

Original Article

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Low quality of life in binge eating disorder compared to healthy controls

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ABSTRACT

INTRODUCTION. Patients with binge eating disorder (BED) tend to report a lower quality of life (QoL) than patients with other eating disorders. However, most research on QoL in eating disorders include generic rather than disease-specific measures. Depression and obesity are frequent comorbid conditions in patients with BED affecting QoL. In the present study, we aimed to assess disease-specific QoL in BED and to investigate the impact of obesity and depression.

METHODS. Adult patients who met the DSM-5 criteria for BED (N = 98) were recruited from a newly established specialised online treatment programme for BED and completed the following questionnaires: the Eating Disorder Quality of Life Questionnaire (EDQLS), the Major Depression Inventory (MDI) and the newly introduced Binge Eating Disorder Questionnaire for measuring BED severity. Healthy, normal-weight individuals were recruited through online invitations on social media, n = 190.

RESULTS. QoL in BED individuals was significantly lower than in healthy individuals. No relationship was found between BMI and EDQLS, whereas significant, negative correlations were found between depression and all subscales of the EDQLS.

CONCLUSION. Disease-specific QoL in BED was associated with depression but not with BMI.

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Binge eating disorder (BED) is the most prevalent eating disorder (ED) affecting around 3.5% of women and 2% of men [1]. No prevalence studies of BED have been conducted in Denmark, but the Danish Health Authority estimates that more people suffer from BED than from anorexia and bulimia combined, which corresponds to 40,000-50,000 adults suffering from BED [2]. BED was included in the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5) as a diagnostic entity in 2013 [3]. BED has also been established as a diagnosis in the Diagnostic System International Classification of Diseases version 11 (ICD-11) [4], which will soon be implemented in Danish healthcare. In both diagnostic manuals, BED is characterised by repeated episodes of binge eating where large amounts of food are consumed within a short period of time while experiencing

marked distress and loss of control. There are no compensatory behaviours after binges, such as purging or excessive exercise, which differentiates it from bulimia nervosa [3, 4].

In general, EDs are associated with significantly reduced health-related quality of life (HRQoL) [5-8] with impact on physical, psychological and social aspects of functioning and well-being. Research has been conducted on QoL in anorexia and bulimia [5-7], but studies on BED are limited. In some studies, patients with BED report the lowest HRQoL compared with patients with other EDs [7].

High rates of overweight (BMI \geq 25 kg/m²) and obesity (BMI \geq 30 kg/m²) are found in patients with BED [5, 9]. Obesity is associated with lower QoL [10] and the risk of various diseases increases steadily with increasing body mass, including type 2 diabetes, hypertension and cardiovascular diseases [11]. Likewise, weight-based discrimination and stigma in society have harmful impacts on QoL and are associated with an increased likelihood of maladaptive eating behaviours and an increased risk of BED [10]. Furthermore, the link between depression was confirmed in a meta-analysis where results showed an increased risk of developing depression in persons with obesity and vice versa [12].

Studies on obesity in BED have been associated with decreased HRQoL in physical aspects of QoL [9], lower scores in mental components of HRQoL [13], greater functional impairment, more subjective stress and a lower overall HRQoL [5]. Based on experience from Danish treatment projects, the severity of BED was shown to depend on psychiatric comorbidity such as depression and anxiety, suicidality and other factors, such as motivation for treatment [2].

The most widely used generic tool to measure QoL is the Medical Outcome Studies Short Form Scale (SF-36 and SF-12) [7]. However, for ED interventions where treatment focus is on improving QoL, disease-specific measures are highly warranted [6]. In 2007, the Eating Disorder Quality of Life Questionnaire (EDQLS) was developed and validated as a disease-specific QoL measure for all EDs. It included broader aspects of life that were confirmed to be important to patients with ED, along with those that were specifically affected by EDs and their treatment (e.g., HRQoL). The development and validation study of the EDQLS included patients diagnosed with anorexia nervosa, bulimia nervosa and ED not otherwise specified (EDNOS). However, only 8% of the EDNOS group were overweight and none were diagnosed with BED [14].

The objective of this study was to evaluate disease-specific QoL in Danish BED patients compared with healthy controls and to evaluate the potential impact of depression and obesity in patients seeking treatment for BED. Our study is the first step towards developing and implementing patient-reported assessments of QoL during treatment courses for this patient group in Denmark.

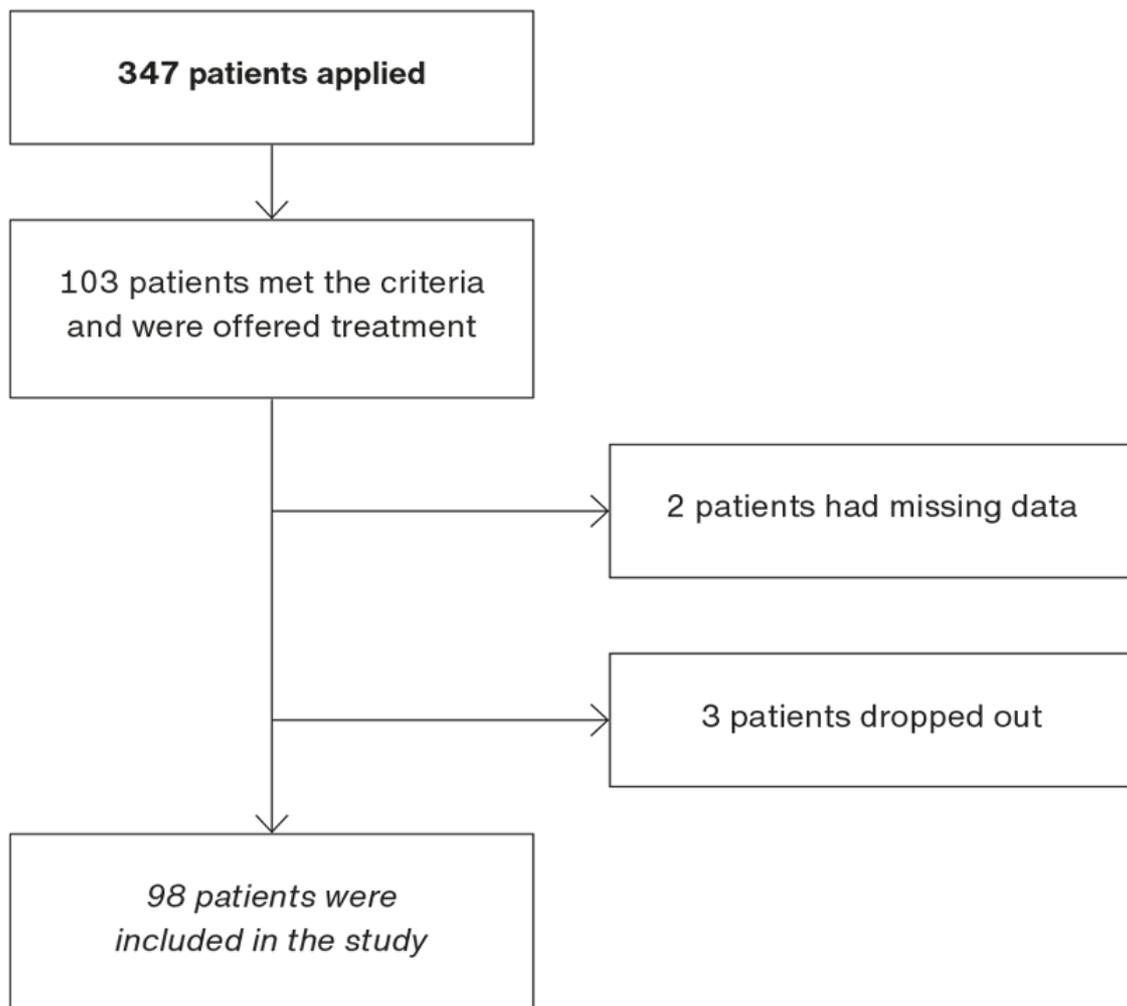
METHODS

Participants

The patients were 98 (response rate 94.9%) adults receiving internet-based treatment for BED at Odense University Hospital, Denmark. The treatment was advertised online. It was free of charge, financed by the Danish Ministry of Health and application was online and available for all adult Danish citizens. Participants were consecutively screened online by completing a BED questionnaire based on the DSM-5 [3] criteria for BED, and inclusion criteria were mild to moderate BED. The participants were assessed by clinicians using the SCID-I for BED, affective disorders and anxiety disorders. Exclusion criteria were severe or extreme BED and/or severe psychiatric comorbidity. Patients suffering from somatic complications that prohibited them from participating in a three-hour session were also excluded. The number of individuals who applied was 347, and 103 met the inclusion criteria and were offered treatment. Five either did not complete questionnaires or dropped out of

treatment (Figure 1). The age ranged from 19 to 68 years (males: 38.9 years, standard deviation (SD): ± 11.7 years) and 86.7% (n = 85) were female. BMI was calculated from self-reported height and weight. Mean BMI was 39.0 (SD: ± 8.1) kg/m². The comparison group was healthy females aged 13-40 years with a BMI of 18.5-24.9 kg/m², obtained from another study [15].

FIGURE 1 Flow chart demonstrating the inclusion of patients in the study.



Study design

This is a cross-sectional study describing the disease-specific QoL of patients with BED compared with healthy controls. Participants completed the self-report questionnaires listed below.

Assessment materials

Eating Disorder Quality of Life Scale

The Eating Disorder Quality of Life Scale (EDQLS) is a disease-specific measure of QoL in EDs (alpha = 0.96). It

was developed with participation from patients with EDs, their families and ED treatment providers. It is a self-report questionnaire containing 40 items measuring 12 domains of life: Cognitive; Educational/vocational; Family and close relationships; Relationships with others; Future outlook; Appearance; Leisure; Psychological; Emotional; Values and beliefs; Physical; Eating disorder. Lower scores on subscales indicate lower QoL in the subsequent area. Based on our clinical involvements and experiences, we studied the effect of removing two selected items from the EDQLS that we speculate may be problematic in BED and obesity, item 13: "I can see positive things about my appearance" and item 40: "I feel physically cold".

Binge eating disorder

BED severity was assessed in two ways. Traditionally, it has been assessed by the number of self-reported overeating episodes from the previous week. The Binge Eating Disorder Questionnaire (BED-Q) is a newly introduced scale for measuring BED severity, which was developed in Denmark in 2020 ($\alpha = 0.812$). It is a nine-item questionnaire developed from the DSM-5 diagnostic criteria for BED. The questionnaires assess the frequency of the BED symptoms, and the sum score is interpreted as: 0 = no symptoms; 1-9 = subclinical symptoms of BED; 10-14 = mild BED; 15-21 moderate BED; 22-28 = severe BED; 29-35 = extremely severe BED. It controls for compensatory behaviours and assesses if binges are experienced as distressing [16]. BED-Q is currently under validation for its psychometric properties in Danish cohorts of binge-eating patients.

Eating Disorder Questionnaire

The Eating Disorder Questionnaire (EDE-Q) is a widely used and validated self-report questionnaire based on the Eating Disorder Examination Interview [17]. It provides two types of data. First, frequency of key behaviours specific for each ED and, second, a subscale score reflecting the severity of the psychopathology of each disorder. The subscales include: Restraint ($\alpha = 0.688$); Eating concern ($\alpha = 0.556$); Shape concern ($\alpha = 0.571$); Weight concern ($\alpha = 0.386$) and Global scale ($\alpha = 0.744$).

Major Depression Inventory

The Major Depression Inventory (MDI) was used to screen for depressive symptoms ($\alpha = 0.862$). It is a self-report measure assessing the severity of depressive states from none to severe. The score is interpreted as: < 20: normal; 20-24: light depression; 25-29: moderate depression; and > 29: severe depression [18].

Statistical analysis

Descriptive statistics for categorical variables were calculated as percentages to describe participant characteristics. Continuous variables were calculated using mean with standard deviations for normally distributed data. Continuous variables were analysed using Spearman's correlation in Excel version 16.43. The significance (p-value) of the correlation coefficient (r) was analysed using STATA version 16.1 [19]. To prevent Type 1 error, the Bonferroni method of adjustment was used where the significance level was adjusted by dividing the conventional 0.05 with the number of tests per variable ($n = 13$). The adjusted significance level for each of the comparisons was thus 0.004.

Ethical considerations

Participants were informed that study participation was voluntary and would have no effect on their treatment. Participants gave their consent to participation in the study. Data were kept in REDCap databases to ensure safe handling of data. For participation in a questionnaire survey, ethics committee approval is not required in Denmark.

Trial registration: ClinicalTrials.gov NCT05010798.

RESULTS

In this sample of patients with BED patients (N = 98), we found a total EDQLS score of 118.1 (SD: ± 16.9) and a global EDE-Q score of 3.71. Mean BMI was 39.0 (SD: ± 8.1) kg/m². Obesity (BMI ≥ 30 kg/m²) had a prevalence of 90.8% and morbid obesity, defined as BMI > 40 kg/m², had a prevalence of 42.9%. The prevalence of depression was 56% according to self-reported data (MDI), while 34.7% had a depression diagnosis (Table 1). Correlation analysis was performed (Table 2) with the EDQLS, BMI, Depressive symptomatology, BED-Q and Overeating Episodes per Week. We found no correlation between BMI and EDQLS. We found significant negative correlations between MDI and EDQLS in almost all domain scores. After dropping items 13 and 40 of the EDQLS, the correlation of EDQLS to BED-Q changed from $r = -0.28$, $p < 0.05$ to $r = -0.29$, $p < 0.05$.

TABLE 1 Demographics and health characteristics of binge eating disorder patients included in the study (N = 98).

	n (%)	Mean (\pm SD)
<i>Gender</i>		
Male	13 (13.3)	
Female	85 (86.7)	
Age, yrs		38.9 (\pm 1.7)
<i>Physical comorbidity, diagnoses^a</i>		
Hypertension	17 (17.3)	
Diabetes mellitus type 2	7 (7.1)	
Sleep apnoea	11 (11.2)	
Osteoarthritis	16 (16.3)	
Other	42 (42.9)	
<i>Psychiatric comorbidity, diagnoses^a</i>		
Depression	34 (34.7)	
Other, including anxiety	43 (43.9)	
<i>Eating disorder symptoms</i>		
<i>BED-Q score:</i>		
Overall		18.8 (\pm 5.6)
No symptoms: 0	0	
Subclinical: 1-9	4 (4.1)	
Mild: 10-14	23 (23.5)	
Moderate: 15-21	47 (49.0)	
Severe: 22-28	19 (19.4)	
Extremely severe: 29-35	5 (5.1)	
<i>Overeating, episodes/wk:</i>		
Overall		5.5 (\pm 3.1)
None	2 (2.0)	
Mild: 1-3	29 (29.6)	
Moderate: 4-7	43 (43.9)	
Severe: 8-13	23 (23.5)	
Extremely severe: > 13	1 (1.0)	
<i>EDE-Q score:</i>		
Restraint		2.39 (\pm 1.4)
Eating concern		3.57 (\pm 0.8)
Shape concern		4.6 (\pm 1.3)
Weight concern		4.32 (\pm 1.3)
Global		3.71 (\pm 1.0)
Binge-eating episodes: item 14		15.9 (\pm 10.6)
<i>Depression, self-reported: MDI score</i>		
Depression		26.4 (\pm 9.82)
Depression prevalence: \geq 26	55 (56)	
<i>BMI, kg/m²</i>		
Overall		39.0 (\pm 8.1)
18-24.9	2 (2)	
25-29.9	7 (7.1)	
<i>Obese:</i>		
Class 1: 30-34.9	25 (25.5)	
Class 2: 35-39.9	22 (22.4)	
Class 3: > 40	42 (42.9)	

BED-Q = Binge Eating Disorder Questionnaire; EDE-Q = Eating Disorder Examination Questionnaire; MDI = Major Depression Inventory; SD = standard deviation.

a) Some of the patients were diagnosed with > 1 comorbidity and some had 0.

TABLE 2 Correlation coefficients among patients (N = 98).

	Correlation coefficient			
	BMI	MDI	BED-Q	overeating episodes
<i>Domain scores of EDQLS</i>				
Cognitive	-0.08	-0.48*** ^c	-0.07	-0.17
Education	-0.09	-0.42*** ^c	-0.19	-0.30
Family	-0.01	-0.24**	-0.18	-0.26
Relationships	-0.00	-0.40*** ^c	-0.23*	-0.16
Future	-0.16	-0.42*** ^c	-0.08	-0.06
Appearance	-0.16	-0.38*** ^c	-0.28*	-0.25
Leisure	-0.07	-0.37*** ^c	-0.02	-0.09
Psychological	-0.03	-0.26**	-0.16	-0.11
Emotional	-0.13	-0.50*** ^c	-0.20	-0.13
Values	-0.06	-0.19	-0.21	-0.14
Physical	-0.11	-0.56*** ^c	-0.05	-0.18
Eating disorder	-0.08	-0.39*** ^c	-0.31**	-0.36*** ^c
Total EDQLS	-0.11	-0.64*** ^c	-0.30**	-0.33*** ^c
<i>2 items removed^a</i>				
Total EDQLS	-0.08	-0.62*** ^c	-0.29**	-0.31**
<i>Others</i>				
BMI	-			
MDI	0.19	-		
BED-Q	0.22	0.28**	-	
Overeating episodes ^b	0.21	0.26**	0.52*** ^c	

BED-Q = Binge Eating Disorder Questionnaire; EDQLS = Eating Disorder Quality of Life Scale; MDI = Major Depression Inventory.

**) p < 0.01; ***) p < 0.001.

a) Removal of item 13: "I can see positive things about my appearance", and item 40: "I feel physically cold".

b) Overeating episodes/wk.

c) Bonferroni-corrected significant correlations: p ≤ 0.0004.

DISCUSSION

This study examined disease-specific QoL in patients with BED using the EDQLS and explored the effects of BMI and depression on QoL. EDQLS was also compared with that of healthy individuals. Our overall findings were that depression significantly, negatively influenced disease-specific QoL, whereas no relationship was found between BMI and EDQLS. As expected, disease-specific QoL was significantly lower in patients with BED than in healthy controls (Table 3).

TABLE 3 Eating Disorder Quality of Life Scale (EDQLS) scores in binge eating disorder (BED) patients compared with healthy controls [17] where lower scores indicate poorer quality of life^a.

EDQLS subscale	Score	
	BED patients (N = 98)	healthy controls (N = 190)
Cognitive	8.25	12.6
Education	8.42	13.3
Family	10.97	13.2
Relationships	9.71	12.3
Future	11.53	13.6
Appearance	7.45	9.9
Leisure	10.51	13
Psychological	8.94	12
Emotional	7.36	10.8
Values	7.55	10.4
Physical	8.63	11.3
Eating disorder	18.87	28.3

a) p value, t-test = 0.05.

Obesity, which was highly prevalent in our study, has generally been associated with lower QoL [10], whereas studies on obesity in EDs are contradictory [5-9]. In our study, a higher BMI was not correlated with lower QoL, and no significant relationship was seen in any domain score. This may suggest that a greater degree of obesity (higher BMI) does not contribute to a poorer QoL in BED patients and may indicate that the subjective experience of being obese is the main contributor to a poorer QoL rather than actual obesity status. Another explanation is that patients with ED in general tend to be dissatisfied about their body weight irrespective of their actual body weight. However, BMI variation was not large in this study, ~90% had BMI > 30 kg/m² and morbid obesity was prevalent, while BED patients tend to be mildly to moderately obese at the lower end of the spectrum [1]. This finding was similar to that of a comparative analysis between BED patients and individuals without ED where the authors found no association between HRQoL and BMI [8]. Additionally, a meta-analysis on QoL in EDs found no association between generic HRQoL and extremes in BMI among patients with ED when including patients of normal weight [6]. These results, however, contradict the findings of a study on generic QoL, which found a significant correlation between obesity and generic HRQoL on the Physical Component Summary scores of the SF-36 [9].

Depression proved to play a major role for QoL in patients with BED exerting a negative influence on the EDQLS in all domains. This finding has been observed in all EDs [5, 7, 17] and in BED [8, 9]. Depression is a prevalent and well-documented comorbidity of all EDs [8, 9, 13] and in this study, depression had a prevalence of 56%. In addition, depression may trigger binge eating and vice versa, creating a vicious circle [10, 20]. These findings show that psychopathology, like depression, may influence disease-specific QoL more than obesity, adding to the increased consensus on this relation from previous studies [6, 8]. This does not exclude the negative influences of obesity on physical health [10, 11], however; it rather suggests that psychological comorbidities weigh heavier on QoL in BED.

2% reported no binge eating in BED-Q (Table 1). We did not exclude them, since the screening questions cannot exclude mild BED and since the DSM-5 criteria go back six months (versus only 28 days in BED-Q). Also, the 2% were actively seeking treatment for BED and scored on some of the other questions such as feeling a loss of control and feeling shameful or guilty after a meal. The classification of EDs is under constant debate and revision. One of the participants had a BMI of 18 kg/m², which does not exclude BED. However, according to the DSM-5, it could also have been classified as Other Specified Feeding and Eating Disorder, and during a course it could prove to be anorexia nervosa or bulimia nervosa.

Some limitations need to be considered. We found a noticeable difference in reported binge eating episodes in BED-Q and EDE-Q (Table 1), which may illustrate critical limitations in the assessment methods. The BED-Q asks for the number of binge eating episodes within the past three months, whereas the EDE-Q item 14 is worded as follows: "How many times during the past 28 days have you eaten what other people would regard as an unusually large amount of food?". We believe the differences illustrate the importance of screening tools being thoroughly validated and that a single item may never stand alone. This was a cross-sectional correlational study and the sample size was relatively small with a high prevalence of women. Furthermore, all information on age, BMI, health and medication was based on self-reported data, including the diagnostic questionnaire for BED. Controls were recruited through social-media and self-referral with a risk of selection bias.

CONCLUSION

QoL in BED was significantly lower than in healthy controls. No relationship was found between BMI and EDQLS, whereas significant negative correlations were found between depression and all subscales of the EDQLS.

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Conflicts of interest Potential conflicts of interest have been declared. Disclosure forms provided by the authors are available with the article at ugeskriftet.dk/dmj

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