



# Health related quality of life, physical fitness and physical activity participation in treatment-seeking obese persons with and without binge eating disorder



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## ABSTRACT

This study compared the mental and physical health related quality of life (HRQL) of 40 obese persons with BED with 20 age, gender and body mass index (BMI) matched obese persons without BED and 40 age and gender matched non-obese volunteers. Variables contributing to the variability in HRQL were identified. Participants were asked to fill in the MOS 36-item Short Form Health Survey (SF-36), the Symptoms Checklist-90 (SCL-90), the Baecke questionnaire, the bulimia subscale of the Eating Disorder Inventory and the Body Attitude Test. All participants also performed a 6-minute walk test (6MWT). BED patients showed a significant impaired physical and mental HRQL compared with obese and non-obese control groups. In the BED-group female participants showed a significantly more impaired mental HRQL than male participants ( $40.0 \pm 21.2$  versus  $66.6 \pm 10.1$ ). The distance achieved on the 6MWT ( $512.1 \pm 75.8$  m) explained 22.5% of the variability in physical HRQL in the obese BED-group while gender and the SCL-90 depression score ( $39.1 \pm 12.2$ ) explained 47.1% of the variability in mental HRQL. The present findings suggest that the treatment of obese individuals with BED might benefit by giving more attention to HRQL, depressive symptoms and physical fitness.

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## 1. Introduction

Binge eating disorder (BED) is characterised by frequent and persistent episodes of binge eating accompanied by feelings of loss of control and marked distress in the absence of regular compensatory behaviours (American Psychiatric Association, 2013). Furthermore, binge eating episodes are associated with three or more of the following: (a) eating much more rapidly than normal, (b) eating until uncomfortably full, (c) eating large amounts of foods when not feeling physically hungry, (d) eating alone because of being embarrassed by how much one is eating, and (e) feeling disgusted with oneself, depressed, or very guilty after overeating. Epidemiological studies have shown BED to be the most common eating disorder, with a lifetime prevalence of 3.5% among women and 2.0% among men (Hudson et al., 2007).

BED is associated with specific psychiatric co-morbidity and significant medical and psychosocial impairments (Fontenelle

et al., 2003; Javaras et al., 2008). Patients with BED also report worse health-related quality of life (HRQL) compared with available general population norms (Masheb and Grilo, 2004). Research in BED has identified a positive association between obesity and depression with mental and physical HRQL (Marchesini et al., 2000, 2003; de Zwaan et al., 2002; Masheb and Grilo, 2004; Kolotkin et al., 2004; Rieger et al., 2005; Grenon et al., 2010). BED patients who report extreme weight and shape concerns have significantly higher levels of severe HRQL impairment compared to those who do not report such concerns (Hrabosky et al., 2007a; Mond et al., 2007a, 2007b; Grilo et al., 2009a, 2009b).

Previous research (Hulens et al., 2002) has demonstrated that a limited physical fitness and a sedentary lifestyle impair HRQL in obese persons. Patients with BED are known to have a reduced physical fitness (Vancampfort et al., 2009) and to be sedentary (Levine et al., 1996; Sherwood et al., 1999; Hrabosky et al., 2007b), however, this literature has not identified if these parameters are also associated with HRQL impairment in individuals with BED.

The aim of the present study therefore was to identify if next to eating disorder related and psychopathological symptoms, physical fitness and a sedentary lifestyle could explain the variability in mental and physical HRQL in individuals with BED.

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## 2. Methods

### 2.1. Participants and procedure

All obese persons with BED seeking treatment to a weekly multidisciplinary programme at the KU Leuven Department of Neurosciences and the UPC KU Leuven, campus Kortenberg, Belgium (Vanderlinden et al., 2012) were asked to participate at their first treatment session.

Obese patients with BED were compared with age, gender and body mass index (BMI) matched obese treatment-seeking patients without BED. This obese control group without BED were all persons seeking treatment for obesity at the KU Leuven, campus Gasthuisberg, Leuven, Belgium. The obese controls were asked to participate at intake.

Secondly, we also included age and gender matched non-obese controls. The non-obese control group were employees of the hospitals or friends or relatives of the research assistants who volunteered to participate.

Group stratification was based on BMI, age and gender for the treatment-seeking obese controls. For the non-obese controls this stratification was based on age and gender. Stratification on group-level was performed by an independent statistician blinded to the results of the physical and mental health outcomes.

### 2.2. Eligibility criteria

Only obese (BMI > 30) participants meeting the DSM-IV criteria for BED (American Psychiatric Association, 1994) were included. Diagnosis was made by a psychiatrist using the Structured Clinical Interview for DSM-IV Disorders (SCID). Patients with a severe current psychiatric condition that required residential psychiatric treatment in addition to the weekly multidisciplinary BED programme were excluded.

Obese control persons were excluded if they had a DSM-IV diagnosis for BED. Somatic exclusion criteria for all participants included significant cardiovascular, neuromuscular and endocrine disorders. By identifying these disorders we were able to ensure safe participation for exercise testing (Donnelly et al., 2009; American Thoracic Society, 2002). A history of anorexia or bulimia nervosa was no exclusion criterion for any of the groups.

### 2.3. Data collection and ethics

Data was collected between October 2007 and October 2012. The study procedure was approved by the Scientific and Ethical Committees of the participating centres. All participants gave their written informed consent.

### 2.4. Health related quality of life: the MOS 36-item Short Form Health Survey (SF-36)

The SF-36 quality of life questionnaire (Ware et al., 1993) has demonstrated high levels of reliability and validity (Karlsen et al., 2011). It examines eight different items of functioning: physical functioning, role limitations due to physical problems, energy/vitality, bodily pain, social functioning, and role limitations due to emotional problems, mental health and general health. Scores range from zero to 100, with higher scores indicating a better health state. The four sub-domains: physical functioning, role limitations due to physical problems, bodily pain and general health are summarised into a physical component score (PCS), whereas the four sub-domains: energy/vitality, social functioning, role limitations due to emotional problems and mental health constitute a mental component score (MCS). The SF-36 has been used previously in BED patients (Masheb and Grilo, 2004). The Cronbach's  $\alpha$  of the SF-36 scales ranged from 0.82 (general health) to 0.92 (physical functioning).

### 2.5. Physical fitness: the 6-minute walk test (6MWT)

The 6MWT was performed according to the American Thoracic Society guidelines (2002) in an indoor corridor with a minimum of external stimuli. Two cones, 25 m apart, indicated the length of the walkway. Participants were instructed to walk back and forth around the cones during six minutes, without running or jogging. Resting was allowed if necessary, but walking was to be resumed as soon as the participants were able to do so. The protocol stated that the testing was to be interrupted if threatening physiological symptoms (chest pain, intolerable dyspnoea, leg cramps, staggering, diaphoresis, and pale or ashen appearance) appeared. The total distance walked in six minutes was recorded to the nearest decimetre and performed by one trained physiotherapist. Standardised encouragements were provided at recommended intervals. Patients were requested to refrain from eating, drinking coffee or smoking during a two-hour period prior to the tests. Prior to the 6MWT, persons were also asked for conditions that might interfere with their functional exercise capacity. They were asked whether they suffered intermittently from friction of the skin, urinary stress incontinence, known hip problems or pain, foot or ankle static problems or pain. Furthermore, they were

asked to rate on a Likert scale (never, seldom, sometimes, frequently or always) if they suffered from knee or low back pain. Directly after the first test, physical complaints or discomforts were recorded. The 6MWT has been shown to be a reliable and valid test to assess the physical fitness of obese patients (Larsson and Rejnisdottir, 2008; Beriault et al., 2009).

### 2.6. Physical activity: Baecke Physical Activity Questionnaire

The 12-month recall Baecke Physical Activity Questionnaire (Baecke et al., 1982) consists of 16 questions organised in three sections: at work (eight items), sport during leisure time (four items), and during leisure excluding sport (four items). Questions in each section are scored on a five point Likert scale (never, seldom, sometimes, often, always). The two most frequently reported sports activities are explored in additional questions about the number of months per year and hours per week of participation. The three derived indices (work, sports, and leisure), are scored in units ranging from one to five. In the current study we used the total Baecke score. The measure has demonstrated adequate validity (Westerterp, 1999) and reliability (Pereira et al., 1997). The Cronbach's  $\alpha$  value of the total score in the current study was 0.73.

### 2.7. Bulimia: Eating Disorder Inventory (EDI) subscale

The EDI (Garner et al., 1993) is a widely used 64-item questionnaire aimed at assessing the psychological characteristics, eating related attitudes and traits of eating disorders. Participants are asked to respond to a 6-point forced-choice format by rating how much the item applied to them. Options range from 'always' to 'never'. The most extreme eating disorder response earns a score of 3, the intermediate response scores 2, and the next response scores 1; the other three responses receive no score. We only included the bulimia subscale which consists of 7 items. The total score ranges from 0 to 21. A higher total score indicates more severe bulimia pathology. Previous research demonstrated that the EDI can be used reliably for those with BED (Tasca et al., 2003). In the current study, the Cronbach's  $\alpha$  value for the bulimia subscale was 0.81.

### 2.8. Body Attitude Test (BAT)

The BAT (Probst et al., 1995) consists of 20 items to be scored on a 6-point scale ranging from 0 (never) to 5 (always). The BAT is intended to measure the subjective body experience and the attitude towards one's body. The maximum score is 100 and the higher the score, the more deviating the body experience is. We only used the total score. The measure has demonstrated adequate validity and reliability (Carano et al., 2006), with a Cronbach's  $\alpha$  of 0.82 in our sample.

### 2.9. Symptom checklist-90 (SCL-90)

The SCL-90 (Derogatis, 1983) assesses several psychopathological complaints and was offered in a Dutch translation (Arrindell and Ettema, 1986). It is composed of 90 items, which might be answered according to a 5-point scale, graded from 0 to 4, from 'none' to 'extremely'. The scale evaluates, besides a total general psychoneuroticism score, eight primary domains of symptoms: agoraphobia, anxiety, depression, somatization, cognitive-performance deficits, interpersonal sensitivity and mistrust, acting-out hostility and sleep difficulties. A higher total score indicates higher psychopathology. The SCL-90 demonstrated good internal consistency and validity data for obese treatment-seeking patients (Ransom et al., 2010). The Cronbach's  $\alpha$  of the SCL-90 scales ranged from 0.74 (acting-out hostility) to 0.89 (depression).

### 2.10. Anthropometric data

Body weight was measured in light clothing to the nearest 0.1 kg using a SECA beam balance scale, and height to the nearest 0.1 cm using a wall-mounted stadiometre.

### 2.11. Statistical analysis

Descriptive statistics were undertaken and included the mean  $\pm$  SD for each variable and one-way frequency tables for the physical symptoms that might interfere with the functional exercise capacity and for the physical complaints after the walk test. The Kolmogorov-Smirnov test was used to assess the normal distribution of the data. Analyses of variances (ANOVA) with post-hoc Scheffe was applied to assess the differences in variables between the BED group and obese and healthy control participants. Differences in the presence of physical complaints were assessed using the Fisher's Exact test. Relationships between variables within the BED group were calculated using the Pearson or Spearman Rho correlation coefficient when appropriate.

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