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## Review article

## Quality of life in eating disorders: A meta-analysis



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## ARTICLE INFO

## Article history:

Received 10 June 2013

Received in revised form

1 May 2014

Accepted 3 May 2014

Available online 14 May 2014

## Keywords:

Anorexia nervosa

Binge eating disorder

Bulimia nervosa

Eating disorder not otherwise specified

Quality of life

Short-form 36

## ABSTRACT

Eating disorders (EDs) comprise a variety of symptoms and have a profound impact on everyday life. They are associated with high morbidity and mortality. The objective of this study was to analyse published data on health-related quality of life (HRQoL) in EDs so as to compare the results to general population norm data and to investigate potential differences between ED diagnostic groups. A systematic review of the current literature was conducted using a keyword-based search in PubMed and PsychInfo. The search covered anorexia nervosa (AN), bulimia nervosa (BN), eating disorders not otherwise specified (EDNOS) and binge eating disorder (BED) and used the Medical Outcomes Study Short Form-36 Health Survey (SF-36) as a measure of HRQoL. Of the 102 citations identified, 85 abstracts were reviewed and seven studies were included in the meta-analysis. AN patients were included in five studies ( $n=227$ ), BN in four studies ( $n=216$ ), EDNOS in two studies ( $n=166$ ) and BED in four studies ( $n=148$ ). We tested for between-study variation and significant differences between the diagnostic groups. The results confirmed a significantly lower level of HRQoL in all EDs compared to a population mean. It was not possible to establish any differences between the diagnostic groups.

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## 1. Introduction

An eating disorder (ED) is characterized by an abnormal eating behaviour with either insufficient or excessive food intake, accompanied by feelings of distress or concern about weight or body shape, sometimes in combination with compensatory behaviour, to the detriment of the person's physical health. Anorexia nervosa (AN), bulimia nervosa (BN) and eating disorder not otherwise specified (EDNOS) are well-known diagnoses that are described in the Diagnostic and Statistical manual of Mental disorders (DSM-IV) (Association, 2000). AN is characterized by an inadequate intake of nutrition and an inability to maintain a minimum stable, healthy weight. BN is characterized by recurrent episodes of binge eating followed by compensatory behaviour. Patients with symptoms of an ED not meeting the diagnostic criteria of AN or BN are diagnosed with EDNOS, which constitutes the most common group of EDs with approximately half of patients diagnosed with an ED receiving this diagnosis (Button et al., 2005). The diagnostic group is highly heterogeneous and included patients with binge eating disorder (BED) prior to the publication of the DSM-5. (Hay et al., 2010).

The DSM-5 (Association, 2013), a revised edition of DSM-IV, was published in May 2013 and included BED as an autonomous diagnosis. In DSM-IV this diagnosis only appeared in the appendix (Moran, 2012). BED is defined by recurrent episodes of binge eating accompanied by a sense of loss of control.

Less than half of the patients suffering from AN recover and approximately one-fifth will develop a chronic course (Steinhausen, 2002). A meta-analysis published in 2011 (Arcelus et al., 2011) revealed an approximate six-fold increase in mortality compared to the general population with a standardized mortality ratio of 5.9, which equals the highest mortality of any psychosomatic disorder (Erdur et al., 2012). Patients with an ED also have a high occurrence of relapse (30–50%) (Guarda, 2008). There is no evidence that the prognosis has improved throughout the 20th century (Steinhausen, 2002).

EDs comprise a variety of symptoms that severely impair physical, mental and social aspects of everyday life. The term Global Burden of Disease (GBD) was introduced in 1990 after an extensive collaboration between health experts with the aim to assess the mortality and disability in major diseases. The study introduced the term disability adjusted life years (DALY), which combines mortality and morbidity into one single measure by summing up the years of life lost (YLL) and the years lived with disability (YLD). In 2000, EDs were ranked as number 15 in the “top 20” disorders for women, ahead of for instance psychoses and rheumatoid arthritis (Ware and Sherbourne, 1992; Public Health Division, 1999). In 1999, the number of DALYs was found to be similar for EDs and schizophrenia in women (Ware et al., 1993).

Studies have shown that patients with EDs present lower health-related quality of life (HRQoL) compared to other psychiatric disorders, including severe depression and compared to the general population (de la Rie et al., 2005). It is unclear whether there are differences between the ED diagnostic groups, although a recent review found that patients with BED tended to report the lowest HRQoL (Jenkins et al., 2011). These differences have not, to our knowledge, been explored further.

The classification of EDs remains controversial (Hebebrand and Bulik, 2011) and several changes have been made in the DSM-5 with the introduction of new diagnoses and changes in the existing criteria. Potential differences in HRQoL could assist in classifying EDs and highlight the importance of establishing specific treatment options for each ED.

The aim of this meta-analysis was to explore the differences in HRQoL between AN, BN, EDNOS and BED, measured by the Medical Outcomes Study Short Form-36 Health Survey (SF-36).

To our knowledge, no previous attempts have been made to pool the results of the existing research in this area.

## 2. Methods

### 2.1. Search strategy

A systematic review of the current literature was conducted using a keyword-based search in the databases PubMed and PsychInfo using the following terms: anorexia or bulimia or EDNOS or eating disorders OR binge eating AND quality of life OR QoL AND SF-36. Studies not in English and intervention studies without baseline values were excluded. We did not exclude studies based on publishing year or define an age restrictions. The search was conducted on May 15th 2012 and repeated on June 13th 2012. The authors discussed and evaluated the process on a regular basis.

Prior to limiting the search to the generic questionnaire SF-36, a literature search was performed on two disease-specific questionnaires (the Eating Disorders Quality of Life scale (EDQoL) (Adair et al., 2010) and the Health Related Quality of Life Eating Disorders questionnaire (HRQoL) (Las Hayas et al., 2006)), but was discarded due to an insufficient number of studies to be able to perform a meta-analysis.

### 2.2. Selection procedure

Using the search terms, 102 citations were identified as potentially eligible (54 studies from PsychInfo and 48 studies from PubMed), see Fig. 1. Seventeen duplicates were removed and a further 53 abstracts were rejected because the study did not include patients with an ED or lacked HRQoL measurement. Of the 32 articles retrieved for more detailed evaluation, 24 were excluded because they repeated the same population as articles already included ( $n=2$ ), did not differentiate the ED diagnostic groups ( $n=2$ ) or included patients without an ED diagnosis ( $n=5$ ), did not use the SF-36 ( $n=10$ ) or did not report the raw scores for the SF-36 subscales ( $n=5$ ). The authors of three studies that only included summarized SF-36 scores were contacted in the purpose of obtaining the raw scores, but unsuccessful. Finally, one review article was excluded after examining the reference list to check for further eligible studies.

This reduced the final number of articles for examination to seven. The first author carried out the identification of studies, data extraction and assessment.

### 2.3. Instruments

We limited the analysis to studies using SF-36. SF-36 is a validated (Ware and Sherbourne, 1992), generic, self-report questionnaire used to assess health-related HRQoL. It is a widely used generic questionnaire when assessing HRQoL in EDs and a large US study found high internal consistency reliability coefficients for all subscales ( $> 0.8$ ) (Leung et al., 2013). The SF-36 consists of eight subscales that assess physical functioning (PF), role limitations due to physical health problems (RP), bodily pain (BP), general health perception (GHP), vitality (VT), social functioning (SF), role limitations due to emotional problems (RE) and general mental health (MH). The sum for each subscale is transformed into a 0–100 scale with higher scores indicating better HRQoL. The scores can be transformed into  $t$ -scores and summarized into a physical component summary (PCS) score and a mental component summary (MCS) score.

We compared data from the included studies to a US population norm ( $n=2474$ ) published by the questionnaire authors (Ware et al., 1993). Included studies originate from the UK, US, Netherlands and Spain which are all industrialized countries with comparable demographics.

### 2.4. Analysis

The SF-36 subscale data from the seven studies were pooled. Effect sizes (mean scores) from the included studies were used in the meta-analysis. For each of the four ED groups, and for the ED group as a whole, the mean scores and standard deviations for each of the eight subscales were combined to estimate a single mean score with confidence intervals (CI). We tested for heterogeneity by testing if between-trial variance was equal to 0. In all eight subscales the variance was not significantly different from 0 (Table 2) and therefore no heterogeneity was to be found in the included trials. This implied that the true value did not differ in the included study cohorts. The variation between the trials was therefore no bigger than expected by chance and the metaregression could be done in a fixed effect model. This meta-analysis has low power, which might hide the differences in scores, but due to the low power we were not able to determine this variation. To strengthen the fact that we found no significant differences we performed a meta-regression analysis and found insignificant differences.

This was done using the procedure Proc Mixed from the statistical analysis software (SAS) version 9.2. This procedure is capable of estimating both fixed and

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