



Is the Eating Disorder Questionnaire-Online (EDQ-O) a valid diagnostic instrument for the DSM-IV-TR classification of eating disorders?

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Abstract

Background: The Eating Disorder Questionnaire-Online (EDQ-O) is an online self-report questionnaire, which was developed specifically to provide a DSM-IV-TR classification of anorexia nervosa (AN), bulimia nervosa (BN), binge-eating disorder (BED), and eating disorder not otherwise specified (EDNOS), without using a face-to-face clinical interview.

Objective: The purpose of the present study was to examine the psychometric quality of the EDQ-O.

Methods: The validity of the EDQ-O was determined by examining the agreement with the diagnoses obtained from the Longitudinal, Expert, and All DATA (LEAD) standard. Participants included 134 new patients of a specialist center for eating disorders located in the Netherlands.

Results: Assessment of the validity of the EDQ-O yielded acceptable to good AUC (area under the receiver operating characteristic curve) values with a range from 0.72 to 0.83. Most other diagnostic efficiency statistics were also good except for a low sensitivity for AN (0.44), a low positive predictive value for BN (0.50), and a relatively low sensitivity for BED (0.66).

Conclusion: The results of the present study suggest that the EDQ-O performs acceptably as a diagnostic instrument for all DSM-IV-TR eating disorder classifications. However, suggestions are made to further improve the validity of the EDQ-O.

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1. Introduction

Eating disorders are common in the Dutch population, and these disorders seriously affect the quality of life of patients. Although effective treatments are available, only a small proportion of those with an eating disorder are diagnosed and receive professional treatment [1]. In the Netherlands, only 7.5% of patients with bulimia nervosa and

33% of patients with anorexia nervosa are treated within the mental health care system [1]. For patients with binge eating disorder no Dutch data are available, but according to a study in the United States, less than half of these patients seek treatment for their disorder [2].

Patients experience several barriers to access face-to-face treatment. Most patients are ashamed of their eating disorder and symptoms are often concealed [3]. Furthermore, many clinicians fail to ask the right questions in order to diagnose an eating disorder, and sometimes patients deny the disorder even when clinicians inquire directly about them [3]. Moreover, when patients do ask for help, geographic distance, costs, a lack of available treatments, and long waiting times are reasons for not receiving the professional care needed [4,5].

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A number of these barriers experienced by patients in face-to-face treatment do not or to a lesser extent apply to Web-based interventions. Internet brings about the advantage of potential anonymity, 24-hour accessibility, and not being bound to one location. As such, Internet may fit well to the needs of a subgroup of patients with eating disorders. As Web-based interventions are low-threshold and easily accessible, they may reach those who otherwise do not receive the care they need. In 2009, a Web-based cognitive behavioral therapy (CBT) intervention was developed for Dutch-speaking patients with eating disorders [6,7]. This intervention includes a structured treatment program with intensive therapeutic support in which patients communicate asynchronously with their therapist via the Internet. As no face-to-face contacts are required and patients do not have to visit a treatment setting, their anonymity is assured. In addition, asynchronous interaction provides the opportunity to participate in the Web-based CBT intervention at any time of the day, without the need for scheduled appointments with clinicians.

Internet interventions are effective in reducing eating disorder psychopathology, binge eating and purging, as well as in improving quality of life [8]. The diagnostic classification process according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) [9] is different for online interventions than for face-to-face treatment. In daily face-to-face practice, clinical interviews are used to set DSM eating disorder classifications. Yet, with a Web-based intervention aimed at reducing the threshold to seek help, face-to-face clinical interviews are not suitable. The choice for a Web-based intervention implies that a self-report questionnaire has to be used in order to make a classification.

One questionnaire that is frequently used to assess disordered eating behavior is the Eating Disorder Examination-Questionnaire (EDE-Q) [10]. However, the EDE-Q does not sufficiently ask for binge eating disorder criteria, and in addition only focuses on the past 28 days whereas the DSM-IV-TR criteria for bulimia nervosa and binge eating disorder are based on the past 3 and 6 months, respectively. Therefore, although widely used, the EDE-Q cannot be used to make official DSM-IV-TR eating disorder classifications. As far as we know, there is no appropriate online self-report questionnaire available yet that meets all demands to aid in the diagnostic classification of eating disorders. We therefore developed a brief self-report questionnaire, the Eating Disorder Questionnaire-Online (EDQ-O), that should be able to provide DSM-IV-TR diagnoses of anorexia nervosa (AN), bulimia nervosa (BN), binge-eating disorder (BED), and eating disorder not otherwise specified (EDNOS).

The present study focuses on the psychometric quality of the self-report EDQ-O as a new tool for the diagnostic classification of eating disorders, which is compared to the clinical diagnostic classification used in face-to-face treatment including the Longitudinal, Expert, and All Data (LEAD) standard [11].

2. Methods

2.1. Participants

From March 2012 to February 2013, 134 participants were recruited from an existing group of people who registered themselves as new patients at Amaram, specialist center for eating disorders located in the Netherlands, to participate in the present study. All participants were Dutch-speaking and at least 16 years old. Participants were 118 women (88%) and 16 men (12%) with a mean age of 31.4 years (SD 10.9, range 16–60).

2.2. Procedures

Patients were invited for an intake interview by postal mail and in this letter patients were asked to participate in the present study. A document containing detailed information about the study was attached to the letter. At the beginning of the study (from March 21 to May 3, 2012) patients were asked to be present 20 minutes before the intake interview to complete the online questionnaire. When patients arrived at the treatment setting, they signed the informed consent form and they completed the online questionnaire on a laptop in a private room. After about six weeks the study procedure was modified in order to increase the response rate, as only 14 patients had participated in the study at that time. Patients were then asked to complete the online questionnaire on their computer at home, prior to their intake interview at the treatment setting. The URL of the online questionnaire was included in the letter that patients received. In order to obtain informed consent, patients were asked to consent with the study by filling in their name and the date after completing the EDQ-O. As a result of the new procedure, the EDQ-O was no longer completed just before the intake interview but at an earlier time (on average 9 days before the intake at the treatment center, with a range from 48 days to several hours). If possible in terms of the timeframe, participants were reminded by email and phone to complete the EDQ-O.

2.3. Measures

The EDQ-O, written entirely in Dutch, was developed to establish an online eating disorder diagnosis for adults according to the DSM-IV-TR [9] based on self-report items, without using face-to-face contact with a clinician. For the development of the diagnostic questions concerning AN and BN within the EDQ-O, the Mini-International Neuropsychiatric Interview (MINI)-Plus [12,13] part N and part O were used. In order to fit the characteristics of an online diagnostic self-report measurement, some items were textually adapted. As BED is not an official eating disorder in the DSM-IV-TR but part of the EDNOS category, the MINI-Plus interview does not ask for this disorder. However, with the prospect of BED becoming an official eating disorder classification in the DSM-V, the EDQ-O also diagnosed BED. To determine whether patients met the BED diagnosis, the DSM-IV-TR research criteria were reformed into self-report questions. In

accordance with the MINI-Plus interview, the EDQ-O used routing to make sure that patients only received questions that applied to their situation with a completion time of approximately 5 minutes.

Appendix A includes the specific items of the EDQ-O. First it was determined whether the DSM-IV-TR diagnosis of AN was applicable. Items A1 to A4 measured patients' height and body weight in order to determine whether they were underweight. This was assessed by comparing the lowest body weight of patients in the past three months with the threshold weight, corresponding with their height according to the table presented in the MINI-Plus part N (anorexia nervosa) [13]. This table was derived from the Metropolitan Life Insurance Company (MLIC) table [14,15]. We had to adjust the table to fill in weight-threshold per cm length (a prerequisite for the computer to conduct routing) since the MINI-Plus does not provide this information with sufficient detail. The computer system automatically determined whether the body weight of patients was above or below the threshold weight. When patients had a significantly low body weight, the next item (A5b) determined if they refused to gain weight and if they therefore met DSM-IV-TR criterion A of AN. When this criterion was applicable, patients were asked if they had intensively feared gaining weight or becoming fat, even though they were underweight (A6; DSM-IV-TR criterion B of AN). If this applied to the patients, criterion C of AN was subsequently measured with items A7a to A7c. These items determined whether there was a disturbance in the way patients experienced their body weight or shape, whether patients' body weight or shape had an undue influence on their self-evaluation, or whether patients denied the seriousness of their current low body weight. When patients answered one of these items with yes, DSM-IV-TR criterion C of AN was determined to be applicable to them (A7d). Accordingly, the computer system also automatically determined whether the patients were female or male and in case they were male the patients were diagnosed with AN (A7e). In case the patients were female, criterion D (amenorrhea in postmenarcheal females) was measured with items A8a and A8b. If there was an absence of at least three consecutive menstrual cycles, female patients met criterion D and were diagnosed with AN. Whenever one of the DSM-IV-TR criteria did not apply to patients, the following items measuring the other DSM-IV-TR criteria for AN were skipped.

After measuring the DSM-IV-TR criteria for AN, it was determined whether patients fulfilled the DSM-IV-TR criteria of BN or BED. First, patients were asked whether they had had eating binges during the past three months (B1a). In case patients answered yes, they were asked to give a description of an average episode of binge eating (B1b). When patients did report having eating binges, it was determined how often they had these episodes in the past six months (B2a) and in the past three months (B2b), and whether they had a sense of lack of control over their eating during the binge eating episodes (B3). Patients for whom this was applicable met DSM-IV-TR criterion A of BN and BED (recurrent episodes of binge eating). Accordingly, item B4 measured whether patients did

anything to compensate for, or to prevent a weight gain from these binges. In case of inappropriate compensatory behavior, DSM-IV-TR criterion B of BN was applicable, and subsequently item B5 assessed whether patients' body weight or shape greatly influenced how they felt about themselves. Patients for whom this was applicable and who had binge eating episodes at least twice a week during the past three months were diagnosed as having BN, unless they fulfilled the criteria of AN and the binge eating episodes only occurred during episodes of AN (B6). In those cases patients were diagnosed with AN subtype binge-eating/purging. In case BN was diagnosed, item B7 measured whether patients were regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics or enemas in order to specify the type of BN.

If patients had eating binges, but exhibited no compensatory behaviors, they did not fulfill DSM-IV-TR criterion B of BN and hence did fulfill DSM-IV-TR criterion E of BED. For those patients, the other DSM-IV-TR criteria of BN were skipped and they received several questions to measure the DSM-IV-TR criteria of BED. First, based on the answers that patients gave previously, the computer system automatically determined whether patients had eating binges (C1a), whether they had a sense of lack of control over their eating during these binges (C1b), and whether these binges occurred at least twice a week in the past six months (C2). If the three items were confirmed, item C4 measured whether patients did feel unhappy or uncomfortable about their eating binges. If confirmed, patients were asked whether their binge eating episodes were associated with the following characteristics: (1) eating much more rapidly than normal (C5a); (2) eating until feeling uncomfortably full (C5b); (3) eating large amounts of food when not feeling physically hungry (C5c); (4) eating alone because of feeling embarrassed by how much one is eating (C5d); (5) feeling disgusted with oneself, depressed, or very guilty afterwards (C5e). When three or more of these characteristics were applicable (C5f), they were diagnosed as having BED according to the DSM-IV-TR classification system.

In case patients had several eating disorder characteristics, but did not meet all specific criteria for AN, BN, or BED (D1), they were diagnosed as EDNOS.

2.4. Clinical diagnostic DSM-IV-TR classification

The clinical diagnostic classification according to the DSM-IV-TR was performed consistent with the LEAD standard [11]. This standard was executed by expert clinicians who utilize longitudinal data from all available sources over time. In this study, the clinicians of Amaram specialist center for eating disorders established a DSM-IV-TR diagnosis for each patient based on all available information collected during a telephonic screening and two intake interviews. During the telephonic screening (approximately 30 minutes) the patient's reason for sign up, his/her disordered eating behavior, previous care, further somatic disorders, and medication use was assessed. After this screening, the patient received an invitation for the first

intake interview together with a personal history questionnaire, which should be completed at home, prior to the interview. The personal history questionnaire assessed eating disorder symptoms, other physical and psychological complaints, history, and family situation. During the two 45-minute interview sessions many issues were discussed with the patient and (in almost all cases) with family members, e.g., the personal history questionnaire, current eating behavior, body attitude, self-image, and consequences of the eating disorder for personal life. In addition, patient's body weight and height were measured under observation. The interviews were conducted by clinical assessors with at least a bachelor's degree in psychology, who were blind to the results of the self-report EDQ-O. After the interviews, the clinical assessor determined a descriptive diagnosis and a provisional DSM-IV-TR diagnostic classification based on all available information. Subsequently, all patients were discussed in a multidisciplinary intake consultation (psychiatrist, psychologists, mental health care psychologists, clinical psychologist, psychotherapist, and psychiatric nurses), in order to establish the final DSM-IV-TR eating disorder diagnosis and to discuss treatment alternatives.

2.5. Statistical analysis

Agreement between the DSM-IV-TR eating disorder diagnosis determined by the LEAD standard and the EDQ-O was accomplished using the area under the receiver operating characteristic (ROC) curve (AUC) [16]. The AUC is a measurement of the diagnostic ability of the EDQ-O in order to correctly classify a DSM-IV-TR eating disorder diagnosis. An AUC value of 1.0 is considered as a perfect test, whereas a value of .5 is considered as a bad test. The guidelines for interpreting the AUC values are as follows: AUC of 0.7–0.8 is acceptable, AUC of 0.8–0.9 is excellent, and AUC of 0.9 or greater is outstanding [17]. Besides the AUC values, classification accuracy was measured by the following indicators: (1)

overall accuracy, the proportion of total correct classifications of the eating disorder; (2) sensitivity, the proportion of the sample with the eating disorder that is correctly classified as having this disorder; (3) specificity, the proportion of the sample without the eating disorder correctly classified as not having this disorder; (4) positive predictive value (PPV), the proportion of the sample classified as having the eating disorder that in fact does have this disorder; (5) negative predictive value (NPV), the proportion of the sample classified as not having the eating disorder that in fact does not have this disorder. These values range from 0 to 1 with a higher value indicating a better classification accuracy.

3. Results

As determined by the LEAD standard, half of the participants were diagnosed as EDNOS ($n = 67$). Of the other participants, 18 were diagnosed as AN (13%), 18 as BN (13%), and 29 as BED (22%). For two participants no eating disorder diagnosis was determined. Table 1 demonstrates the agreement in DSM-IV-TR diagnosis between the LEAD standard (validity criterion) and EDQ-O for each specific eating disorder; with highest agreement of 93% for AN, followed by an agreement of 91% for BED and 87% for BN, and lowest agreement of 79% for EDNOS.

Table 2 presents the diagnostic efficiency statistics for each eating disorder diagnosis. For AN, the AUC value of 0.72 was acceptable with high specificity, positive predictive value and negative predictive value. However, sensitivity was low (0.44), indicating that a substantial part of the participants diagnosed with AN by the LEAD standard were not identified as having this disorder by the EDQ-O. For BN, the AUC value was excellent, and sensitivity and specificity were good as well as negative predictive value. However, positive predictive value was low (0.50), meaning that a number of participants were classified as having BN although they did not have this disorder according to the

Table 1
Agreement in DSM-IV-TR diagnosis for each specific eating disorder.

Anorexia nervosa (AN)				Bulimia nervosa (BN)			
EDQ-O	LEAD standard			EDQ-O	LEAD standard		
	Yes	No	Total		Yes	No	Total
Yes	8	0	8	Yes	14	14	28
No	10	116	126	No	4	102	106
Total	18	116	134	Total	18	116	134
Binge eating disorder (BED)				Eating disorder not otherwise specified (EDNOS)			
EDQ-O	LEAD standard			EDQ-O	LEAD standard		
	Yes	No	Total		Yes	No	Total
Yes	19	2	21	Yes	58	19	77
No	10	103	113	No	9	48	57
Total	29	105	134	Total	67	67	134

Table 2
Agreement between the LEAD standard and the EDQ-O for each specific eating disorder DSM-IV-TR diagnosis.

Eating disorder	Accuracy	AUC	Sensitivity	Specificity	PPV	NPV
AN	0.93	0.72	0.44	1.00	1.00	0.92
BN	0.87	0.83	0.78	0.88	0.50	0.96
BED	0.91	0.82	0.66	0.98	0.90	0.91
EDNOS	0.79	0.79	0.87	0.72	0.75	0.84

Abbreviations: AUC, area under the receiver operating characteristic curve; PPV, positive predictive value; NPV, negative predictive value; AN, anorexia nervosa; BN, bulimia nervosa; BED, binge eating disorder; EDNOS, eating disorder not otherwise specified.

LEAD standard. For BED, most indicators were excellent, except for a relatively low sensitivity (0.66). Therefore, several participants with BED were not identified as having this disorder by the EDQ-O. The test characteristics for EDNOS were overall acceptable to good.

4. Discussion

In the current study, the Dutch version of the EDQ-O, an online self-report questionnaire to measure DSM-IV-TR eating disorder diagnosis, has been compared to the LEAD procedure, which is considered to be the gold standard [11]. The results of the current study showed that the EDQ-O yielded satisfactory classification accuracy in diagnosing the eating disorders AN, BN, BED, and EDNOS. The number of consistent diagnoses between the LEAD standard and the self-report EDQ-O was relatively high, especially for AN, BED, and BN. Overall agreement for EDNOS was acceptable. The main weaknesses of the EDQ-O were the low sensitivity in diagnosing AN, the low positive predictive value of diagnosing BN, and a relatively low sensitivity of BED diagnosis.

As far as we know, the EDQ-O is the only available online diagnostic measurement to establish a diagnosis for all specific eating disorders (AN, BN, BED, EDNOS), in accordance with the DSM-IV-TR classification system based on self-report questions, without any face-to-face or telephone interaction with a clinician. In general, clinical interviews are accepted as the best way to diagnose eating disorders [18]. However, interviews are not suitable for Web-based interventions, as it would increase the threshold for participating in these interventions. The likely consequence would be that potential patients with eating disorders decide not to seek help, whereas it is particularly important to offer low-threshold and accessible interventions to these patients because the majority is currently not treated for their disorder. Therefore, the availability of a valid online diagnostic self-report measurement is highly desirable.

The EDQ-O had a low sensitivity in diagnosing AN. Most misdiagnoses were caused by dissimilarities in interpretation regarding DSM-IV-TR criterion D (amenorrhea) and the use of different methods to determine underweight (DSM-IV-TR

criterion A). First, when participants use birth control pills, the DSM-IV-TR states that AN can be diagnosed if menstrual bleeding occurs only in the presence of hormonal treatment (e.g., birth control pills). The LEAD standard therefore estimated whether the menstruation would lack if participants would stop using these pills based on their current Body Mass Index (BMI) and situation. With a BMI below 18.5, it was expected that amenorrhea would indeed be present in the patient if she were to stop using birth control pills. Contrary, the EDQ-O concluded in this case that the criterion of amenorrhea could not be determined with certainty and therefore participants were not diagnosed with AN. Second, if participants had irregular menstruation but no absence for three consecutive months, AN was still diagnosed in some cases by the LEAD standard because future absence of menstruation could be reliably expected if the participant's situation of recent severe weight loss continued unchanged. As the EDQ-O only adhered to the specific criteria and did not account for any expectations based on the situation of the participant, these participants were not diagnosed with AN. Third, in the LEAD standard, underweight is determined by a BMI below 18.5 for adults (and adjusted BMI's for younger people). The EDQ-O determined underweight using a table with height and weight thresholds based on the table from the MINI-Plus Interview part N (anorexia nervosa), which was derived from the MLIC table. The critical weight thresholds were generally consistent with a BMI lower than 18.5. However, for some participants their weight was above the critical threshold of the table but below the weight related to a BMI of 18.5. Subsequently, according to the EDQ-O these participants were not severely underweight and therefore other DSM-IV-TR criteria of AN were not assessed with the consequence that participants were not diagnosed as AN by the EDQ-O. A study of Thomas and colleagues [19] also showed that, as a result of the general guidelines on expected body weight calculation in the DSM-IV, several different methods have been used to assess underweight, leading to significant discrepancies in the pool of individuals who are eligible for AN diagnosis. According to the authors, normative weight tables such as the MLIC table have several disadvantages and many of these limitations can be circumvented by using BMI cut-offs, as are also used in the LEAD standard of our study. To obtain a higher sensitivity with regard to detecting AN in the future, it is advisable to use the BMI of participants (taking into account their age) for determining the criterion of underweight and to adjust the interpretation of the criterion of amenorrhea in case participants use birth control pills. It is expected that the sensitivity and other classification accuracy indicators of the EDQ-O will improve by these adjustments. However, complete agreement between the two diagnostic instruments is unlikely, as it is difficult for an online self-report questionnaire to take in account different situations and circumstances of participants when assessing an online diagnosis because all algorithms are determined beforehand.

The low positive predictive value of the EDQ-O in diagnosing BN was mainly caused by the relatively low prevalence of BN in the general population as well as differences in reporting or interpretation of binge eating episodes and/or compensatory behavior. Some participants reported at the EDQ-O that they compensated their binge eating, but according to the LEAD standard they had no actual compensatory behavior or their compensatory behavior was inadequate. In some cases, these differences were the result of recently changed behaviors resulting from the time between filling out the EDQ-O and participating in the intake interview, but in most cases participants seemed to misinterpret the definition of compensatory behavior while completing the EDQ-O. For example, several participants reported at the EDQ-O that they did exercise excessively, however, according to the LEAD standard these participants had normal exercise habits (e.g. running twice a week or walking with a dog daily). Furthermore, according to the LEAD standard a few participants had no official binge eating episodes but did experience subjective eating binges (the feeling of having eating way too much while in fact the amount can objectively not be considered as that much), while these participants did report having eating binges at the EDQ-O. Additionally, a few participants were diagnosed by the LEAD standard with EDNOS because they alternated between BN and AN, while these participants were diagnosed with BN by the EDQ-O based on their current situation. Improvement of the EDQ-O as a valid diagnostic instrument for the diagnosis of BN might be accomplished when the definitions of binge eating episodes and compensatory behavior are more clear to participants. It is therefore desirable to give more information about these characteristics and to measure the type and frequency of participants' compensatory behaviors more explicitly. However, establishing a DSM-IV-TR eating disorder classification using a self-report questionnaire will always have some restrictions and necessitate some concessions in diagnosing the disorder.

For BED most diagnostic efficiency statistics were satisfactory except for the relatively low sensitivity. Comparison of both diagnostic measurements showed that several of these misdiagnoses were related to the low positive predictive value we found for BN. These participants were diagnosed with BN by the EDQ-O because they reported compensatory behavior, but according to the LEAD standard these participants did not (adequately) compensate their eating binges and therefore they were diagnosed as having BED. Furthermore, the BED misdiagnoses by the EDQ-O were the result of a difference in participants' reporting of whether or not they had eating binges or the frequency of these binge eating episodes in the past six months. In line with the suggestions for improving the EDQ-O in order to make a valid diagnosis for BN, it is also desirable for a correct diagnosis of BED that participants correctly interpret, and hence report, eating disorder characteristics such as eating binges, compensatory behavior and a sense of lack of control over eating.

Although the test characteristics for EDNOS were in general moderate to good, the classification accuracy indicators of this disorder will likely improve when the test characteristics of the other eating disorders (AN, BN, BED) also improve given their relationship.

An important strength of the current study is that the present sample consisted of a real clinical sample of patients with all types of eating disorders within a naturalistic setting. Furthermore, the EDQ-O is derived from the MINI-Plus, a valid structured diagnostic interview with robust psychometric characteristics that is widely used in clinical settings as well as research [20].

The study also has some limitations. First, the procedure of the study was modified after a couple of weeks. This gave an important boost to the recruitment of participants. However, it also had the disadvantage that participants no longer completed the EDQ-O just before their intake interview but at an earlier time on their computer at home. For some participants the increased time between both diagnostic measurements resulted in different answers on the same question (e.g. the frequency of binge eating episodes in the past few months), which resulted in a disagreement between the LEAD standard and the EDQ-O. Second, in some cases the LEAD standard deviated from the full DSM-IV-TR criteria in classifying an eating disorder. The decisions to deviate were based on the full clinical presentation of the participants and they were consensus-based within the multidisciplinary team. Although the DSM-IV-TR classification system provides room for interpretation, it would have been appropriate if this study also measured the inter-rater reliability of the LEAD standard.

5. Conclusions

This study showed that the EDQ-O seems to be an acceptable alternative to diagnose all DSM-IV-TR eating disorder classifications in cases where a clinical interview is not possible or not in line with the primary objectives of a specific (Web-based) intervention. In order to further improve the validity of this online self-report questionnaire, we have now adjusted the EDQ-O in response to the above-mentioned suggestions which emerged from the current study. For the future it will be interesting to conduct a follow-up study on this revised version of the EDQ-O.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

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Appendix A. Eating Disorder Questionnaire-Online (EDQ-O).

EDQ-O questions ^a	EDQ-O answer options ^b	DSM-IV-TR criteria	
Anorexia nervosa			
A1 What is your height?	... cm → A2	AN criterion A: Refusal to maintain body weight at or above a minimally normal weight for age and height (e.g., weight loss leading to maintenance of body weight less than 85% of that expected; or failure to make expected weight gain during period of growth, leading to body weight less than 85% of that expected).	
A2 What is your current weight?	... kg → A3		
A3 What was your lowest weight in the past three months?	... kg → A4		
A4 What was your highest weight in the past three months?	... kg → A5a		
A5a <i>Is the patient's weight lower than the threshold corresponding to his/her height?</i> (see Table A)	No = <i>No diagnosis of AN</i> → B1 Yes → A5b		
A5b In spite of your low weight, have you tried not to gain weight in the past three months?	No = <i>No diagnosis of AN</i> → B1 Yes → A6		
A6 Have you intensively feared gaining weight or becoming fat in the past three months, even though you were underweight?	No = <i>No diagnosis of AN</i> → B1 Yes → A7a		AN criterion B: Intense fear of gaining weight or becoming fat, even though underweight.
A7a Have you considered yourself or certain parts of your body too big or fat?	No/Yes → A7b		AN criterion C: Disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or denial of the seriousness of the current low body weight.
A7b Has your body weight or shape greatly influenced how you feel about yourself?	No/Yes → A7c		
A7c Have you thought that your current low body weight is normal or excessive?	No/Yes → A7d		
A7d <i>Are questions 7a, 7b or 7c answered YES?</i>	No = <i>No diagnosis of AN</i> → B1 Yes → A7e		
A7e <i>Is the patient a man?</i>	No → A8a Yes = <i>DSM-IV-TR diagnosis AN</i> → B1	AN criterion D: In postmenarcheal females, amenorrhea, i.e., the absence of at least three consecutive menstrual cycles. (A woman is considered to have amenorrhea if her periods occur only following hormone, e.g., estrogen, administration.)	
A8a Do you have regular menstrual periods, i.e. every 21 to 35 days? Choose not applicable if you use birth control pills, or if you are pregnant, nursing or in transition.	No → A8b Yes = <i>No diagnosis of AN</i> → B1 Not applicable = <i>No diagnosis of AN</i> → B1		
A8b During the last three months, did you miss all your menstrual periods?	No = <i>No diagnosis of AN</i> → B1 Yes = <i>DSM-IV-TR diagnosis AN</i> → B1		
Bulimia nervosa			
B1a In the past three months, did you have eating binges or times when you ate a very large amount of food within a 2-hour period? Eating binges is defined as: eating an amount of food that is regarded by others as very much, for example one or more bags of chips along with a chocolate bar or a pack of magnums along with a piece of cheese or a sausage. Eating a few biscuits or a bag of chips can possibly be a lot for someone, but this is not regarded as a real binge, because with eating binges the quantities are larger.	No = <i>No diagnosis of BN</i> → C1 Yes → B1b	BN criterion A: Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following: (1) eating, in a discrete period of time (e.g., within any 2-hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances.	
B1b What does an average binge look like for you? Can you give a description of the foods and quantities that you often take during a binge? And can you also specify the situations in which these binges often occur and how you eat at these moments?	... → B2a		
B2a How often did you have eating binges in the past six months?	Less than once a week/once a week/twice a week or more → B2b		

(continued on next page)

Appendix A. (continued)

EDQ-O questions ^a	EDQ-O answer options ^b	DSM-IV-TR criteria
B2b How often did you have eating binges in the past three months?	Less than once a week/once a week/twice a week or more → B3	BN criterion C: The binge eating and inappropriate compensatory behaviors both occur, on average, at least twice a week for three months.
B3 During these binges, did you feel that your eating was out of control or that you could not stop eating?	No = <i>No diagnosis of BN</i> → C1 Yes → B4	BN criterion A: Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following: ... (2) a sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating).
B4 Did you do anything to compensate for, or to prevent a weight gain from these binges, like vomiting, fasting, exercising, or taking laxatives, diuretics, enemas, or other medications?	No = <i>No diagnosis of BN</i> → C1 Yes → B5	BN Criterion B: Recurrent inappropriate compensatory behavior in order to prevent weight gain, such as self-induced vomiting; misuse of laxatives, diuretics, enemas, or other medications; fasting; or excessive exercise.
B5 Does your body weight or shape greatly influence how you feel about yourself?	No = <i>No diagnosis of BN</i> → C1 Yes → B6a	BN criterion D: Self-evaluation is unduly influenced by body shape and weight.
B6a Did the patient have binge eating episodes at least twice a week in the past three months (B2b)?	No = <i>No diagnosis of BN</i> → C1 Yes → B6b	BN criterion C: The binge eating and inappropriate compensatory behaviors both occur, on average, at least twice a week for three months.
B6b Does the patient's symptoms meet the criteria for AN?	No → B7 Yes → B6c	BN criterion E. The disturbance does not occur exclusively during episodes of Anorexia Nervosa.
B6c Do these binges occur only during the periods when your weight is too low for someone of your height? For you this means less than kg. ^c	No → B7 Yes = <i>DSM-IV-TR diagnosis AN Binge-eating/purging type</i> → C1	
B7 Are you regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics or enemas?	No = <i>DSM-IV-TR diagnosis BN non-purging type</i> → C1 Yes = <i>DSM-IV-TR diagnosis BN purging type</i> → C1	Type of BN: (1) purging type (during the current episode of BN, the person has regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas) or (2) non-purging type (during the current episode of BN, the person has used other inappropriate compensatory behaviors, such as fasting or excessive exercise, but has not regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas)
Binge eating disorder		
C1a Did the patient have binge eating episodes in the past three months (B1a)?	No = <i>No diagnosis of BED</i> → D1 Yes → C1b	BED criterion A: Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following: (1) eating, in a discrete period of time (e.g., within any 2-hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances, and (2) a sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating)..
C1b Did the patient feel that his/her eating was out of control or that he/she could not stop eating (B3)?	No = <i>No diagnosis of BED</i> → D1 Yes → C2	
C2 Did the patient have binge eating episodes at least twice a week in the past six months (B2a)?	No = <i>No diagnosis of BED</i> → D1 Yes → C3	BED criterion D: The binge eating occurs, on average, at least twice a week for six months.
C3 Does the patient compensate for, or prevent a weight gain from the binge eating episodes (B4)?	No → C4 Yes = <i>No diagnosis of BED</i> → D1	BED criterion E: The binge eating is not associated with the recurrent use of inappropriate compensatory behavior (for example, purging) and does not occur exclusively during the course of bulimia nervosa or anorexia nervosa
C4 Do you feel unhappy or uncomfortable about your eating binges?	No = <i>No diagnosis of BED</i> → D1 Yes → C5a	BED criterion C: Marked distress regarding binge eating is present.
C5a Are the binge-eating episodes associated with the following characteristics?	No/Yes → C5b	BED criterion B: The binge-eating episodes are associated with three (or more) of the following:
C5b - Eating much more rapidly than normal	No/Yes → C5c	1. eating much more rapidly than normal
C5b - Eating until feeling uncomfortably full	No/Yes → C5c	2. eating until feeling uncomfortably full
C5c - Eating large amounts of food when you are not feeling physically hungry	No/Yes → C5d	3. eating large amounts of food when not feeling physically hungry
C5d - Eating alone because you are feeling embarrassed by how much you eat	No/Yes → C5e	4. eating alone because of feeling embarrassed by how much one is eating
C5e - Feeling disgusted with yourself, depressed, or very guilty afterward	No/Yes → C5f	5. feeling disgusted with oneself, depressed, or very guilty afterwards

Appendix A. (continued)

EDQ-O questions ^a	EDQ-O answer options ^b	DSM-IV-TR criteria
C5f <i>Are 3 or more B9 answers (a, b, c, d, e) coded YES?</i>	No = <i>No diagnosis of BED</i> → D1 Yes = <i>DSM-IV-TR diagnosis of BED</i> → D1	
Eating disorder not otherwise specified		
D1 <i>Does the patient met the diagnosis of AN, BN or BED?</i>	No = <i>DSM-IV-TR diagnosis of EDNOS</i> → END Yes = <i>No diagnosis of EDNOS</i> → END	

^a Self-report questions to the patient are written in normal font. Sentences written in italics were not presented to the patient but the answers were automatically determined by the computer system based on the given answers of the patient.

^b An arrow (→) behind an answer indicates the next question which is automatically presented to the patient. An equal sign (=) behind an answer indicates the DSM-IV-TR diagnosis of the patient based on the given answers to the self-report questions.

^c The computer takes the threshold weight for this patient's height/weight from Table A (see below).

Table A
Critical threshold weights in kilograms by height in centimeters for men and women.

Men				Women			
Height (cm)	Threshold weight (kg)	Height (cm)	Threshold weight (kg)	Height (cm)	Threshold weight (kg)	Height (cm)	Threshold weight (kg)
145	43	181	61	135	36	171	55
146	43	182	62	136	36	172	55
147	44	183	62	137	36	173	56
148	44	184	63	138	37	174	57
149	45	185	64	139	37	175	57
150	45	186	65	140	37	176	58
151	45	187	65	141	37	177	58
152	46	188	66	142	38	178	59
153	46	189	67	143	38	179	60
154	46	190	67	144	39	180	60
155	47	191	68	145	39	181	61
156	48	192	69	146	40	182	62
157	48	193	69	147	40	183	62
158	48	194	70	148	41	184	63
159	48	195	71	149	42	185	64
160	49	196	72	150	42	186	65
161	49	197	72	151	43	187	65
162	49	198	73	152	43	188	66
163	50	199	74	153	44	189	67
164	50	200	74	154	44	190	67
165	51	201	75	155	45	191	68
166	51	202	76	156	46	192	69
167	52	203	77	157	46	193	69
168	53	204	77	158	47	194	70
169	53	205	78	159	47	195	71
170	54	206	79	160	48	196	72
171	55	207	80	161	48	197	72
172	55	208	81	162	49	198	73
173	56	209	81	163	50	199	74
174	57	210	82	164	50	200	74
175	57	211	83	165	51	201	75
176	58	212	84	166	51	202	76
177	58	213	84	167	52	203	77
178	59	214	85	168	53	204	77
179	60	215	86	169	53	205	78
180	60			170	54		

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