et al., 2018).

The four subscales of the EDE-Q were originally determined in a clinical interview (Cooper and Fairburn, 1987) as Restraint, and Eating-, Weight- and Shape- Concern. Subsequently, some confirmatory factor analyses have found that weight and shape concern were better considered as a single factor (Carey et al., 2019; Grilo et al., 2015; Zohar et al., 2017), so that a three-factor structure was recommended. Other studies have suggested alternate four-factor structures (Friborg et al., 2013) that are available in short forms as well (Rand-Giovannetti et al., 2020).

Because of the usefulness of the EDE-Q clinically, epidemiologically, and in basic research, there have been several attempts to derive a short form of the questionnaire. Machado et al. (2020) used a sample of patients from two eating disorder clinics and a large control group of community volunteers to compare several short versions of the EDE-Q to the original Fairburn and Beglin (1994) 28-item questionnaire. While specificity and sensitivity of the Carey et al. (2019) 18-item and the Kliem et al. (2016) eight-item versions were adequate, only the Grilo et al. (2013) seven-item version retained the three factor structure found in the original 28-item EDE-Q. Based on these results, Machado et al. (2020) recommended the use of the seven-item version of the EDE-Q together with the final six bingeing and purging items of the original 28-item scale, resulting in a 13-item version. However, the six bingeing and purging items (e.g. “in the past 28 days how many times have you eaten what other people would regard as an unusually large amount of food [given the circumstances]?”) require open numerical responses questions allowing answers between 0 and infinity, whereas the response categories for the other items are grouped, for example “no days”, “1–5 days”, 6–12 days”. People with EDs tend to inflate the number of their bingeing and purging episodes, resulting in inadequate reliability for these subscales that are therefore generally excluded from analyses (Goldfein et al., 2005). We recoded the responses to the six questions about bingeing and purging so that their response categories corresponded to those of the other items.

The purpose of the current study was to examine the structural and the convergent validity of the resulting 13-item questionnaire as compare with the structural and convergent validity of the original 28-item questionnaire.

We hypothesized that:

1. The EDE-Q-13 would demonstrate good construct structure (using confirmatory factor analysis [CFA]).
2. Total and subscale scores of the EDE-Q-13 would correlate strongly with the original EDE-Q total and subscale scores.
3. EDE-Q-13 total scores (and the original EDE-Q scores) would correlate negatively with measures of positive body experiences, positive affect, positive eating, life satisfaction and social and emotional connection and would correlate positively with negative affect.
4. EDE-Q-13 total scores would yield a pattern of correlations similar to that yielded by the 28-item EDE-Q total scores.

Method

Participants

A total of 1,160 (188; 11.4% males) community volunteers between 18 and 76 years of age (M = 28.79, SD = 9.92) registered online to participate in the study. Some participants were recruited via the social media and others via an introductory psychology course, for which they received class credit. Two thirds (65.9%) of the participants were single, 368 (31.7%) were married and 54 (4.7%) were divorced or reported “other” status. They had 0–11 children (M = 1.16, SD = 1.65) and a mean of 13.98 years of schooling (SD = 2.23). Their body mass index (BMI) ranged between 16.31 and 53.15 (M = 23.46, SD = 5.11).

Measures

Eating disorder Symptoms

EDE-Q

Eating disorder symptoms were assessed using the original version of the Eating Disorders Examination – Questionnaire (EDE-Q; Fairburn and Beglin, 1994). The EDE-Q was translated into Hebrew with permission (Zohar et al., 2017), using a process of translation, independent back translation and revision. It contains 28 items assessing core eating disorder symptoms related cognitions, and includes four subscales, each containing five to eight items: 1) Dietary Restraint (DR) e.g. “Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight [whether or not you have succeeded]?”; 2) Eating Concern (EC) e.g. “Over the past 28 days, how concerned have you been about other people seeing you eat?”; 3) Weight Concern (WC) e.g. “Have you had a definite fear that you might gain weight?”; and 4) Shape Concern (SC) e.g. “Have you had a definite desire to have a totally flat stomach?”. A Global score averaging the subscales is also used. The responses to 22 items are rated using a seven-point forced-choice format from 0 (*never*) to 6 (*always*), with higher scores reflecting greater symptom severity. The remaining six items about the frequency of weight, shape and use of purging techniques during the past 28 days require open, numerical responses, are used for diagnostic purposes and are generally excluded from factor analyses. A cut-off of four (for subscales and the global score) indicates risk for a clinical eating disorder, for both men and women (Luce et al., 2008). Zohar et. al. (2017) assessed 292 community volunteers and found sound psychometric properties for the Hebrew translation, but recommended combining WC and SC into one subscale. In the current study, the internal reliability was acceptable (Cronbach's alpha > .78).

EDE-Q-13

This version of the EDE-Q contains seven items from the original questionnaire as suggested by Machado et al. (2020) that were pulled from the complete EDE-Q. These items are the original items 1, 3 and 4 that assess DR, items 22 and 23 assessing WC and SC (renamed Shape and Weight

Overevaluation [SWO] as in Machado et al. [2020]), and items 25 and 26 that measure BD. For all items, the participant response options are a series of six frequency categories: 1–5 days (score of 1); 6–12 days (score of 2); 13–15 days (score of 3); 16–22 days (score of 4); 23–27 days (score of 5); and every day (score of 6). The six open ended questions about bingeing (e.g. “You felt a loss of control over your food as you were eating”) and purging (e.g. “You made yourself vomit in order to control your weight”) that appear at the end of the 28-item EDE-Q were reformatted with the same frequency response categories and included in the scoring of the EDE-Q-13, following the general recommendation of Machado et al. (2020). It should be noted, however, that the adaptation of these items into a Likert-type response format was not suggested by Machado et al, 2020. We adopted this format so that all items would be scored in the same way. The EDE-Q-13 appears in Appendix 1.

Positive body experiences

Positive body experiences were measured by the Dresden Body Image Questionnaire-35 (DKB-35; Matthes et al., 2012; Pöhlmann et al., 2013). The DKB-35 is a 35-item body image scale, originally validated in German. It was translated into Hebrew and English following the star paradigm with permission from the authors (Lev-Ari et.al., 2020; Zohar et. al., 2017). The Hebrew version has shown good reliability and validity (Zohar et. al., 2017). Its five subscales, rated between 1 (“not at all true for me”) and 5 (“very true for me”), are: 1) Vitality e.g. “I am physically fit”; 2) Body Narcissism (BN) e.g. “I find it pleasant and stimulating when somebody looks at me attentively”; 3) Sexual Fulfillment (SF) e.g. “I feel my body pleasantly and intensely in sexuality”; 4) Body Acceptance (BA) e.g. “I am satisfied with how I look”; and 5) Physical Contact (PC) e.g. “Physical contact is important for me to express closeness.” The subscales displayed excellent reliability, with Cronbach's alphas ranging between 0.80 and 0.90.

Social and emotional connection

Social and emotional connection was assessed using the Social and Emotional Connection (SEC) subscale of the Eating Disorders Recovery Questionnaire (EDRQ; Bachner-Melman et al., 2018). The EDRQ is a 28-item questionnaire used to assess recovery from EDs, the other subscales of which are Physical Health, Lack of Symptoms and Body Acceptance. A sample item for this Emotion and Social Connection subscale is “I am in touch with my own feelings”. Responses are noted on a seven-point Likert scale between 0 (I do not agree at all) and 6 (I completely agree), with higher scores reflecting a higher level of recovery. The alpha Cronbach of the EDRQ was 0.92.

Life satisfaction

Life Satisfaction was assessed using the Satisfaction with Life Scale (SWLS; Diener et al., 1985). The SWLS contains five items that cognitively appraise the respondents’ life in general. The SWLS is a common measure of well-being and has good psychometric properties (Diener et al., 1985). Items are scored between 1 (“strongly disagree”) and 7 (“strongly agree”), with high scores indicating greater life satisfaction. A Hebrew version previously used in research was administered in this study (Shmotkin, 1998). The alpha Cronbach in this study was 0.89.

Positive and negative affect

Positive and negative affect were assessed via the Positive and Negative Affect Schedule – Short Form (PANAS-SF; Thompson, 2007). The PANAS-SF is a ten-item questionnaire with five items about positive affect (PANAS-SF-Pos) and five about negative affect (PANAS-SF-Neg). Respondents were asked to report the strength with which they usually feel emotions such as excitement or anger on a five-point Likert scale between 1 (“hardly at all”) to 5 (“very strongly”). The PANAS-SF has been shown to have good validity and reliability in various cultures (Thompson, 2007). A Hebrew translation previously used in research (Zohar et al., 2011) was administered in this study. The alpha Cronbach in this study was 0.79 for positive affect and 0.83 for negative affect.

Positive eating

Positive eating was reported by completing the Positive Eating Scale (PES; Sproesser et al., 2018), an eight-item questionnaire that asks about enjoyment of eating. It has two subscales that assess Satisfaction with Eating (e.g. “I am relaxed about eating”) and Pleasure when Eating (e.g. “Eating is fun for me”). Items are scored on a five-point Likert scale between 1 (“I strongly disagree”) and 4 (“I strongly agree”). In nonclinical samples in Germany, India and the US, the psychometric properties and six-month test-retest reliability of the PES were acceptable (Sproesser et al., 2018). A Hebrew translation (Bachner-Melman et al., submitted) was used in this study, and in this study the alpha Cronbach was 0.93.

Procedure

The study received approval from the Institutional Internal Review Board. Participants were sent a link to the questionnaires, which they completed online. A full explanation about the study was provided on the first screen, and informed consent was provided. Participants reported on demographic information, height and weight, before completing the questionnaires. All participants completed the EDE-Q and the DKB-35 and a subset of nine hundred sixty participants completed the PANAS-SF, PES, SWLS, and SEC in addition. On the last screen, contact details of the researchers were provided and participants were encouraged to send them questions, comments or difficulties.

Data analysis

AMOS 23.0 was used for the CFA. To test for convergent validity, Pearson correlations were calculated between EDE-Q-13 total scores and positive body experiences (DKB-35), positive eating (PES), positive and negative affect (PANAS-SF), satisfaction with life (SWLS) and social and emotional connection (SEC). Analyses were conducted using the Statistical Package for the Social Sciences (SPSS, version 23).

Results

Hypothesis 1: *The EDE-Q-13 would demonstrate good construct structure (using CFA).*

CFA of EDE-Q-13 (N=1,160)

CFA was used to test the hypothesized structure of the EDE-Q-13. This analysis examines the consistency of constructs as they are conceptualized theoretically or empirically. The following values were chosen for acceptance of the hypothesized structure: Comparative Fit Index (CFI) > .90 (Bentler & Bonett, 1980), root mean square error of approximation (RMSEA) < .08 (Browne, & Cudeck, 1993) and SRMR<.08 (see Figure 1). The model showed good fit ($\chi^2_{(55)}$=282.63; p<.001; CFI=.98, RMSEA=.05; SRMR=.04). Cronbach's alphas for the EDE-Q-13 subscales were .99 for SWO, .89 for BD, .92 for ER, .89 for Bingeing and .63 for Purging.

Hypothesis 2:*Total and subscale scores of the EDE-Q-13 would correlate strongly with the original EDE-Q total and subscale scores (n=1,160)*

Pearson correlations between the EDE-Q-13 subscales and the original EDE-Q subscales are presented in Table 1. All correlations were significant at p<.001 and ranged between .29 and .95. The correlation between EDE-Q-13 total scores and the original EDE-Q total score was .92.

Pearson inter-correlations between the EDE-Q-13 subscales are presented in Table 2. All correlations were significant at p<.001 and ranged between .15 and .83. The mean for Purging was lowest and all other means ranged between 3.41-3.93.

Hypotheses 3 and 4:*EDE-Q-13 total scores (and the original EDE-Q scores) would correlate negatively with measures of positive body experiences (DKB-35), positive affect (PANAS-SF-Pos), positive eating (PES), life satisfaction (SWLS) and social and emotional connection (SEC) and would correlate positively with negative affect (PANAS-SF-Neg). EDE-Q-13 total scores would yield a pattern of correlations similar to that yielded by the 28-item EDE-Q total scores.*

Pearson correlations between the EDE-Q-13 and the original EDE-Q total scores and the *DKB-35, PANAS-SF, PES, SWLS and EDRQ* are presented in Table 3. All correlations were significant at p<.001 and ranged between -.09 and .69. The correlations between the EDE-Q-13 total score and the original EDE-Q total score and other variables assessing body acceptance and psychological well-being were similar.

Discussion

The purpose of this study was to compare the Hebrew version of the 13-item EDE-Q-13 with that the Hebrew translation of the complete 28-item EDE-Q. The responses to the bingeing and purging items of the original questionnaire were restructured and included in the scoring of the short version. The structure of the scales was compared using CFA and the pattern of correlations between the total and subscale scores of both questionnaires was observed, as well as the pattern of correlations between EDE-Q-13 and EDE-Q total scores respectively with several scales measuring related variables.

Our results supported a five-factor model for the EDE-Q-13, with subscale scores for Eating Restraint, Body Dissatisfaction, Shape and Weight Overevaluation, Bingeing and Purging. This factor structure found for the EDE-Q-13 replicated the factor structure of the EDE-Q7 presented in Machado et al. (2020). It

also replicated the structure of the 28-item EDE-Q Restraint and Eating Concern subscales, with the original Weight Concern and Shape Concern items combined into a single factor (Shape and Weight Overevaluation) as in many previous studies (Zohar et al., 2017; Hilbert et al., 2012). A major disadvantage of the full EDE-Q to date is that the open-ended structure of the response categories of the bingeing and purging items has prevented them from being included in scoring and data analyses. The recoding of these items and the inclusion of Bingeing and Purging subscales in the EDE-Q-13 score is therefore one major advantage of this short version of the questionnaire. Participants who scored above 1 on the Bingeing or Purging subscales scored higher on the EDE-Q-13 total scores excluding these two subscales, providing some validity for these subscales.

Another major advantage of the EDE-Q-13 is that it is short, user-friendly and parsimonious. Its total and subscale scores correlated strongly with those of the 28-item EDE-Q, so that significant information does not seem to be missed when it is used in lieu of the longer version, and it preserves the central features of the EDE-Q.

The EDE-Q-13 also showed convergent validity. Participants who reported higher levels of eating disorder symptoms tended to have significantly lower levels of positive body experiences, positive affect, positive eating, life satisfaction and social and emotional connection to others, and significantly higher levels of negative affect.

Our study has limitations. First, the version of the EDE-Q-13 used in this study was in Hebrew, so its psychometric properties should be verified in other languages. Second, this study was conducted with a community sample of predominantly female, single, educated community sample and may therefore not be generalizable to other populations. Third, although the use of the Likert format for the binge/purge items allows researchers and clinicians to incorporate behavioral frequency information within a continuous subscale or global scale score, it also obscures the actual frequency of binge eating/purging, such that it no longer becomes possible to determine whether participants reported “clinical” levels of these behaviors (i.e., 4x/month). It is also unclear whether adding scores for bingeing and purging behaviors may result in some respondents with these behaviors receiving higher scores on the total scale that may or may not be warranted. Further studies should investigate the validity of the EDE-Q-13 in clinical settings, its ability to accurately distinguish between cases and controls and its sensitivity to change.

The EDE-Q is widely used, but reporting on the full version is time-consuming, and presents significant participant burden. This may deter some respondents from completing the entire questionnaire. Researchers wishing to use a short version of the questionnaire have tried to decide which version is most useful (Machado et al., 2020). Although the shortest version suggested had only 7 items and had excellent psychometric properties, it omitted to ask about bingeing and purging. Thus, the EDE-Q-13 builds on the 7 items but adds the bingeing and purging items, which are very important in assessing EDs. The EDE-Q-13 makes self-report less burdensome in two distinct ways: it is more than 50% shorter,

and it has a unified response scale which makes it easier on the respondent. Future research should try and validate this version of the EDE-Q in other languages and in clinical settings.

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List Of Abbreviations

Eating Disorders Examination–Questionnaire (EDE-Q)

Eating Disorders Examination–Questionnaire – seven items (EDE-Q-7)

Eating Disorders Examination–Questionnaire – thirteen items (EDE-Q-13)

Dietary Restraint (DR)

Eating Concern (EC)

Weight Concern (WC)

Shape Concern (SC)

The Dresden Body Image Questionnaire-35 (DKB-35)

Body Narcissism (BN)

Sexual Fulfillment (SF)

Body Acceptance (BA)

Physical Contact (PC)

Social and Emotional Connection (SEC)

The Eating Disorders Recovery Questionnaire (EDRQ)

Th Satisfaction with Life Scale (SWLS)

The Positive and Negative Affect Schedule – Short Form (PANAS-SF)

Positive affect (PANAS-SF-Pos)

Negative affect (PANAS-SF-Neg).

The Positive Eating Scale (PES)

Confirmatory factor analysis (CFA)

Comparative Fit Index (CFI)

Root mean square error of approximation (RMSEA)

Declarations

Ethics approval and consent to participate:

All ethical guidelines were adhered to and IRB approval was received.

Consent for publication

All authors have given their consent for publication.

Availability of data and materials

All data and materials are available upon request.

Competing interests

We have no competing interests and have nothing to disclose.

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Authors' contributions

The corresponding author (Lilac Lev-Ari, PhD, ldlevari@gmail.com) conceived and conducted the study and wrote parts of the manuscript. She also has full access to the data and has the right to publish it. All the authors participated in a meaningful way in the preparation of the manuscript. Professor Zohar and Professor Bachner-Melman advised on the recoding of the questionnaire, wrote significant parts of the manuscript and edited it. Dr Lev-Ari performed all statistical analyses.

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Tables

Table 1 *Correlations between the EDE-Q-13 and the original EDE-Q total and subscales*

Original EDE-Q EDE-Q-13	Eating Restraint	Eating Concerns	Shape and Weight Concerns	EDE-Q total
Eating Restraint	.95	.58	.66	.82
Shape and Weight Overevaluation	.61	.65	.86	.78
Body Dissatisfaction	.59	.60	.89	.77
Bingeing	.30	.50	.35	.41
Purging	.30	.28	.22	.29
EDE-Q-13 total	.86	.75	.88	.92

Note: All correlations were significant at the p<.001 (2-tailed).

Table 2 *Intercorrelations between the EDE-Q-13 subscales (n=1,160)*

	Eating Restraint	Shape and Weight Overevaluation	Body Dissatisfaction	Bingeing	Purging	EDE-Q-13 total
Eating Restraint		.57	.54	.24	.26	.83
Shape and Weight Overevaluation			.72	.28	.16	.81
Body Dissatisfaction				.30	.15	.80
Bingeing					.42	.53
Purging						.42
Mean (SD)	3.50 (2.19)	3.72 (2.11)	3.93 (2.00)	3.41 (6.47)	1.43 (3.15)	3.11 (2.35)

Note: All correlations were significant at the p<.001 (2-tailed).

Table 3 *Correlations between a. total EDE-Q-13 and 28-item EDE-Q scores and b. DKB-35, PANAS-SF, PES, SWLS and SEC scores (n=960)*

	DKB-35					PANAS-SF				
	Vitality	BA	BN	SF	PC	Pos	Neg	PES	SWLS	SEC
EDE-Q-13 total	-.31	-.51	-.09	-.28	-.15	-.13	.45	-.53	-.29	-.35
Original EDE-Q total	-.37	-.69	-.14	-.37	-.20	-.13	.50	-.63	-.34	-.37

Note: All correlations were significant at p<.001 (2-tailed). DKB-35=Dresden Body Image Questionnaire-35; PANAS-SF=Positive And Negative Affect Scale – Short Form; Vitality=DKB-35 Vitality subscale; BA=DKB-35 Body Acceptance subscale; BN=DKB-35 Body Narcissism subscale; SF=DKB-35 Sexual Fulfillment subscale; PC=DKB-35 Physical Contact subscale; Pos=PANAS-SF Positive subscale; Neg=PANAS-SF Negative subscale; PES= Positive Eating Scale; SWLS=Satisfaction with Life; SEC= Social and Emotional Connection subscale of the Eating Disorder Recovery Questionnaire.

Figures

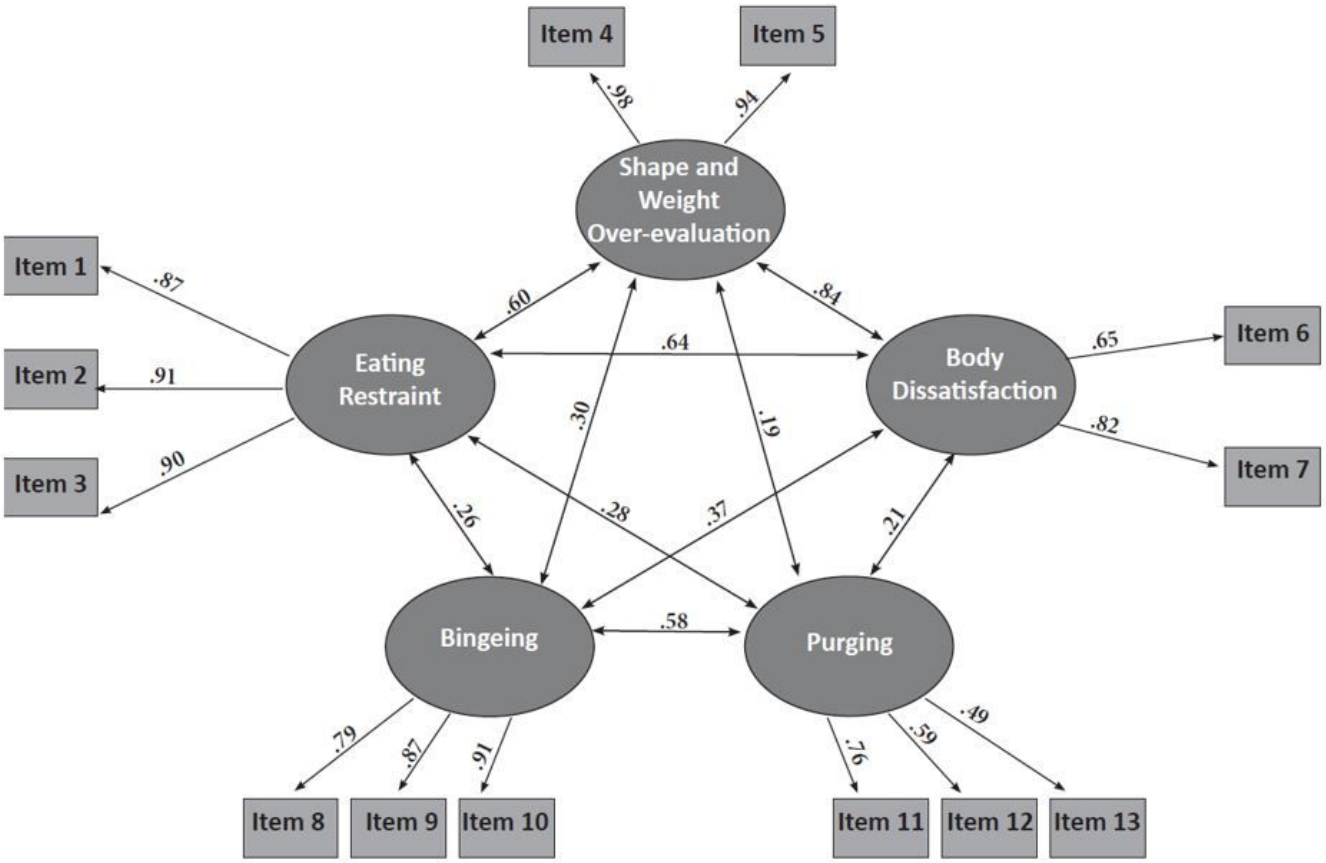

Figure 1

CFA of the five-factor EDE-Q-13 model

Supplementary Files

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- Appendix1.docx