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The relationship between eating disorder psychopathology and health-related quality of life within a community sample

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Abstract
Purpose Recent research has begun investigating the impact of eating disorders on health-related quality of life (QOL). The present study examined the impact of eating disorder psychopathology on QOL within a community sample.
Methods Two hundred and fourteen women completed questionnaires assessing eating disorder symptoms, body dissatisfaction, body checking and body avoidance behaviors, and general psychopathology.
Results Eating disturbance and body image dissatisfaction were associated with poorer QOL. In addition, eating disorder psychopathology uniquely predicted QOL above and beyond the variance accounted for by general psychopathology. Both subjective bulimic episodes and objective bulimic episodes were associated with impairments in QOL.
Conclusions These results indicate that eating disorder psychopathology may adversely affect the lives of women within the community. Early intervention and detection could reduce the negative impact of eating disorder psychopathology on women's lives and protect individuals with mild eating disorder symptoms from a further reduction in QOL.

Keywords Quality of life · Eating psychopathology · Binge eating · Subjective bulimic episodes · General psychopathology

Abbreviations

BCQ	Body checking questionnaire
BDI-II	Beck depression inventory II
BIAQ	Body image avoidance questionnaire
BMI	Body mass index (kg/m)
BSI	Brief symptom index
BSQ	Body Shape questionnaire
EDE-Q	Eating disorders examination questionnaire
EDI-II	Eating disorders inventory-2
MCS	Mental health component summary
OBE	Objective bulimic episode
OO	Objective overeating
PCS	Physical health component summary
QOL	Quality of life
SBE	Subjective bulimic episode
SF-36	Medical Outcomes Survey Short-form Health Survey
WHOQOL	World Health Organization quality of life group

Introduction

Health-related quality of life (QOL) is a central concept within health care. It has historically been used to document the burden associated with physical illnesses and to measure the effects of specific treatments. The concept of QOL is widely used in medical health care, and it has been recognized as important in the area of mental health

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research [1, 2]. Given the recent influx of interest in QOL research within the mental health arena, the World Health Organization Quality of Life Group (WHOQOL) formulated a definition that is one of the most widely used. They defined QOL as "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" [3]. QOL involves the physical, psychological, social, and environmental aspects of a person's life [2–5]. The psychological aspect of QOL has only recently been added to WHOQOL's definition of QOL, thus providing further opportunity for QOL research in mental health patients [2, 4, 6].

Individuals with eating disorders display significant impairments in physical [7], psychological [8], and social functioning [9, 10]. Several studies have observed impairment in QOL among individuals with diagnosed eating disorders [11–17]. Such studies have highlighted the negative impact of eating disorders on an individual's QOL. Less research, however, has investigated the impairment associated with eating disorder psychopathology that constitutes sub-clinical eating concerns or "milder" forms of these disorders. Given that eating disorders are associated with such severe psychological, physical, and social impairment, it is likely that both clinical and sub-clinical eating disorder psychopathology can have a negative effect on QOL.

Research on binge eating and QOL has also shown that individuals with bulimia nervosa or binge eating disorder are impaired on measures of QOL [14, 18] and show significant impairment in psychosocial functioning [19–21]. More specifically, research has also shown that purging behaviors [13] and bulimic pathology [14] predict impairment in QOL. Recently, even sub-clinical variants of binge eating episodes (subjective bulimic episodes) were found to significantly predict QOL in a sample of individuals with eating disorders [22].

Although some researchers have found a relationship between greater severity of eating disorder symptoms and lower QOL [23, 24], it is unclear to what extent QOL is affected in those displaying eating disorder psychopathology but who may not meet full criteria for clinical diagnoses. As previous literature has found an association between eating disorders and impairment, the present study proposed that sub-clinical eating disturbances also result in a reduced QOL.

The aim of the current study was to examine the association between eating disorder psychopathology and QOL within a nonclinical sample. We hypothesized that eating disturbances (such as eating and weight concerns, dieting, body dissatisfaction, and binge eating) would be negatively associated with physical and mental health components of QOL. We also hypothesized that both binge eating and its sub-clinical variant, subjective bulimic episodes, would be associated with impairments in QOL. Finally, we hypothesized that eating disturbances and body image dissatisfaction would predict QOL, independently of the predictive effect of general psychopathology.

Method

Participants

Participants were 214 women between the ages of 17 and 65 years recruited from a New Zealand University ($n = 113$) and from the wider community of Christchurch, New Zealand ($n = 101$). Recruitment involved advertising at the university campus and in local community newspapers/newsletters, at various workplaces and on notice boards at Christchurch community centers. All participants provided informed consent and filled out a questionnaire package that included questions on demographic information (age, height, weight, ethnicity, educational background, and marital status) as well as the following questionnaires. This study was approved by the University Ethics Committee at the University of Canterbury.

Measures

Quality of life

The Medical Outcomes Survey Short-form Health Survey (SF-36) [5] is a 36-item measure of everyday functioning ability. The eight dimensions assessed include Physical Functioning, Role Physical, Bodily Pain, General Health, Vitality, Social Functioning, Mental Health, and Role Emotional. Two summary measures used in this scale were the physical health component summary (PCS) and the mental health component summary (MCS). Low scores indicate greater impairment in QOL, and high scores indicate less impairment in QOL. The summary scores have been shown to be valid measures and high in internal consistency (Cronbach's alphas: PCS = .92, MCS = .88) [25]. Both summary measures of the SF-36 have been shown to be useful tools for measuring the severity and deterioration of health in patients with eating disorders [12, 14–16].

Eating disorder psychopathology

The Eating Disorders Examination Questionnaire (EDE-Q) [26] is a 36-item self-report measure adapted from the 12th edition of the Eating Disorder Examination [27]. It uses a 7-point, forced-choice, Likert scale. Higher scores indicate greater severity. Four subscales related to eating disorder

psychopathology consist of Eating Concerns, Weight Concerns, Shape Concern, and Restraint. The EDE-Q has been found to yield highly reliable scores (alpha = .93) and to have good concurrent and criterion validity [24, 28]. The EDE-Q also provides a comprehensive assessment of specific eating disorder symptoms relevant to diagnostic criteria [28], and it has been validated in a nonclinical sample [24, 28]. This measure assessed three forms of binge eating/overeating that were examined in the present study: objective bulimic episodes (OBEs), the consumption of a large amount of food while experiencing a loss of control; subjective bulimic episodes (SBEs), the consumption of a moderate amount of food while experiencing a loss of control; objective overeating (OO), the consumption of a large amount of food while not experiencing a loss of control.

The Eating Disorders Inventory-2 (EDI-II) [29] is a widely used, 91-item questionnaire consisting of items relating to eating disorder psychopathology and is considered an adequate measure of eating disturbance. Eleven subscales consist of Drive for Thinness, Bulimia, Body Dissatisfaction, Ineffectiveness, Perfectionism, Interpersonal Distrust, Interoceptive Awareness, Maturity Fears, Asceticism, Impulse Regulation, and Social Insecurity. The EDI-2 has been extensively studied and found to yield good reliability and validity data among both clinical and nonclinical samples [29]. The subscales are often scored on a 0–3 scoring system; however, for this sample the scale was scored from 1 = never to 6 = always, to maintain as much individual variation within data as possible. This scoring system has been validated within a nonclinical sample [30].

Body dissatisfaction

The Body Shape Questionnaire (BSQ) [31] is a 34-item measure assessing how individuals have felt about their appearance over the past 4 weeks on a 5-point Likert scale. It is a commonly used measure of satisfaction and concern with body shape with good reliability and validity [31]. Higher scores represented a higher frequency of body shape dissatisfaction.

The Body Checking Questionnaire (BCQ) [32] is a 23-item inventory assessing body checking behaviors on a 5-point Likert scale. Body checking has been repeatedly shown, in a variety of samples, to be an important behavioral manifestation of body dissatisfaction and core eating psychopathology [32–34]. Higher scores represent a higher frequency of body checking behaviors. Reas et al. reported good test–retest reliability (0.94) and good internal consistency.

The Body Image Avoidance Questionnaire (BIAQ) [35] is a 19-item questionnaire assessing avoidance of situations that provoke concern about physical appearance. Items are rated on a 6-point scale. Participants are asked to rate how often they engage in each behavior at the present time by circling a number between 5 = always and 0 = never. Rosen et al. reported good internal consistency (Cronbach's alpha at 0.89) and good test–retest reliability.

General psychopathology

The Beck Depression Inventory II (BDI-II) is a 21-item instrument designed to measure depressive symptoms on a 4-point Likert scale. Higher scores indicate a greater severity of depressive symptoms. A score of 0–13 indicates minimal depressive symptoms, 14–19 mild, 20–28 moderate, and 29–63 severe symptoms. The BDI-II is widely used and considered to have sound psychometric properties [36, 37].

The Brief Symptom Index (BSI) [38–40] is a self-report measure of overall psychological distress derived from the Global Symptom Index of the Symptom Checklist–90–Revised (SCL-90-R) [38]. The BSI scale items are rated on a 5-point Likert scale indicating how much each problem has distressed or bothered respondents during the past week including the current day. The BSI measures nine symptom dimensions: Somatization, Obsessive–compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. Higher scores on subscale and total scores indicate more symptoms of general psychopathology. Researchers have reported adequate internal consistency coefficients for the nine dimensions ranging from .71 to .85 [39] and test–retest reliabilities (0.68–0.91 over a 2-week period). The BSI also correlated well with other psychological measures supporting its convergent, discriminant, predictive, and construct validity [40].

Statistical analyses

Data analysis was performed using SSPS 17.0. Pearson-product moment correlations were calculated to test the association between QOL and measures of eating disorder psychopathology and body dissatisfaction. The three overeating categories, OBEs, SBEs, and OO, were analyzed by dividing into two groups: the individuals who indicated two or more episodes per month of each type of episode and those individuals who indicated less than two episodes per month. This division was based on research indicating that individuals with subthreshold binge eating, defined as one or more binge episodes per month, have similar general impairment and eating pathology [41]. The QOL scores of the high and low groups of each of the overeating categories were compared by conducting independent samples t-tests. Next, a principal components

analysis was performed to reduce the number of variables and to eliminate the multicollinearity of the variables to strengthen the results of the regression analyses. The regression analyses included the components that emerged from the principal components analysis to examine the potential predictors of QOL. Alpha level was set at $P < .05$.

Results

Demographic data

The reported ethnic composition of the sample was 83.1% New Zealand European, 7.5% Asian, 6.1% Maori, and 1.9% other European. The mean age of the sample was 31.83 (SD = 12.76) years. The majority (50.5%) had never been married and had some university education (58.8%). Using the categories of the National Heart, Lung, and Blood Institute (1998), 55% had a BMI within the normal range (BMI of 18.5–24.9), and the remainder were overweight (23%; BMI of 25–29.9), obese (16%; BMI $\geq$ 30), or underweight (6%; BMI < 18.5). A minority of the sample (29%) indicated having received treatment for psychological concerns. Nineteen percent indicated that they had received treatment for depression. Two percent indicated that they had received treatment for eating concerns. (Although the analyses reported below include this 2% of participants, the data were additionally analyzed while excluding this 2%. The results were identical when including or excluding these individuals.) As recruitment occurred from two different sources, group differences were examined, and community members (47%) were higher than university students (53%) on age ($t(212) = -7.94$, $P < .05$) and BMI ($t(206) = -3.53$, $P < .05$) and lower on EDI-II Bulimia ($t(214) = 2.82$, $P < .05$) EDI-II Maturity Fears ($t(214) = 2.59$, $P < .05$) EDI-II Impulse Regulation ($t(214) = 2.45$, $P > .05$) and BCQ ($t(214) = 2.61$, $P < .05$); however, the lack of significant differences between these samples on all the other variables led to the decision to combine the participants for the main analyses.

Associations between eating psychopathology, body dissatisfaction, and QOL

All four EDE-Q subscales and the eating-specific subscales of the EDI-II, Drive for Thinness and Bulimia, were significantly correlated with the Physical and Mental Health Component Summary measures of the SF-36, as shown in Table 1. In addition, each measure of body dissatisfaction (the BSQ, BIAQ, BCQ, and the EDI-II Body Dissatisfaction subscale) was significantly correlated with both the PCS and the MCS.

Binge eating, overeating, and QOL

Participants with high (two or more episodes in the past month) and low (fewer than two episodes in the past month) episodes of binge eating/overeating (OBEs, SBEs, and OOs) were compared on the QOL summary component measures. As shown in Table 2, participants who reported two or more OBEs reported more impairment in the PCS and MCS of the SF-36 relative to those who experienced fewer than two OBEs. Similarly, individuals who had experienced two or more SBE showed significantly more impairment in the PCS and MCS than those who experienced fewer than two SBEs. Those who indicated two or more episodes of OO showed no statistically significant difference in impairment in either the PCS or MCS when compared to those with less than two episodes of OO.

Regression analyses predicting QOL

To explore the relationship between eating disorder psychopathology and QOL, multiple regression analyses were conducted using the PCS and the MCS of the SF-36 as

Table 1 Correlations between eating disorder psychopathology, body dissatisfaction, and quality of life components

Variable	SF-36 physical health component summary measure (PCS)	SF-36 mental health component summary measure (MCS)
EDE-Q eating concerns	−.39	−.47
EDE-Q shape concerns	−.41	−.51
EDE-Q restraint	−.19	−.29
EDE-Q weight concerns	−.39	−.48
EDI-II drive for thinness	−.30	−.44
EDI-II bulimia	−.33	−.44
EDI-II body dissatisfaction	−.34	−.38
BIAQ	−.44	−.48
BCQ	−.24	−.45
BMI	−.32	−.13

All correlations statistically significant at $P < .01$

EDE-Q Eating disorders examination questionnaire; *EDI-II* Eating disorders inventory-2; *BIAQ* Body image avoidance questionnaire; *BCQ* Body checking questionnaire; *BMI* Body mass index (kg/m)

Table 2 Mean QOL scores among participants with more frequent and less frequent episodes of binge eating/overeating

Binge eating/overeating episode	≥2 episodes per month ($n = 103$)	<2 episodes per month ($n = 109$)	t	d
SF-36 PCS				
Objective bulimic episodes	61.88	57.87	2.90**	.46
Subjective bulimic episodes	61.54	58.65	2.06*	.33
Overeating episodes	61.71	59.39	1.78	.28
SF-36 MCS				
Objective bulimic episodes	52.12	44.91	4.67**	.80
Subjective bulimic episodes	52.81	46.14	3.64**	.58
Overeating episodes	50.83	50.32	0.35	.06

* $P < .05$, ** $P < .01$

criterion variables. As a preliminary step, we conducted a principal components analysis (PCA) with varimax rotation on the predictor variables, namely the EDE-Q, Eating Restraint, Eating Concern, Shape Concern, and Weight Concern, the subscales of the EDI-II (Drive for Thinness, Bulimia, Body Dissatisfaction, Ineffectiveness, Perfectionism, Interpersonal Distrust, Interoceptive Awareness, Maturity, Ascetism, Impulsivity, and Social Insecurity), and the BIAQ, BSQ, BCQ, BDI, and BSI. We conducted the PCA for two related reasons: (1) to reduce the number of predictor variables given that many of the variables measured overlapping constructs and (2) to create non-correlated composite predictor variables to strengthen the outcome of regression analysis and eliminate the issue of multicollinearity, thus increasing "scientific parsimony" [42]. Based on an examination of the scree plot, we chose to retain two factors that accounted for 68.2% of the variance in the data from all the questionnaires. Factor 1 accounted for 56.2% of the variance and included all subscales of the EDE-Q: Eating Restraint, Eating Concern, Shape Concern, and Weight Concern, subscales on the EDI-II: Drive for Thinness, Bulimia, Body Dissatisfaction, and the BSQ, BIAQ, and the BCQ. Factor 1 was labeled Eating Disorder Psychopathology. Factor 2 accounted for an additional 12.0% of the variance and included the BDI, BSI and subscales of the EDI-II: Ineffectiveness, Perfectionism, Interpersonal Distrust, Interoceptive Awareness, Maturity Fears, Asceticism, Impulse Regulation, and Social Insecurity. This factor was labeled General Psychopathology. We then used factor scores (based on the regression method) for the two factors as predictors in the regressions.

The results of the regression, shown in Table 3, demonstrate the unique contribution of each predictor in accounting for variance in the QOL physical and mental health component summary measures. Eating disorder

Table 3 Regression analyses predicting quality of life from general and eating disorder psychopathology

	Adjusted R^2	Beta	F
SF-36 PCS	.22		
Eating disorder psychopathology		−.29**	30.04**
General psychopathology		−.38**	
SF-36 MCS	.58		
Eating disorder psychopathology		−.29*	141.55**
General psychopathology		−.70**	

* $P < .05$, ** $P < .01$

psychopathology accounted for 8% of the explained variance in PCS, and general psychopathology accounted for 14%. Eating disorder psychopathology accounted for 8% of the explained variance in MCS, and general psychopathology accounted for 50% of the variance. Adding BMI as an additional predictor in these analyses did not alter the significance of the two other predictors, eating psychopathology and general psychopathology, which remained significant. However, BMI was a significant additional predictor of PCS ($\beta = .23$, $P < .05$), but not of MCS.

Discussion

The present study demonstrated that among a community sample, eating disorder psychopathology is associated with reduced QOL. This association was above and beyond that attributable to general psychopathology. These findings suggest that community individuals who experience eating concerns may show impairment in both the physical and mental health aspects of QOL. The results are consistent with previous findings that individuals with eating disturbances had impaired QOL [14, 15, 23, 43, 44] Hay [14] found that individuals with disordered eating behaviors, especially binge eating and bulimic symptoms, had significantly compromised QOL. Individuals with bulimia nervosa or binge eating disorder also showed impairment on measures of QOL [14, 18].

The relationship between general psychopathology and QOL, and its worsening when eating disorder symptoms are present, is also consistent with prior research. De la Rie et al. [11] found that patients with eating disorders were more impaired on "almost all SF-36 subscales" when compared to patients with mood disorders (p. 1315). Their study suggested that whereas mood disorders have a considerable negative impact on QOL, eating disorders seem to show a significantly higher rate of impairment. Researchers investigating the impact of mood disorders on QOL have found that individuals with major depression used health services more often and reported poorer functioning in everyday activities [6, 45]. In addition,

researchers investigating QOL in individuals with anxiety disorders such as social phobia [46], obsessive–compulsive disorder [47], and substance- and alcohol-related disorders [48–50] have found that these disorders, which are often co-morbid with eating disorders, are linked with impairment in QOL. These findings suggest that those with mood or anxiety disturbances will likely be more impaired if co-morbid eating psychopathology is present.

Objective bulimic episodes were associated with impairment in QOL. In addition, the frequent experience of a loss of control over eating in the absence of eating large amounts of food (SBE) was associated with an increased impairment in both mental and physical QOL. In contrast, eating a large amount of food in the absence of loss of control (OO) was not associated with QOL impairment. This finding suggests that the loss of control over eating, to a greater degree than the amount of food consumed, have an important relationship with QOL. The importance of loss of control while eating has also been suggested by previous research showing that SBEs are associated with impairment in QOL and strongly correlated with other eating disturbances and general psychopathology [51, 52]. The present findings on SBEs, along with previous research suggesting that SBEs have a similar impact to OBEs, suggest that these episodes require careful assessment and attention in the prevention and treatment of eating disorders.

BMI accounted for a small yet significant component of the variance in PCS. However, the relationship between BMI and impairment in MCS was found to be not significant. This result supports the findings of some researchers investigating BMI and QOL, in that physical health is more impaired than mental health in those with high body weight [53, 54].

The present study had several limitations, the most significant being that the data were correlational. Thus, we cannot make causal inferences about the direction of the relationship between disordered eating and QOL. Although we believe it likely that reduced QOL is at least partly a result of the disordered eating, it is also possible that the opposite relationship holds, or that other unmeasured variables influence both eating behavior and QOL. Related to this, there is some potential overlap between the measures of QOL and of general psychopathology, especially the BDI. The association between these measures could indicate not only the impact of depressive symptoms on QOL but also the lack of complete distinction between these measures' underlying constructs.

Another limitation of this research relates to the subjective nature of self-reported quality of life, which may be influenced or distorted by medication, motivation for change, and cognitive and emotional perspective. For example, individuals with eating disturbances (such as anorexia nervosa) may lack insight into the impact their illness may have on QOL [55]. However, the effects of such bias are likely to be minor in the current study, which used a nonclinical sample. In addition, the use of self-report questionnaires may result in different conclusions about eating behaviors than the use of clinical interviews [56, 57]. Future research should utilize interview procedures and more objective methods to assess both eating disturbances and QOL. Finally, the generalizability of the data may be limited by the sample's self-selected nature and by its combination of community members and students. These samples did differ in some ways; however, the lack of significant differences between these samples on most variables led to the decision to combine the participants for the main analyses.

This research has demonstrated that eating disorder psychopathology is associated with significant impairment in both physical and mental QOL. These findings highlight the adverse effects that eating disorder psychopathology may have on women in a nonclinical, community setting. Subclinical eating disturbances are less often the focus of research or clinical attention; however, these disturbances may negatively affect the physical, psychological, social, and environmental aspects of women's lives. As prior research has suggested, when an eating disorder develops into a chronic condition, the associated impairments and disabilities can have a major impact on the patient's life that often persists over the long term [11, 16]. The correlation between eating disturbances and quality of life suggests that within clinical settings, it may be important to go beyond the treatment of specific eating disorder symptomotology and also attend to the broader, lasting consequences of the disorder on patients' general functioning and quality of life. For example, it has been recommended that the cognitive-behavioral treatment for eating disorders should also focus on broad impairments such as interpersonal difficulties, core low self-esteem, and mood disturbances [58]. The present results from a nonclinical sample suggest the need for early intervention and detection of eating disturbance and body image dissatisfaction to protect individuals with mild eating disorder symptoms from a further reduction in QOL.

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